

SECTION 00410

APPROVED BID BOND

(Construction)

STATE OF FLORIDA

KNOW ALL MEN BY THESE PRESENTS:

The Guarantee Company of North America USA

That we Best Roofing Services, LLC, as Principal, and, as Surety, are

held and firmly bound unto the City of Hollywood in the sum of

Ten Percent of the Amount Bid Dollars (\$ 10% of the Amount Bid) lawful

money of the United States, amounting to 10% of the total Bid Price, for the payment of said sum, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal has submitted the accompanying bid, dated February 1st, 2018 for

CITY OF HOLLYWOOD, FLORIDA
METER SHOP ROOF REPLACEMENT PROJECT
PROJECT NO. 17-2142

NOW, THEREFORE, if the principal shall not withdraw said bid within 90 days after date of the same and shall within ten days after the prescribed forms are presented to him for signature, enter into a written contract with the CITY, in accordance with the bid as accepted, and give bond with good and sufficient surety or sureties, and provide the necessary Insurance Certificates as may be required for the faithful performance and proper fulfillment of such Contract, then this obligation shall be null and void.

Approved Bid Bond

In the event of the withdrawal of said bid within the specified period, or the failure to enter into such contract and give such bond and insurance within the specified time, the principal and the surety shall pay to the City of Hollywood the difference between the amount specified in said bid and such larger amount for which the City of Hollywood may in good faith contract with another party to perform the work and/or supply the materials covered by said bid.

IN WITNESS WHEREOF, the above bound parties have executed this statement under their several seals this _____ 1st
day of _____ February _____, 20 18, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

WHEN THE PRINCIPAL IS AN INDIVIDUAL:

Signed, sealed and delivered in the presence of:

Witness

Signature of Individual

Address

Printed Name of Individual

Witness

Address

Approved Bid Bond

WHEN THE PRINCIPAL IS A CORPORATION:

Attest:

DALE E. EBY
Secretary

Best Roofing Services, LLC

Name of Corporation

1600 N.E. 12th Terrace

Business Address

Fort Lauderdale, FL 33305

By: [Signature]

(Affix Corporate Seal)

Don Youker

Printed Name

Vice President

Official Title

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, DALE E. EBY, certify that I am the secretary of the Corporation named as Principal in the attached bond; that DON YOUKER who signed the said bond on behalf of the Principal, was then Vice President of said Corporation; that I know his signature, and his signature thereto is genuine and that said bond was duly signed, sealed and attested for and on behalf of said Corporation by authority of its governing body.

DALE E. EBY (SEAL)
Secretary

Approved Bid Bond

TO BE EXECUTED BY CORPORATE SURETY:

Attest: As Per Attached Power of Attorney

Secretary

The Guarantee Company of North America USA
Corporate Surety
One Towne Square, Suite 1470
Business Address
Southfield, MI 48076 - 3725
BY: [Signature]
(Affix Corporate Seal)

David T. Satine
Attorney-in-Fact
Alter Surety Group, Inc.
Name of Local Agency
5979 NW 151st Street, #202
Business Address
Miami Lakes, FL 33014

STATE OF FLORIDA

Before me, a Notary Public, duly commissioned, qualified and acting, personally appeared, _____
David T. Satine to me well known, who being by me first duly sworn upon oath
says that he is the attorney-in-fact for the The Guarantee Company of North America USA and
that he has been authorized by The Guarantee Company of North America USA to execute the foregoing bond
on behalf of the CONTRACTOR named therein in favor of the City of Hollywood, Florida.
Subscribed and sworn to before me this 1st day of February 2018

[Signature]
Notary Public, State of Florida
Karol Kelly
Notary Public State of Florida
Karol Kelly
My Commission FF 164600
Expires 09/30/2018

My Commission Expires: September 30th, 2018

-END OF SECTION-



THE GUARANTEE COMPANY OF NORTH AMERICA USA

Southfield, Michigan

POWER OF ATTORNEY

KNOW ALL BY THESE PRESENTS: That THE GUARANTEE COMPANY OF NORTH AMERICA USA, a corporation organized and existing under the laws of the State of Michigan, having its principal office in Southfield, Michigan, does hereby constitute and appoint

Warren M. Alter, David T. Satine
Alter Surety Group, Inc.

its true and lawful attorney(s)-in-fact to execute, seal and deliver for and on its behalf as surety, any and all bonds and undertakings, contracts of indemnity and other writings obligatory in the nature thereof, which are or may be allowed, required or permitted by law, statute, rule, regulation, contract or otherwise.

The execution of such instrument(s) in pursuance of these presents, shall be as binding upon THE GUARANTEE COMPANY OF NORTH AMERICA USA as fully and amply, to all intents and purposes, as if the same had been duly executed and acknowledged by its regularly elected officers at the principal office.

The Power of Attorney is executed and may be certified so, and may be revoked, pursuant to and by authority of Article IX, Section 9.03 of the By-Laws adopted by the Board of Directors of THE GUARANTEE COMPANY OF NORTH AMERICA USA at a meeting held on the 31st day of December, 2003. The President, or any Vice President, acting with any Secretary or Assistant Secretary, shall have power and authority:

1. To appoint Attorney(s)-in-fact, and to authorize them to execute on behalf of the Company, and attach the Seal of the Company thereto, bonds and undertakings, contracts of indemnity and other writings obligatory in the nature thereof; and
2. To revoke, at any time, any such Attorney-in-fact and revoke the authority given, except as provided below
3. In connection with obligations in favor of the Florida Department of Transportation only, it is agreed that the power and authority hereby given to the Attorney-in-Fact includes any and all consents for the release of retained percentages and/or final estimates on engineering and construction contracts required by the State of Florida Department of Transportation. It is fully understood that consenting to the State of Florida Department of Transportation making payment of the final estimate to the Contractor and/or its assignee, shall not relieve this surety company of any of its obligations under its bond.
4. In connection with obligations in favor of the Kentucky Department of Highways only, it is agreed that the power and authority hereby given to the Attorney-in-Fact cannot be modified or revoked unless prior written personal notice of such intent has been given to the Commissioner -- Department of Highways of the Commonwealth of Kentucky at least thirty (30) days prior to the modification or revocation.

Further, this Power of Attorney is signed and sealed by facsimile pursuant to resolution of the Board of Directors of the Company adopted at a meeting duly called and held on the 6th day of December 2011, of which the following is a true excerpt:

RESOLVED that the signature of any authorized officer and the seal of the Company may be affixed by facsimile to any Power of Attorney or certification thereof authorizing the execution and delivery of any bond, undertaking, contracts of indemnity and other writings obligatory in the nature thereof, and such signature and seal when so used shall have the same force and effect as though manually affixed.



IN WITNESS WHEREOF, THE GUARANTEE COMPANY OF NORTH AMERICA USA has caused this instrument to be signed and its corporate seal to be affixed by its authorized officer, this 23rd day of February, 2012.

THE GUARANTEE COMPANY OF NORTH AMERICA USA

Stephen C. Ruschak

Randall Musselman

STATE OF MICHIGAN
County of Oakland

Stephen C. Ruschak, Vice President

Randall Musselman, Secretary

On this 23rd day of February, 2012 before me came the individuals who executed the preceding instrument, to me personally known, and being by me duly sworn, said that each is the herein described and authorized officer of The Guarantee Company of North America USA; that the seal affixed to said instrument is the Corporate Seal of said Company; that the Corporate Seal and each signature were duly affixed by order of the Board of Directors of



Cynthia A. Takai
Notary Public, State of Michigan
County of Oakland
My Commission Expires February 27, 2018
Acting in Oakland County

IN WITNESS WHEREOF, I have hereunto set my hand at The Guarantee Company of North America USA offices the day and year above written.

Cynthia A. Takai

I, Randall Musselman, Secretary of THE GUARANTEE COMPANY OF NORTH AMERICA USA, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney executed by THE GUARANTEE COMPANY OF NORTH AMERICA USA, which is still in full force and effect.



IN WITNESS WHEREOF, I have thereunto set my hand and attached the seal of said Company this 1st day of February, 2018

Randall Musselman

Randall Musselman, Secretary



STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD
2601 BLAIR STONE ROAD
TALLAHASSEE FL 32399-0783

(850) 487-1395

WALLICK, ZACHARY G
BEST ROOFING SERVICES LLC
1600 NE 12TH TERRACE
FORT LAUDERDALE FL 33305

Congratulations! With this license you become one of the nearly one million Floridians licensed by the Department of Business and Professional Regulation. Our professionals and businesses range from architects to yacht brokers, from boxers to barbeque restaurants, and they keep Florida's economy strong.

Every day we work to improve the way we do business in order to serve you better. For information about our services, please log onto www.myfloridalicense.com. There you can find more information about our divisions and the regulations that impact you, subscribe to department newsletters and learn more about the Department's initiatives.

Our mission at the Department is: License Efficiently, Regulate Fairly. We constantly strive to serve you better so that you can serve your customers. Thank you for doing business in Florida, and congratulations on your new license!



STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND
PROFESSIONAL REGULATION

CCC1329779

ISSUED: 07/07/2016

CERTIFIED ROOFING CONTRACTOR
WALLICK, ZACHARY G
BEST ROOFING SERVICES LLC

IS CERTIFIED under the provisions of Ch.489 FS.
Expiration date AUG 31, 2018 L1607070000806

DETACH HERE

RICK SCOTT, GOVERNOR

KEN LAWSON, SECRETARY

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
CONSTRUCTION INDUSTRY LICENSING BOARD

LICENSE NUMBER

CCC1329779

The ROOFING CONTRACTOR
Named below IS CERTIFIED
Under the provisions of Chapter 489 FS.
Expiration date: AUG 31, 2018



WALLICK, ZACHARY G
BEST ROOFING SERVICES LLC
1600 NE 12TH TERRACE
FORT LAUDERDALE FL 33305



ISSUED: 07/07/2016

DISPLAY AS REQUIRED BY LAW

SEQ # L1607070000806

BROWARD COUNTY LOCAL BUSINESS TAX RECEIPT

115 S. Andrews Ave., Rm. A-100, Ft. Lauderdale, FL 33301-1895 - 954-831-4000
VALID OCTOBER 1, 2017 THROUGH SEPTEMBER 30, 2018

DBA: BEST ROOFING
Business Name: BEST ROOFING SERVICES, LLC

Receipt #: 185-1950
Business Type: (ROOFING CONTR)

Owner Name: ZACHARY G. WALLICK
Business Location: 1600 NE 12 TER
FT LAUDERDALE
Business Phone:

Business Opened: 07/12/2001
State/County/Cert/Reg: CCC1329779
Exemption Code:

Rooms Seats Employees Machines Professionals
100

Number of Machines:				For Vending Business Only			Vending Type:	
Tax Amount	Transfer Fee	NSF Fee	Penalty	Prior Years	Collection Cost	Total Paid		
150.00	0.00	0.00	0.00	0.00	0.00	150.00		

THIS RECEIPT MUST BE POSTED CONSPICUOUSLY IN YOUR PLACE OF BUSINESS

THIS BECOMES A TAX RECEIPT

WHEN VALIDATED

This tax is levied for the privilege of doing business within Broward County and is non-regulatory in nature. You must meet all County and/or Municipality planning and zoning requirements. This Business Tax Receipt must be transferred when the business is sold, business name has changed or you have moved the business location. This receipt does not indicate that the business is legal or that it is in compliance with State or local laws and regulations.

Mailing Address:

BEST ROOFING SERVICES, LLC
1600 NE 12 TER
FORT LAUDERDALE, FL 33305

Receipt # 02A-16-00005545
Paid 07/12/2017 150.00

2017 - 2018

SECTION 00300 – PROPOSAL

TO THE MAYOR AND COMMISSIONERS
CITY OF HOLLYWOOD, FLORIDA

SUBMITTED 2-1-18

Dear Mayor and Commissioners:

The undersigned, as BIDDER, hereby declares that the only person or persons interested in the Proposal as principal or principals is or are named herein and that no other person than herein mentioned has any interest in this Proposal or in the Contract to be entered into; that this Proposal is made without connection with any other person, company or parties making a Bid or Proposal; and that it is in all respects fair and in good faith without collusion or fraud.

The BIDDER further declares that he has examined the site of the Work and informed himself fully in regard to all conditions pertaining to the place where the Work is to be done; that he has examined the Drawings and Specifications for the Work and contractual documents relative thereto, including the Notice to Bidders, Instructions to Bidders, Proposal Bid Form, Form of Bid Bond, Form of Contract and Form of Performance Bond, General, Supplementary and Technical Specifications, Addenda, Drawings, and MBE/WBE Program, Exhibit A-D, and has read all of the Provisions furnished prior to the opening of bids; and that he has satisfied himself relative to the work to be performed.

The undersigned BIDDER has not divulged to, discussed or compared his bid with other bidders and has not colluded with any other BIDDER of parties to this bid whatever.

If this Proposal is accepted, the undersigned BIDDER proposes and agrees to enter into and execute the Contract with the City of Hollywood, Florida, in the form of Contract specified; of which this Proposal, Instructions to Bidders, General Specifications, Supplementary Conditions and Drawings shall be made a part for the performance of Work described therein; to furnish the necessary bond equal to one hundred (100) percent of the total Contract base bid, the said bond being in the form of a Cash Bond or Surety Bond prepared on the applicable approved bond form furnished by the CITY; to furnish all necessary materials, equipment, machinery, tools, apparatus, transportation, supervision, labor and all means necessary to construct and complete the work specified in the Proposal and Contract and called for in the Drawings and in the manner specified; to commence Work on the effective date established in the "Notice to Proceed" from the ENGINEER; and to substantially complete all Contract Work as per Project Schedule of Section 00800, and stated in the "Notice to Proceed" or pay liquidated damages for each calendar day in excess thereof, or such actual and consequential damages as may result therefrom, and to abide by the MBE/WBE Program.

The BIDDER acknowledges receipt of the following addenda:

No. 1 Dated 1-17-18

No. _____ Dated _____

No. _____ Dated _____

And the undersigned agrees that in case of failure on his part to execute the said Contract and the Bond within ten (10) days after being presented with the prescribed Contract forms, the check or Bid Bond accompanying his bid, and the money payable thereon, shall be paid into the funds of the City of Hollywood, Florida, otherwise, the check or Bid Bond accompanying this Proposal shall be returned to the undersigned.

Attached hereto is a certified check on the

_____ Bank of _____

or approved Bid Bond for the sum of

_____ Dollars (\$) according to the conditions under the Instructions to Bidders and provisions therein.

NOTE: If a Bidder is a corporation, the legal name of the corporation shall be set forth below, together with signature(s) of the officer or officers authorized to sign Contracts on behalf of the corporation and corporate seal; if Bidder is a partnership, the true name of the firm shall be set forth below with the signature(s) of the partner or partners authorized to sign Contracts in behalf of the partnership; and if the Bidder is an individual, his signature shall be placed below; if a partnership, the names of the general partners.

WHEN THE BIDDER IS AN INDIVIDUAL:

(Signature of Individual)

(Printed Name of Individual)

(Address)

WHEN THE BIDDER IS A SOLE PROPRIETORSHIP OR OPERATES UNDER A TRADE NAME:

(Name of Firm)

(Address)

_____(SEAL)
(Signature of Individual)

WHEN THE BIDDER IS A PARTNERSHIP:

(Name of Firm) A Partnership

(Address)

By: _____
(SEAL)
(Partner)

Name and Address of all Partners:

WHEN THE BIDDER IS A JOINT VENTURE:

(Correct Name of Corporation)

By: _____
(SEAL)
(Address)

(Official Title)

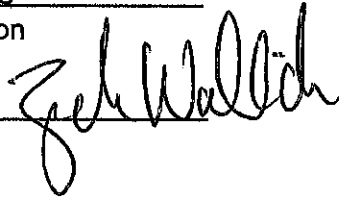
As Joint Venture
(Corporate Seal)

Organized under the laws of the State of _____, and authorized
by the law to make this bid and perform all Work and furnish materials and equipment
required under the Contract Documents.

WHEN THE BIDDER IS A CORPORATION:

Best Roofing Services LLC
(Correct Name of Corporation)

By: Zachary Wallick
(SEAL)



Senior Vice President
(Official Title)

1600 NE 12th Terr. Fort Lauderdale, FL 33305
(Address of Corporation)

Organized under the laws of the State of Florida, and authorized by the law to make this bid and perform all Work and furnish materials and equipment required under the Contract Documents.

CERTIFIED COPY OF RESOLUTION OF BOARD OF DIRECTORS

Best Roofing Services LLC
(Name of Corporation)

RESOLVED that Zachary Wallick
(Person Authorized to Sign)

Senior Vice President, Best Roofing Services LLC of
(Title) (Name of Corporation)

be authorized to sign and submit the Bid or Proposal of this corporation for the following project:

CITY OF HOLLYWOOD, FLORIDA
DRAINAGE IMPROVEMENTS FOR ALLEYS SOUTH OF HOLLYWOOD
BOULEVARD, BETWEEN 22ND AND 26TH AVENUES
PROJECT NO. 16-11040

The foregoing is a true and correct copy of the Resolution adopted by

Best Roofing Services LLC at a meeting of its Board of
(Name of Corporation)

Directors held on the _____ day of _____, 20_____.

By: Zachary Wallick

Title: Senior Vice President

(SEAL)

The above Resolution MUST BE COMPLETED if the Bidder is a Corporation.

- END OF SECTION -

SECTION 00420

INFORMATION REQUIRED FROM BIDDERS

GENERAL INFORMATION

The Bidder shall furnish the following information. Failure to comply with this requirement may cause its rejection. Additional sheets shall be attached as required.

1. Contractor's Name/Address: Best Roofing Services LLC, 1600 NE 12th Terr,
Fort Lauderdale, Florida 33305

2. Contractor's Telephone Number: 954-941-9111
and e-mail address: zwallick@bestroofing.net

3. Contractor's License (attach copy): CCC1329779
Primary Classification: Roofing Contractor
Broward County License Number (attach copy): CCC1329779

4. Number of years as a Contractor in construction work of the type involved in this
Contract: 40 Years

5. List the names and titles of all officers of Contractor's firm:
Gregg Wallick, Dale Eby, Zachary Wallick, Donald Youker, Alexandra Labarr,
Leopoldo Rossi

6. Name of person who inspected site or proposed work for your firm:
Name: David Fry
Date of Inspection: 1-11-18

7. What is the last project of this nature you have completed?

Provided at Award

8. Have you ever failed to complete work awarded to you; if so, where and why?

No

9. Name three individuals or corporations for which you have performed work and to which you refer:

Hotwire Communications, Weingarten Properties, and Keiser University

10. List the following information concerning all contracts on hand as of the date of submission of this proposal (in case of co-venture, list the information for all coventures).

Name of Project	City	Total Contract Value	Contracted Date of Completion	% Completion to Date
Provided at Award				

(Continue list on inset sheet, if necessary)

11. What equipment do you own that is available for the work?

Provided at Award

12. What equipment will you purchase for the proposed work?

Provided at Award

NOTE:

If requested by CITY, the Bidder shall furnish a notarized financial statement, references and other information, sufficiently comprehensive to permit an appraisal of its current financial condition.

LIST OF SUBCONTRACTORS

The Bidder shall list below the name and address of each Subcontractor who will perform work under this Contract in excess of one-half percent of the total bid price, and shall also list the portion of the work which will be done by such Subcontractor. After the opening of Proposals, changes or substitutions will be allowed with written approval of the City of Hollywood. Subcontractors must be properly licensed and hold a valid Hollywood Certificate of Competency.

	Work to be Performed	Subcontractor's Name / Address
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

NOTE: Attach additional sheets if required.

- END OF SECTION -

SECTION 00435

LOCAL PREFERENCE

(EXHIBIT "A")

Pursuant to §38.50 of the City of Hollywood *Code of Ordinances*, the City shall grant a preference to local Hollywood vendors if their initial bid is within 5% of the bid of the lowest responsive responsible bidder that is a non-local Hollywood vendor. The preference shall allow the local Hollywood vendor to submit a second and final offer, which must be at least 1% less than the bid of the lowest responsive responsible non-local Hollywood vendor to be awarded. The local Hollywood vendor shall have the burden of demonstrating that it maintains a permanent place of business with full-time employees within the City limits and has done so for a minimum of one (1) year prior to the date of issuance of a bid or proposal solicitation within Hollywood, Florida. All supporting documentation (e.g. City of Hollywood valid local business tax receipt) for local preference eligibility must be received with the bid package prior to the bid opening date and time.

SECTION 00301

**CITY OF HOLLYWOOD
DEPARTMENT OF PUBLIC UTILITIES
ENGINEERING & CONSTRUCTION SERVICES DIVISION**

PROPOSAL BID FORM

Project No.: 17-2142**Project Name: Meter Shop Roof Replacement**

If this Proposal is accepted, the undersigned Bidder agrees to complete all work under this contract within 60 calendar days following the issuance of the Notice to Proceed. All entries on this form must be typed or written in block form in ink.

BASE BID:

No.	Description	Qty	Unit	Unit Price	Total
1	Mobilization/Demobilization, Bonds and Insurance	1	LS	\$5,000.00	\$5,000.00
2	Install new roof – east section from expansion joint.	1	LS	\$8.74/SF	\$80,992.00
3	Install new roof – west section from expansion joint.	1	LS	\$10.63/SF	\$37,350.00
4	Install new gutters, downspouts and splash blocks on north-, east- and south-sides of building – east section from expansion joint	1	LS	\$12.21/LF	\$5,300.00
5	Install new gutters, downspouts and splash blocks on south-side of building– west section from expansion joint.	1	LS	\$10.49/LF	\$3,450.25
6	Remove / replace turbine vent, APV vent and 2 – 2' X 2' exhaust vents east side of expansion joint	1	LS	\$250.00	\$500.00
7	Perform all mechanical and electrical tasks and/or installation necessary to complete project.	1	LS	\$3714.29	\$3,800.00
8	Repair and/or replace existing broken concrete roof features.	1	LS	\$11.87	\$995.00

SECTION 00301

**CITY OF HOLLYWOOD
DEPARTMENT OF PUBLIC UTILITIES
ENGINEERING & CONSTRUCTION SERVICES DIVISION**

PROPOSAL BID FORM

9	Owner's Contingency	1	LS			\$25,000
10	Permit, Licenses, Testing / Engineering and Fee Allowance	1	LS			\$5,000
11	Consideration of Indemnification	1	LS			\$10.00
	TOTAL BASE BID					
TOTAL BASE BID IN WORDS						

NOTES:

1. SUBSTANTIAL COMPLETION TIME AND PROJECT CLOSEOUT TIME FOR THE CONTRACT SHALL BE AS DEFINED IN THE PROJECT SCHEDULE IN THE SUPPLEMENTARY GENERAL CONDITIONS (SGC'S).



INSIDE: YOUNG GUNS

Meet the Roofing Contractors Shaping the Industry's Future **PG 30**

The Premier Magazine for Commercial and Residential Roofing & Insulation

A **bnr** PUBLICATION

MARCH 2016
RoofingContractor.com

ROOFING CONTRACTOR

Using the Right
Tools Keeps Roofing
Crews 'Sustainable'

PG 16

**BECOMING
THE
BEST
THEY CAN BE**



What to Expect From
the DOL's Changes to
Overtime Rules

PG 20

Proper Perspective and Focus
Points to a Strong Future for
Best Roofing **PG 24**

Contractor Q&A with
Newman Roofing LLC,
Sunbury, Ohio

PG 40

what can **Q** do for you?

REGISTER
& **EARN**
REWARDS
TODAY!

polyglassqrewards.com





➤ Best Roofing Owner Gregg Wallick is focused on sharing his three decades of roofing experience with the next generation, including sons Zack (back left) and Ian (right)

BECOMING THE BEST THEY CAN BE

Combining a Unique Culture with Determination and
Proper Perspective is Working in South Florida

By Art Aisner

After more than three decades of growing multiple roofing contractor businesses, Gregg Wallick is at an enviable stage in his career. Though he's still working hard and nowhere near ready to turn the business over to his sons, the president and CEO of Best Roofing in Ft. Lauderdale, Fla., has the luxury of not having to focus on where the next job comes from. And he's taking a long-term view of where his company and the roofing industry as a whole are going.

Wallick bought Best Roofing in 2001 after spending more than 20 years building the General Roofing Services group of companies. Except for a few tough years during the Great Recession, he has focused largely on growth based on his years of "hands-on" roofing experience. In addition to the Ft. Lauderdale headquarters, the company opened a branch office in Miami and has roughly 200 non-union employees focused heavily on roof replacement and service work (90 percent) versus new construction.

Wallick said the bulk of work is in commercial roofing (72 percent), although a large portion of that includes retirement villages, condos, and residential complexes that are prevalent in south Florida. Roof service accounts for roughly 22 percent of revenue, followed by traditional residential (6 percent).

And business is good. Since 2011, Best has consistently grown by an average of 20 percent each year, and was in the first 40 of *RC's* 2015 Top 100 list with a reported \$27 million in total revenue.

"We were able to hang on, but now that the work is back it's allowed us to thrive. If you aren't making it now, you're not going to make it," he said, noting that about 35 percent of Best's competition closed in recent years.

Best was hardly immune to the recession. Backlog shrunk and the steady stream of new business dried up, forcing Wallick to shed overhead. At the lowest point, the staff dwindled to 55 people and the company had to get resourceful. Wallick focused on streamlining operations but also invested in prequalification sales training and software that improved the overall closing ratio by 25 percent.

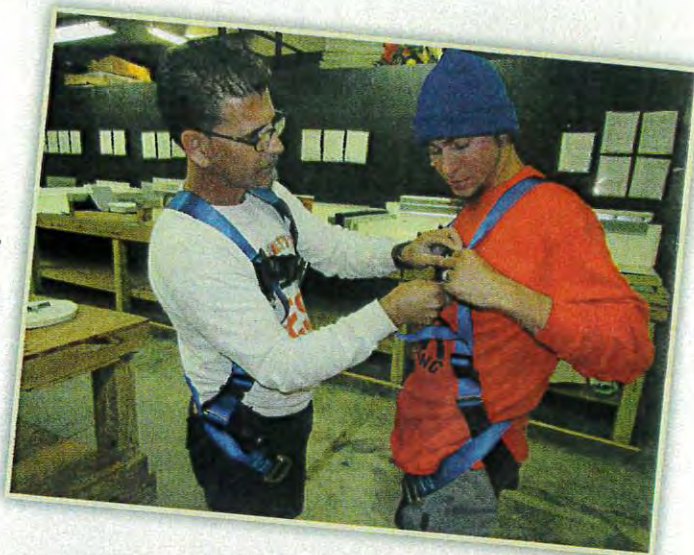
The lessons stuck.

"We understand our pipeline of future opportunities and have figured out how to avoid the peaks and valleys that are so typical in this industry," he said.

Creating a Culture

Wallick earned both a bachelor's degree and master's degree in business administration from the University of Miami — neither of which would have been possible without a football scholarship.

Once he got into business, the former team captain developed several strategies to create an atmosphere that illustrate how roofing is a team sport. Communication and mastering the fundamentals of one's job are key, and were not prevalent in the company he took over in 2001. Within his first three years as owner, Wallick replaced every employee from the previous regime. He also re-engineered all of the departments and shifted focus from being a "bid and beg" contractor on new construction projects into a consultative roof replacement and service provider.



➤ Regular safety training and 'tool-box talks' are part Best Roofing's culture.

Now, every department has structured weekly meetings that start with discussions about the 'fundamentals' — an accumulated list of nearly two dozen guiding principles that Wallick staunchly believes helps employees provide the excellent service Best has built its strong reputation on.

"It's important that everyone has a position to play in the delivery process of our goods and services," he said.

Each quarter, every member of management has a formal review and quarterly bonuses are issued based on achievement. Around the same time, the entire company gathers for 'The Huddle' — part meeting, part pep rally — where employees are recognized for their accomplishments and get a preview of the next quarter's projections and goals.

Little details matter too. All employees are expected to wear clean uniforms with shirts tucked in and hats worn straight. In addition to trucks used for equipment, Best also has a fleet of branded buses that the crews use to travel to and from jobsites together.

Once a year, the office staff cooks breakfast for the entire field staff as a formal 'thank you' in what's called "The Breakfast of Champions."

Much like a team locker-room, there's a real sense of camaraderie, accountability and teamwork in the building that ultimately generates more business.

"Nobody is more important than anyone else," he explained. "If everyone — from the person who takes the initial inquiry to the person collecting the payment — does their job and the client has an outstanding experience, we build solid relationships."

Best also provides health insurance, 401K benefits, paid holidays and between seven and 21 days of personal time off, depending on years of service.

On the safety front, Best hosts weekly 'tool-box talk' meetings and conducts regular jobsite inspections. Inside headquarters are a hands-on training room and large classroom for ongoing instruction. Wallick said they also work with manufacturers and vendors on safety recommendations, and partner with the Florida Roofing and Sheet Metal Contractors Association (FRSA) for specific training.



► 'The Huddle' Best Roofing employees gather every quarter at company headquarters in Ft. Lauderdale to recognize achievements and set goals for the months ahead. Photos courtesy of Best Roofing.

Not Afraid of Fun, Failure

Another facet of Best's internal culture is a willingness to try new and innovative approaches to attracting business, while separating the company from competitors in what can be a fierce market.

In addition to traditional marketing efforts, Best is known for distributing personalized emails with witty cartoons or inspiring messages to its vast contact list. A robust and dynamic website offers detailed information on the company's history, culture and service offerings. Going above and beyond, the site also has interactive features like a client portal, a window for live chats and embedded links to their vibrant social media channels.

Part of that strategy emanates from Wallick's entrepreneurial spirit that allows for innovation — and failure occasionally. Another part is added by his eldest son, Zack, who's continued to enhance the business' knack for reaching and engaging existing customers and prospects in new ways (see page 34). He officially joined the company in 2009 and worked his way up from a re-roof crew, to estimating, sales and now vice president.

One of the more popular branding tools Best has used successfully is devoting a lot of marketing collateral to Zack's dog, Jake, a pure-bred boxer. He became the company mascot and has even been requested by clients at business meetings. There's even a photo gallery dedicated to him as "director of stress reduction" on the website.

"I came to realize that he kind of humanizes us as a company and brings down some of the walls," Zack explained. "We're a much more relationship-based than transaction-based business and it helps us get to know the people we work with on projects."

Zack recently earned his general contractor license and ultimately has a vision to diversify Best's offerings further by building individual profit centers around its existing commercial business model. New service opportunities and adding doors and windows to product offerings are distinct possibilities.

Wallick's younger son, Ian, is also in the fold in operations. He was recently tabbed with heading a new residential division that will focus on growing Best's footprint in the single-family home market.

From estimating and installation to sales and marketing, Zack said he's grateful to have literally learned the industry from the ground up standing beside his father. He's also appreciative of the perspective he offers.

"He's extremely successful and he's earned everything he has in this business," he said. "He's really taken a backseat and guided me on how to successfully manage a team, and through his training and mentorship every day, he's taught me how to fish (for my family)."

At this stage of the game, the elder Wallick wouldn't have it any other way.

"My primary focus at this stage of my career in the roofing industry is developing the next generation of leaders," he said. "I have the privilege of working with a number of very talented people. Understanding them and helping them achieve their objectives is what gets me excited these days." **RC**

Art Aisner is editor of Roofing Contractor. He can be reached at 248-244-6497 or aisnera@bnpmedia.com.

BEST ROOFING

SINCE 1978

COMPLETED PROJECTS IN 2017

	Completed Project	City	Size	Date
1	5875 NW 163rd Street	Miami Lakes	C	Jun, 2017
2	62nd Street Plaza	Fort Lauderdale	C	February, 2017
3	A & S Holdings	Pompano Beach	A	November, 2017
4	Aquarius Condo Assoc	Hollywood	A	November, 2017
5	Assurant Satellite Learning Center	Miami	D	March, 2017
6	Barry University	Miami Shores	C	August, 2017
7	Bonaire Village	Delray Beach	B	October, 2017
8	Davita Hammock Dialysis	Miami	A	August, 2017
9	Ed Morse Sawgrass Chevy	Sunrise	B	November, 2017
10	Emjac Industries	Hialeah	D	June, 2017
11	Family Dollar at Forest Hill Center	West Palm Beach	A	October, 2017
12	Festival Plaza	Miami	A	August, 2017
13	Flagler OSW	Medley	C	October, 2017
14	Golden Lakes - Lake Constance	West Palm Beach	B	February, 2017
15	Golden Lakes - Lake Rebecca	West Palm Beach	B	September, 2017
16	Hollywood Chrysler Jeep	Hollywood	A	February, 2017
17	Hotwire Communications	Fort Lauderdale	D	March, 2017
18	Jefferson Square	North Lauderdale	B	August, 2017
19	Keiser University	Port St. Lucie	C	February, 2017
20	Lehman Toyota of North Miami	Miami	A	February, 2017
21	Macy's at Coral Square Mall	Coral Springs	D	December, 2017
22	Mango Plaza	Seffner	A	March, 2017
23	Medley West	Medley	D	November, 2017
24	Miami City Hall	Miami	B	November, 2017
25	Miami Jewish Home & Hospital	Miami	B	June, 2017
26	Miami-Dade College Inter America	Miami	C	April, 2017
27	Monte Carlo of Miami Condo	Miami	D	September, 2017
28	New River Center	Fort Lauderdale	B	October, 2017
29	North Lake Village Center	Okeechobee	B	March, 2017
30	Omega Condo	Plantation	C	March, 2017
31	Our Lady of the Lakes	Haialeah	A	February, 2017
32	Palm Beach Biltmore Condo	Palm Beach	B	September, 2017
33	Palm Beach Iron Works	West Palm Beach	B	February, 2017
34	Palmetto West Park Condo	Doral	A	September, 2017
35	Panera Bread at the Sheridan Plaza	Hollywood	A	April, 2017
36	Paradise by the Sea	Hallandale Beach	C	March, 2017

Hotwire
COMMUNICATIONS

KEISER
UNIVERSITY

HOLLYWOOD
CHRYSLER Jeep

BARRY
UNIVERSITY

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SAWGRASS
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ADVANTAGE
A PROMISE OF EXCELLENCE

macy's

ROOMS
TO GO

T.J. maxx

Panera
BREAD®

A - up to \$100,000
B - \$100,001 TO \$250,000
C. - \$250,001 TO \$500,000
D. - \$500,001 and over



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Product Approval

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FL #	FL16440-R12								
Application Type	Revision								
Code Version	2017								
Application Status	Pending FBC Approval								
Comments									
Archived									
Product Manufacturer	Carlisle SynTec Systems								
Address/Phone/Email	1285 Ritner Highway P.O. Box 7000 Carlisle, PA 17013 (717) 245-7000 malpezzi@syntec.carlisle.com								
Authorized Signature	Joe Malpezzi malpezzi@syntec.carlisle.com								
Technical Representative	Robert Patton								
Address/Phone/Email	1555 Ritner Highway Carlisle, PA 17013 (717) 245-7264 Robert.PATTON@syntec.carlisle.com								
Quality Assurance Representative									
Address/Phone/Email									
Category	Roofing								
Subcategory	Single Ply Roof Systems								
Compliance Method	Evaluation Report from a Florida Registered Architect or a Licensed Florida Professional Engineer Evaluation Report - Hardcopy Received								
Florida Engineer or Architect Name who developed the Evaluation Report	Robert Nieminen								
Florida License	PE-59166								
Quality Assurance Entity	UL LLC								
Quality Assurance Contract Expiration Date	06/01/2019								
Validated By	John W. Knezevich, PE ✓ Validation Checklist - Hardcopy Received								
Certificate of Independence	FL16440_R12_COI_2017_01_COI_Nieminen.pdf								
Referenced Standard and Year (of Standard)	<table> <thead> <tr> <th>Standard</th><th>Year</th></tr> </thead> <tbody> <tr> <td>TAS 110</td><td>2000</td></tr> <tr> <td>TAS 114</td><td>2011</td></tr> <tr> <td>TAS 131</td><td>1995</td></tr> </tbody> </table>	Standard	Year	TAS 110	2000	TAS 114	2011	TAS 131	1995
Standard	Year								
TAS 110	2000								
TAS 114	2011								
TAS 131	1995								
Equivalence of Product Standards Certified By									
Sections from the Code									

Product Approval Method

Method 1 Option D

Date Submitted

12/13/2017

Date Validated

12/14/2017

Date Pending FBC Approval

12/19/2017

Summary of Products

FL #	Model, Number or Name	Description
16440.1	Carlisle Sure-Weld TPO Single Ply Roof Systems	Thermoplastic (TPO) single ply roof systems for HVHZ.
Limits of Use Approved for use in HVHZ: Yes Approved for use outside HVHZ: No Impact Resistant: N/A Design Pressure: +N/A/-495 Other: 1.) The design pressure noted in this application pertains to one assembly. Refer to ER Appendix for all assemblies and max. design pressures. 2.) Refer to ER Section 5 for Limitations. 3.) This Product Approval is for HVHZ jurisdictions. Refer to FL14083 for Non-HVHZ.		Installation Instructions FL16440 R12 II 2017 12 FINAL A1 ER CARLISLE Sure-Weld TPO HVHZ FL16440-R12.pdf Verified By: Robert Nieminen PE-59166 Created by Independent Third Party: Yes Evaluation Reports FL16440 R12 AE 2017 12 FINAL ER CARLISLE Sure-Weld TPO HVHZ FL16440-R12.pdf Created by Independent Third Party: Yes

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Product Approval Accepts:

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APPENDIX 1: ATTACHMENT REQUIREMENTS FOR WIND UPLIFT RESISTANCE

Table	Deck	Application	Type	Description	Page
1A	Wood	New, Reroof (Tear-Off), Recover	C	Mechanically Attached Insulation, Bonded Roof Cover	5
1B	Wood	New, Reroof (Tear-Off), Recover	D-1	Insulated, Mechanically Attached Roof Cover	5
1C	Wood	New, Reroof (Tear-Off), Recover	D-3	Non-Insulated, Mechanically Attached Base Sheet, Bonded Roof Cover	6
1D	Wood	New, Reroof (Tear-Off), Recover	E-1	Non-Insulated, Mechanically Attached Roof Cover	6
1E	Wood	New, Reroof (Tear-Off), Recover	E-2	Non-Insulated, Mechanically Attached Base Sheet, Bonded Roof Cover	6
2A	Steel or Structural Concrete	New, Reroof (Tear-Off), Recover	B-1	Mech. Attached Base Insulation, Bonded Top Insulation, Bonded Roof Cover	7-8
2B	Steel or Structural Concrete	New, Reroof (Tear-Off), Recover	B-1	Mech. Attached Base Insulation, Bonded Top Insulation, Bonded Base Ply, Bonded Roof Cover	9
2C	Steel	New, Reroof (Tear-Off), Recover	B-2	Mech. Attached Thermal Barrier, Bonded Vapor Barrier, Bonded Insulation, Bonded Roof Cover	10-11
2D	Steel or Structural Concrete	New, Reroof (Tear-Off), Recover	C-1	Mechanically Attached Insulation, Bonded Roof Cover	12-16
2E	Steel or Structural Concrete	New, Reroof (Tear-Off), Recover	C-1	Mechanically Attached Insulation, Bonded Base Ply, Bonded Roof Cover	17
2F	Steel	New, Reroof (Tear-Off), Recover	C-2	Mechanically Attached Insulation, Plate-Bonded Roof Cover	18-19
2G	Steel or Structural Concrete	New, Reroof (Tear-Off), Recover	D-1	Insulated, Mechanically Attached Roof Cover (Stress Plates)	20-23
2H	Steel or Structural Concrete	New, Reroof (Tear-Off), Recover	D-2	Insulated, Mechanically Attached Roof Cover (RUSS Strips)	24
3A	Structural Concrete	New, Reroof (Tear-Off)	A-1A	Bonded Insulation, Bonded Roof Cover	25-30
3B	Structural Concrete	New, Reroof (Tear-Off)	A-1A	Bonded Insulation, Bonded Base Ply, Bonded Roof Cover	31
3B	Structural Concrete	New, Reroof (Tear-Off), Recover	C-2	Mechanically Attached Insulation, Plate-Bonded Roof Cover	32-33
3C	Structural Concrete	New, Reroof (Tear-Off)	F	Non-Insulated, Bonded Roof Cover	33
4A	LWIC	New, Reroof (Tear-Off)	A-1A	Bonded Insulation, Bonded Roof Cover	34
4B	LWIC	New, Reroof (Tear-Off)	A-2	Mech. Attached Anchor Sheet, Bonded Insulation, Bonded Roof Cover	34
4C	LWIC over Steel	New, Reroof (Tear-Off)	F	Non-Insulated, Bonded Roof Cover	35-36
4D	LWC over Structural Concrete	New, Reroof (Tear-Off)	F	Non-Insulated, Bonded Roof Cover	37-38
5A	CWF	New, Reroof (Tear-Off)	A-1	Bonded Insulation, Bonded Roof Cover	39
6A	Gypsum	Reroof (Tear-Off)	A-1	Bonded Insulation, Bonded Roof Cover	40
6B	Gypsum	Reroof (Tear-Off)	F	Non-Insulated, Bonded Roof Cover	40
7A	Various	Recover	A-1	Bonded Insulation, Bonded Roof Cover	41-42
7B	Various	Recover	A-1	Bonded Insulation, Bonded Base Ply, Bonded Roof Cover	43
7C	Steel	Recover	C-2	Mechanically Attached Insulation, Plate-Bonded Roof Cover	44
7D	Steel	Recover	D-1	Insulated, Mechanically Attached Roof Cover	45
7E	Steel	Recover	D-2	Insulated, Mechanically Attached Roof Cover (RUSS Strips)	46
7F	Various	Recover	E-1	Non-Insulated, Mechanically Attached Roof Cover	47
7G	Various	Recover	F-1	Non-Insulated, Bonded Roof Cover	48
7H	Various	Recover	F-2	New LWC over Existing Roof, Bonded Roof Cover	49



The following notes apply to the systems outlined herein:

1. The evaluation herein pertains to above-deck roof components; deck-attachment details and pertain to 'as-tested' conditions under TAS 114, Appendix J. Roof decks shall be in accordance with FBC (HVHZ) requirements to the satisfaction of the Authority Having Jurisdiction.
2. Unless otherwise noted, fasteners and stress plates for Insulation attachment shall be as follows. Fasteners shall be of sufficient length for the following engagements:
 - Wood Deck: Sure-Seal HP Fastener with Sure-Seal Insulation Plate (aka, Carlisle's Insulation Fastening Plate). Minimum 1-inch wood penetration.
 - Steel Deck: Sure-Seal HP Fastener with Sure-Seal Insulation Plate (aka, Carlisle's Insulation Fastening Plate). Minimum 0.75-inch steel penetration, engage the top flute of the steel deck.
 - Concrete Deck: Sure-Seal HD 14-10 Concrete Fastener, Carlisle CD-10 or HP Concrete Spike (1/4") with Sure-Seal Insulation Plate (aka, Carlisle's Insulation Fastening Plate). Minimum 1.25-inch embedment. Fasteners installed with a pilot hole in accordance with the fastener manufacturer's published installation instructions.
3. Unless otherwise noted, insulation may be any one layer or combination of polyisocyanurate, polystyrene, fiberboard, perlite and/or gypsum-based insulation board that meets the QA requirements of F.A.C. Rule 61G20-3 and is documented as meeting FBC 1516 and, for foam plastic, FBC Chapter 26, when installed with the roof cover.
4. If mechanical attachment to the structural deck through lightweight insulating concrete is proposed, field withdrawal resistance testing shall be performed to confirm equivalent or determine enhanced fastening patterns and density. All testing and fastening design shall be in compliance with Testing Application Standard TAS 105 and Roofing Application Standard RAS 117 and/or RAS 137. Calculations shall be prepared, signed and sealed by a qualified design professional.
5. Preliminary insulation attachment for System Type D = Minimum four fasteners per 4 x 8 ft board or minimum two fasteners per 4 x 4 ft board.
6. Unless otherwise noted, insulation adhesive application rates are as follows. Ribbon or bead width is at the time of application; the ribbons/beads shall expand as noted in the manufacturer's published instructions:
 - Hot asphalt: FULL-coverage at 25 lbs/square.
 - Carlisle FAST 100, FAST 100 LV (FULL): FULL-coverage at 1 gal. /square.
 - Carlisle FAST 100, FAST 100 LV (RIBBON): Continuous 0.75 to 1-inch wide ribbons, 12-inch o.c.
 - Carlisle Flexible FAST (FULL): FULL-coverage at 1 gal. /square.
 - Carlisle Flexible Fast (RIBBON): Continuous 0.75 to 1-inch wide ribbons, 12-inch o.c.
 - Carlisle FAST Dual-Cartridge (FAST D-C): Continuous 0.75 to 1-inch wide ribbons, 12-inch o.c.
 - Carlisle FAST Bag in a Box Adhesive (BIAB): Continuous 0.75 to 1-inch wide ribbons, 12-inch o.c.
 - Carlisle FAST Dual-Tank (FAST D-T) (FULL): Continuous 0.5-inch wide, wet-beads, 4-inch o.c.
 - Carlisle FAST Dual-Tank (FAST D-T) (RIBBON): Continuous 0.5-inch wide, wet-beads, 12-inch o.c. Note: When installing multiple layers of insulation, FAST Dual-Tank beads shall be placed perpendicular to those placed for attachment of the previous layer.
 - OlyBond 500 (OB500): Continuous 0.75 to 1-inch wide ribbons, 12-inch o.c. using PaceCart or SpotShot. Note: OlyBond 500 Green may be used where OlyBond 500 is referenced.
 - Note: When multiple layer(s) of insulation and/or coverboard are installed in ribbon-applied adhesive, boards shall be staggered from layer-to-layer.
 - Note: The maximum edge distance from the adhesive ribbon to the edge of the insulation board shall be not less than one-half the specified ribbons spacing.
7. Unless otherwise noted, all Insulations are flat stock or taper board of the minimum thickness noted. Tapered polyisocyanurate at the following thickness limitations may be substituted with the following Maximum Design Pressure (MDP) limitations. In no case shall these values be used to 'increase' the MDP listings in the tables; rather if MDP listing below meets or exceeds that listed for a particular system in the tables, then the thinner board listed below may be used as a drop-in for the equivalent thicker material listed in the table.
 - FAST 100, FAST 100 LV or Flexible FAST: MDP -157.5 psf (Min. 0.5-inch thick)
 - OlyBond 500 (OB500): MDP -187.5 psf (Min. 0.5-inch thick)
8. Bonded polyisocyanurate insulation boards shall be maximum 4 x 4 ft.
9. Perimeter and corner areas shall comply with the enhanced uplift pressure requirements of these areas. Fastener densities shall be increased, as calculated in compliance with Roofing Application Standard RAS 117 and/or RAS 137 by a qualified design professional. **This extrapolation is not permitted for systems marked with an asterisk*.*
10. For assemblies marked with an asterisk*, the maximum design pressure (MDP) limitation listed shall be applicable to all roof pressure zones (i.e., field, perimeters and corners). Neither rational analysis, nor extrapolation is permitted for enhanced attachment at enhanced pressure zones (i.e., perimeters, corners and extended corners).



11. Fastener spacing for mechanical attachment of anchor/base sheet or membrane is based on a minimum fastener resistance value in conjunction with the maximum design pressure (MDP) listed for a specific system. Should the fastener resistance be less than that required, as determined by the Building Official, a revised fastener spacing – prepared, signed and sealed by a qualified design professional – may be submitted. Said revised fastener spacing shall utilize the withdrawal resistance value taken from Testing Application Standard TAS 105 and calculations in compliance with Roofing Application Standard RAS 117 or RAS 137.
12. For bonded insulation or membrane over existing substrates in a recover installation, the existing roof system shall be capable of resisting project design pressures on its own merit to the satisfaction of the Authority Having Jurisdiction, as documented through field uplift testing in accordance with TAS 124.
13. For System Type D, steel deck applications, the roof membrane shall be run with its length perpendicular to the steel deck flutes.
14. For recover installations, the existing roof shall be examined in accordance with FBC 1521. For Recover Applications using System Type C-2 (Plate Bonded Roof Cover) or Type D (Mechanically Attached Roof Cover), the insulation is optional. Alternatively, min. 0.5-inch HP Recovery Board, SecurShield HD or H-Shield HD or min. 0.25-inch to 0.625-inch Dens Deck, Dens Deck Prime, SECUROCK Gypsum-Fiber Roof Board or SECUROCK Glass-Mat Roof Board or min. 3/8-inch Insulfoam R-Tech EPS or Fan-Fold may be used as a separator board, preliminarily attached prior to roof cover installation. The separator component shall be documented as meeting FBC HVHZ 1516 and, for foam plastic, FBC Chapter 26, when installed with the roof cover in Recover applications.
15. For adhered membrane systems, side laps shall be minimum 2-inch wide sealed with min. 1.5-inch heat weld. Unless otherwise noted, membrane adhesive application rates are as follows:

Membrane	Adhesive	Method	Rate
Sure-Weld, Sure-Weld HS	Sure-Weld Bonding Adhesive	Contact (both sides)	60 ft ² /gal
Sure-Weld, Sure-Weld HS	Aqua Base 120 Bonding Adhesive	Contact (both sides)	120 ft ² /gal
Sure-Weld, Sure-Weld HS	Low VOC Bonding Adhesive	Contact (both sides)	60 ft ² /gal
Sure-Weld, Sure-Weld HS	Sure-Seal 90-8-30A Bonding Adhesive	Contact (both sides)	60 ft ² /gal
Sure-Weld FleeceBACK	Aqua Base 120 Bonding Adhesive	Wet lay (substrate)	120 ft ² /gal
Sure-Weld FleeceBACK	HydroBond Water-Based Adhesive	Wet lay (substrate)	100 to 133 ft ² /gal
Sure-Weld FleeceBACK	FAST 100, FAST 100LV, Flexible FAST, FAST D-C, FAST D-T	Wet lay (substrate)	RIBBON spaced as noted herein or FULL Coverage = 1 gal/square or continuous ribbons, maximum 4-inch o.c.
Sure-Weld AFX	Carlisle Cold Applied Adhesive (C-CAA)	Wet lay (substrate)	1.5 gal/square
Sure-Weld AFX	Hot asphalt	Wet lay (substrate)	25 lbs/square

16. For membrane systems attached using TPO 10-inch Pressure-Sensitive RUSS, the underside of the membrane which comes in contact with the tape shall be primed with TPO Primer. The membrane shall be secured by placing the primed portion onto the tape portion of the Sure-Weld TPO 10-inch Pressure-Sensitive RUSS and roll with a steel hand roller to ensure contact.
17. For adhered membrane systems, unless otherwise noted:
 - > Reference to "Sure-Weld" membrane below also includes "Sure-Weld EXTRA" and "Sure-Weld HS";
 - > Reference to "Sure-Weld FleeceBACK" includes 100, 115 and 135;
 - > Reference to "Sure-Weld AFX" includes AFX 120, AFX 135 and AFX 155;



18. Vapor barrier options for use over structural concrete deck followed by adhesive-applied insulation carry the following Maximum Design Pressure (MDP) limitations. The lesser of the MDP listings below vs. those in Table 3A or 3B applies.

VAPOR BARRIER OPTIONS; STRUCTURAL CONCRETE DECK; FOLLOWED BY ADHESIVE-APPLIED INSULATION PER TABLE 3A OR 3B:					
Option #	Primer	Vapor Barrier		Insulation Adhesive	MDP (psf)
		Type	Application		
VB-1.	702 Primer	VapAir Seal 725TR	Self-adhering	FAST 100 LV, FULL-coverage at 1 gal/square.	-67.5
VB-2.	702 Primer	VapAir Seal 725TR	Self-adhering	FAST 100 LV, FAST Bag In a Box (BIAB) or FAST Dual Cartridge (RIBBON, 12-inch o.c.)	-67.5
VB-3.	702 LV Primer	VapAir Seal 725TR	Self-adhering	FAST 100 LV, FULL-coverage at 1 gal/square.	-97.5
VB-4.	702 LV Primer	VapAir Seal 725TR	Self-adhering	FAST 100 LV, FAST Bag In a Box (BIAB) or FAST Dual Cartridge (RIBBON, 12-inch o.c.)	-97.5
VB-5.	CAV-GRIP Primer	VapAir Seal 725TR	Self-adhering	FAST 100 LV, FULL-coverage at 1 gal/square.	-127.5
VB-6.	CAV-GRIP Primer	VapAir Seal 725TR	Self-adhering	FAST 100 LV, FAST Bag In a Box (BIAB) or FAST Dual Cartridge (RIBBON, 12-inch o.c.)	-127.5
VB-7.	ASTM D41	SureMB 90TG Base	Torch-applied	FAST 100 LV or FAST Dual Cartridge (RIBBON, 12-inch o.c.)	-165.0
VB-8.	ASTM D41	SureMB 90 Base	Hot-asphalt	Hot asphalt at 25 lbs/square	-172.5
VB-9.	ASTM D41	SureMB 90TG Base	Torch-applied	Hot asphalt at 25 lbs/square	-180.0

19. "MDP" = Maximum Design Pressure is the result of testing for wind load resistance based on allowable wind loads. Refer to FBC (HVHZ) 1620 and Roofing Application Standard RAS 128 for determination of design wind loads.

TABLE 7A: RECOVER APPLICATIONS
SYSTEM TYPE A-1: BONDED INSULATION, BONDED ROOF COVER

System No.	Substrate (Note 12)	Base Insulation Layer		Top Insulation Layer		Roof Cover (Notes 15 & 17)		MDP (psf)
		Type	Attach	Type	Attach	Type	Application	
R-11	Existing asphaltic BUR or mineral surface cap sheet	(Optional) Polyiso HP-H, InsulBase, HP-N, or HP-W, ENRGY 3, H-Shield, SecurShield, H-Shield CG, or AC Foam II	FAST 100, FAST 100 LV (FULL)	Polyiso HP-NB, StormBase, H-Shield NB (plywood only)	FAST 100, FAST 100 LV (FULL)	Sure-Weld FleeceBACK	FAST 100, FAST 100 LV, Flexible FAST (FULL)	-187.5*
R-12	Existing gravel-surfaced asphaltic BUR	Min. 1-inch Insulfoam SP	Flexible FAST (FULL)	None	N/A	Sure-Weld FleeceBACK	Flexible FAST (FULL)	-222.5*
R-13	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.5-inch Polyiso HP-H, InsulBase, HP-N, HP-W, AC Foam II, H-Shield, SecurShield, H-Shield CG, ENRGY-3	FAST 100, FAST 100 LV, Flexible FAST (FULL)	(Optional) Additional layers of base insulation	FAST 100, FAST 100 LV, Flexible FAST (FULL)	Sure-Weld FleeceBACK	Aqua Base 120 BA, HydroBond Water-Based	-232.5*
R-14	Existing asphaltic BUR or mineral surface cap sheet	Min. 1-inch Insulfoam SP	FAST 100 LV (FULL)	None	N/A	Sure-Weld FleeceBACK	FAST 100 LV (FULL)	-232.5*
R-15	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.5-inch SecurShield HD Composite, H-Shield HD Composite	FAST 100, FAST 100 LV	None	N/A	Sure-Weld FleeceBACK	FAST 100 LV (FULL)	-232.5*
R-16	Existing asphaltic BUR or mineral surface cap sheet	Min. 19/32-inch APA rated plywood or min. 0.25-inch Dens Deck or Dens Deck Prime	FAST 100, FAST 100 LV (FULL)	(Optional) One or more layers min. 19/32-inch APA rated plywood or min. 0.25-inch Dens Deck or Dens Deck Prime	FAST 100, FAST 100 LV (FULL)	Sure-Weld FleeceBACK	FAST 100, FAST 100 LV, Flexible FAST (FULL)	-232.5*
R-17	Existing asphaltic BUR or mineral surface cap sheet	Polyiso HP-H, InsulBase, HP-N or HP-W, ENRGY 3, H-Shield, SecurShield, H-Shield CG, or AC Foam II	FAST 100, FAST 100 LV (FULL)	Min. 19/32-inch APA rated plywood or min. 0.25-inch Dens Deck or Dens Deck Prime	FAST 100, FAST 100 LV (FULL)	Sure-Weld FleeceBACK	FAST 100, FAST 100 LV, Flexible FAST (FULL)	-232.5*
R-18	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.0-inch Polyiso HP-H, InsulBase, H-Shield, SecurShield, H-Shield CG	FAST 100, FAST 100 LV (FULL)	(Optional) Additional layers of base insulation	FAST 100, FAST 100 LV (FULL)	Sure-Weld FleeceBACK	FAST 100, FAST 100 LV, Flexible FAST (FULL)	-300.0*
R-19	Existing gravel-surfaced asphaltic BUR	Min. 1-inch Insulfoam SP	FAST 100 LV (FULL)	None	N/A	Sure-Weld FleeceBACK	FAST 100 LV (FULL)	-395.0*

Sure-Weld[®] TPO Reinforced Membrane



Overview

Carlisle's Sure-Weld TPO reinforced membrane is a premium, heat-weldable, single-ply thermoplastic polyolefin (TPO) sheet designed for new roof construction and re-roofing applications. Sure-Weld High Slope (HS) membrane is formulated with additional flame retardant for higher-slope fire code approvals. Sure-Weld EXTRA is 80 mils thick for significantly higher strength and weatherability.

Sure-Weld TPO membranes use advanced polymerization technology that combines the flexibility of ethylene-propylene (EP) rubber with the heat weldability of polypropylene. All Sure-Weld TPO membranes include OctaGuard XT[™], an industry-leading, state-of-the-art weathering package. OctaGuard XT technology enables Sure-Weld TPO to withstand the extreme weatherability testing that is intended to simulate exposure to severe climates.

Physical properties of the membrane are enhanced by a strong polyester fabric that is encapsulated between the TPO-based top and bottom plies. The combination of the fabric and TPO plies provides high breaking and tearing strength, as well as excellent puncture resistance. The relatively smooth surface of the membrane produces a total surface fusion weld that results in a consistent, watertight, monolithic roof assembly. The membrane is environmentally friendly and safe to install.

Carlisle's standard and HS TPO membranes are available in highly reflective white, tan, and gray, in both 45-mil and 60-mil thicknesses. 80-mil Sure-Weld EXTRA (including HS) is also offered in white, gray, and tan colors. Special color Sure-Weld TPO membranes are also available (see Carlisle's TPO Color Palette brochure). Carlisle's TPO is offered in 4-, and 6-ft perimeter sheets and 8-, 10-, and 12-ft Sure-Weld field sheets. Sure-Weld HS and special color TPO membranes are available in limited sizes.

Carlisle's tan and white TPO membranes are ENERGY STAR[®]-qualified and California Title 24 compliant and can contribute toward LEED[®] (Leadership in Energy and Environmental Design) credits.

Productivity Boosting Features and Benefits:

Optional APEEL[™] Protective Film

Carlisle's Sure-Weld TPO reinforced membrane is available with an optional APEEL Protective Film, saving time and labor by eliminating the need for roof cleaning upon project completion. Carlisle's innovative APEEL Protective Film can be left in place for up to 90 days without affecting the integrity of the film, guarding the TPO membrane's surface from scuffs and dirt accumulation during installation. Durable and easy to remove, APEEL Protective Film improves aesthetics and long-term reflectivity and is ideal for re-roofing, re-cover, and new construction projects.



PROTECTIVE FILM

Features and Benefits

- » Outstanding puncture resistance
- » Excellent fire resistant assemblies
- » Environmentally friendly and stable formulation
- » Excellent resistance to impact and low temperatures
- » Excellent chemical resistance to acids, bases and restaurant exhaust emissions
- » UL 2218 Class 4 hail rating
- » Exceptional resistance to heat, solar UV, ozone and oxidation
- » Manufactured using a hot-melt extrusion process for complete scrim encapsulation
- » 100% recyclable (see Carlisle's Recyclability Statement)
- » Enhanced with the OctaGuard XT weathering package
- » APEEL Protective Film application guards the TPO membrane's surface from scuffs and dirt accumulation during installation, improving the roof system's appearance and long-term performance
- » APEEL Protective Film can be left in place for up to 90 days without degrading due to its excellent heat- and UV-resistance

Sure-Weld TPO

Reinforced Membrane

Installation

1. Sure-Weld TPO roofing systems are quick to install, as minimal labor and few components are required. TPO systems are installed using an Automatic Heat Welder, making sheet welding fast, clean, consistent, and easy to learn, while reducing strain on the roofing technician.
2. APEEL Protective Film should be removed from within areas that are to be heat-welded together. In areas that do not require heat-welding, the APEEL Protective Film can be left in place for up to 90 days. When the installation of the entire TPO roofing system is complete, remove and discard the APEEL Protective Film.
3. **The Carlisle Mechanically Fastened Roof System** installation starts by fastening the insulation with a minimum of 4 fasteners per 4' by 8' board. The membrane is mechanically fastened to the deck using HP-X™ Fasteners and Piranha Plates™ or HP-XTRA Fasteners and Piranha XTRA Plates. Adjoining sheets of membrane are overlapped over the fasteners and plates and joined together with a minimum 1½"-wide (4 cm) hot-air weld.

Typical Properties and Characteristics

Physical Property	ASTM D6878 Requirement	45-mil	60-mil	80-mil EXTRA
Tolerance on Nominal Thickness, % ASTM D751 test method	+15, -10	± 10	± 10	± 10
Thickness Over Scrim, in. (mm) ASTM D7635 optical method, average of 3 areas	0.015 min (0.380)	0.018 typical (0.457)	0.024 typical (0.610)	0.034 typical (0.864)
Breaking Strength, lbf (kN) ASTM D751 grab	220 (976 N) min	225 (1.0) min 320 (1.4) typical	250 (1.1) min 360 (1.6) typical	350 (1.6) min 425 (1.9) typical
Elongation Break of Reinforcement, % ASTM D751 grab method	15 min	15 min 25 typical	15 min 25 typical	15 min 25 typical
Tearing Strength, lbf (N) ASTM D751 proc. B 8 in. x 8 in.	55 (245) min	55 (245) min 130 (578) typical	55 (245) min 130 (578) typical	55 (245) min 130 (578) typical
Brittleness Point, °F (°C) ASTM D2137	-40 (-40) max	-40 (-40) max -50 (-46) typical	-40 (-40) max -50 (-46) typical	-40 (-40) max -50 (-46) typical
Linear Dimensional Change, % ASTM D1204, 6 hours at 158°F	± 1 max	± 1 max -0.2 typical	± 1 max -0.2 typical	± 1 max -0.2 typical
Ozone Resistance, no cracks 7X ASTM D1149, 100 pphm, 168 hrs	PASS	PASS	PASS	PASS
Water Absorption Resistance, mass % ASTM D471 top surface only 166 hours at 158°F water	± 3.0 max	± 3.0 max 0.90 typical	± 3.0 max 0.90 typical	± 3.0 max 0.90 typical
Factory Seam Strength, lbf/in (kN/m) ASTM D751 grab method	66 (290) min	66 (290) min	66 (290) min	66 (290) min
Field Seam Strength, lbf/in (kN/m) ASTM D1876 tested in peel	No requirement	25 (4.4) min 50 (8.8) typical	25 (4.4) min 60 (10.5) typical	40 (7.0) min 70 (12.3) typical
Water Vapor Permeance, perms ASTM E96 proc. B	No requirement	0.10 max 0.05 typical	0.10 max 0.05 typical	0.10 max 0.05 typical
Puncture Resistance, lbf (kN) FTM 101C, method 2031 (see supplemental section)	No requirement	250 (1.1) min 325 (1.4) typical	300 (1.3) min 350 (1.6) typical	400 (1.8) min 450 (2.0) typical
Properties After Heat Aging ASTM D573, 32 weeks @ 240°F or 8 weeks @ 275°F No cracking when bent around 3" diameter mandrel Weight Change, %	PASS No cracking ± 1.5 max	PASS No cracking 1.0 max	PASS No cracking 1.0 max	PASS No cracking 1.0 max
Typical Weights lb/ft² (kg/m²)		0.23 (1.1)	0.29 (1.4)	0.40 (2.0)

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

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4. **The Carlisle Fully Adhered Roofing System** installation begins by fastening the insulation at the required density necessary to meet the appropriate warranty or wind load requirement. The substrate and membrane are then coated with an appropriate Sure-Weld TPO bonding adhesive and the membrane is rolled into place.

Review Carlisle specifications and details for complete installation information.

Precautions

- » Sunglasses that filter out ultraviolet light are strongly recommended, as tan and white surfaces are highly reflective. Roofing technicians should dress appropriately and wear sunscreen.
- » Surfaces may become slippery due to frost and ice buildup. Exercise caution during cold conditions to prevent falls.
- » Care must be exercised when working close to a roof edge when the surrounding area is snow-covered, as the roof edge may not be clearly visible.
- » Use proper stacking procedures to ensure sufficient stability of the rolls.
- » Exercise caution when walking on wet membrane. Membranes may be slippery when wet.
- » Store membrane in the original undisturbed plastic wrap in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. Membrane that has been exposed to the weather must be prepared with Weathered Membrane Cleaner prior to hot-air welding.
- » Take care not to stand or place heavy objects on the edge of folded-over membrane, as this could cause a hard crease in the membrane.
- » Maximum sustained temperature not to exceed 160°F (71°C) for TPO membrane.
- » Do not use razor blades or other sharp tools to cut the APEEL Protective Film while it is still adhered to the TPO membrane as damage to the underlying membrane may occur. Pull the protective film away from the membrane prior to cutting.
- » Remove APEEL Protective Film by pulling towards the center of the roof. Do not remove the film by pulling towards the roof edge.
- » A static electric charge may develop when removing APEEL Protective Film from the surface of the membrane sheet. To avoid the possibility of ignition, lids must be closed on any flammable products and a fire extinguisher should be readily available.
- » Color membranes will 'fade' over time mainly due to the ultraviolet portion of sunlight. Since most roof surfaces are exposed to variable sunlight, some areas will be more susceptible to color changes caused by UV fading. Warranties for color membranes do not cover fading of colors.

EXTREME Testing for Severe Climates

ASTM Standard D6878 is the material specification for Thermoplastic Polyolefin-Based Sheet Roofing. It covers material property requirements for TPO roof sheeting and includes initial and aged properties after heat and xenon-arc exposure. As stated in the scope of the standard, "the tests and property limits used to characterize the sheet are values intended to ensure minimum quality for the intended purpose." Carlisle's goal is to produce TPO that delivers maximum performance for the intended purpose of roofing membranes. Maximum performance requires the membrane to far exceed the requirements of ASTM D6878.

Heat Aging accelerates the oxidation rate that roughly doubles for each 18°F (10°C) increase in roof membrane temperature. Oxidation (reaction with oxygen) is one of the primary chemical degradation mechanisms of roofing materials.

Carlisle Testing – Heat Aging

	ASTM Requirement	Sure-Weld Requirement
ASTM TEST 240°F	32 weeks**	>128 weeks

**Heat exposure comparable to 3,120 weeks (60 years) at 185°F for 8 hours/day.

- » Test specimen is a 2" by 6" piece of 45-mil membrane unbacked, placed in circulating hot-air oven.
- » Criterion – no visible cracks after bending aged test specimen around 3"-diameter mandrel.

Xenon-arc exposes the membrane samples to the combined effect of UV, visible and infrared radiation as well as ozone, heat and water spray to greatly accelerate the effects of outdoor weathering. The radiation dose is measured in kilojoules per square meter (kJ/m²) at 340 nm machine UV wavelength. The irradiance power of the xenon-arc lamp is measured in watts per square meter (W/m²).

Carlisle Testing – Xenon-Arc

	Sure-Weld Requirements			
ASTM TEST	ASTM D6878 Requirement	45-mil	60-mil	80-mil
kJ/m ² at 340 nm	10,080	>40,000	>50,000	>60,000

- » Test specimen is a 2.75" by 5.5" piece of membrane, unbacked, weathering side facing arc lamp.
- » Criterion – no visible cracks when viewed under 7x magnification while wrapped around 3"-diameter mandrel.

Sure-Weld TPO

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Q-Trac testing combines accelerated weathering with real-world conditions using an array of ten mirrors to reflect and concentrate full spectrum sunlight onto membrane test specimens. The Q-Trac device automatically tracks the sun's path from morning to night. Also, it adjusts to compensate for seasonal changes in the sun's altitude. Eight years in Q-Trac testing is equal to 40 years of real-world exposure. Carlisle requires its Sure-Weld TPO membranes to pass the equivalent of 40 years of exposure in the Q-Trac.

Carlisle Testing – Q-Trac

	ASTM D6878 Requirement	Sure-Weld Requirement
ASTM TEST N/A	N/A	Equivalent of 40 years of exposure

Environmental Cycling subjects the membrane to repeated cycles of heat aging, hot-water immersion, and xenon-arc exposure.

- » ASTM requirement – none
- » Carlisle EXTREME test*:
 - 10 days heat aging at 240°F (116°C) followed by
 - 5 days water immersion at 158°F (70°C) followed by
 - 5,040 kJ/m² (2000 hours at 0.70 W/m² irradiance) xenon-arc exposure

*Test specimen is 2.75" by 5.5" piece of membrane with edges sealed.

*Criterion – after 3 complete cycles, test specimens shall remain flexible and not have any cracking under 10x magnification while wrapped around a 3"-diameter mandrel.

Supplemental Approvals, Statements and Characteristics:

1. Sure-Weld TPO meets or exceeds the requirements of ASTM D6878 Standard Specification for Thermoplastic Polyolefin-Based Sheet Roofing.
2. Radiative Properties for ENERGY STAR, Cool Roof Rating Council (CRRC) and LEED.
3. Sure-Weld TPO membranes conform to requirements of the US E.P.A. Toxic Leachate Test (40 CFR part 136) performed by an independent analytical laboratory.
4. Sure-Weld TPO was tested for dynamic puncture resistance per ASTM D5635-04 using the most recently modified impact head. 45-mil was watertight after an impact energy of 12.5 J (9.2 ft-lbf) and 60-mil was watertight after 22.5 J (16.6 ft-lbf). 80-mil EXTRA was watertight after an impact energy of 30.0 J (22.1 ft-lbf).
5. NSF-P151 Certification for rainwater catchment system components.
 - Plant 91/White Only

Radiative Properties for ENERGY STAR*, and LEED

	Test Method	White TPO	Tan TPO	Gray TPO
ENERGY STAR – Initial solar reflectance	Solar Spectrum Reflectometer	0.79	0.71	N/A
ENERGY STAR – Initial solar reflectance after 3 years	Solar Spectrum Reflectometer (uncleaned)	0.70	0.64	N/A
CRRC – Initial solar reflectance	ASTM C1549	0.79	0.71	0.46
CRRC – Solar reflectance after 3 years	ASTM C1549 (uncleaned)	0.70	0.64	0.43
CRRC – Initial thermal emittance	ASTM C1371	0.90	0.86	0.89
CRRC – Thermal emittance after 3 years	ASTM C1371 (uncleaned)	0.86	0.87	0.88
LEED – Thermal emittance	PASS	0.90	0.86	0.85
SRI - Initial (Solar Reflectance Index)		99	86	53
SRI - 3 year aged (Solar Reflectance Index)		85	77	48

Solar Reflectance Index (SRI) is calculated per ASTM E1980. The SRI is a measure of the roof's ability to reject solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is 0 and a standard white (reflectance 0.80, emittance 0.90) is 100. Materials with the highest SRI values are the coolest choices for roofing. Due to the way SRI is defined, particularly hot materials can even take slightly negative values and particularly cool materials can even exceed 100.

*ENERGY STAR recommends that using the Roof Savings Calculator (rsc.ornl.gov), which factors in both heating and cooling costs, to determine whether a cool roof will be an energy efficient choice for your geographic climate and building type.

LEED Information

Pre-consumer Recycled Content	10%
Post-consumer Recycled Content	0%
Manufacturing Location	Senatobia, MS Tooele, UT Carlisle, PA
Solar Reflectance Index (SRI)	99 (white) 86 (tan)



FleeceBACK® TPO Membranes



Overview

FleeceBACK TPO membranes with Octaguard XT™ are manufactured using a hot-melt extrusion process for complete scrim encapsulation. Once the TPO is reinforced and enhanced with fleece, the total sheet thicknesses available are 100, 115, and 135 mils, creating a very tough, durable and versatile sheet that is ideal for re-roofing or new construction projects. FleeceBACK TPO sheets are chlorine free and plasticizer free with excellent chemical resistance to acids, bases, restaurant oils, and greases.

All FleeceBACK TPO membranes utilize Octaguard XT™ weathering package technology to withstand extreme durability testing intended to simulate exposure to severe climates. FleeceBACK TPO's advanced polymerization technology combines the flexibility of ethylene-propylene (EP) rubber with the heat weldability of polypropylene.

FleeceBACK TPO membranes are intended to be used with adhered or mechanically fastened roofing systems. FleeceBACK TPO is ideally suited for roof garden and solar panel applications and projects demanding superior wind uplift resistance due to its added toughness and durability. FleeceBACK TPO is also a great solution for buildings requiring low noise and odors during roofing application.

Features and Benefits

- » Choice of white, gray, or tan membranes that are UL Class A rated
- » Superior wind uplift performance and ratings (up to an FM 1-945) due to a mechanical bond between fleece and adhesive
- » 75% fewer seams than Modified Bitumen
- » Wide window of weldability

- » Fleece reinforcement adds toughness, durability, and enhanced puncture resistance
 - 115-mil membrane delivers 33% greater puncture resistance and 33% greater breaking strength than 60-mil TPO
 - Greater puncture resistance than Modified Bitumen
- » Excellent hail damage resistance
 - Passes FM's severe hail test
 - Passes UL-2218 Class 4 rating
 - Passes National Bureau of Standards – 23 Ice Ball test up to 3"-diameter hail with the membrane cooled to 32°F

Installation

Adhered Roofing System

Insulation is mechanically fastened or adhered. Spray-apply or extrude FAST™ or Flexible FAST Adhesive to the substrate and allow foam to "string/body" approx 1½ - 2 minutes prior to setting FleeceBACK TPO into the FAST Adhesive. Roll FleeceBACK TPO membrane with a 30"-wide, 150-pound weighted roller to ensure full embedment. Splices are hot-air welded. End laps are butted and sealed with reinforced membrane or a head sheet may be utilized.

Review Carlisle specifications and details for complete installation information, including mechanically fastened options.

Precautions

- » Use proper stacking procedures to ensure sufficient stability.
- » Exercise caution when walking on wet membrane.
- » UV-resistant sunglasses are required when working with FleeceBACK TPO membranes.
- » White surfaces reflect heat and may become slippery due to frost and ice accumulation.
- » Care must be exercised when working close to a roof edge when the surrounding area is snow covered.
- » FleeceBACK TPO membrane rolls must be tarped and elevated to keep dry prior to installation. If the fleece gets wet, use a wet vac system to help remove moisture from the fleece. **DO NOT INSTALL MEMBRANE IF FLEECE IS WET.**
- » FleeceBACK TPO membrane exposed to the weather must be prepared with Weathered Membrane Cleaner prior to hot-air welding.

FleeceBACK TPO

Membranes

LEED® Information

Pre-consumer Recycled Content	10%
Post-consumer Recycled Content	0%
Manufacturing Location	Senatobia, MS Tooele, UT
Solar Reflectance Index	White: 99 Gray: 53 Tan: 86

Radiative Properties for ENERGY STAR®, Cool Roof Rating Council (CRRC) and LEED

Physical Property	Test Method	White	Gray	Tan
ENERGY STAR – Initial solar reflectance	Solar Spectrum Reflectometer	0.79	N/A	0.71
ENERGY STAR – Solar reflectance after 3 years	Solar Spectrum Reflectometer (uncleaned)	0.70	N/A	0.64
CRRC – Initial solar reflectance	ASTM C1549	0.79	0.46	0.71
CRRC – Solar reflectance after 3 years	ASTM C1549 (uncleaned)	0.70	0.43	0.64
CRRC – Initial thermal emittance	ASTM C1371	0.90	0.89	0.86
CRRC – Initial thermal emittance after 3 years	ASTM C1371 (uncleaned)	0.86	0.88	0.87
LEED – Thermal emittance	C1371	0.90	0.89	0.86
Solar Reflectance Index (SRI)	ASTM E1980	99	53	86

Carlisle Extreme Testing – Heat Aging

	ASTM Requirement	FleeceBACK TPO Requirement
ASTM Test 240°F	670 hours or 4 weeks	5,376 hours or 32 weeks*

*Comparable to 1,024 weeks (20 years) at 185°F for 6 hrs/day.

Heat Aging accelerates the oxidation rate that roughly doubles for each 18°F (10°C) increase in roof membrane temperature. Oxidation (reaction with oxygen) is one of the primary chemical degradation mechanisms of roofing materials.

Carlisle Extreme Testing – Environmental Cycling

–10 days heat aging at 240°F (116°C) followed by 5 days water immersion at 158°F (70°C)

Followed by 5,040 kJ/m² (2000 hrs. at 0.70 W/m² irradiance) xenon-arc exposure

Environmental Cycling subjects the membrane to repeated cycles of heat aging, hot-water immersion followed by xenon-arc exposure.

EXTREME Testing for Severe Climates

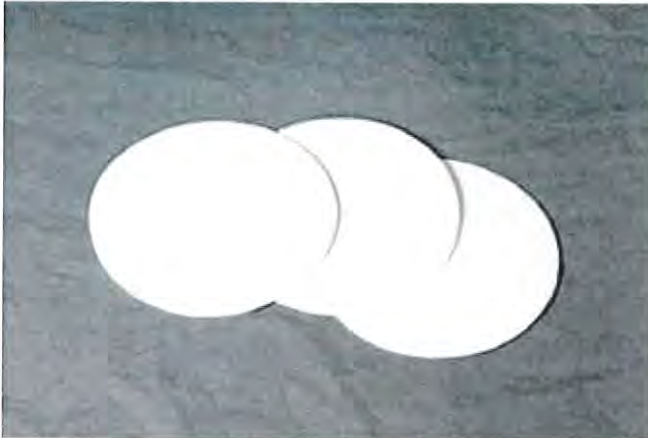
ASTM Standard D6878 is the material specification for Thermoplastic Polyolefin-Based Sheet Roofing. It covers material property requirements for TPO roof sheeting and includes initial and aged properties after heat and xenon-arc exposure. As stated in the scope of the standard, “the tests and property limits used to characterize the sheet are values intended to ensure minimum quality for the intended purpose.” Carlisle’s goal is to produce TPO that delivers maximum performance for the intended purpose of roofing membranes. Maximum performance requires the membrane to far exceed the requirements of ASTM D6878.

Typical Properties and Characteristics

Physical Property	Test Method	SPEC. (Min.)	FleeceBACK TPO Typical
Tolerance on Nominal Thickness, %	ASTM D751	±10	±10
Thickness over Fleece, min			
100-mil (2.54 mm)	—	—	.045 (1.14)
115-mil (2.92 mm)	—	—	.060 (1.52)
135-mil (3.43 mm)	—	—	.080 (2.03)
Weight, lbm/ft²			
100-mil	—	—	0.27
115-mil	—	—	0.33
135-mil	—	—	0.46
Breaking Strength, min, lbf (kN)	ASTM D751 Grab Method	220 (1)	350 (1.6) 450 (2) 500 (2.2)
Elongation at break of internal fabric, %	ASTM D751	15	25
Tearing Strength, min, lbf (N)	ASTM D751 B Tongue Tear	55 (245)	100 (445)
Puncture Resistance, Joules	ASTM D5635		
100-mil	—	—	17.5
115-mil	—	—	22.5
135-mil	—	—	30.0
Puncture Resistance, lbf	FTM 101C Method 2031	350 400 425	450 500 525
Brittleness point, max, °F (°C)	ASTM D2137	-40 (-40)	-50 (-46)
Linear Dimensional Change, %	ASTM D1204	± 1 max	-0.2 typical
Field Seam Strength, lbf/in. (kN/m)	ASTM D1876		
ASTM D1876 tested in peel			
100-mil		25 (4.4)	50 (8.8)
115-mil		25 (4.4)	60 (10.5)
135-mil		40 (7.0)	70 (12.3)
Water Vapor Permeance, perms	ASTM E96 Proc B	—	0.10 max 0.05 typical
Resistance to Microbial Surface Growth, Rating (1 is very poor, 10 is no growth)	ASTM D3274	—	9-10 typical
Properties after heat aging—ASTM D573, 670 hrs. at 240 °F	ASTM D573		
Breaking strength, % retained	—	—	90 min
Elongation reinf. % retained	—	—	90 min
Tearing Strength, % retained	—	—	60 min
Weight Change, %	—	—	± 1.0 max
Ozone Resistance	ASTM D1149	No cracks	No cracks
100 pphm, 168 hours			
Resistance to Water Absorption	ASTM D471	± 3.0	0.90
After 7 days immersion @ 158°F (70°C)			
Change in mass, max, % (one side)			
Resistance to Outdoor (Ultraviolet) Weathering	ASTM G155	No cracks No loss of breaking or tearing strength	No cracks No loss of breaking or tearing strength
Xenon-Arc, total radiant exposure at 0.70 W/m² irradiance, 80°C black panel temp.			
100-mil			17,640 kJ/m²
115-mil			20,160 kJ/m²
135-mil			27,720 kJ/m²

Sure-Weld TPO

T-Joint Covers



Overview

Let Carlisle simplify your next Sure-Weld TPO installation with molded T-Joint Covers. Sure-Weld TPO T-Joint Covers are used to seal step-offs at splice intersections. Installation is mandatory on all 60- and 80-mil TPO systems and on 45-mil systems where step-offs have not been properly sealed. Sure-Weld TPO T-Joint Covers consist of 60-mil non-reinforced TPO formed into a perfect 4.5"-diameter circle and packaged 100 parts per carton. Available in white, tan and gray.

Carlisle's Sure-Weld TPO T-Joint Covers are part of the Certified Fabricated Accessory (CFA) program. Certified Fabricated Accessories are the only factory-fabricated TPO accessories that meet the stringent quality tolerances required to be included in a Carlisle warranted roofing system.

Features and Benefits

- » Every T-Joint cover is a perfect 4.5" diameter circle
- » More consistent appearance than hand-cut flashing
- » Provides substantial labor savings compared to field-cut flashing
- » Seals channels at splice intersections created by seam step-offs

Installation

1. If membrane has been exposed to the weather, clean splice intersection area with Weathered Membrane Cleaner.
2. Use a lower temperature setting on the hand heat welder than that used for welding reinforced TPO membrane. (Typically a setting of "6" on a scale of "10" is appropriate for welding TPO T-Joint Covers.)
3. Center the T-Joint Cover over the splice intersection, begin welding at the center point and work towards the outside. Use the edge of the roller to crease the T-Joint cover into membrane step-offs to achieve a proper seal.
4. Using a probe, check all splices for voids and cold welds only once the T-Joint Cover has completely cooled. Make any needed repairs.

Review Carlisle specifications and details for complete installation information.

Precautions

- » The TPO T-Joint Cover is not intended to overlay fasteners and plates as this requires the use of reinforced membrane.
- » Store T-Joint Covers in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. T-Joint Covers that have been exposed to the weather must be prepared with Weathered Membrane Cleaner before hot-air welding.

Typical Properties and Characteristics

Size	4.5" (114 mm)
Thickness	0.060" (1.5 mm)
Packaging	100 per box
Weight (per box)	3.5 lbs. (1.6 kg)
Material	Non-Reinforced TPO
Color	White, Gray, Tan

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

Sure-Weld[®] TPO

Outside Corners



Overview

Let Carlisle simplify your next Sure-Weld TPO installation with prefabricated Outside Corners. Sure-Weld TPO Outside Corners are pre-molded and are used for flashing outside corners on a variety of details. Installation is fast and easy with no cutting or stretching required.

Carlisle's Sure-Weld TPO Outside Corners are part of the Certified Fabricated Accessory (CFA) program. Certified Fabricated Accessories are the only factory-fabricated TPO accessories that meet the stringent quality tolerances required to be included in a Carlisle warranted roofing system.

Features and Benefits

- » Provide a substantial labor savings compared to field fabricating from non-reinforced flashing
- » Pre-stretched, multi-wave design allows wrapping outside corners that are out of square and not exactly 90 degrees
- » More consistent appearance than outside corners field fabricated from flashing

Installation

1. Place the center point of the Sure-Weld TPO Outside Corner over the outside intersection of the corner.
2. Begin welding at the innermost center point and work away from the center by first welding the vertical portion of the flashing.
3. Use a lower temperature setting on the heat welder than when welding reinforced TPO membrane. (Typically a setting of 6 on a scale of 10 is appropriate for welding TPO Outside Corners).

4. Use the edge of the roller to crease the corner flashing into any membrane step-off to create a proper seal.
5. Probe all welded edges of the corner only once the material has completely cooled to ensure watertight performance.

Review Carlisle specifications and details for complete installation information.

Precautions

- » Store TPO Outside Corners in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. TPO Outside Corners or TPO membrane that has been exposed to the weather prior to use must be prepared with Weathered Membrane Cleaner before hot-air welding.

Typical Properties and Characteristics

Thickness	0.060" (1.5 mm)
Packaging	12 per bag
Color	White, Gray, Tan
Material	Injection-molded TPO

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

LEED[®] Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Bloomington, IL
Solar Reflectance Index (SRI)	N/A

Sure-Weld[®] TPO

Inside Corners



Overview

Let Carlisle simplify your next Sure-Weld TPO installation with prefabricated Inside Corners. TPO Inside Corners are pre-molded and are used for flashing inside corners on a variety of details. Installation is fast and easy with no cutting or stretching required.

Carlisle's TPO Inside Corners are part of the Certified Fabricated Accessory (CFA) program. Certified Fabricated Accessories are the only factory-fabricated TPO accessories that meet the stringent quality tolerances required to be included in a Carlisle warranted roofing system.

Features and Benefits

- » Forms easily into "out-of-square" corners that are not exactly 90°
- » Provides substantial labor savings compared to field fabricating the flashing detail from non-reinforced flashing
- » More consistent appearance than inside corners field-fabricated from flashing

Installation

1. Position the TPO Inside Corner into the building corner, begin welding at the innermost corner point and work away from the corner.
2. Use a lower temperature setting on the heat welder than when welding reinforced TPO membrane. (Typically a setting of 6 on a scale of 10 is appropriate for welding TPO Inside Corners).
3. Use the edge of the roller to crease the corner flashing into any membrane step-off to create a proper seal.
4. Probe all welded edges of the corner only once the material has completely cooled to ensure watertight performance.

Review Carlisle specifications and details for complete installation information.

Precautions

- » Store TPO Inside Corners in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. TPO Inside Corners or TPO membrane that has been exposed to the weather prior to use must be prepared with Weathered Membrane Cleaner before hot air welding.

Typical Properties and Characteristics

Thickness	0.060" (1.5 mm)
Packaging	12/bag
Color	White, Gray, Tan
Material	Injection molded

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

LEED[®] Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Bloomington, IL
Solar Reflectance Index (SRI)	N/A

Sure-Weld[®] TPO Pipe Seals



Overview

Let Carlisle simplify your next Sure-Weld TPO installation with TPO Molded Pipe Seals. TPO Pipe Seals are injection-molded, pre-formed flashings for pipes ¾" (19.0 mm) to 8" (203.2 mm) in diameter. TPO Pipe Seals are packaged in boxes of eight and come with universal stainless steel clamping rings.

Carlisle's TPO Molded Pipe Seals are part of the Certified Fabricated Accessory (CFA) program. Certified Fabricated Accessories are the only factory-fabricated TPO accessories that meet the stringent quality tolerances required to be included in a Carlisle warranted roofing system.

Features and Benefits

- » Provides a reliable method of waterproofing round pipe penetrations
- » Provides a substantial labor savings compared to field fabricating from non-reinforced flashing
- » Provides more consistent appearance than field-fabricated pipe flashings
- » Double-ribbed cutting guide provides easier, smoother and straighter cuts
- » Rib design also keeps the clamp in the proper position for the life of the roofing system

Productivity Boosting Features and Benefits:

- » Up to 60% labor savings compared to traditional field fabrication
- » Quick and simple installation with no stretching required
- » Provides a consistent, finished appearance



Installation

1. Cut pipe seal between the two raised "ribs" to the desired diameter as illustrated on the flange of the pipe seal. (Do not cut off both raised "ribs".)
2. Pull TPO Pipe Seal over pipe until base flange is in contact with the membrane. (Application of heat to the top portion of the TPO Pipe Seal may be necessary to allow installation over the pipe.)
3. Mark pipe around the top of the TPO Pipe Seal.
4. Pull TPO Pipe Seal upwards on pipe until mark on the pipe is visible.
5. Install Water Cut-off Mastic below mark which indicates the top of the installed TPO Pipe Seal.
6. Pull TPO Pipe Seal back down over pipe and into position.
7. Heat weld the TPO Pipe Seal base flange to deck membrane (the hand-welder temperature setting should be between 5 and 6).
8. Install a stainless steel universal clamping ring to provide constant compression of the sealant.

Review Carlisle specifications and details for complete installation information.

Precautions

- » Remove all lead and other flashing.
- » Temperature of pipe must not exceed 160°F (71°C).
- » When used with mechanically fastened membrane, install a minimum of four fastening plates around pipe penetrations. Position fastening plates around the penetration so the plates are covered by the pipe seal flange. A minimum 1½"-wide weld must be maintained around the outer edge of the flange beyond the plates. If fastening plates cannot be installed in a manner to allow a minimum 1½" weld, the plates must be placed outside the TPO Pipe Seal flange and covered with a reinforced TPO overlay.
- » Store pre-molded pipe seals in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. TPO Pipe Seals or membrane that has been exposed to the weather prior to use must be prepared with Weathered Membrane Cleaner prior to hot-air welding.

Sure-Weld TPO

Pipe Seals

Typical Properties and Characteristics

Sizes	¾" to 8" O.D. pipe (19.0 to 203.2 mm)
Packaging	8/box
Weight (each)	0.63 lbs (0.3 kg)
Material	Injection-molded TPO
Color	White, gray and tan

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

LEED® Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Bloomington, IL
Solar Reflectance Index (SRI)	N/A

Please use the chart below to cross-reference your pipe size with the proper step to cut as shown.

Copper Tubing (C.T.S.)

Nominal tube size	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	5"	6"	8"
Pipe O.D.	.88	1.13	1.38	1.63	2.13	2.63	3.13	4.13	5.13	6.13	N/A
Step of boot used	1	1	1	1½	2	2	3	4	5	6	N/A

Schedule 40 / 80 Steel Pipe - PVC Standard - Polyethylene Pipe IPS

Nominal tube size	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	5"	6"	8"
Pipe O.D.	1.05	1.32	1.66	1.90	2.38	2.88	3.50	4.50	5.56	6.63	8.63
Step of boot used	1	1	1½	1½	2	3	3	4	5	6	8

Cast Iron Pipe

	Pit Class A & Spun 100 – 250					Pit Class B, C & D				
Nominal tube size	2"	3"	4"	6"	8"	2"	3"	4"	6"	8"
Pipe O.D.	2.50	3.96	4.80	6.90	9.50	N/A	3.96	5.00	7.10	9.30
Step of boot used	2	4	5	6	N/A	N/A	4	5	6	N/A

Sewer - Soil Pipe

PVC Plastic SDR 35 & 41 - Cast Iron Soil Pipe no hub - service weight & extra heavy

Nominal tube size	4"	4"	4"	4"	6"	6"	6"	6"	8"	8"	8"	8"
Pipe O.D.	4.22	4.38	4.30	4.62	6.28	6.30	6.30	6.62	8.40	8.38	8.38	8.75
Step of boot used	4	4	4	4	6	6	6	6	8	8	8	8

Conduit EMT

Nominal tube size	¾"	1"	1¼"	1½"	2"	2½"	3"	3½"	4"
Pipe O.D.	.922	1.16	1.51	1.74	2.19	2.88	3.50	4.00	4.50
Step of boot used	1	1	1	1½	2	3	3	4	4

Conduit IMC

Nominal tube size	¾"	1"	1¼"	1½"	2"	2½"	3"	3½"	4"
Pipe O.D.	1.02	1.29	1.63	1.88	2.36	2.85	3.47	3.97	4.46
Step of boot used	1	1	1½	1½	2	3	3	4	4

Conduit Rigid

Nominal tube size	¾"	1"	1¼"	1½"	2"	2½"	3"	3½"	4"	5"
Pipe O.D.	1.05	1.32	1.66	1.90	2.37	2.87	3.5	4	4.5	5.56
Step of boot used	1	1	1½	1½	2	3	3	4	4	5

Sure-Weld TPO Split Pipe Seals



Overview

Carlisle's Sure-Weld TPO Split Pipe Seals are prefabricated flashings made from specially designed 60-mil reinforced TPO Detail Membrane that allows for the elimination of T-Joint Covers at crossovers. Designed to fit pipes ranging from 1" (25.4 mm) to 6" (152.4 mm) in diameter, TPO Split Pipe Seals can be used to wrap round pipes with obstructions that would prevent the use of a standard pre-molded pipe seal.

TPO Split Pipe Seals are available in standard white and are packaged 8 per carton. Each carton also contains 8 universal clamping rings. Additional sizes and colors are available on a special-order basis.

Carlisle's TPO Split Pipe Seals are part of the Certified Fabricated Accessory (CFA) program. Certified Fabricated Accessories are the only factory-fabricated TPO accessories that meet the stringent quality tolerances required to be included in a Carlisle warranted roofing system.

Features and Benefits

- » Special, more flexible TPO Detail Membrane allows for the elimination of T-Joint Covers at crossovers
- » Simplifies the contractor's job when flashing a pipe with an obstruction
- » Easier to work with in colder temperatures
- » Required on 25- or 30-year warranties

Productivity Boosting Features and Benefits:

- » Up to 60% labor savings compared to traditional field fabrication
- » Quick and simple installation with no stretching required
- » Provides a consistent, finished appearance



Installation

Confirm the outside diameter of the pipe to be flashed as most pipe sizes refer to inside diameter. TPO Split Pipe Seals indicate the maximum outside diameter they will fit, not the size pipe they will fit. For example, a 2" PVC pipe has a 2 3/8" outside diameter, therefore a 3" Split Pipe Seal is required to fit the 2" inside diameter of the pipe.

Each Split Pipe Seal can fit a pipe with an outside diameter that is 1" smaller than the Split Pipe Seal's stated size. A 3" Split Pipe Seal can fit pipes with a 2" to 3" outside diameter.

1. Wrap the TPO Split Pipe Seal around the pipe until the vertical leg is tight against the outside of the pipe.
2. Mark the pipe around the top of the TPO Split Pipe Seal.
3. Remove the TPO Split Pipe Seal from around the pipe.
4. Install Water Cut-Off Mastic below the mark indicating the top of the installed TPO Split Pipe Seal.
5. Wrap the TPO Split Pipe Seal back around the penetration until the vertical leg is tight against the outside of the pipe.
6. Tack-weld the back edge of the pipe seal's vertical leg, ensuring that good contact is maintained between the TPO Split Pipe Seal and the pipe. This process will hold the TPO Split Pipe Seal in place.
7. Heat-weld the entire width of the vertical overlap. Hand-roll against the outer surface of the pipe to create the pressure necessary to achieve an acceptable weld.
8. Heat-weld the base flange to the deck membrane and complete the horizontal overlap weld.
9. Once the flashing has completely cooled, check all splices for voids and cold welds. Make any needed repairs.

Sure-Weld TPO

Split Pipe Seals

10. Install a stainless steel universal clamping ring to provide constant compression of the sealant.
11. Apply TPO Cut-Edge Sealant to all edges of the TPO Split Pipe Seal that are located on the horizontal plane. Do not apply the sealant to vertical surfaces.

Review Carlisle specifications and details for complete installation information.

Precautions

- » Remove all lead and other flashing.
- » Temperature of pipe must not exceed 160°F (71°C).
- » Install a minimum of four fastening plates around pipe penetrations on mechanically fastened systems. Position fastening plates around the penetration so the plates are covered by the TPO Split Pipe Seal flange. A minimum 1½"-wide weld must be maintained around the outer edge of the flange beyond the plates. If fastening plates cannot be installed in a manner to allow a minimum 1½" weld, the plates must be placed outside the pipe seal flange and covered with a heat-welded reinforced TPO overlay.
- » Store pipe seals in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. TPO Split Pipe Seals or membrane that have been exposed to the weather prior to use must be prepared with Weathered Membrane Cleaner prior to hot-air welding.

Typical Properties and Characteristics

Sizes	1", 2", 3", 4", 5", and 6" O.D. Pipe (25.4, 50.8, 76.2, 101.6, 127.0, and 152.4 mm)
Packaging	8/box
Weight (box)	1" 4 lbs (2 kg) 2" 5 lbs (2 kg) 3" 5 lbs (2 kg) 4" 6 lbs (3 kg) 5" 6 lbs (3 kg) 6" 6 lbs (3 kg)
Material	Reinforced 60-mil TPO Detail Membrane
Color	White (Gray and Tan are available via custom order)

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

LEED® Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Piedmont, SC Eugene, OR
Solar Reflectance Index (SRI)	White:99

Sure-Weld[®] TPO

Pocket Extensions



Overview

Let Carlisle simplify your next Sure-Weld TPO installation with pre-fabricated Pocket Extensions. TPO Pocket Extensions are fabricated from 60-mil-thick TPO reinforced membrane and TPO coated metal. The Pocket Extensions are used with the Prefabricated or Molded Sealant Pockets and can be used full length, cut to size for customized lengths or welded to each other for extra long applications. They are packaged 10 legs per carton and are available in white.

Carlisle's TPO Pocket Extensions are part of the Certified Fabricated Accessory (CFA) program. Certified Fabricated Accessories are the only factory-fabricated TPO accessories that meet the stringent quality tolerances required to be included in a Carlisle warranted roofing system.

Features and Benefits

- » Provide a substantial labor savings compared to field fabricating odd-sized sealant pockets
- » Allows extension of the standard TPO Molded or Prefabricated Sealant Pockets without the need to custom order a custom-sized pocket
- » Can be cut to length to minimize sealant usage
- » Provides a reliable method to waterproof odd-shaped penetrations
- » Professional finished appearance

Installation

1. Clean the inside of the Pocket Extensions and TPO Sealant Pocket as well as the areas where the pocket overlaps, the underside of the pocket flange, and the deck membrane with Weathered Membrane Cleaner. Use a Primer Pad with the cleaner if the membrane has been exposed for an extended period of time.
2. Place the TPO Sealant Pocket and Extensions around the penetration(s), overlapping the two sections of the pocket with the Extensions. The Extensions must be positioned as follows: the 2" TPO overlap tab is placed on the topside of the pocket and the opposite end (with no welding tab) is placed on the underside of the opposing pocket.
3. Cut a piece of cardboard (approximately 4" x 4") and place it under the overlap area to be welded. The cardboard prevents the pocket and extension leg from fusing to the deck membrane when first welding the overlaps.
4. Using a hand-welder, weld the angle change in the overlap areas at each end of the extension leg. Using the end of a seam probe assists in this process. The hand-welder temperature setting should be between 5 and 6.
5. Hand-weld the remainder of the horizontal overlaps.
6. Position the TPO Sealant Pocket and Extension so the vertical overlap is against the penetration. This will allow proper pressure to be applied with the 2" silicone roller.
7. Weld all the vertical overlaps starting at the angle change and progressing to the top of the pocket.
8. Make tack-welds on all four sides of the pocket to hold it in place.
9. Weld the entire horizontal flange of the molded pocket and extension legs to the deck membrane. Crease all step-offs with the edge of the silicone roller to avoid water channeling.
10. Once the weld area is completely cool, check all splices for voids and cold-welds using a seam probe. Make any needed repairs.
11. Apply a thin coat of TPO Primer to the TPO membrane, penetration(s), and around the top rim of the pocket using a small paint brush. Do not apply TPO Primer to the galvanized metal surface on the inside of the TPO Pocket Extensions.
12. Fill the pocket with White One-Part Pourable Sealer. Use an adequate amount of sealant to ensure that contact is made with the top rim of the pocket. One set of TPO Pocket Extensions welded to a TPO Molded Sealant Pocket will require 1-gallon (3.785 liters) of sealant to fill the extended pocket.

Review Carlisle specifications and details for complete installation information.

Sure-Weld TPO

Pocket Extensions

Precautions

1. The walls of the TPO Extensions and sealant pockets must be a minimum of one inch from any penetration.
2. TPO Pocket Extensions are designed to fit both sides of the TPO Sealant Pocket without having a designated left or right part.
3. Clean TPO Pocket Extensions, sealant pocket, TPO membrane and the penetration(s) prior to use with Weathered Membrane Cleaner. Primer pads must be used if the membrane has been exposed for an extended period of time. Apply TPO Primer to the TPO membrane and penetration(s) surfaces only. Do not apply TPO Primer to the galvanized metal surface utilized on the inside of the TPO Pocket Extensions.

Typical Properties and Characteristics

Sizes	14" (35.56 cm) overall length; 10" (25.4 cm) installed length
Packaging	10 per carton
Weight (each)	6 lbs. (2.72 kg)
Material	Reinforced 60-mil TPO membrane and coated metal
Color	White

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.

LEED® Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Eugene, OR
Solar Reflectance Index (SRI)	N/A

Sure-Weld[®] TPO Universal Corners



Overview

Carlisle's labor-saving, pre-molded Sure-Weld TPO Universal Corners are ideal for flashing corners on a variety of details.

Carlisle's Sure-Weld TPO Universal Corners are a part of the Certified Fabricated Accessory (CFA) program. CFAs are the only factory-fabricated TPO accessories that meet the stringent quality tolerances required to be included in a Carlisle warranted roofing system.

Features and Benefits

- » Conforms easily to details on new construction installations, where right angles are common
- » Each Universal Corner can be cut into one outside corner or one inside corner
- » Large, 6"-wide deck flange reduces the need for T-Joint Covers (when used as an outside corner)
- » Provide a substantial labor savings compared to field-fabricating from non-reinforced flashing
- » More professional, consistent appearance than field-fabricated corners

Productivity Boosting Features and Benefits:

- » Up to 60% labor savings compared to traditional field fabrication
- » Quick and simple installation with no stretching required
- » One product to utilize for both an inside or outside corner



Installation

See the diagram on page two for cutting instructions. The cutting instructions are also molded into each part. Use a lower temperature setting on the heat welder than when welding reinforced TPO membrane. Typically, a setting of 6 on a scale of 10 is appropriate for welding Universal Corners.

Outside Corner

1. Clean the surface to be welded with Weathered Membrane Cleaner.
2. Place the outside Corner into position over the outside intersection of the corner.
3. Begin welding at the bottom point of the outside corner. Weld straight up the vertical portion of the corner. Weld each side of the outside corner, working from the inside toward the outside.
4. Weld the bottom flange starting on the inside and working towards the outer edges. Use the edges of the roller to crease the corner into any membrane step-off to create a proper seal.
5. Once the material has completely cooled, probe all welded edges of the corner to ensure watertight performance.

Inside Corner

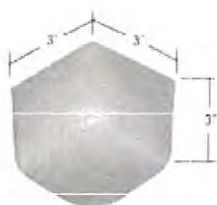
1. Clean the surfaces to be welded with Weathered Membrane Cleaner.
2. Position the inside corner into the corner setting. Begin welding at the innermost corner point and work up and away from the corner. Weld each side of the inside corner, working from the inside toward the outside.
3. Weld the bottom flange starting on the inside and working towards the outer edges. Use the edge of the roller to crease the corner into any membrane step-off to create a proper seal.
4. Once the material has completely cooled, probe all welded edges of the corner to ensure watertight performance.

Review Carlisle specifications and details for complete installation information.

Sure-Weld TPO

Universal Corners

Each Universal Corner can be cut into one Inside or Outside Corner.



Inside Corner



Outside Corner

Typical Properties and Characteristics

Thickness	0.060" (1.5 mm)
Packaging	20 per carton
Color	White, gray and tan
Material	Injection-molded TPO

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

LEED® Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Bloomington, IL

Precautions

- » Store TPO Universal Corners in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. TPO Universal Corners or TPO membrane that has been exposed to the weather prior to use must be prepared with Weathered Membrane Cleaner before hot-air welding.

Sure-Weld™ TPO

Non-Reinforced Flashing



Overview

Carlisle's Sure-Weld TPO Non-Reinforced Flashing is a 60-mil thermoplastic polyolefin (TPO)-based membrane available in 12" and 24" by 50' rolls. When the use of prefabricated accessories is not feasible, this product can be used to create inside and outside corners, field-fabricated pipe flashings, sealant pockets, and scuppers. Standard colors are white, tan, and gray.

Features and Benefits

- » New and improved TPO Flashing provides 35% more flexibility, making it easier to field-fabricate details
- » Compounded with the same OctaGuard XT™ weathering package as Carlisle's Sure-Weld TPO membranes for maximum longevity
- » Superior weldability allows for consistent, high-quality seams in penetrations and other critical roof areas
- » Available in white, gray, and tan colors to match Carlisle's Sure-Weld TPO membranes

Installation

1. TPO Flashing is used to flash various roofing system details and penetrations. The specific installation method will vary based on the situation.
2. Use a lower temperature setting on the heat welder than when welding reinforced TPO membrane. Typically, a setting of "6" on a scale of "10" is appropriate for welding TPO Flashing.

3. Use the edge of the roller to crease the flashing into any membrane step-offs for a proper seal.

Review Carlisle specifications and details for complete installation information.

Precautions

- » Review the applicable Safety Data Sheet for complete safety information prior to use.
- » Sunglasses that filter out ultraviolet light are strongly recommended, as tan and white surfaces are highly reflective. Roofing technicians should dress appropriately and wear sunscreen.
- » Store TPO Flashing in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. TPO Flashing that has been exposed to the weather for approximately 7 days or longer must be prepared with Weathered Membrane Cleaner prior to hot air welding.

Typical Properties and Characteristics

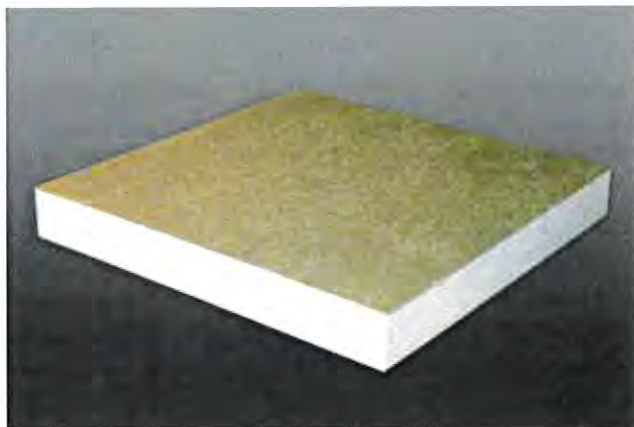
Properties	ASTM Test Method	Specification
Tolerance on nominal thickness, %	D 412	plus 15/ minus 10
Weight, lb/ft ² (kg/m ²), typical		0.30 (1.5)
Tensile strength, min., psi (Mpa)	D 412 Die C	1200 (8.3)
Elongation, ultimate, min., %	D 412 Die C	600
Tear strength, min., lbf/in (kN/m)	D 624 Die C	250 (43.8)
Ozone resistance, 168h @ 100 pphm, 50% ext.	D 1149	No Cracks
Heat aging: 28 days at 240°F (116°C)	D 573	
Tensile strength, min., psi (MPa)	D 412	1000 (6.9)
Elongation, ultimate, min., %	D 412	500
Tear strength, min., lbf/in (kN/m)	D 624	200 (35.0)
Linear dimensional change, max. %	D 1204	±4
Resistance to Xenon-arc weathering	G 155	No Cracks
Xenon-Arc, 10,080 kJ/m ² total radiant exposure, visual condition at 10X	0.70 W/m ² 80°C B.P.T.	

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

LEED® Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Greenville, IL
Solar Reflectance Index (SRI)	N/A

InsulFoam SP



Overview

Carlisle's InsulFoam SP roof insulation is made up of lightweight, high-performance closed-cell expanded polystyrene (EPS) with a durable, factory-laminated coated glass facer (CGF). Featuring a nominal density of 1.25 pounds per cubic foot (pcf), this product meets or exceeds the requirements of ASTM C578, Type VIII, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation. InsulFoam SP offers a long-term, stable R-value and has excellent dimensional stability, compressive strength, and water-resistant properties.

InsulFoam SP is specifically designed for low-slope ballasted EPDM roofing systems, as well as fully adhered and mechanically fastened TPO, PVC, and EPDM systems. InsulFoam is compatible with Carlisle's FAST and Flexible FAST adhesives. InsulFoam SP is not compatible with solvent-based or water-based adhesives.

Features and Benefits

- » Premium coated glass facer improves fire resistance, moisture resistance, and dimensional stability
- » Fire-rated slip sheets and thermal barriers are not required in many applications
- » Recognized in the International Code Council Evaluation Service (ICC-ES)
- » UL Classified
- » Contains no formaldehyde or ozone-depleting HCFCs
- » Contains up to 25% recycled material
- » 100% recyclable foam core
- » Does not readily absorb moisture

Product Characteristics

InsulFoam SP is available in several standard thicknesses and is made with Type VIII expanded polystyrene with a nominal density of 1.25 pcf. Custom thicknesses are available with little impact on lead time.

Standard Sizes

Thickness	Width	Length	Pieces per Bundle
1"	4'	8'	36
4.5"	4'	8'	8
4.75"	4'	8'	8
5.9"	4'	8'	5
7.0"	4'	8'	5

Installation

Installation Considerations

- » Install only as much insulation as can be covered by a roof membrane system, and/or made watertight by the end of each day.
- » InsulFoam SP should not be exposed directly to solvent- or petroleum-based adhesives and sealants.
- » Allow approximately a ¼" space between insulation and vertical surfaces or roof projections. Do not force or jam product into place.
- » Review the layout of all tapered EPS systems before loading and installing panels.
- » In re-cover applications, ensure no moisture is trapped in the new or existing roofing system.

Loose-Laid Insulation

Install InsulFoam SP with continuous side joints and end joints, staggered so they are offset by a minimum of 12" from the end joints in adjacent rows. Insulation should abut tightly against adjacent boards. Joints greater than ½" should be filled with the same insulation that is being used in the field of the roof. If insulation is being installed over a thermal barrier or existing layer of insulation, or under a cover board, all joints must be offset a minimum of 6" between layers. When installing InsulFoam SP directly to a metal deck, the edges of the insulation parallel to the deck ribs must be solidly supported and centered on the ribs. Additionally, for metal decks, ensure that the insulation has a thickness that is adequate to span the rib openings. *When conditions dictate, in order to prevent wind blow-off or damage during installation, loose-laid insulation should be weighed down or tacked into place with a minimal quantity of mechanical fasteners.*

InsulFoam SP

Mechanically Fastened

Install InsulFoam SP with continuous side joints and end joints, staggered so they are offset by a minimum of 12" from the end joints in adjacent rows. Insulation should abut tightly against adjacent boards. Joints greater than ½" should be filled with the same insulation that is being used in the field of the roof. If insulation is being installed over a thermal barrier or an existing layer of insulation, or under a cover board, all joints must be offset a minimum of 6" between layers. Use an approved mechanical fastener of sufficient length to penetrate into or through the deck by the amount prescribed for the specific fastener. Fasteners should never be closer than 6" from the edges of the insulation board, and should be placed in a pattern that achieves the desired approval. Use appropriate insulation plates with the fasteners. Care must be taken to avoid over-driving or under-driving the fastener and plate assembly. When installing InsulFoam SP directly to a metal deck, the edges of the insulation parallel to the deck ribs must be solidly supported and centered on the ribs. Additionally, for metal decks, ensure that the insulation has a thickness that is adequate to span the rib openings.

Review Carlisle specifications and details for complete installation information.

Typical Properties and Characteristics

Property	Test Method	Value
Density (nom. pcf)	ASTM C303	1.25
C-Value (Conductance) BTU / (hr • ft ² • °F) (per inch) @25°F @40°F @75°F	ASTM C518 or ASTM C177	0.22 0.235 0.255
R-Value (Thermal Resistance) (hr • ft ² • °F) / BTU (per inch) @25°F @40°F @75°F	ASTM C518 or ASTM C177	4.55 4.25 3.92
Compressive Strength (psi, 10% deformation)	ASTM D1621	13-18
Flexural Strength (min. psi)	ASTM C203	30
Dimensional Stability (maximum %)	ASTM D2126	2
Water Vapor Permeance (max. perm., 1 inch)	ASTM E96	3.5
Water Absorption (max. % vol.)	ASTM C272	3
Capillarity	-	None
Flame Spread	ASTM E84	<20
Smoke Developed	ASTM E84	150-300

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

LEED® Information

Pre-consumer Recycled Content	Up to 25%
Post-consumer Recycled Content	0%
Manufacturing Location	Anchorage, AK Puyallup, WA Dixon, CA Chino, CA Mead, NE Aurora, CO Phoenix, AZ Lakeland, FL

Sure-Weld[®] TPO

Coated Metal



Overview

Sure-Weld TPO Coated Metal is a 24-gauge (0.6 mm) galvanized steel sheet that is coated with a layer of .035" non-reinforced TPO flashing. TPO membrane may be welded directly to the coated metal, eliminating the need to strip in the metal with a separate piece of TPO Pressure-Sensitive Coverstrip. The sheet is cut to the appropriate width and used to fabricate metal drip edges or other roof perimeter edging profiles. The metal is available in 4' by 10' (1.2 m by 3.1 m) sheets and comes packaged 10 or 25 sheets per pallet.

Carlisle's TPO Coated Metal is part of Carlisle's comprehensive TPO accessory offering that meets the stringent quality tolerances required to be included in a Carlisle warranted roofing system.

Features and Benefits

- » Allows direct welding of TPO membrane to the metal, eliminating the need to strip in edging with additional TPO Pressure-Sensitive Coverstrip.
- » Easy to cut and form for creating a variety of edge sizes and profiles.

Installation

1. Install TPO Coated Metal with 1/8" to 1/4" (3-6 mm) between adjoining sections.
2. Install 2"-wide (5 cm) duct tape over joints in TPO Coated Metal.
3. Heat-weld 6"-wide (15.5 cm) piece of TPO non-reinforced flashing over joint.
4. Position TPO reinforced membrane and heat-weld to the TPO Coated Metal with a minimum 1 1/2" (4 cm) weld.

Review Carlisle specifications and details for complete installation information.

Precautions

- » Store coated metal in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. TPO Coated Metal that has been exposed to the weather must be prepared with Weathered Membrane Cleaner prior to hot-air welding.

Typical Properties and Characteristics

Sheet Size	4' by 10' (1.2 m by 3.0 m)
Weight	1.1 lb/ft ² (5.4 kg/m ²)
Color	Gray, Tan and White
Flashing Thickness	0.035" (0.9 mm) nominal
Steel Thickness	0.024" (0.6 mm) nominal (24 gauge)
Steel Type	Hot Dipped Galvanized Steel – G90
Conforms to ASTM A653	
Packaging	10 or 25 sheets per pallet

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

LEED[®] Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Franklin Park, IL
Solar Reflectance Index (SRI)	N/A

Sure-Weld[®] TPO

Bonding Adhesive



Overview

Carlisle's Sure-Weld TPO Bonding Adhesive is a high-strength solvent-based contact adhesive that allows bonding of TPO membrane to various porous and non-porous substrates.

Features and Benefits

- » Solvent-based bonding adhesive that allows for quick drying
- » Can be roller-applied with medium nap roller
- » Provides excellent adhesion to various substrates

Coverage Rate

60 ft² (5.6 m²) per gallon finished surface. Coverage rates are average and may vary due to conditions on the jobsite. Porous surfaces and substrates may require more bonding adhesive than the typical coverage rate.

Mixing

Stir thoroughly until all settled pigments are dispersed and the adhesive is uniform in color. Minimum 5 minutes stirring is recommended.

Application

1. The surface, on or against which adhesive is to be applied, shall be clean, smooth, dry, free of fins, sharp edges, loose and foreign materials, oil and grease. Depressions greater than 1/4" (6 mm) should be feathered, using epoxy, mortar or other approved patching material. All sharp projections shall be removed by sweeping, blowing or vacuum cleaning.

2. After thorough stirring (minimum 5 minutes), apply TPO Bonding Adhesive to substrate and membrane using a 9" (23 mm) medium nap roller. Application shall be continuous and uniform, avoiding globs or puddles. An open time of 5 to 50 minutes, based on drying conditions is recommended before assembly. TPO Bonding Adhesive must be allowed to dry until it does not string or stick to a dry finger touch. Any coated area which has been exposed to rain should be allowed to dry and then recoated. Do not apply adhesive to splice areas to be hot-air welded.
3. Roll the membrane onto the adhesive-coated substrate while avoiding wrinkles. Immediately brush down the bonded portion of the sheet with a soft-bristle push broom or a clean dry roller applicator to achieve maximum contact.

Review current Carlisle specifications and details for specific application requirements.

Precautions

- » Review the applicable Material Safety Data Sheet for complete safety information prior to use.
- » TPO Bonding Adhesive is EXTREMELY FLAMMABLE – it contains solvents that are dangerous fire and explosion hazards when exposed to heat, flame or sparks. Do not smoke while applying. Do not use in a confined or unventilated area. Vapors are heavier than air and may travel along ground or may be moved by ventilation and ignited by pilot lights, other flames, sparks, heaters, smoking, electrical motors, static discharge or other ignition sources at locations distant from material handling point and flashback. All containers should be grounded when material is transferred from one container to another. A red caution label is required when shipping. A fire extinguisher should be available. In case of fire, use water spray, foam, dry chemical or carbon dioxide. Do not use a solid stream of water because it can scatter and spread the fire.
- » Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately. During application, efforts must be made to prevent fumes from entering the building via air ventilation ducts. Do not place open containers or mix adhesive near fresh air intake units. When possible, shut down or seal off the closest units.
- » If swallowed, DO NOT INDUCE VOMITING. Call a physician immediately.
- » Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with plenty of clean water for at least 15 minutes. Contact a physician immediately.

Sure-Weld TPO

Bonding Adhesive

- » Avoid contact with skin. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water. Contact physician if irritation persists.

Note: Permeation-resistant gloves (that meet ANSI/ISEA 105-2005) are recommended to be worn when using this product to protect hands from irritating ingredients.
- » Do not thin TPO Bonding Adhesive. Thinning will affect performance. Excessively thick or gelled material should be discarded.
- » Jobsite storage in excess of 90°F (32°C) may affect product shelf life. Should the TPO Bonding Adhesive be stored at temperatures lower than 60°F (15°C), restore to room temperature prior to use.
- » Opened containers of TPO Bonding Adhesive should be used within 48 hours. Adhesives will begin to thicken after this point, making it difficult, and eventually impossible, to control applied thickness. In hot weather, do not leave sealed containers on roof for prolonged periods of time. In cold weather, keep material at room temperature until ready to use. Stir adhesive occasionally while using.
- » Adhesive must be allowed to dry thoroughly. If membrane is mated with the substrate prior to the adhesive being dry, blistering will occur and not subside over time.
- » KEEP OUT OF THE REACH OF CHILDREN.

Typical Properties and Characteristics

Base	Synthetic rubber
Color	Yellow
Solids	20%
Flash Point	-4°F (-20°C) closed cup
Brookfield Viscosity	2600 centipoises
Average Net Weight	7.1 lbs/gal (3.2 kg)
Packaging	5-gal pail
Shelf Life	1 year

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

LEED® Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Carlisle, PA
VOC Content	670 g/L

FleeceBACK®

FAST™ Bag in a Box Adhesive



Overview

FAST Bag in a Box Adhesive is a VOC-free, two-component, construction-grade, insulating, polyurethane adhesive. The low-rise, expanding characteristics of FAST Bag in a Box Adhesive are designed to securely bond Carlisle's FleeceBACK® membranes and insulations to a variety of substrates. FAST Adhesive is compatible with: HP Fiberboard, HP Polyiso, extruded polystyrene (XPS), expanded polystyrene (EPS), spray polyurethane foam (SPF), DensDeck®, Securock® and OSB. Compatible deck types include concrete, cellular lightweight concrete, gypsum, cementitious wood fiber, wood, and painted or galvanized steel. FAST is also compatible with the following roofing materials for recover applications: weathered smooth or gravel-surfaced BUR, mineral cap sheet, weathered smooth or granule-surfaced Mod-Bit, weathered coal tar pitch, aged EPDM, aged TPO, aged Hypalon and Carlisle's 725TR Air and Vapor Barrier. Previously unexposed asphalt vapor barriers or unexposed asphalt must be primed with CAV-GRIP™. FAST Bag in a Box Adhesive is extruded to produce a strong, low-rise adhesive with superior wind uplift resistance and a nominal free-rise core density of 2½ lbs. per cu. ft.

FAST Installation

Requires PaceCart 2™

1. The surface to which adhesive is to be applied shall be dry, free of fins, protrusions, sharp edges, loose and foreign materials, oil, and grease. Depressions greater than ¼" (6 mm) shall be filled with FAST Adhesive or other approved patching material. All sharp projections shall be removed. **Previously unexposed asphalt must be primed with CAV-GRIP for extrusion application.**
2. Seal gaps between the wall/penetration and concrete deck with Carlisle 725TR or other suitable material to avoid condensation issues and positive pressure from air infiltration.

3. For re-roofing sprayed-in-place (SPF) urethane roofs, all wet areas must be removed. The surface must then be scarified or perforated, depending on the coating, before applying FAST Bag in a Box Adhesive.
4. Apply **FAST Bag in a Box** when substrate and ambient temperature are 50°F (10°C) or above.
5. Apply **FAST Bag in a Box IC** when substrate and ambient temperatures are between 25° – 50°F (-4° – 10°C). FAST must be kept warm.
6. Remove static mixing nozzle when stopping for more than one minute. Failure to remove nozzle can cause damage to the PaceCart™.
7. High slope applications may require adhesive to be applied to the bottom of the insulation board to avoid running.

FleeceBACK Installation

Mod-Bit Method:

1. Unroll FleeceBACK sheet and position. Fold sheet in half length-wise.
2. Apply FAST Bag in a Box Adhesive to the substrate at 4", 6" or 12" on center with a **minimum ½" wet bead** achieving light-yellow-colored foam.
3. Once "string time" occurs, gradually feed FleeceBACK sheet into FAST adhesive checking for "string body" every few feet. Stop feeding FleeceBACK sheet into the adhesive when applicator reaches adhesive that has NOT developed "string body". Immediately begin to roll membrane with a 150-lbs. weighted roller width-wise. Repeat process until FleeceBACK sheet is fully installed.

Barn Door Method:

1. Unroll FleeceBACK sheet and position. Fold sheets in half width-wise and bond one sheet at a time.
2. Apply FAST Bag in a Box Adhesive to the substrate at 4", 6" or 12" on center with a **minimum ½" wet bead** achieving light-yellow-colored foam.
3. Allow adhesive to rise and develop "string/body" (approx. 1½-2 minutes), then place FleeceBACK membrane into FAST Adhesive. String time will vary based on environmental conditions like temperature and humidity.
4. As soon as membrane is set, roll membrane with a roller not to exceed 150 lbs. to ensure fleece embedment. If adhesive contaminates the splice area, immediately remove with Weathered Membrane Cleaner.

Review Carlisle specifications and details for complete installation information.

FleeceBACK

FAST Bag in a Box Adhesive

Insulation Attachment

1. Apply FAST Bag in a Box Adhesive to the substrate at 4", 6" or 12" on center with a minimum ½" wet bead achieving light-yellow-colored foam. For steel decks, extrusion of FAST must run parallel with and be on top of the steel deck flutes.

Bead spacing parameters for 5-, 10-, or 15-year 55 mph warranties (Contact Carlisle Project Review for bead spacing on higher mph warranties or 20- and 30-year warranty projects)

Building Height	Bead Spacing (Perimeter)	Bead Spacing (Field)
0' – 25'	6" o.c. (4' perimeter)	12" o.c.
25' – 50'	6" o.c. (8' perimeter)	12" o.c.
50' – 75'	6" o.c. (12' perimeter)	12" o.c.
75' – 100'	6" o.c. (16' perimeter)	12" o.c.
100' or greater: Contact Carlisle for bead spacing requirements		

2. Factory Mutual bead spacing guidelines in the perimeter and corner may differ from the table above. Beads at 12" o.c. are not acceptable at perimeters or corners.
3. Place insulation boards (maximum 4' x 4' insulation boards when FAST Adhesive is extruded at 12" o.c. or when boards exceed 4" thickness) into FAST Bag in a Box Adhesive after allowing it to rise between ½" to ¾" and develop "string/body" (approx. 1½-2 min.). String time will vary based on environmental conditions like temperature and humidity. Do not allow the adhesive to over-cure prior to setting insulation boards.
4. Designate one person to walk boards into place and then roll the boards between 5-7 minutes from the initial adhesive application. Boards may be temporarily weighted or relief cut where necessary to keep the boards in constant contact with the adhesive until the adhesive cures.
5. At the beginning of the insulation attachment process and periodically throughout the day, check the adhesion of boards to ensure a tight bond is created and maximum contact is achieved. Allow a minimum of 30 minutes before checking boards.

Precautions

- » Review the application MSDS for complete safety information prior to use.
- » The foam produced is an organic material. It must be considered to be combustible and may constitute a fire hazard. The foam adhesive must not be left exposed or unprotected. Shield from heat and sparks.

- » Do not smoke during application.
- » Use with adequate ventilation. Avoid breathing vapors. Wear a NIOSH- or MSHA-approved respirator for organic vapors with prefilters and solvent-resistant cartridges if concentrations of MDI exceed the TLV or are unknown. Proper safety training is essential for all persons involved in the installation process. If vapor is inhaled, remove to fresh air and administer oxygen if breathing is difficult. Consult a physician immediately.
- » Avoid contact with eyes. Safety glasses or goggles are required. If splashed in eyes, immediately flush eyes with plenty of clean water for at least 15 minutes. Contact a physician immediately.
- » Avoid contact with skin. Wear long-sleeved shirts and long pants. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water or corn oil. NOTE: Permeation-resistant gloves that meet ANSI/ISEA 105-2005 are required when handling the material or during application.
- » Jobsite storage temperatures in excess of 90°F (32°C) may affect product shelf life. Should the components be stored at temperatures lower than 55°F (13°C), restore to room temperature prior to use. Do not allow FAST Adhesive in boxes or in PaceCart to freeze.
- » Previously unexposed asphalt must be primed with CAV-GRIP.
- » KEEP OUT OF THE REACH OF CHILDREN.

Coverage Rates

FleeceBACK or insulation attachment to a smooth, flat non-porous approved surface:

170 ft² per gallon at 12" o.c.

95 ft² per gallon at 6" o.c.

65 ft² per gallon at 4" o.c.

(ft² per gallon may vary due to jobsite conditions...gravel BUR will consume twice as much adhesive)

Typical Properties and Characteristics

Base	FAST Part A (1) Polymeric Isocyanate	FAST Part B (2) Polyols, Surfactants & Catalysts
Mixing Ratios by Volume	1:1 Part A to Part B	
Viscosity (CPS@25°C)	250	300-500
Avg. Net Weight	10.25 lbs/gal	8.75 lbs/gal
Packaging	5-gal box (19 L)	5-gal. box (19 L)
Speeds	Standard	Standard (50° F and above) IC FAST (25° – 50° F)
Shelf Life	1 year	1 year
VOC Content	0 g/L	0 g/L
Manufacturing Location	Carlisle, PA	Carlisle, PA

CAV-GRIP III Low-VOC Adhesive/Primer



Overview

Carlisle's CAV-GRIP III Low-VOC Aerosol Contact Adhesive/Primer can be used for a variety of applications: adhering FleeceBACK®, standard Sure-Weld® TPO, and Sure-Seal® EPDM membrane to vertical walls, enhancing the bond between Carlisle's VapAir Seal™ 725TR and various substrates, and priming unexposed asphalt prior to applying FAST™ Adhesive for insulation attachment. CAV-GRIP III can also be used with standard TPO membranes as a substrate adhesive on horizontal surfaces for warranties up to 20 years.

CAV-GRIP III's Low-VOC, methylene chloride-free formula promotes tenacious adhesion and quick drying in a wide range of temperatures. Applied using a self-contained spray system that provides quick and even coverage, this system requires minimal cleanup or maintenance. **Please note: cylinder, hoses, and gun are each sold separately.**

Features and Benefits

- » Excellent option for adhering any FleeceBACK, standard TPO, and EPDM membrane to vertical walls and standard TPO to horizontal surfaces
- » Can be used in temperatures as low as 25°F
- » Easy setup
- » Easy cleanup
- » Low odor and Low-VOC

Productivity Boosting Features and Benefits:

- » Quick application with spray gun
- » Fast tack time (less than 5 minutes)
- » No stirring
- » Up to 60% labor savings compared to traditional bonding adhesive



Installation

1. Connect spray gun to hose and connect hose to cylinder. Use lithium grease or petroleum jelly on all fittings and be careful to avoid cross-threading. Open valve on cylinder to check fittings for leaks. **Keep cylinder valve open to maintain pressure in the hose/spray gun when not in use.**
2. CAV-GRIP III can be applied at ambient temperature of 25°F and above. **Propellant in cylinders must be kept above 60°F for the product to spray properly.** Substrate shall be clean, dry, and free of debris and contaminants.
3. For applications taking place in ambient temperature below 60°F, store cylinders in heated space and move to project area during application. Cylinders must be kept warm on the jobsite. Dispense product from cylinder while it is still warm. When product in cylinder becomes too cold, it will begin to spit rather than spray. If this occurs, swap cold cylinder for warmer one and return cold cylinder to heated area. When changing cylinder, close the valve on the cylinder and depressurize the hose. Remove the hose and attach to the new cylinder. Open valve and do a test spray.
4. Apply CAV-GRIP III in an even coat to substrate (refer to the drawing on the next page), keeping the spray tip approximately 12" (30.5 cm) away and perpendicular to the surface during spray. Avoid high thickness buildup.
5. Allow CAV-GRIP III to flash-off until it does not transfer to finger when touched. Limit application of CAV-GRIP III to surfaces that will be covered with membrane or Carlisle's VapAir Seal 725TR the same day.

Vertical Applications of Standard TPO, EPDM membrane, or any FleeceBACK membrane:

Acceptable substrates include: Carlisle's InsulBase® Polyiso, SecurShield® Polyiso, SecurShield HD, SecurShield HD Plus, SecurShield CD, InsulFoam SP, DensDeck® Prime, SECUROCK®, OSB, plywood, metal, residual asphalt, and clean concrete block. To improve adhesion and reduce the potential for asphalt bleed-through on vertical surfaces with residual asphalt, apply an initial "sealing" base coat of CAV-GRIP III and allow to flash off properly; then, apply a secondary coating of CAV-GRIP III to the vertical surface.

There are no height restrictions when using CAV-GRIP III for vertical applications if the appropriate membrane terminations are utilized.

1. Spray wall and back of the membrane with enough overlap to ensure 100% coverage (2"-3" of overlap).
2. Do not apply adhesive to splice areas to be hot-air welded.
3. Allow adhesive to become tacky but not overly dry; it should not transfer to fingers when touched.
4. Mate membrane with the wall from the center of the sheet towards the edges, smoothing by hand.
5. Broom the membrane with a soft-bristle broom.
6. Roll in with a hand roller.

CAV-GRIP III Low-VOC Adhesive/Primer

Horizontal Application of Standard Sure-Weld TPO Membranes

Acceptable substrates include: Carlisle's InsulBase Polyiso, SecurShield Polyiso, SecurShield HD, SecurShield HD Plus, SecurShield CD, DensDeck Prime, SECUROCK, OSB, and plywood. Please see Carlisle's Thermoplastic Specification for a complete list of acceptable substrates.

The surface, on or against which adhesive is to be applied, shall be clean, smooth, dry, free of films, sharp edges, loose and foreign materials, oil and grease. Depressions greater than 1/4" (6 mm) should be feathered, using epoxy, mortar or other approved patching material. All sharp projections shall be removed by sweeping, blowing or vacuum cleaning.

Application shall be continuous and uniform, avoiding globs or puddles.

1. Spray wall and back of the membrane with enough overlap to ensure 100% coverage (2"-3" of overlap).
2. Do not apply adhesive to splice areas to be hot-air welded.
3. Allow adhesive to become tacky but not overly dry; it should not transfer to fingers when touched.
4. Roll the membrane onto the adhesive-coated substrate while avoiding wrinkles. Immediately brush down the bonded portion of the sheet with a soft-bristle push broom or a clean dry roller applicator to achieve maximum contact.

CLEANUP Carlisle's Low-VOC UN-TACK™: Safe solvent or mineral spirits can be used to clean tools and surfaces. If the spray gun valve becomes stuck, attach hose and spray gun to cylinder of Citrus Cleaner or Low-VOC UN-TACK and trigger spray gun repeatedly until operation is smooth. If the spray gun is clogged, a small-gauge wire or torch clean-out tool is helpful after soaking the brass fitting in Low-VOC UN-TACK.

STORAGE: Store cylinders in protected, conditioned space with temperature maintained above 60°F. Do not store cylinders in areas where temperatures reach 110°F or higher. Contents are flammable. Store in accordance with local, state, and federal regulations. **Keep cylinder valve open to maintain pressure in the hose and spray gun.** Periodically spray in a safe manner to help prevent possible clogging. Keep spray gun trigger locked when not in use. Flush gun and hose with Low-VOC UN-TACK for long-term use.

CYLINDER DISPOSAL: When all adhesive/primer in the cylinder has been used, close cylinder valve and evacuate hose and spray gun before disconnecting hose from cylinder. If hose is not to be connected to a new cylinder immediately, do not evacuate hose and spray gun to ensure material does not harden in spray gun and hose. Clean up adhesive/primer residue, spray gun, and spray tips with Low-VOC UN-TACK or mineral spirits. In most areas, the empty cylinder can be disposed as an aerosol can or recycled as scrap metal. If disposal is not allowed in your area, contact your distributor for disposal arrangements. Federal law forbids transportation if refilled.

Review Carlisle specifications and details for complete installation information.

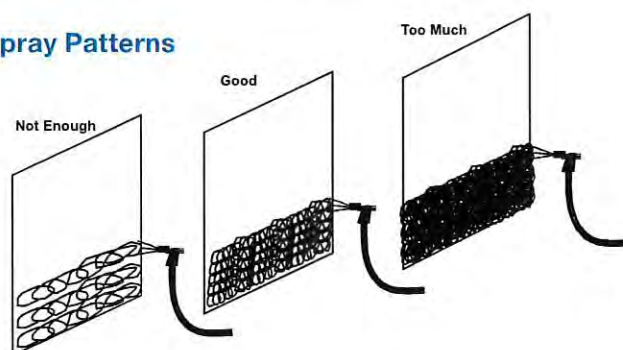
Precautions

CAV-GRIP III is a flammable liquid propellant and vapor: Keep away from open flame. Use with adequate ventilation. Avoid inhalation of spray mist or vapors. Harmful or fatal if swallowed. May cause eye irritation. Keep out of reach of children. Review Safety Data Sheet for complete safety information prior to use. Use of goggles and gloves is required. Aerosol cylinders are not refillable and when empty are harmless and disposable. Dispose according to local codes and laws. Read safety precautions and warnings on cylinder label. Wear gloves and goggles before using this product. Do not aim spray gun at people or animals at any time. PPE Gloves must be used while handling material.

For industrial professional use only.

*Important note: cylinder, hoses, and gun are each sold separately

Spray Patterns



Packaging

Product	Size/Weight	Part Number
CAV-GRIP III	#40 Aerosol Cylinder Gross Weight: 30 lbs Fill Weight: 30 lbs of adhesive	329902
6' Hose	6' Length	304302
12' Hose	12' Length	304303
18' Hose	18' Length	304304
Spray Gun Including Nozzle	—	304300
Low-VOC UN-TACK	#8 Aerosol Cylinder	330793

Typical Properties and Characteristics

Physical Property	Typical Value
Color	Light Green
Consistency	Aerosol Spray
Spray Pattern	Variable Web
Odor	Low
Base	Rubber/Solvent Blend
Solvent	Cyclohexane/Acetone
Coverage Rate	1-Sided Primer - 2000 ft ² * 2-Sided Adhesive - Walls – 1000 ft ² * 2-Sided Adhesive - Field – 1000 ft ² *
Drying Time	5 minutes**
Adhesion	Excellent
Service Temperature	-30°F to 200°F
Flammability	Flammable when wet. Non-flammable when dry.
Water Resistance	Excellent
Mildew Resistance	Excellent
Shelf Life	12 months (unopened container)

* Approximate Coverage

** Or more depending on climate conditions

LEED® Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Lynchburg, VA
VOC	206 g/L

CAV-GRIP III Low-VOC Adhesive/Primer

CAV-GRIP Accessories



CAV-GRIP Spray Gun and Spray Gun with Extension Overview

Carlisle's CAV-GRIP Spray Gun is an industrial grade spray gun for use with CAV-GRIP adhesive. The ergonomic handle makes it easy to apply bonding adhesive to vertical surfaces. The CAV-GRIP Spray Gun should be used to apply CAV-GRIP III Low-VOC Adhesive/Primer to various vertical surfaces. The CAV-GRIP Gun with Extension is designed to be used to apply CAV-GRIP III to horizontal surfaces without the need to bend over.

Features and Benefits

- » Ergonomic 4-finger trigger and comfortable handle
- » Strong aluminum alloy frame
- » Interchangeable spray tip

Installation

1. Use the adjustment wheel to close the valve until use
2. Ensure all fittings are tight and leak free
3. Position the gun tip 12 to 14 inches from the surface. This allows for maximum pattern width.
4. Try to hold the gun at a 90 degree angle to the surface by locking your wrist. Try not to move your wrist as that will cause an irregular spray pattern.
5. When you are done spraying, turn the adjustment wheel to the closed position. This will lock the gun.
6. When you want to resume spraying, turn the adjustment when to the open position. No cleaning should be needed if the hose and gun remain pressurized.
7. When job is complete, turn the canister off at the valve. Ensure there is no glue left in the hose and gun. Hook the hose up to a cylinder of Low-VOC UN-TACK to clean the system. Turn cylinder off and drain Low-VOC UN-TACK from the hose.

Specifications

Spray Gun		Spray Gun with Extension	
Tip	6501	Tip	9502
Spray Angle	65°	Spray Angle	95°
GPM	1	GPM	2
Weight	1 lb	Weight	1.5 lbs



CAV-GRIP Hose Overview

Nylon lined with a braided synthetic yarn reinforcement and synthetic rubber cover, the CAV-GRIP Hose should be used in conjunction with CAV-GRIP and a CAV-GRIP Spray Gun. The CAV-GRIP Hose is available in 6-foot, 12-foot and 18-foot lengths.

Features and Benefits

- » Wide range of operating temperatures 0°F to 190°
- » Low change in length at operating pressure
- » Lightweight

Installation

1. Ensure all fittings are tight and leak free
2. No cleaning should be needed if the hose and gun remain pressurized.
3. When job is complete, turn the canister off at the valve. Ensure there is no glue left in the hose and gun. Hook the hose up to a cylinder of Low-VOC UN-TACK to clean the system. Turn cylinder off and drain Low-VOC UN-TACK from the hose.

Specifications

Nominal Bore	0.25"
Nominal O.D.	0.50"
Maximum Working Pressure	750psi
Bend Radius	2.50"

Water Cut-Off Mastic



Overview

Let Carlisle simplify your next membrane installation with its Water Cut-Off Mastic. Water Cut-Off Mastic is a one-component, low-viscosity, self-wetting, butyl-blend mastic designed to be used in conjunction with roofing and waterproofing systems. It is primarily used as a sealing agent between various membranes and applicable when membrane is being terminated using a compression-type seal.

Water Cut-Off Mastic is an extremely tacky material and will remain as such when used with compression-type terminations.

Features and Benefits

- » Extremely tacky
- » Provides a durable compression-type seal between various membranes and parapet wall constructions

Coverage Rate

10 linear feet per tube at the recommended application rate of a ½" bead.

Application

1. All surfaces to be sealed with Water Cut-Off Mastic must be free of moisture, oil, dirt and other foreign materials. Water Cut-Off Mastic cannot be used on insulation.
2. Apply a ½" (13 mm) bead of Water Cut-Off Mastic between the substrate and the edge of the membrane.
3. Apply appropriate termination material and secure to provide constant compression for the Water Cut-Off Mastic.

Review Carlisle specifications and details for complete application information.

Precautions

- » Review the applicable Material Safety Data Sheet for complete safety information prior to use.
- » Water Cut-Off Mastic is FLAMMABLE – contains solvents that are dangerous fire and explosion hazards when exposed to heat, flame or sparks. Store and use away from all sources of heat, flame or sparks. Do not smoke while applying. Do not use in a confined or unventilated area. Vapors are heavier than air and may travel along ground to a distant ignition source and flash back.
- » Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
- » If swallowed, DO NOT INDUCE VOMITING. Call a physician immediately.
- » Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with plenty of clean water for at least 15 minutes. Contact a physician immediately.
- » Avoid contact with skin. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water.

Note: Permeation-resistant gloves (that meet ANSI/ISEA 105-2005) are recommended to be worn when using this product to protect hands from irritating ingredients.

Water Cut-Off Mastic

Typical Properties and Characteristics

Color	Gray
Solids	80%
Flash Point	40°F (4°C) Closed Cup
Service Temperature	-40°F to 200°F (-40°C to 93°C)
Specific Gravity	1.29
Cold Weather Flexibility	Excellent
Average Brookfield Viscosity	1,320,000 cps
Packaging	25 tubes/carton
Clean up	Weathered Membrane Cleaner
Average net weight/carton	28 lbs (13 kg)
Shelf life	1 year, unopened container

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

LEED® Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Carlisle, PA
VOC Content	250 g/L

Sure-Weld TPO Cut-Edge Sealant



Overview

Carlisle's TPO Cut-Edge Sealant is a medium solids content, free-flowing, polymeric material designed to be used for sealing cut edges of Sure-Weld TPO Reinforced Membrane. It is available in clear for use with various colors of TPO membrane.

Carlisle TPO Cut-Edge Sealant is used to seal cut edges of TPO Membrane, providing a waterproof barrier where scrim reinforcement is exposed.

Features and Benefits

- » Provides excellent sealing of exposed fabric at cut membrane edges
- » Squeeze-bottle packaging allows easy, no-mess application
- » Available in clear for use with various colors of Sure-Weld TPO membrane

Coverage Rate

Approximately 225' – 275' (70 – 85 m) per 16-oz. bottle when applied with 1/8" (3 mm) bead. Approximately 115' – 140' (35 – 45 mm) per 8-oz. bottle when applied with 1/8" (3 mm) bead.

»

Application

1. All surfaces to be sealed with TPO Cut-Edge Sealant must be clean, dry and free from oil, grease, dirt and other foreign materials.
2. Apply a 1/8" (3 mm) bead of TPO Cut-Edge Sealant from the plastic squeeze bottle to seal cut edges of reinforced TPO membrane. Do not apply TPO Cut-Edge Sealant on vertical surfaces.
3. Sealant should be tack-free in 2 hours and fully cured in 24 hours depending on weather conditions and application thickness.

Review Carlisle specifications and details for complete installation information.

Precautions

Sure-Weld TPO

Cut-Edge Sealant

- » Review the applicable Material Safety Data Sheet for complete safety information.
- » TPO Cut-Edge Sealant is **FLAMMABLE** – it contains solvents that are dangerous fire and explosion hazards when exposed to heat, flame or spark. Do not smoke while applying. Do not use in a confined area or unventilated area. Vapors are heavier than air and may travel along the ground to a distant ignition source and flashback.
- » Avoid breathing vapors. Keep container closed when not in use. Use with adequate ventilation. If inhaled, remove to fresh air. If not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
- » If swallowed, **DO NOT INDUCE VOMITING**. Call a physician immediately.
- » Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with plenty of water for at least 15 minutes. Contact a physician immediately.
- » Avoid contact with skin. Permeation-resistant gloves (that meet ANSI/ISEA 105-2005) recommended. Wash thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water.
- » Jobsite storage temperatures in excess of 90°F (32°C) may affect product shelf life. Should the TPO Cut-Edge Sealant be stored at temperatures below 60°F (15°C), restore to room temperature prior to use.
- » **KEEP OUT OF THE REACH OF CHILDREN**

Typical Properties and Characteristics

Base	Synthetic Rubber
Color	Clear
Solids	14%
Viscosity	3,500 cps
Flash Point	39°F (4°C)
Net Weight Gallon	7.4 lbs (3.3 kg)
Resistance to:	
Ozone	Excellent
UV	Excellent
Water	Excellent
Packaging	Eight 16-oz. bottles/carton (3.8 L) or two 8-oz. bottles (1.9 L)
Shelf Life	1 year

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

LEED® Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Rockland, MA
VOC Content	750 g/L

Safety Data Sheet

Material Name: Aquabase 120

Product #307431

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name

Aquabase 120

Synonyms

Water based Adhesive

Chemical Family

Adhesive

Product Use

Contact Adhesive for TPO/EPDM Single-ply roofing

Restrictions on Use

None identified

Manufacturer Information

Carlisle SynTec

1285 Ritner Highway

Carlisle, PA 17013 USA

Phone: +1-800-479-6832

Emergency Phone #: +1-800-424-9300 (Chemtrec)

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.

Skin Sensitization - Category 1

GHS Label Elements

Symbol(s)



Signal Word

Warning

Precautionary Statement(s)

Prevention

Avoid breathing vapors, mist, or spray.

Wear protective gloves

Contaminated work clothing must not be allowed out of the workplace

Safety Data Sheet

Material Name: Aquabase 120

Product #307431

Response

IF ON SKIN was with plenty of soap and water

If skin irritation or rash occurs: Get medical advice/attention

Wash contaminated clothing before reuse

Storage

Not prescribed

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations

Classification complies with OSHA Hazard Communication Standard (29 CFR 1910.1200) and is consistent with the provisions of the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

See Section 11 for additional toxicological information.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
102-71-6	Triethanolamine	0.1-1

Section 4 - FIRST AID MEASURES

Inhalation

Move to fresh air. If not breathing, give artificial respiration. If symptoms develop and persist, get medical attention

Skin

Immediately wash skin thoroughly with soap and water. Remove contaminated clothing and footwear. If symptoms develop and persist, get medical attention.

Eyes

Rinse immediately with water for 15 minutes also under the eyelids. Get medical advice/attention.

Ingestion

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person..

Symptoms

See section 11

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media

Safety Data Sheet

Material Name: Aquabase 120

Product #307431

Extinguishing Media

Use extinguishing measures appropriate to local circumstances and the surrounding environment.

Unusual fire or explosion hazards:

This product is an aqueous mixture which will not burn. If evaporated to dryness, the solid residue may pose a slight fire hazard.

Hazardous Combustion Products

Oxides of carbon

Special firefighting procedures: Keep unnecessary personnel away. Fire fighters should wear positive pressure self-contained breathing apparatus (SCBA).

Section 6 - ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Methods and Materials for Containment and Cleaning Up

Keep unnecessary personnel away. Ensure adequate ventilation. Wear appropriate protective equipment and clothing during clean-up. Dispose of contaminated material as waste according to Section 13.

Environmental Precautions

Prevent further leakage or spillage if safe to do so. Do not allow material to contaminate ground water system. Do not allow product to enter sewer or waterways

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling

Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Conditions for Safe Storage

Do not freeze.

Incompatible Materials

Acids, bases, strong oxidizing agents

For information on product shelf life, please review labels on container or check the Technical Data Sheet.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Safety Data Sheet

Material Name: Aquabase 120

Product #307431

Triethanolamine	102-71-6
ACGIH TLV:	5 mg/m3 TWA
OSHA (US) PEL:	None
AIHA WEEL	None

Engineering Controls

Work should be done in an adequately ventilated area (i.e., ventilation sufficient to maintain concentrations below one half of the PEL and other relevant standards). Local exhaust ventilation is recommended when general ventilation is not sufficient to control airborne contamination.

Eye/face protection

Safety goggles or safety glasses with side shields. Full face protection should be used if the potential for splashing or spraying of product exists.

Skin Protection

Use impermeable gloves and protective clothing as necessary to prevent skin contact. Wear suitable protective clothing.

Respiratory Protection

Use NIOSH approved respirator if there is potential to exceed exposure limit(s). Observe OSHA regulations for respirator use (29 CFR 1910.134).

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	liquid	Physical State	liquid
Odor	Ammonia	Color	pink
Odor Threshold	Not available	pH	8.25
Melting Point	0 °C (32°F) (Freezing point)	Boiling Point	56 - 139 °C (133-283 °F)
Freezing point	Not available	Evaporation Rate	Same as water.
Boiling Point Range	100 °C (212°F)	Flammability (solid, gas)	Not available
Autoignition	Not determined	Flash Point	> 100 °C (> 212°F)
Lower Explosive Limit	Not available.	Decomposition	Not available
Upper Explosive Limit	Not available.	Vapor Pressure	Not determined
Vapor Density (air=1)	Heavier than air	Specific Gravity (water=1)	1.06

Safety Data Sheet

Material Name: Aquabase 120

Product #307431

Water Solubility	Soluble	Partition coefficient: n-octanol/water	Not determined
Viscosity	Not available.	VOC	0.0 G/L

Other Information

No additional information available.

Section 10 - STABILITY AND REACTIVITY

Reactivity

Not available

Stability

Stable under normal conditions of use.

Hazardous Reactions

Will not occur.

Conditions to Avoid

Do not freeze

Incompatible Materials

Contact with water reactive materials (such as oleum) can cause exothermic reactions.

Hazardous decomposition products

Oxides of carbon

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Inhalation

Inhalation of vapors or mists of the product may be irritating to the respiratory system.

Skin Contact

Prolonged or repeated skin contact may cause skin irritation or allergic skin sensitization reaction.

Eye Contact

This product may cause slight irritation to the eyes.

Ingestion

Ingestion of this product is unlikely. However, ingestion of product may produce gastrointestinal irritation and disturbances.

Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and the following selected endpoints are published:



Safety Data Sheet

Material Name: Aquabase 120

Product #307431

Triethanolamine

Oral LD50 Rat 8.0 g/kg

Dermal LD50 Rabbit >20,000 mg/kg

Immediate Effects

Irritant, Allergen

Component Carcinogenicity

Triethanolamine	
IARC:	No
OSHA	No
NTP	No

Section 12 - ECOLOGICAL INFORMATION

Ecological information

Not available

Section 13 - DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal:

Legal disposition of wastes is the responsibility of the owner/generator of the waste. Applicable federal, state and/or local regulations must be followed during treatment, storage, or disposal of waste containing this product.

Hazardous waste number:

Not a RCRA hazardous waste.

Section 14 - TRANSPORT INFORMATION

The transport information provided in this section only applies to the material/formulation itself, and is not specific to any package/configuration.

U.S. Department of Transportation Ground (49 CFR)

Proper shipping name: Not regulated

Hazard class or division: None



Safety Data Sheet

Material Name: Aquabase 120

Product #307431

Identification number: None

Packing group: None

International Air Transportation (ICAO/IATA)

Proper shipping name: Not regulated

Hazard class or division: None

Identification number: None

Packing group: None

Water Transportation (IMO/IMDG)

Proper shipping name: Not regulated

Hazard class or division: None

Identification number: None

Packing group: None

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations

TSCA 8 (b) Inventory Status

All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.

TSCA 12 (b) Export Notification:

None above reporting de minimis

CERCLA/SARA Section 302 EHS: None above reporting de minimis

CERCLA/SARA Section 311/312: Immediate Health

CERCLA/SARA Section 313: None above reporting de minimis

California Proposition 65:

This product contains a chemical known in the State of California to cause cancer. This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Canada Regulatory Information

CEPA DSL/NDSL Status:

One or more components are not listed on, and are not exempt from listing on either the Domestic Substances List or the Non-Domestic Substances List.



Safety Data Sheet

Material Name: Aquabase 120

Product #307431

Section 16 - OTHER INFORMATION

Summary of Changes

New SDS: May 20, 2015

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States.

Other Information

Disclaimer:

The information contained herein is based upon data and information available to us, and reflects our best professional judgment. This product may be formulated in part with components purchased from other companies. No warranty of merchantability, fitness for any use, or any other warranty is expressed or implied regarding the accuracy of such data or information. The results to be obtained from the use thereof, or that any such use does not infringe any patent, since the information contained herein may be applied under conditions of use beyond our control and with which we may be unfamiliar, we do not assume responsibility for the results of such application. This information is furnished upon the condition that the person receiving it shall make his own determination of the suitability of the material for his particular use

Safety Data Sheet

Material Name: Clear Cut-Edge Sealant

Product #: 303436

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name: Clear Cut-Edge Sealant

Synonym: Industrial Sealant

Chemical Family: Solvent Based Sealant

Product Use: Sealant for TPO Single-Ply Roofing Membranes

Restrictions on Use: For industrial use only.

Manufacturer Information

Carlisle SynTec

1285 Ritner Highway

Carlisle, PA 17013

USA

Phone: +1-800-479-6832

Emergency Phone #: +1-800-424-9300 (CHEMTREC)

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.

Reproductive Toxicity- Category 2

Skin Irritation - Category 2

Aspiration Hazard - Category 1

Specific Target Organ Toxicity - Single Exposure - Category 3

Specific Target Organ Toxicity - Repeated Exposure - Category 2

Flammable Liquids- Category 2

GHS Label Elements

Symbol(s)



Signal Word

Danger

Hazard Statement(s)

H225: Highly flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H336: May cause drowsiness or dizziness.

H361: Suspected of damaging fertility or the unborn child.

H373: May cause damage to organs through prolonged or repeated exposure.

Precautionary Statement(s)



Safety Data Sheet

Material Name: Clear Cut-Edge Sealant

Product #: 303436

Prevention

- [201]: Obtain special instructions before use.
- P202: Do not handle until all safety precautions have been read and understood.
- P210: Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
- P233: Keep container tightly closed.
- P240: Ground/bond container and receiving equipment.
- P241: Use explosion-proof electrical/ventilating/lighting equipment.
- P242: Use only non-sparking tools.
- P243: Take precautionary measures against static discharge.
- P260: Do not breathe dust/fume/gas/mist/vapors/spray.
- P264: Wash hands, forearms, and other exposed areas thoroughly after handling.
- P271: Use only outdoors or in a well-ventilated area.
- P272: Contaminated work clothing should not be allowed out of the workplace.
- P273: Avoid release to the environment.
- P280: Wear protective gloves/protective clothing/eye protection/face protection.

Response

- P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
- P302+P352: IF ON SKIN: Wash with plenty of soap and water.
- P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P304+P340: IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
- P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P308+P313: IF exposed or concerned: Get medical advice/attention.
- P312: Call a POISON CENTER or doctor/physician if you feel unwell.
- P314: Get medical advice/attention if you feel unwell.
- P331: Do NOT induce vomiting.
- P332+P313: If skin irritation occurs: Get medical advice/attention.
- P337+P313: If eye irritation persists: Get medical advice/attention.
- P342+P311: If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
- P362: Take off contaminated clothing and wash before reuse.
- P370+P378: In case of fire: Use appropriate media to extinguish.
- P391: Collect spillage.

Storage

- P403 + P235 Store in a well-ventilated place. Keep cool
- P403 + P233 Store in a well-ventilated place. Keep container tightly closed
- P405 Store locked up

Disposal

- P501 Dispose of contents/container in accordance with local/regional/national/international regulations

EMERGENCY OVERVIEW

IMMEDIATE CONCERNS: DANGER! Extremely flammable liquid and vapor. Vapor may cause flash fire and explosion. Harmful or fatal if swallowed. Harmful if absorbed through the skin. Pulmonary aspiration hazard. After ingestion, may enter lungs and produce damage. High vapor concentrations may cause drowsiness. Can cause eye, skin and respiratory tract irritation.

POTENTIAL HEALTH EFFECTS

Safety Data Sheet

Material Name: Clear Cut-Edge Sealant

Product #: 303436

EYES: Can cause severe eye irritation and corneal damage.

SKIN: Causes defatting and skin irritation. Can cause dermatitis.

SKIN ABSORPTION: May be absorbed through the skin in harmful amounts.

INGESTION: Can cause gastrointestinal irritation, nausea and vomiting. Aspiration of material into the lungs may cause chemical pneumonitis, which can be fatal. Harmful or fatal if swallowed.

INHALATION: May cause nose or throat irritation. High concentrations may lead to central nervous system effects (drowsiness, dizziness, nausea, headaches, paralysis and loss of consciousness).

ROUTES OF ENTRY: Eye Contact, Ingestion, Inhalation, Skin Absorption, and Skin Contact

TARGET ORGAN STATEMENT: Central Nervous System (CNS)

IRRITANCY: Eyes, nose, throat, respiratory tract, and skin irritation.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
108-88-3	Toluene	45 - 70
1330-20-7	Xylene(o-, m-, p-Isomers)	15-40

Section 4 - FIRST AID MEASURES

EYES: Immediately flush eyes with plenty of tempered water (at least 15-20 minutes) lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN: Immediately wash skin with soap and plenty of water. Remove contaminated clothing. Get medical attention if symptoms occur. Wash or dispose of clothing before reuse.

INGESTION: Do not induce vomiting, keep person warm, quiet and get medical attention immediately. If vomiting occurs naturally, have victim lean forward to reduce the risk of aspiration. Aspiration of this material into the lungs due to vomiting can cause chemical pneumonitis which can be fatal.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Seek immediate medical attention.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

EYES: Liquid and vapor can severely irritate the eyes depending on type of exposure (splash, vapor) and exposure time.

SKIN: Mild to moderate skin irritant.

SKIN ABSORPTION: May be absorbed through the skin and can contribute to overall exposure. Effects are similar to CNS depression.

INGESTION: May result in central nervous system (CNS) depression with symptoms such as headaches, nausea, vomiting, diarrhea, dizziness, incoordination and unconsciousness. Aspiration of material into lungs may cause chemical pneumonitis which can be fatal.



Safety Data Sheet

Material Name: Clear Cut-Edge Sealant

Product #: 303436

INHALATION: High vapor concentrations may cause CNS depression with symptoms including light headedness, giddiness, nausea, drowsiness, headache, nose, throat and respiratory tract irritation, reduced appetite, confusion, and unconsciousness.

ACUTE TOXICITY: High vapor concentrations may cause central nervous system (CNS) depression with symptoms including light headedness, giddiness, nausea, drowsiness, headache, nose, throat and respiratory tract irritation, reduced appetite, confusion and unconsciousness.

CHRONIC EFFECTS: Damage to the nervous system of the extremities, peripheral neuropathy, with symptoms including numbness, tingling and weakness in the toes and fingers, sensory impairment to touch, pain, vibration and temperature, muscular weakness, blurred vision, coldness of extremities, loss of body weight and reflexes, and even paralysis. Frequent or prolonged contact may irritate the skin and cause a skin rash(dermatitis).

Section 5 - FIRE FIGHTING MEASURES

FLAMMABLE CLASS: Class IB

GENERAL HAZARD: Flammable liquid and vapor.

Extinguishing Media

Dry chemical, foam, carbon dioxide, water spray or fog.

Explosion Hazards

Avoid fire, sparks, static electricity and hot surfaces. Liquid readily evaporates at room/ambient temperature. Vapors are invisible, flammable, heavier than air, and may accumulate in low areas and spread long distances. Distant ignition and flashback are possible.

Hazardous Combustion Products

Carbon Monoxide, Carbon Dioxide, Aldehydes

Fire Fighting Measures

As in any fire, wear self-contained breathing apparatus with pressure-demand, full face piece SCBA (MSHA/NIOSH approved or equivalent) and full protective gear.

Sensitive to Static Discharge: Likely to catch fire from near-by spark. Static charge may accumulate by flow or agitation. Grounding and bonding of containers is required.

Hazardous Decomposition Products: Carbon Monoxide and Carbon Dioxide may form when heated to decomposition.

Section 6 - ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover spilled material on absorbent, such as sawdust or vermiculite, and



Safety Data Sheet

Material Name: Clear Cut-Edge Sealant

Product #: 303436

sweep into closed containers for disposal. After all visible traces, including ignitable vapors, have been removed, thoroughly wet vacuum the area. Do not flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc. as necessary and place in closed containers for disposal. Only those persons who are adequately trained, authorized, and wearing the required personal protective equipment (PPE) should participate in spill response and clean-up.

LARGE SPILL: Keep spectators away. Only those persons who are adequately trained, authorized and wearing the required personal protective equipment (PPE) should participate in spill response and clean-up. Ventilate the area by natural means or by explosion proof mechanical means (i.e. fans). Know and prepare for spill response before using or handling this product. Eliminate all ignition sources (flames, hot surfaces, portable heaters and sources of electrical, static, or frictional sparks). Dike and contain spill with inert material (e.g. sand, earth). Transfer liquids to covered and labeled metal containers for recovery or disposal, or remove with inert absorbent. Use only non-sparking tools and appropriate PPE. Place absorbent diking materials in covered metal containers for disposal. Prevent contamination of sewers, streams, and groundwater with spilled material or used absorbent.

Section 7 - HANDLING AND STORAGE

GENERAL PROCEDURES: For professional or industrial use only. Follow label instructions. Keep out of the reach of children. Not for consumption. No smoking. Do not breathe vapors. Avoid contact with body. Turn off all pilot lights, flames, stoves, heaters, electric motors, welding equipment and other sources of ignition. Empty containers must not be washed and re-used for any purpose. Contact lens wearers must wear protective eye wear around chemical vapors and liquid. Wash hands thoroughly after handling. Flammable vapors may cause flash fire or ignite explosively. To prevent build-up of vapors, use adequate natural and/or mechanical ventilation (e.g. open all windows and doors to achieve cross ventilation). Containers may be hazardous when empty. Never use welding or cutting torch on or near container. Do not cut, drill, grind, or expose containers to heat, sparks, static electricity or other source of ignition. Explosion may occur causing injury or death.

HANDLING: Use adequate ventilation and appropriate respiratory protection to avoid breathing vapors when cover is removed. Ground and bond all equipment when handling flammable solvent-borne material.

Storage

Keep container closed when not in use. Store in a dry, well ventilated area, out of the sun and away from ignition sources. Do not remove or deface label. Prevent water or moist air from entering container.

STORAGE TEMPERATURE: 15.5°C (60°F) Minimum to 35°C (95°F) Maximum

Incompatible Materials

Strong oxidizing agents, acids, bases

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits



Safety Data Sheet

Material Name: Clear Cut-Edge Sealant

Product #: 303436

Toluene	108-88-3	
OSHA (US):	200 ppm TWA	300 ppm STEL Ceiling
ACGIH:	20 ppm TWA	
Xylene(o-, m-, p-Isomers)	1330-20-7	
OSHA (US):	100ppm TWA; 435 mg/m³ TWA	
ACGIH	100 ppm TWA; 434 mg/m³TWA	150 ppm; 651 mg/m³ STEL

Engineering Controls

Provide sufficient explosion proof mechanical (general and/or local exhaust) ventilation to maintain exposure below the occupational exposure limit and exposure concentration.

Individual Protection Measures, such as Personal Protective Equipment

Eye/face protection

Wear safety glasses with side shields (or goggles) or a full face respirator.

Skin Protection

Wear chemical protective clothing & boots to prevent repeated or prolonged skin contact. Wear impervious gloves, if needed, to prevent repeated or prolonged skin contact.

Respiratory Protection

NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection. respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

Glove Recommendations

Wear appropriate chemical resistant gloves such as nitrile rubber.

WORK HYGIENIC PRACTICES: Use good hygiene practices when handling this material. Wash hands thoroughly after use.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	viscous liquid	Physical State	liquid
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Safety Data Sheet

Material Name: Clear Cut-Edge Sealant

Product #: 303436

Odor	Solvent-like	Color	clear
Boiling Point Range	110.6°C(231°F) to 137°C(278.6°F)	Flammability Limit	1.0 to 7.1
Autoignition	526 °C (980 °F)	Flash Point	8.9°C (48 °F)
Specific Gravity (water=1)	0.872	% Volatile (by weight)	84.1
Vapor Density (air=1)	4	VOC	732.800 g/L EPA method 24
Density	7.27 lbs/gal		

COMMENTS: 5.27 lb VHAP/lb Solid 84.1% by weight HAP

Section 10 - STABILITY AND REACTIVITY

Reactivity

No reactivity hazard is expected.

Chemical Stability

Stable under normal conditions of use.

Possibility of Hazardous Reactions

Hazardous polymerization will not occur.

Conditions to Avoid

Avoid fire, sparks, static electricity and hot surfaces.

Incompatible Materials

Strong oxidizing agents, strong acids and strong bases.

Hazardous decomposition products

Carbon monoxide and carbon dioxide may form when heated to decomposition.

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Inhalation

May cause respiratory irritation.

Skin Contact

Causes skin irritation.

Irritation

Eyes, nose, throat, respiratory tract irritation.

Corrosivity

Not applicable

Sensitization:

Not applicable

Neurotoxicity:



Safety Data Sheet

Material Name: Clear Cut-Edge Sealant

Product #: 303436

Not applicable

Genetic Effects:

Not applicable

Mutagenicity:

Not applicable

Reproductive Effects:

This product contains toluene, a chemical known to the state of California to cause birth defects or other reproductive harm.

Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and the following selected endpoints are published:

Toluene (108-88-3)

Oral LD50 Rat 2600 mg/kg - 7500 mg/kg

Dermal LD50 Rabbit 12,124 mg/kg

Inhalation LD50 Rat 8000 ppm (4hr dose)

Xylene (1330-20-7)

Oral LD50 Rat 4300 mg/kg

Dermal LD50 Rabbit 2000 mg/kg

Inhalation LD50 Rat 26800 ppm

Component Carcinogenicity

Toluene	108-88-3
IARC:	3
Xylene(o-, m-, p-Isomers)	1330-20-7
IARC:	3

Section 12 - ECOLOGICAL INFORMATION

Environmental Data

This product contains components that will normally float on water. These components may be harmful to aquatic organisms and may cause long term adverse effects in the aquatic environment.

Ecotoxicological Information:

Contains components that are potentially toxic to freshwater and saltwater ecosystems.

Bioaccumulation/Accumulation

Contains components with the potential to bio-accumulate.

Section 13 - DISPOSAL CONSIDERATIONS



Safety Data Sheet

Material Name: Clear Cut-Edge Sealant

Product #: 303436

Disposal Methods

Dispose of contents/container in accordance with local/regional/national/international regulations.

Chemical Name	Wt. %	CAS
Toluene	45 - 70	108-88-3
Xylenes (o-,m-,p- Isomers)	15 - 40	1330-20-7

Section 14 - TRANSPORT INFORMATION

US DOT Information:

Shipping Name: ADHESIVES

Hazard Class: 3

UN/NA #: UN1133

Packing Group: II

NAERG: 128

Marine Pollutant #1: None

OTHER SHIPPING INFORMATION: contains (Toluene, Xylene)

SPECIAL SHIPPING NOTES: If individual container size is less than 1.3 gallons, the proper shipping name is:

ORM-D Consumer Commodity

Non-Regulated

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations

None of this products components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

SARA Section 311/312 (40 CFR 370 Subparts B and C)

Acute Health: Yes **Chronic Health:** Yes **Fire:** Yes **Pressure:** No **Reactivity:** No

EPCRA SECTION 313 SUPPLIER NOTIFICATION

Chemical Name	Wt. %	CAS
Toluene	45 - 70	108-88-3
Xylenes (o-,m-,p- Isomers)	15 - 40	1330-20-7

CERCLA (COMPREHENSIVE RESPONSE, COMPENSATION, AND LIABILITY ACT)

Chemical Name	Wt. %	CERCLA RQ
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Safety Data Sheet

Material Name: Clear Cut-Edge Sealant
Product #: 303436

Toluene	45 - 70	
Xylenes (o-,m-,p- Isomers)	15 - 40	100

TSCA (TOXIC SUBSTANCE CONTROL ACT)

Chemical Name	CAS	TSCA SECTION
Toluene	108-88-3	1,000 lbs.
Xylenes (o-,m-,p- Isomers)	1330-20-7	8a, 8d, 12b,

CLEAN AIR ACT

Chemical Name	Wt. %	CAS
Toluene	45 - 70	108-88-3
Xylenes (o-,m-,p- Isomers)	15 - 40	1330-20-7

CALIFORNIA PROPOSITION 65: This product contains toluene, a chemical known to the state of California to cause birth defects or other reproductive harm.

Chemical Name	Wt. %	Listed
Toluene	45 - 70	Developmental Toxicity

STATES WITH SPECIAL REQUIREMENTS
Canadian WHMIS Ingredient Disclosure List (IDL)
CANADA
WHMIS HAZARD SYMBOL AND CLASSIFICATION


Chemical Name	Requirements
Toluene	New Jersey Right to Know List Pennsylvania Right to Know List Massachusetts Toxic Use Reduction Act (TURA) Reportable Chemical
Xylenes (o-,m-,p-Isomers)	New Jersey Right to Know List Pennsylvania Right to Know List Massachusetts Toxic Use Reduction Act (TURA) Reportable Chemical Illinois Right to Know List Minnesota Right to Know List Rhode Island Right to Know List

Flammable Liquid

Toxic



Safety Data Sheet

Material Name: Clear Cut-Edge Sealant

Product #: 303436

DOMESTIC SUBSTANCE (INVENTORY): Toluene and Xylene are specified on the Canadian Domestic Substance List (DSL).

Section 16 - OTHER INFORMATION

HMIS Rating

Health: 2 Fire: 3 Reactivity: 0 Personal Protection B

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

NFPA Ratings

Health: 2 Fire: 3 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes

New SDS: April 17, 2015

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States.

Other Information

Disclaimer:

The information contained herein is based upon data and information available to us, and reflects our best professional judgment. This product may be formulated in part with components purchased from other companies. No warranty of merchantability, fitness for any use, or any other warranty is expressed or implied regarding the accuracy of such data or information. The results to be obtained from the use thereof, or that any such use does not infringe any patent, since the information contained herein may be applied under conditions of use beyond our control and with which we may be unfamiliar, we do not assume responsibility for the results of such application. This information is furnished upon the condition that the person receiving it shall make his own determination of the suitability of the material for his particular use.

Safety Data Sheet

Material Name: FAST Bag in a Box Part A

Product #: 317332

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name: FAST Bag in a Box Part A

Synonym: Polymethylene Polyphenylisocyanate

Chemical Family: Aromatic isocyanates

Product Use: Two-part adhesive for roofing systems

Restrictions on Use: For industrial use only.

Manufacturer Information

Carlisle SynTec

1285 Ritner Highway

Carlisle, PA 17013

USA

Phone: +1-800-479-6832

Emergency Phone #: +1-800-424-9300 (CHEMTREC)

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.

Acute Toxicity- Category 4 (Inhalation- mist)

Skin Corrosive/Irritation - Category 2

Eye Damage/Irritation - Category 2B

Specific Target Organ Toxicity - Single Exposure --(Irritating to respiratory system)-Category 3

Specific Target Organ Toxicity - Repeated Exposure --(by inhalation)-Category 2

Skin Sensitivity - Category 1B

Respiratory Sensitization- Category 1

Carcinogenicity-Category 2

GHS Label Elements

Symbol(s)



Signal Word

Danger

Hazard Statement:

H320 Causes eye irritation.

H315 Causes skin irritation.

H332 Harmful if inhaled.

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

H317 May cause an allergic skin reaction.



Safety Data Sheet

Material Name: FAST Bag in a Box Part A

Product #: 317332

H335 May cause respiratory irritation.

H351 Suspected of causing cancer.

H373 May cause damage to organs (Olfactory organs) through prolonged or repeated exposure (inhalation).

Precautionary Statements (Prevention):

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P271 Use only outdoors or in a well-ventilated area.

P260 Do not breathe dust/gas/mist/vapours.

P201 Obtain special instructions before use.

P261 Avoid breathing mist.

P202 Do not handle until all safety precautions have been read and understood.

P284 [In case of inadequate ventilation] wear respiratory protection.

P272 Contaminated work clothing should not be allowed out of the workplace.

P264 Wash with plenty of water and soap thoroughly after handling.

Precautionary Statements (Response):

P312 Call a POISON CENTER or doctor/physician if you feel unwell.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P311 IF exposed or concerned: Call a POISON CENTER or doctor/physician.

P314 Get medical advice/attention if you feel unwell.

P303 + P362 IF ON SKIN (or hair): Wash with plenty of soap and water.

P333 + P361 If skin irritation or rash occurs: Call a POISON CENTER or doctor/physician.

P362 + P364 Take off contaminated clothing and wash before reuse.

P332 + P313 If skin irritation occurs: Get medical advice/attention.

P337 + P311 If eye irritation persists: Call a POISON CENTER or doctor/physician.

Precautionary Statements (Storage):

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

P405 Store locked up.

Precautionary Statements (Disposal):

P501 Dispose of contents/container to hazardous or special waste collection point.

Hazards not otherwise classified

No specific dangers known, if the regulations/notes for storage and handling are considered.

Labeling of special preparations (GHS):

CONTAINS ISOCYANATES. INHALATION OF ISOCYANATE MISTS OR VAPORS MAY CAUSE RESPIRATORY IRRITATION, BREATHLESSNESS, CHEST DISCOMFORT AND REDUCED PULMONARY FUNCTION. OVEREXPOSURE WELL ABOVE THE PEL MAY RESULT IN BRONCHITIS, BRONCHIAL SPASMS AND PULMONARY EDEMA. LONG-TERM EXPOSURE TO ISOCYANATES HAS BEEN REPORTED TO CAUSE LUNG DAMAGE, INCLUDING REDUCED LUNG FUNCTION WHICH MAY BE PERMANENT. ACUTE OR CHRONIC OVEREXPOSURE TO ISOCYANATES MAY CAUSE SENSITIZATION IN SOME INDIVIDUALS, RESULTING IN ALLERGIC RESPIRATORY REACTIONS INCLUDING WHEEZING,



Safety Data Sheet

Material Name: FAST Bag in a Box Part A

Product #: 317332

SHORTNESS OF BREATH AND DIFFICULTY BREATHING. ANIMAL TESTS INDICATE THAT SKIN CONTACT MAY PLAY A ROLE IN CAUSING RESPIRATORY SENSITIZATION. ANIMAL TESTS AND OTHER RESEARCH INDICATE THAT SKIN CONTACT WITH MDI MAY PLAY A ROLE IN CAUSING RESPIRATORY SENSITIZATION.

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Emergency overview

DANGER:

CONTAINS ISOCYANATES. INHALATION OF ISOCYANATE MISTS OR VAPORS MAY CAUSE RESPIRATORY IRRITATION, BREATHLESSNESS, CHEST DISCOMFORT AND REDUCED PULMONARY FUNCTION. OVEREXPOSURE WELL ABOVE THE PEL MAY RESULT IN BRONCHITIS, BRONCHIAL SPASMS AND PULMONARY EDEMA. LONG-TERM EXPOSURE TO ISOCYANATES HAS BEEN REPORTED TO CAUSE LUNG DAMAGE, INCLUDING REDUCED LUNG FUNCTION WHICH MAY BE PERMANENT. ACUTE OR CHRONIC OVEREXPOSURE TO ISOCYANATES MAY CAUSE SENSITIZATION IN SOME INDIVIDUALS, RESULTING IN ALLERGIC RESPIRATORY REACTIONS INCLUDING WHEEZING, SHORTNESS OF BREATH AND DIFFICULTY BREATHING. ANIMAL TESTS INDICATE THAT SKIN CONTACT MAY PLAY A ROLE IN CAUSING RESPIRATORY SENSITIZATION. AVOID CONTACT WITH SKIN AND EYES. SKIN OR EYE CONTACT MAY CAUSE IRRITATION.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
101-68-8	Diphenylmethane-4,4'-diisocyanate (MDI)	25.0 - 50.0
17589-24-1	1,3-Diazetidine-2,4-dione, 1,3-bis[4-[(4-isocyanatophenyl)methyl]phenyl]-	1.0 - 3.0
26447-40-5	Methylenediphenyl diisocyanate	3.0 - 7.0
57636-09-6	Isocyanic acid, polymethylenepolyphenylene ester, polymer with.alpha.-hydro-.omega.-hydroxypoly(oxy-1,2-ethanediyl)	1.0 - 3.0
9016-87-9	P-MDI	50.0 - 75.0

Safety Data Sheet

Material Name: FAST Bag in a Box Part A

Product #: 317332

Section 4 - FIRST AID MEASURES

General advice: Remove contaminated clothing.

EYES: In case of contact with the eyes, rinse immediately for at least 15 minutes with plenty of water. Immediate medical attention required.

SKIN: Wash affected areas thoroughly with soap and water. If irritation develops, seek medical attention.

INGESTION: Rinse mouth and then drink plenty of water. Do not induce vomiting. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions. Immediate medical attention required

INHALATION: Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary. Immediate medical attention required.

Most important symptoms and effects, both acute and delayed

Symptoms: The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11., Eye irritation, skin irritation, allergic symptoms

Hazards: Symptoms can appear later.

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Hazards: Respiratory sensitization may result in allergic (asthma-like) signs in the lower respiratory tract including wheezing, shortness of breath and difficulty breathing, the onset of which may be delayed. Repeated inhalation of high concentrations may cause lung damage, including reduced lung function, which may be permanent. Substances eliciting lower respiratory tract irritation may worsen the asthma-like reactions that may be produced by product exposures.

Indication of any immediate medical attention and special treatment needed

Note to physician

Antidote: Specific antidotes or neutralizers to isocyanates do not exist.

Treatment: Treatment should be supportive and based on the judgement of the physician in response to the reaction of the patient.

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media

Dry powder, foam, carbon dioxide, water spray.

Special hazards arising from the substance or mixture

Hazards during fire-fighting: nitrous gases, fumes/smoke, isocyanate, vapour

Fire Fighting Measures

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Material Name: FAST Bag in a Box Part A

Product #: 317332

As in any fire, wear self-contained breathing apparatus and full protective gear.

Further information:

Keep containers cool by spraying with water if exposed to fire. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Clear area. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.

Environmental precautions

Do not discharge into drains/surface waters/groundwater.

Methods and material for containment and cleaning up

For small amounts: Absorb isocyanate with suitable absorbent material (see § 40 CFR, sections 260, 264 and 265 for further information). Shovel into open container. Do not make container pressure tight. Move container to a well-ventilated area (outside). Spill area can be decontaminated with the following recommended decontamination solution: Mixture of 90 % water, 8 % concentrated ammonia, 2 % detergent. Add at a 10 to 1 ratio. Allow to stand for at least 48 hours to allow escape of evolved carbon dioxide.

For large amounts: If temporary control of isocyanate vapor is required, a blanket of protein foam or other suitable foam (available from most fire departments) may be placed over the spill. Transfer as much liquid as possible via pump or vacuum device into closed but not sealed containers for disposal.

For residues: The following measures should be taken for final cleanup: Wash down spill area with decontamination solution. Allow solution to stand for at least 10 minutes.

Dike spillage.

Section 7 - HANDLING AND STORAGE

Precautions for safe handling

Provide suitable exhaust ventilation at the processing machines. Ensure thorough ventilation of stores and work areas. Avoid aerosol formation. When handling heated product, vapours of the product should be ventilated, and respiratory protection used. Wear respiratory protection when spraying. Danger of bursting when sealed gastight. Protect against moisture. If bulging of drum occurs, transfer to well ventilated area, puncture to relieve pressure, open vent and let stand for 48 hours before resealing.

Protection against fire and explosion:

Storage No explosion proofing necessary.

Conditions for safe storage, including any incompatibilities

Keep away from water. Segregate from foods and animal feeds. Segregate from acids and bases. Segregate from bases.

Suitable materials for containers: Carbon steel (Iron), High density polyethylene (HDPE), Low



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Material Name: FAST Bag in a Box Part A

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density polyethylene (LDPE), Stainless steel 1.4301 (V2)

Further information on storage conditions: Formation of CO₂ and build up of pressure possible. Keep container tightly closed and in a well-ventilated place. Outage of containers should be filled with dry inert gas at atmospheric pressure to avoid reaction with moisture.

Storage stability:

Storage temperature: 32 - 110 °F

Protect against moisture.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

Diphenylmethane-4,4'-diisocyanate (MDI)	101-68-8
OSHA PEL	CLV 0.02 ppm 0.2 mg/m ³
ACGIH TLV	TWA value 0.005 ppm
P-MDI	9016-87-9
OSHA PEL	CLV 0.02 ppm 0.2 mg/m ³
ACGIH TVL	TWA value 0.005 ppm
Isocyanic acid, polymethylene - polyphenylene ester (P-MDI)	57636-09-6
OSHA PEL	CLV 0.02 ppm 0.2 mg/m ³
ACGIH TLV	TWA value 0.005 ppm

Personal protective equipment

Respiratory protection:

When workers are facing concentrations above the occupational exposure limits they must use appropriate certified respirators. When atmospheric levels may exceed the occupational exposure limit (PEL or TLV) NIOSH-certified air-purifying respirators equipped with an organic vapor sorbent and particulate filter can be used as long as appropriate precautions and change out schedules are in place. For

Safety Data Sheet

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emergency or non-routine, high exposure situations, including confined space entry, use a NIOSH-certified full facepiece pressure demand self-contained breathing apparatus (SCBA) or a full facepiece pressure demand supplied-air respirator (SAR) with escape provisions.

Hand protection:

Chemical resistant protective gloves should be worn to prevent all skin contact., Suitable materials may include, chloroprene rubber (Neoprene), nitrile rubber (Buna N), chlorinated polyethylene, polyvinylchloride (Pylox), butyl rubber, depending upon conditions of use.

Eye protection:

Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.

Body protection:

Cover as much of the exposed skin as possible to prevent all skin contact., Suitable materials may include, saran-coated material, depending upon conditions of use.

General safety and hygiene measures:

Wear protective clothing as necessary to prevent contact. Eye wash fountains and safety showers must be easily accessible. Observe the appropriate PEL or TLV value. Wash soiled clothing immediately. Contaminated equipment or clothing should be cleaned after each use or disposed of.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	liquid	Physical State	liquid
Odor	faint aromatic	Color	Dark amber
Boiling Point (@ 5mmHg)	200°C(392°F)	Flammability Limit	Not flammable
Freezing Point (@ 1 ATM)	3°C (37.4°F)	Vapor Pressure (20°C)	0.00016 mmHg
Autoignition	>250 °C (482 °F)	Flash Point	220°C (428 °F)
Solubility in water	Reacts with water	Viscosity, Dynamic (20°C)	200 mPa.s
Vapor Density (air=1)	N/A	Molar Mass	360 g/mol
Density (20°C)	1.22 g/cm ³	pH	N/A
Relative Density(25°C)	1.22	Bulk Density (25°C)	10.17 lb/USg
Thermal decomposition	No decomposition if stored and handled as prescribed.	Evaporation rate:	Value can be approximated from Henry's Law Constant or vapor pressure.

Safety Data Sheet

Material Name: FAST Bag in a Box Part A

Product #: 317332

Other Information: If necessary, information on other physical and chemical parameters is indicated in this section

Section 10 - STABILITY AND REACTIVITY

Reactivity

Corrosion to metals: No corrosive effect on metal.

Oxidizing properties: Not fire-propagating

Chemical Stability

The product is stable if stored and handled as prescribed/indicated.

Possibility of Hazardous Reactions

Reacts with water, with formation of carbon dioxide. Risk of bursting. Reacts with alcohols. Reacts with acids. Reacts with alkalies. Reacts with amines. Risk of exothermic reaction. Risk of polymerization. Contact with certain rubbers and plastics can cause brittleness of the substance/product with subsequent loss in strength.

Conditions to Avoid

Avoid moisture.

Incompatible Materials

Acids, amines, alcohols, water, Alkalines, strong bases, Substances/products that react with isocyanates

Hazardous decomposition products: carbon monoxide, carbon dioxide, nitrogen oxide, hydrogen cyanide, nitrogen oxides, aromatic isocyanates, gases/vapors

Thermal decomposition: No decomposition if stored and handled as prescribed/indicated.

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Primary routes of exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity

Assessment of acute toxicity: Inhalation of vapours may cause irritation of the mucous membranes of the nose, throat or trachea, breathlessness, chest discomfort, difficult breathing and reduced pulmonary function. Inhalation exposure well above the PEL may result additionally in eye irritation, headache, chemical bronchitis, asthma-like findings or pulmonary edema. Isocyanates have also been reported to cause hypersensitivity pneumonitis, which is characterized by flu-like symptoms, the onset of which may be delayed.

Safety Data Sheet

Material Name: FAST Bag in a Box Part A

Product #: 317332

Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and the following selected endpoints are published:

Diphenylmethane-4,4'-diisocyanate (MDI) (101-68-8)

Oral LD50 Rat 2000 mg/kg

Dermal LD50 Rabbit >9,400 mg/kg

Inhalation LD50 Rat 2.0 (OECD Guideline 403)

An aerosol was tested

Assessment other acute effects

Assessment of STOT single:

Causes temporary irritation of the respiratory tract.

Irritation / corrosion

Assessment of irritating effects: Irritating to eyes, respiratory system and skin. Skin contact may result in dermatitis, either irritative or allergic.

Skin

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Species: rabbit

Result: Irritating.

Method: Draize test

Eye

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Species: rabbit

Result: Irritating.

Method: Draize test

Sensitization

Assessment of sensitization: Sensitization after skin contact possible. The substance may cause sensitization of the respiratory tract. As a result of previous repeated overexposures or a single large dose, certain individuals will develop isocyanate sensitization (chemical asthma) which will cause them to react to a later exposure to isocyanate at levels well below the PEL/TLV. These symptoms, which include chest tightness, wheezing, cough, shortness of breath, or asthmatic attack, could be immediate or delayed up to several hours after exposure. Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air, or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Chronic overexposure to isocyanates has also been reported to cause lung damage, including a decrease in lung function, which may be permanent. Prolonged contact can cause reddening, swelling, rash, scaling, or blistering. In those who have developed a skin sensitization, these symptoms can develop as a result of contact with very small amounts of liquid material, or even as a result of vapour-only exposure. Animal tests indicate that skin contact may play a role in causing respiratory sensitization.

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Buehler test

Species: guinea pig

Safety Data Sheet

Material Name: FAST Bag in a Box Part A

Product #: 317332

Result: sensitizing

Mouse Local Lymph Node Assay (LLNA)

Species: mouse

Result: sensitizing

Can cause skin sensitization

other

Species: guinea pig

Result: sensitizing

Studies in animals suggest that dermal exposure may lead to pulmonary sensitization. However, the relevance of this result for humans is unclear.

Chronic Toxicity/Effects

Repeated dose toxicity

Assessment of repeated dose toxicity: The substance may cause damage to the olfactory epithelium after repeated inhalation. The substance may cause damage to the lung after repeated inhalation. These effects are not relevant to humans at occupational levels of exposure.

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Experimental/calculated data: rat (Wistar) (male/female) Inhalation 2 yrs, 6 hr/day 0, 0.2, 1, 6 mg/m³, olfactory epithelium

NOAEL: 0.2 mg/m³

LOAEL: 1 mg/m³

The substance may cause damage to the olfactory epithelium after repeated inhalation. These effects are not relevant to humans at occupational levels of exposure. Repeated inhalative uptake of the substance did not cause damage to the reproductive organs.

Genetic toxicity

Assessment of mutagenicity: The substance was mutagenic in various bacterial test systems; however, these results could not be confirmed in tests with mammals.

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Genetic toxicity in vitro: OECD Guideline 471 Ames-test Salmonella typhimurium: with and without metabolic activation ambiguous

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Genetic toxicity in vivo: OECD Guideline 474 Micronucleus assay rat (male) Inhalation negative.

No clastogenic effect reported.

Carcinogenicity

Assessment of carcinogenicity: A carcinogenic potential cannot be excluded after prolonged exposure to severely irritating concentrations. These effects are not relevant to humans at occupational levels of exposure.

Experimental/calculated data: OECD Guideline 453 rat Inhalation 0, 0.2, 1, 6 mg/m³

Result: Lung tumors

Safety Data Sheet

Material Name: FAST Bag in a Box Part A

Product #: 317332

Reproductive toxicity

Assessment of reproduction toxicity: Repeated inhalative uptake of the substance did not cause damage to the reproductive organs.

Teratogenicity

Assessment of teratogenicity: The substance did not cause malformations in animal studies; however, toxicity to development was observed at high doses that were toxic to the parental animals.

Development

OECD Guideline 414 rat Inhalation 0, 1, 4, 12 mg/m³

NOAEL Mat.: 4 mg/m³

NOAEL Teratog.: 4 mg/m³

The substance did not cause malformations in animal studies; however, toxicity to development was observed at high doses that were toxic to the parental animals.

Symptoms of Exposure

The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11., Eye irritation, skin irritation, allergic symptoms

Medical conditions aggravated by overexposure

The isocyanate component is a respiratory sensitizer. It may cause allergic reaction leading to asthma-like spasms of the bronchial tubes and difficulty in breathing. Medical supervision of all employees who handle or come into contact with isocyanates is recommended. Contact may aggravate pulmonary disorders. Persons with history of respiratory disease or hypersensitivity should not be exposed to this product. Preemployment and periodic medical examinations with respiratory function tests (FEV, FVC as a minimum) are suggested. Persons with asthmatic conditions, chronic bronchitis, other chronic respiratory diseases, recurrent eczema or pulmonary sensitization should be excluded from working with isocyanates. Once a person is diagnosed as having pulmonary sensitization (allergic asthma) to isocyanates, further exposure is not recommended.

Section 12 - ECOLOGICAL INFORMATION

Toxicity

Aquatic toxicity

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations. Based on long-term (chronic) toxicity study data, the product is very likely not harmful to aquatic organisms.

The product may hydrolyse. The test result maybe partially due to degradation products. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Toxicity to fish

LC0 (96 h) > 1,000 mg/l, Brachydanio rerio (OECD Guideline 203, static)

Aquatic invertebrates

Safety Data Sheet

Material Name: FAST Bag in a Box Part A

Product #: 317332

EC50 (24 h) > 1,000 mg/l, *Daphnia magna* (OECD Guideline 202, part 1, static)

Aquatic plants

EC0 (72 h) 1,640 mg/l (growth rate), *Scenedesmus subspicatus* (OECD Guideline 201, static)

Microorganisms/Effect on activated sludge

Toxicity to microorganisms

OECD Guideline 209 aquaticaerobic bacteria from a domestic water treatment plant/EC50 (3 h): > 100 mg/l

Persistence and degradability

Assessment biodegradation and elimination (H₂O) Poorly biodegradable. The product is unstable in water. The elimination data also refer to products of hydrolysis.

Elimination information

0 % BOD of the ThOD (28 d) (OECD Guideline 302 C) (aerobic, activated sludge) Poorly biodegradable.

Assessment of stability in water

In contact with water the substance will hydrolyse slowly.

Information on Stability in Water (Hydrolysis)

t_{1/2} 20 h (25 °C)

Bioaccumulative potential

Assessment bioaccumulation potential

Significant accumulation in organisms is not to be expected.

Bioaccumulation potential

Bioconcentration factor: 200 (28 d), *Cyprinus carpio* (OECD Guideline 305 E)

Mobility in soil

Assessment transport between environmental compartments.

The substance will not evaporate into the atmosphere from the water surface. Adsorption to solid soil phase is not expected.

Section 13 - DISPOSAL CONSIDERATIONS

Waste disposal of substance:

Incinerate or dispose of in a licensed facility. Do not discharge substance/product into sewer system.

Container disposal:

DRUMS:

Steel drums must be emptied and can be sent to a licensed drum reconditioner for reuse, a scrap metal dealer or an approved landfill. Do not attempt to refill or clean containers since residue is difficult to



Safety Data Sheet

Material Name: FAST Bag in a Box Part A

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remove. Under no circumstances should empty drums be burned or cut open with gas or electric torch as toxic decomposition products may be liberated. Do not reuse empty containers.

Section 14 - TRANSPORT INFORMATION

US DOT Information:

Not classified as a dangerous good under transport regulations

Sea transport IMDG

Not classified as a dangerous good under transport regulations

Air transportation IATA/ICAO

Not classified as a dangerous good under transport regulations

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations

Registration status:

Chemical TSCA, US released / listed.

EPCRA 311/312 (Hazard categories)

Acute;Chronic

EPCRA SECTION 313 SUPPLIER NOTIFICATION

Chemical Name	CAS
Diphenylmethane-4,4'-diisocyanate (MDI)	101-68-8
P-MDI	9016-87-9

CERCLA-RQ (COMPREHENSIVE RESPONSE, COMPENSATION, AND LIABILITY ACT)

Chemical Name	CAS	CERCLA RQ
Diphenylmethane-4,4'-diisocyanate (MDI);	101-68-8	5000 lbs
P-MDI	9016-87-9	5,000 lbs

Reportable Quantity for release: 13,157.9 lb

STATE REGULATIONS

Chemical Name	CAS	State RTK
Diphenylmethane-4,4'-diisocyanate (MDI);	101-68-8	MA, NJ, PA
P-MDI	9016-87-9	MA, NJ, PA
Methylenediphenyl diisocyanate	26447-40-5	NJ



Safety Data Sheet

Material Name: FAST Bag in a Box Part A

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Section 16 - OTHER INFORMATION

HMIS Rating

Health: 2 Fire: 1 Physical Hazard: 1

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

NFPA Ratings

Health: 2 Fire: 1 Reactivity: 1

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes

New SDS: April 17, 2015

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH - Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States.

Other Information

Disclaimer:

The information contained herein is based upon data and information available to us, and reflects our best professional judgment. This product may be formulated in part with components purchased from other companies. No warranty of merchantability, fitness for any use, or any other warranty is expressed or implied regarding the accuracy of such data or information. The results to be obtained from the use thereof, or that any such use does not infringe any patent, since the information contained herein may be applied under conditions of use beyond our control and with which we may be unfamiliar, we do not assume responsibility for the results of such application. This information is furnished upon the condition



Safety Data Sheet

Material Name: FAST Bag in a Box Part A

Product #: 317332

that the person receiving it shall make his own determination of the suitability of the material for his particular use.



Safety Data Sheet

Material Name: FAST Bag in a Box Part B

Product #: 317333

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name

FAST Bag in a Box Part B

Synonyms

Urethane System Resin Component

Chemical Family

Resin

Product Use

Membrane and Insulation Adhesive

Restrictions on Use

For industrial use only.

Manufacturer Information

Carlisle SynTec

1285 Ritner Highway

Carlisle, PA 17013

USA

Phone: +1-800-479-6832

Emergency Phone #: +1-800-424-9300 (CHEMTREC)

Section 2 - HAZARDS IDENTIFICATION

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Classification of the product

No need for classification according to GHS criteria for this product.

Label elements

The product does not require a hazard warning label in accordance with GHS criteria.

Hazards not otherwise classified

No specific dangers known, if the regulations/notes for storage and handling are considered.

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Emergency overview

CAUTION:

MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION.



Safety Data Sheet

Material Name: FAST Bag in a Box Part B

Product #: 317333

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

This product does not contain any components classified as hazardous under the referenced regulation.

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

CAS	Component Name	Percent
Trade Secret	Polyol	< 70.0
13674-84-5	tris(2-chloro-1-methylethyl)phosphate	< 30.0
Trade Secret	Catalyst	< 2.0
Trade Secret	Surfactant	< 1.0

The product contains:

CAS Number	Content (W/W)	Chemical name
13674-84-5	>= 20.0 - < 30.0 %	tris(2-chloro-1-methylethyl)phosphate

Section 4 - FIRST AID MEASURES

General advice:

Remove contaminated clothing.

Inhalation

Keep patient calm, remove to fresh air.

Skin

Wash thoroughly with soap and water.

Eyes

Rinse cautiously with water for 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention.

Ingestion

Rinse mouth and then drink plenty of water. Do not induce vomiting..

Most Important Symptoms/Effects

Information on: tris(2-chloro-1-methylethyl)phosphate

Symptoms: Overexposure may cause:, convulsions, depression, hypoxemia, tremors

Indication of any immediate medical attention and special treatment needed



Safety Data Sheet

Material Name: FAST Bag in a Box Part B

Product #: 317333

Note to physician

Treatment: Symptomatic treatment (decontamination, vital functions).

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media

Water spray, dry powder, carbon dioxide, foam

Special Hazards Arising from the Chemical

Hazards during fire-fighting:

No particular hazards known.

Hazardous Combustion Products

Oxides of carbon, oxides of nitrogen

Advice for firefighters

Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

Further information:

Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Wear personal protective clothing and equipment, see Section 8.

Methods and Materials for Containment and Cleaning Up

Spills should be contained, solidified, and placed in suitable containers for disposal.

Environmental Precautions

Do not empty into drains. Do not discharge into the subsoil/soil.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling

Ensure thorough ventilation of stores and work areas. Protect against moisture.

Protection against fire and explosion:

No explosion proofing necessary.

Conditions for Safe Storage, Including any Incompatibilities

Material Name: FAST Bag in a Box Part B

Product #: 317333

Segregate from foods and animal feeds. Segregate from acids. Segregate from oxidants. Suitable materials for containers: Carbon steel (Iron), High density polyethylene (HDPE), Low density polyethylene (LDPE), Stainless steel 1.4301 (V2)

Further information on storage conditions: No special precautions necessary. Avoid extreme heat.

Store protected against freezing

Storage stability:

Storage temperature: 60 - 80 °F. Protect against moisture.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Advice on system design:

Provide local exhaust ventilation to control vapors/mists.

Eye/face protection:

Wear face shield or tightly fitting safety goggles (chemical goggles) if splashing hazard exists.

Skin Protection:

Wear work clothes with long sleeves. Wear protective shoes.

Respiratory Protection:

Wear a NIOSH-certified (or equivalent) organic vapour/particulate respirator as needed.

Hand protection:

Chemical resistant protective gloves.

Body protection:

Standard work clothes and shoes.

General safety and hygiene measures:

Avoid contact with skin. Handle in accordance with good industrial hygiene and safety practice. Wear protective clothing as necessary to prevent contact. Avoid inhalation of vapours/mists. Wash soiled clothing immediately.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	light yellow liquid	Physical State	liquid
Odor	musty	Color	Clear to light yellow
Odor Threshold	Not available	pH	≥ 7
Freezing point	Not available	Evaporation Rate	3.8
Boiling Point	148.8 °C (> 300°F)	Flammability (solid, gas)	Not flammable
Autoignition	>250 °C (482°F)	Flash Point	Approx. >93°C (200°F)
Density (20 °C)	Approx. 1.1 g/cm ³	Decomposition	Not available
Self Igniting	Not self igniting	Vapor Pressure(25 °C)	< 0.1 hPa

Material Name: FAST Bag in a Box Part B

Product #: 317333

Vapor Density (air=1)	N/A	Specific Gravity (water=1)	Not available
Water Solubility	Miscible	Partition coefficient: n-octanol/water	Not available

Other Information

No additional information available.

Section 10 - STABILITY AND REACTIVITY

Reactivity

No hazardous reactions if stored and handled as prescribed/indicated.

Corrosion to metals: No corrosive effect on metal.

Oxidizing properties: Not fire-propagating

Chemical Stability

Stable under normal conditions of use.

Possibility of Hazardous Reactions

No hazardous reactions if stored and handled as prescribed/indicated.

Conditions to Avoid

Temperature: < 0 degrees Celsius

Incompatible Materials

Acids, isocyanates, strong oxidizing agents

Hazardous decomposition products

Decomposition products:

Hazardous decomposition products: carbon monoxide, carbon dioxide, nitrogen oxide, hydrogen cyanide

Thermal decomposition: No decomposition if stored and handled as prescribed/indicated.

Section 11 - TOXICOLOGICAL INFORMATION

Primary Routes of Exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact.

Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute and Chronic Toxicity**Acute toxicity**

Assessment of acute toxicity: No known acute effects.

Assessment other acute effects

Assessment of STOT single:

Based on the available information there is no specific target organ toxicity to be expected after a single exposure.

Origin of data: expert judgement

Material Name: FAST Bag in a Box Part B

Product #: 317333

Irritation / corrosion

Assessment of irritating effects: No irritation is expected under intended use and appropriate handling.

Sensitization

Assessment of sensitization: The chemical structure does not suggest a sensitizing effect.

Aspiration Hazard

No aspiration hazard expected.

Chronic Toxicity/Effects**Repeated dose toxicity**

Assessment of repeated dose toxicity: Repeated oral uptake of the substance did not cause substance-related effects. Repeated inhalative uptake of the substance did not cause substance-related effects. Repeated dermal uptake of the substance did not cause substance-related effects.

Genetic toxicity

Assessment of mutagenicity: The chemical structure does not suggest a specific alert for such an effect.

Carcinogenicity

Assessment of carcinogenicity: The chemical structure does not suggest a specific alert for such an effect.

Reproductive toxicity

Assessment of reproduction toxicity: The chemical structure does not suggest a specific alert for such an effect.

Teratogenicity

Assessment of teratogenicity: The chemical structure does not suggest a specific alert for such an effect.

Other Information

The product has not been tested. The statement has been derived from the properties of the individual components.

Symptoms of Exposure**Medical conditions aggravated by overexposure**

Data available do not indicate that there are medical conditions that are generally recognized as being aggravated by exposure to this substance/product.

Section 12 - ECOLOGICAL INFORMATION

Ecotoxicity**Aquatic toxicity**

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to aquatic organisms. The product has not been tested. The statement has been derived from the properties of the individual components.

Component Analysis - Aquatic Toxicity



Safety Data Sheet

Material Name: FAST Bag in a Box Part B

Product #: 317333

Persistence and Degradability

Assessment biodegradation and elimination (H2O)

Poorly biodegradable.

Elimination information

Poorly biodegradable.

Bioaccumulative Potential

Does not significantly accumulate in organisms..

Mobility in soil

Assessment transport between environmental compartments

Adsorption to solid soil phase is not expected.

Additional information

Adsorbable organically-bound halogen (AOX):

This product contains no organically-bound halogen.

Other ecotoxicological advice:

The product has not been tested. Do not discharge product into the environment without control.

Section 13 - DISPOSAL CONSIDERATIONS

Waste disposal of substance:

Incinerate in a licensed facility. Dispose of in a licensed facility. Do not discharge substance/product into sewer system.

Container disposal:

Steel drums must be emptied and can be sent to a licensed drum reconditioner for reuse, a scrap metal dealer or an approved landfill. Do not attempt to refill or clean containers since residue is difficult to remove. Under no circumstances should empty drums be burned or cut open with gas or electric torch as toxic decomposition products may be liberated. Do not reuse empty containers.

Section 14 - TRANSPORT INFORMATION

Land transport US DOT Information:

Not classified as a dangerous good under transport regulations

Air transport IATA/CAO Information:

Not classified as a dangerous good under transport regulations

Sea transport IMDG Information:

Not classified as a dangerous good under transport regulations

Section 15 - REGULATORY INFORMATION

Federal Regulations



Safety Data Sheet

Material Name: FAST Bag in a Box Part B

Product #: 317333

Registration status:

Chemical TSCA, US released / listed

EPCRA 311/312 (Hazard categories): Not hazardous;

Section 16 - OTHER INFORMATION

HMIS Rating

Health: 1 Fire: 1 Physical Hazard: 1

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

NFPA Ratings

Health: 1 Fire: 1 Reactivity: 1

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes

New SDS: April 28, 2015

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States.

Other Information

Disclaimer:

The information contained herein is based upon data and information available to us, and reflects our best professional judgment. This product may be formulated in part with components purchased from other companies. No warranty of merchantability, fitness for any use, or any other warranty is expressed or implied regarding the accuracy of such data or information. The results to be obtained from the use thereof, or that any such use does not infringe any patent, since the information contained herein may be



Safety Data Sheet

Material Name: FAST Bag in a Box Part B

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applied under conditions of use beyond our control and with which we may be unfamiliar, we do not assume responsibility for the results of such application. This information is furnished upon the condition that the person receiving it shall make his own determination of the suitability of the material for his particular use

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name: Water Cut-Off Mastic

Synonyms: Butyl Mastic

Chemical Family: Mastic

Product Use: Elastomeric sealer for Single-Ply Membranes

Restrictions on Use: For industrial use only.

Manufacturer Information

Carlisle SynTec

1285 Ritner Highway

Carlisle, PA 17013

USA

Phone: +1-800-479-6832

Emergency Phone #: +1-800-424-9300 (CHEMTREC)

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.

Flammable Liquids - Category 2

Skin Corrosion/Irritation - Category 2

Specific Target Organ Toxicity - Single Exposure - Category 3

GHS Label Elements

Symbol(s)



Signal Word

Danger

Hazard Statement(s)

Highly flammable liquid and vapor

Causes skin irritation

May cause drowsiness or dizziness

Precautionary Statement(s)

Prevention

Keep container tightly closed

Keep away from heat/sparks/open flame/hot surfaces - No smoking

Ground/Bond container and receiving equipment

Use explosion-proof electrical/ventilating/lighting equipment

Take precautionary measures against static discharge

Use only non-sparking tools



Safety Data Sheet

Material Name: Water Cut-Off Mastic

Product #: 319621

Use only outdoors or in a well-ventilated area
Wear protective gloves/protective clothing/eye protection/face protection
Avoid breathing dust/fume/gas/mist/vapours/spray
Wash thoroughly after handling

Response

In case of fire: Use appropriate media to extinguish
IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing
IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower
If skin irritation occurs: Get medical advice/attention
Take off contaminated clothing and wash before reuse
Call a POISON CENTER or doctor if you feel unwell
Specific treatment (see label)

Storage

Store in a well-ventilated place. Keep container tightly closed
Keep cool
Store locked up

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
Trade Secret	Silica compound	1-5
Trade Secret	Polyphenol antioxidant	< 0.1
Trade Secret	Severely hydrotreated paraffinic oil	1-5
Trade Secret	Polybutene	10-30
64742-89-8	Solvent naphtha, petroleum, light aliphatic	10-30
Mixture	Hydrous clay	3-7

Section 4 - FIRST AID MEASURES

Inhalation

Remove person to fresh air and keep comfortable for breathing. Give artificial respiration if not breathing. Call a POISON CENTER or doctor if you feel unwell.

Skin

Remove/Take off immediately all contaminated clothing and wash it before reuse. Rinse skin with water/shower. If skin irritation occurs, get medical advice/attention.

Eyes

Rinse cautiously with water for 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention.



Safety Data Sheet

Material Name: Water Cut-Off Mastic

Product #: 319621

Ingestion

If swallowed, do not induce vomiting. Immediately call a POISON CENTER or doctor/physician.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically and supportively.

Most Important Symptoms/Effects

Acute

Causes skin irritation. May cause drowsiness or dizziness.

Delayed

No information on significant adverse effects.

Section 5 - FIREFIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media

Dry chemical, foam or carbon dioxide. Water may be ineffective. Use water spray to keep containers cool.

Unsuitable Extinguishing Media

Do not use high-pressure water streams.

Special Hazards Arising from the Chemical

Highly flammable liquid and vapor. Can burn and explode easily when exposed to open flames or high heat. Vapors are heavier than air and may travel a considerable distance to a source of ignition and flashback.

Hazardous Combustion Products

Oxides of carbon, aldehydes

Firefighting Measures

Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Wear personal protective clothing and equipment, see Section 8.

Methods and Materials for Containment and Cleaning Up

Remove all sources of ignition. Avoid breathing vapors. Ventilate affected area. Absorb with earth, sand or other non-combustible material and transfer to container. Use non-sparking tools. Dike for later disposal. Dispose in accordance with all applicable regulations.

Environmental Precautions

Avoid release to the environment.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling

Keep away from heat/sparks/open flames/hot surfaces. Take precautionary measures against static discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. Do not breathe



Safety Data Sheet

Material Name: Water Cut-Off Mastic

Product #: 319621

dust/fume/gas/mist/vapors/spray. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. KEEP OUT OF REACH OF CHILDREN.

Conditions for Safe Storage, Including any Incompatibilities

Store in a well-ventilated place. Keep container tightly closed

Keep cool

Store locked up

Keep away from heat and ignition sources. Keep away from incompatible materials. Do not cut, puncture, or weld on or near this container.

Incompatible Materials

Strong oxidizing agents, acids, bases

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

Calcium carbonate	1317-65-3	
NIOSH:	10 mg/m ³ TWA total dust; 5 mg/m ³ TWA respirable dust	
OSHA (US):	15 mg/m ³ TWA total dust; 5 mg/m ³ TWA respirable fraction	
Mexico:	10 mg/m ³ TWA LMPE-PPT	20 mg/m ³ STEL [LMPE-CT]
Silica compound	Trade Secret	
OSHA (US):	20 mppcf TWA; ((80)/(% SiO ₂)) mg/m ³ TWA)	
Mexico:	10 mg/m ³ TWA LMPE-PPT	
Carbon compound	Trade Secret	
ACGIH:	3 mg/m ³ TWA inhalable fraction	
NIOSH:	3.5 mg/m ³ TWA; 0.1 mg/m ³ TWA (Carbon black in presence of Polycyclic aromatic hydrocarbons) as PAH	
	1750 mg/m ³ IDLH	
OSHA (US):	3.5 mg/m ³ TWA	
Mexico:	3.5 mg/m ³ TWA LMPE-PPT	7 mg/m ³ STEL [LMPE-CT]
Silica, crystalline	14808-60-7	



Safety Data Sheet

Material Name: Water Cut-Off Mastic

Product #: 319621

ACGIH:	0.025 mg/m ³ TWA respirable fraction	
NIOSH:	0.05 mg/m ³ TWA respirable dust	50 mg/m ³ IDLH respirable dust
OSHA (US):	((30)/(%SiO ₂ + 2) mg/m ³ TWA) total dust; ((250)/(%SiO ₂ + 5) mppcf TWA) respirable fraction; ((10)/(%SiO ₂ + 2) mg/m ³ TWA) respirable fraction	
Mexico:	0.1 mg/m ³ TWA LMPE-PPT respirable fraction	

Biological limit value

There are no biological limit values for any of this product's components.

Engineering Controls

Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

Individual Protection Measures, such as Personal Protective Equipment

Eye/face protection

Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin Protection

Wear chemical resistant clothing and rubber boots when potential for contact with the material exists. Recommended material: protective skin cream.

Respiratory Protection

A NIOSH approved air-purifying respirator with an appropriate cartridge or canister may be appropriate under certain circumstances where airborne concentrations are expected to exceed exposure limits.

Glove Recommendations

Wear appropriate chemical resistant gloves.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	gray viscous liquid	Physical State	liquid
Odor	mild, solvent	Color	gray
Odor Threshold	Not available	pH	Not available
Melting Point	Not available	Boiling Point	119 - 141 °C (246-286 °F)
Freezing point	Not available	Evaporation Rate	3.5
Boiling Point Range	Not available	Flammability (solid, gas)	Not available
Autoignition	246 °C (475 °F)	Flash Point	10 °C (50 °F)
Lower Explosive Limit	0.9 %	Decomposition	Not available
Upper Explosive Limit	6.7 %	Vapor Pressure	11.25 mmHg
Vapor Density (air=1)	4	Specific Gravity (water=1)	Not available
Water Solubility	0.5	Partition coefficient: n-octanol/water	Not available
Viscosity	1200000 cps	Solubility (Other)	hydrocarbons



Safety Data Sheet

Material Name: Water Cut-Off Mastic

Product #: 319621

Density	1.2 - 1.3 (relative)	VOC	250 g/L
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Other Information

No additional information available.

Section 10 - STABILITY AND REACTIVITY

Reactivity

No reactivity hazard is expected.

Chemical Stability

Stable under normal conditions of use.

Possibility of Hazardous Reactions

Hazardous polymerization will not occur.

Conditions to Avoid

Avoid heat, flames, sparks and other sources of ignition. Avoid contact with incompatible materials.

Incompatible Materials

Strong oxidizing agents, acids, bases.

Hazardous decomposition products

Oxides of carbon, aldehydes

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Inhalation

May cause drowsiness or dizziness.

Skin Contact

Causes skin irritation.

Eye Contact

May cause eye irritation.

Ingestion

May cause gastrointestinal irritation.

Acute and Chronic Toxicity

Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and the following selected endpoints are published:

Carbon compound (Trade Secret)

Oral LD50 Rat >8000 mg/kg

Polyphenol antioxidant (Trade Secret)

Oral LD50 Rat >5000 mg/kg

Dermal LD50 Rabbit >5000 mg/kg



Safety Data Sheet

Material Name: Water Cut-Off Mastic

Product #: 319621

Severely hydrotreated paraffinic oil (Trade Secret)

Oral LD50 Rat >5000 mg/kg

Dermal LD50 Rabbit >2000 mg/kg

Polybutene (Trade Secret)

Oral LD50 Rat >34600 mg/kg

Dermal LD50 Rat >10250 mg/kg

Solvent naphtha, petroleum, light aliphatic (64742-89-8)

Oral LD50 Rat >2000 mg/kg

Dermal LD50 Rat >2000 mg/kg

Silica, crystalline (14808-60-7)

Oral LD50 Rat 500 mg/kg

Immediate Effects

Causes skin irritation. May cause drowsiness or dizziness. May cause gastrointestinal irritation.

Delayed Effects

No information on significant adverse effects.

Irritation/Corrosivity Data

Causes skin irritation. May cause gastrointestinal irritation.

Respiratory Sensitization

No data available.

Dermal Sensitization

No data available.

Component Carcinogenicity

Silica compound	Trade Secret
IARC:	Monograph 68 [1997] (Group 3 (not classifiable))
Carbon compound	Trade Secret
ACGIH:	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
IARC:	Monograph 93 [2010]; Monograph 65 [1996] (Group 2B (possibly carcinogenic to humans))
DFG:	Category 3B (could be carcinogenic for man, inhalable fraction)
OSHA:	Present
Silica, crystalline	14808-60-7
ACGIH:	A2 - Suspected Human Carcinogen
IARC:	Monograph 100C [2012]; Monograph 68 [1997] (Group 1 (carcinogenic to humans))
NTP:	Known Human Carcinogen (respirable size)



Safety Data Sheet

Material Name: Water Cut-Off Mastic

Product #: 319621

DFG:	Category 1 (causes cancer in man, alveola fraction)
OSHA:	Present (respirable size)

Germ Cell Mutagenicity

No data available.

Reproductive Toxicity

No data available.

Specific Target Organ Toxicity - Single Exposure

May affect the central nervous nervous system: drowsiness, dizziness.

Specific Target Organ Toxicity - Repeated Exposure

No target organs identified.

Aspiration hazard

No data available.

Medical Conditions Aggravated by Exposure

No data available.

Additional Data

This product contains crystalline silica, which is a known carcinogen. However, this component is bound by the polymer portion of the sealant. The only way this component would be released is through incineration. Therefore, this product is not considered a carcinogen.

Section 12 - ECOLOGICAL INFORMATION

Ecotoxicity

Avoid release to the environment.

Component Analysis - Aquatic Toxicity

Polyphenol antioxidant	Trade Secret
Fish:	LC50 96 h Oncorhynchus mykiss >0.2 mg/L [semi-static]
Algae:	EC50 72 h Pseudokirchneriella subcapitata >0.2 mg/L IUCLID
Invertebrate:	EC50 48 h Daphnia magna >0.2 mg/L IUCLID
Severely hydrotreated paraffinic oil	Trade Secret
Fish:	LC50 96 h Oncorhynchus mykiss >5000 mg/L
Invertebrate:	EC50 48 h Daphnia magna >1000 mg/L IUCLID
Polybutene	Trade Secret
Fish:	Fish LC50 96 hr >1000 mg/L



Safety Data Sheet

Material Name: Water Cut-Off Mastic

Product #: 319621

Solvent naphtha, petroleum, light aliphatic	64742-89-8
Algae:	EC50 72 h Pseudokirchneriella subcapitata 4700 mg/L IUCLID
Hydrous clay	Mixture
Fish:	Fish LC50 96 hr Oncorhynchus 19000 mg/L

Persistence and Degradability

No information available for the product.

Bioaccumulative Potential

No information available for the product.

Mobility

No information available for the product.

Other Toxicity

No additional information available.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods

Dispose of contents/container in accordance with local/regional/national/international regulations.

Section 14 - TRANSPORT INFORMATION

US DOT Information:

Shipping Name: ADHESIVES

Hazard Class: 3

UN/NA #: UN1133

Packing Group: II

Required Label(s): < 0.3 gal use Limited Quantity Label

IATA Information:

Shipping Name: ADHESIVES

Hazard Class: 3

UN#: UN1133

Packing Group: II

Required Label(s): < 0.3 gal use Limited Quantity Label

TDG Information:

Shipping Name: ADHESIVES

Hazard Class: 3

UN#: UN1133

Packing Group: II



Safety Data Sheet

Material Name: Water Cut-Off Mastic

Product #: 319621

Required Label(s):

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations

None of this products components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

SARA Section 311/312 (40 CFR 370 Subparts B and C)

Acute Health: Yes Chronic Health: Yes Fire: Yes Pressure: No Reactivity: No

U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA
Calcium carbonate	1317-65-3	No	Yes	Yes	Yes	Yes
Silica compound	Trade Secret	No	Yes	Yes	Yes	Yes
Carbon compound	Trade Secret	Yes	Yes	Yes	Yes	Yes
Silica, crystalline	14808-60-7	No	Yes	Yes	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer

Carbon compound	Trade Secret
Carc:	carcinogen , initial date 2/21/03 (airborne, unbound particles of respirable size)
Silica, crystalline	14808-60-7
Carc:	carcinogen , initial date 10/1/88 (airborne particles of respirable size)

Canadian WHMIS Ingredient Disclosure List (IDL)

Components of this material have been checked against the Canadian WHMIS Ingredients Disclosure List. The List is composed of chemicals which must be identified on MSDSs if they are included in products which meet WHMIS criteria specified in the Controlled Products Regulations and are present above the threshold limits listed on the IDL

Carbon compound	Trade Secret
	1 %
Silica, crystalline	14808-60-7
	1 %

Component Analysis - Inventory

Calcium carbonate (1317-65-3)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX
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Safety Data Sheet

Material Name: Water Cut-Off Mastic

Product #: 319621

Yes	NSL	EIN	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes
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Silica compound (Trade Secret)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX
No	DSL	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes

Carbon compound (Trade Secret)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX
Yes	DSL	EIN	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes

Polyphenol antioxidant (Trade Secret)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX
Yes	DSL	EIN	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No

Severely hydrotreated paraffinic oil (Trade Secret)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX
Yes	DSL	EIN	Yes	Yes	No	No	Yes	No	Yes	Yes	No

Polybutene (Trade Secret)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX
Yes	DSL	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes

Solvent naphtha, petroleum, light aliphatic (64742-89-8)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX
Yes	DSL	EIN	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes

Hydrous clay (Mixture)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX
Yes	DSL	No	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes

Silica, crystalline (14808-60-7)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX
Yes	DSL	EIN	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes

Section 16 - OTHER INFORMATION



Safety Data Sheet

Material Name: Water Cut-Off Mastic

Product #: 319621

HMIS Rating

Health: 2 Fire: 3 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

NFPA Ratings

Health: 2 Fire: 3 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes

New SDS: March 6, 2015

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States.

Other Information

Disclaimer:

The information contained herein is based upon data and information available to us, and reflects our best professional judgment. This product may be formulated in part with components purchased from other companies. No warranty of merchantability, fitness for any use, or any other warranty is expressed or implied regarding the accuracy of such data or information. The results to be obtained from the use thereof, or that any such use does not infringe any patent, since the information contained herein may be applied under conditions of use beyond our control and with which we may be unfamiliar, we do not assume responsibility for the results of such application. This information is furnished upon the condition that the person receiving it shall make his own determination of the suitability of the material for his particular use.

Safety Data Sheet

Material Name: PVC Cut-Edge Sealant

Product #:307754

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name: PVC Cut-Edge Sealant

Synonym: Vinyl Sealant

Chemical Family: Solvent Based Sealant

Product Use: Sealant for PVC Single-Ply Roofing Membranes

Restrictions on Use: For industrial use only.

Manufacturer Information

Carlisle SynTec

1285 Ritner Highway

Carlisle, PA 17013

USA

Phone: +1-800-479-6832

Emergency Phone #: +1-800-424-9300 (CHEMTREC)

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.

Eye Irritant- Category 2A

Specific Target Organ Toxicity - Single Exposure - Category 3

Flammable Liquids- Category 2

GHS Label Elements

The mixture is classified and labeled according to the the Globally Harmonized System (GHS).

Symbol(s)



Signal Word

Danger

Hazard Statement(s)

H225: Highly flammable liquid and vapour.

H319: Causes serious eye irritation.

H335: May cause respiratory irritation.

Precautionary/ Response Statement(s)

Prevention / Response

P101 If medical advice is needed, have product container or label at hand.

P102 Keep out of reach of children.



Safety Data Sheet

Material Name: PVC Cut-Edge Sealant

Product #:307754

P103 Read label before use.
P210 Keep away from heat/sparks/open flames/hot surfaces.- No smoking
P241 Use explosion-proof electrical/ventilating/lighting/equipment.
P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
P271 Use only outdoors or in a well-ventilated area
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P240 Ground/bond container and receiving equipment.
P233 Keep container tightly closed.
P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position Comfortable for breathing.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.
P405 Store locked up.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P403+P235 Store in a well-ventilated place. Keep cool.
P501 Dispose of contents/container in accordance with local/regional/national/International regulations.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
109-99-9	Tetrahydrofuran	80-88
9002-86-2	Ethene, Chloro, Homopolymer	9-11
28553-12-0	Diisononyl Phthalate	5.7
1843-05-6	(2-Hydroxy-4-(octyloxy)-phenyl)phenylmethanone	0.9-1
128-37-0	Butylated Hydroxytoluene	<0.2

Section 4 - FIRST AID MEASURES

EYES: Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.

SKIN: Generally the product does not irritate the skin.

INGESTION: Give large amounts of water. If symptoms persist, consult a doctor

INHALATION: If inhaled remove to fresh air. In case of complaints seek medical attention.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Safety Data Sheet

Material Name: PVC Cut-Edge Sealant

Product #:307754

Most important symptoms and effects, both acute and delayed

No further relevant information available.

Indication of any immediate medical attention and special treatment needed

No further relevant information available.

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media

CO2, sand, extinguishing powder. Do not use water.

For safety reasons unsuitable extinguishing agents:

Water with full jet.

Special hazards arising from the substance or mixture

No further relevant information available.

Advice for firefighters

Protective equipment:

No special measures required.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep unprotected persons away.

Environmental precautions:

Do not allow product to reach sewage system or any water course. Inform respective authorities in case of seepage into water course or sewage system. Do not allow to enter sewers/surface or ground water.

Methods and material for containment or cleaning up:

Absorb with liquid-binding material (ie. Sand, diatomite, acid binders, universal binders,sawdust). Ensure adequate ventilation. Do not flush with water or aqueous cleansing agents.

Reference to other sections

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

Section 7 - HANDLING AND STORAGE

HANDLING:



Safety Data Sheet

Material Name: PVC Cut-Edge Sealant

Product #:307754

Ensure good ventilation/exhaustion at the workplace. Open and handle receptacle with care. Prevent formation of aerosols.

Information about protection against explosions and fire:

Keep ignition sources away – Do not smoke. Protect from heat. Protect against electrostatic charges.

STORAGE

Requirements to be met by storerooms and receptacles: Store in a cool location.

Information about storage in one common storage facility: Not required.

Further information about storage conditions:

Keep receptacle tightly sealed.

Store in cool, dry conditions in well sealed receptacles.

Protect from heat and direct sunlight.

Specific end use(s) No further relevant information available.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

tetrahydrofuran	109-99-9	
PEL:	Long-term value 200 ppm ;590 mg/m ³	
REL	Short-term value 250 ppm ;735 mg/m ³	Long-term value 200 ppm ;590 mg/m ³
TLV	Short-term value 100 ppm ;295 mg/m ³	Long-term value Skin 200 ppm ;147 mg/m ³
BEI	2 mg/L; urine, end of shift, tetrahydrofuran	

Safety Data Sheet

Material Name: PVC Cut-Edge Sealant

Product #:307754

Individual Protection Measures, such as Personal Protective Equipment

General protective and hygienic measures:

Keep away from foodstuffs, beverages and feed. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work. Avoid contact with the eyes. Avoid contact with the eyes and skin.

Eye/face protection

Tightly sealed goggles.

Protection of hands:

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. Select the glove material based on penetration times, rates of diffusion and degradation.

Additional Information: The lists that were valid during the creation were used as basis.

Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Penetration time of glove material

The exact break-through time has to be determined and observed by the manufacturer of the protective gloves.

Respiratory Protection

Not required.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	liquid	Physical State	liquid
Odor	Ether-like	Color	Colorless
Boiling Point Range	65 °C (149 °F)	Flammability Limit	N/A
Autoignition	Not determined	Flash Point	-21 °C (-6 °F)
Danger of explosion	May form explosive peroxides	Explosion limits	1.5 vol% Low 12 vol% Upper
Vapor pressure @ 20 °C (68 °F)	200 hPa (150 mm Hg)	Relative density	Not determined
Vapor Density (air=1)	Not determined	VOC	780 g/l
Solubility in/ Miscibility with water	Not miscible or difficult to mix	Partition coefficient (n-octanol/water)	Not determined
Dynamic/Kinematic	Not determined	Organic Solvents	83.8%

Safety Data Sheet

Material Name: PVC Cut-Edge Sealant

Product #:307754

Density @ 20 °C (68 °F)	0.930 g/cm3 (7.76 lbs/gal)	pH-value	7
Melting Point Range	-108 °C (-163 °F)	Ignition Temperature	230 °C (446 °F)

COMMENTS: 5.27 lb VHAP/lb Solid 84.1% by weight HAP

Section 10 - STABILITY AND REACTIVITY

Reactivity

No further relevant information available.

Chemical stability

Thermal decomposition/conditions to be avoided:

No decomposition if used according to specifications

Possibility of hazardous reactions

No dangerous reactions known.

Conditions to avoid

No further relevant information available.

Incompatible materials:

No further relevant information available.

Hazardous decomposition products:

No dangerous decomposition products known.

Section 11 - TOXICOLOGICAL INFORMATION

Information on toxicological effects

Acute toxicity:

LD/LC50 values that are relevant for classification:

109-99-9 tetrahydrofuran

Oral LD50 2500 mg/kg (rat)

Primary irritant effect:

On the skin:

No irritant effect.

On the eye:

Irritating effect.

Sensitization:

No sensitizing effects known.

Additional toxicological information:

Carcinogenic categories

IARC (International Agency for Research on Cancer)

Substance is not listed.

NTP (National Toxicology Program)

Substance is not listed.

Safety Data Sheet

Material Name: PVC Cut-Edge Sealant

Product #:307754

Section 12 - ECOLOGICAL INFORMATION

Toxicity

Aquatic toxicity:

No further relevant information available.

Persistence and degradability

No further relevant information available.

Bioaccumulative potential

No further relevant information available.

Mobility in soil

No further relevant information available.

Additional ecological information:

General notes:

Water hazard class 1 (assessment by list): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

Other adverse effects No further relevant information available.

Section 13 - DISPOSAL CONSIDERATIONS

Waste treatment methods

Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

Uncleaned packagings:

Recommendation:

Disposal must be made according to official regulations.

Section 14 - TRANSPORT INFORMATION

UN-Number

DOT, ADR, IMDG, IATA UN1133

UN proper shipping name

DOT Adhesives, containing a flammable liquid.

ADR Not determined

IMDG, IATA Not determined

Transport hazard class(es)

DOT

Class 3 Flammable liquids.

Label 3

ADR Not determined

Class Not determined

IMDG< IATA Not determined



Safety Data Sheet

Material Name: PVC Cut-Edge Sealant

Product #: 307754

Class Not determined

Label Not determined

Packing group

DOT, ADR, IMDG, IATA II

Environmental hazards:

Marine pollutant: No

Special precautions for user Warning: Flammable liquids

Danger code (Kemler) 33

EMS Number: Not applicable.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

Transport/Additional information:

DOT

Remarks: ERG Guide Number: 128

UN "Model Regulation": UN1133, Adhesives, 3, II

Section 15 - REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

Sara

Section 355 (extremely hazardous substances):

Mixture substances are not listed.

Section 313 (Specific toxic chemical listings):

Mixture substances are not listed.

TSCA (Toxic Substance Control Act):

109-99-9 tetrahydrofuran is listed.

Proposition 65

Chemicals known to cause cancer:

Mixture substances are not listed.

Chemicals known to cause reproductive toxicity for females:

Mixture substances are not listed.

Chemicals known to cause reproductive harm to males:

Mixture substances are not listed.

Chemicals known to cause developmental toxicity:

Mixture substances are not listed.

TLV (Threshold Limit Value established by ACGIH)

109-99-9 tetrahydrofuran

NIOSH-Ca (National Institute for Occupational Safety and Health)

Mixture substances are not listed

National regulations

Mixture substances are not listed.

State Right to Know

Mixture substances are not listed.

Chemical safety assessment: A chemical Safety Assessment has not been carried out.



Safety Data Sheet

Material Name: PVC Cut-Edge Sealant

Product #:307754

Section 16 - OTHER INFORMATION

HMIS Rating

Health: 1 Fire: 3 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

NFPA Ratings

Health: 1 Fire: 3 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Other Information

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of the need that the information is current, applicable, and suitable to their circumstances.

Summary of Changes

New SDS: April 17, 2015

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States.

Other Information

Disclaimer:

The information contained herein is based upon data and information available to us, and reflects our best professional judgment. This product may be formulated in part with components purchased from other companies. No warranty of merchantability, fitness for any use, or any other warranty is expressed or implied regarding the accuracy of such data or information. The results to be obtained from the use thereof, or that any such use does not infringe any patent, since the information contained herein may be applied under conditions of use beyond our control and with which we may be unfamiliar, we do not assume responsibility for the results of such application. This information is furnished upon the condition that the person receiving it shall make his own determination of the suitability of the material for his particular use.

Safety Data Sheet

Material Name: FAST 5-Gallon Jug Part A

Product #: 329520

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name: FAST 5-Gallon Jug Part A

Synonym: Polymethylene Polyphenylisocyanate

Chemical Family: Aromatic isocyanates

Product Use: Two-part adhesive for roofing systems

Restrictions on Use: For industrial use only.

Manufacturer Information

Carlisle SynTec

1285 Ritner Highway

Carlisle, PA 17013

USA

Phone: +1-800-479-6832

Emergency Phone #: +1-800-424-9300 (CHEMTREC)

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.

Acute Toxicity- Category 4 (Inhalation- mist)

Skin Corrosive/Irritation - Category 2

Eye Damage/Irritation - Category 2B

Specific Target Organ Toxicity - Single Exposure -(Irritating to respiratory system)-Category 3

Specific Target Organ Toxicity - Repeated Exposure -(by inhalation)-Category 2

Skin Sensitivity - Category 1B

Respiratory Sensitization- Category 1

Carcinogenicity-Category 2

GHS Label Elements

Symbol(s)



Signal Word

Danger

Hazard Statement:

H320 Causes eye irritation.

H315 Causes skin irritation.

H332 Harmful if inhaled.

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

H317 May cause an allergic skin reaction.



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Material Name: FAST 5-Gallon Jug Part A

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H335 May cause respiratory irritation.

H351 Suspected of causing cancer.

H373 May cause damage to organs (Olfactory organs) through prolonged or repeated exposure (inhalation).

Precautionary Statements (Prevention):

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P271 Use only outdoors or in a well-ventilated area.

P260 Do not breathe dust/gas/mist/vapours.

P201 Obtain special instructions before use.

P261 Avoid breathing mist.

P202 Do not handle until all safety precautions have been read and understood.

P284 [In case of inadequate ventilation] wear respiratory protection.

P272 Contaminated work clothing should not be allowed out of the workplace.

P264 Wash with plenty of water and soap thoroughly after handling.

Precautionary Statements (Response):

P312 Call a POISON CENTER or doctor/physician if you feel unwell.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P308 + P311 IF exposed or concerned: Call a POISON CENTER or doctor/physician.

P314 Get medical advice/attention if you feel unwell.

P303 + P352 IF ON SKIN (or hair): Wash with plenty of soap and water.

P333 + P311 If skin irritation or rash occurs: Call a POISON CENTER or doctor/physician.

P362 + P364 Take off contaminated clothing and wash before reuse.

P332 + P313 If skin irritation occurs: Get medical advice/attention.

P337 + P311 If eye irritation persists: Call a POISON CENTER or doctor/physician.

Precautionary Statements (Storage):

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

P405 Store locked up.

Precautionary Statements (Disposal):

P501 Dispose of contents/container to hazardous or special waste collection point.

Hazards not otherwise classified

No specific dangers known, if the regulations/notes for storage and handling are considered.

Labeling of special preparations (GHS):

CONTAINS ISOCYANATES. INHALATION OF ISOCYANATE MISTS OR VAPORS MAY CAUSE RESPIRATORY IRRITATION, BREATHLESSNESS, CHEST DISCOMFORT AND REDUCED PULMONARY FUNCTION. OVEREXPOSURE WELL ABOVE THE PEL MAY RESULT IN BRONCHITIS, BRONCHIAL SPASMS AND PULMONARY EDEMA. LONG-TERM EXPOSURE TO ISOCYANATES HAS BEEN REPORTED TO CAUSE LUNG DAMAGE, INCLUDING REDUCED LUNG FUNCTION WHICH MAY BE PERMANENT. ACUTE OR CHRONIC OVEREXPOSURE TO ISOCYANATES MAY CAUSE SENSITIZATION IN SOME INDIVIDUALS, RESULTING IN ALLERGIC RESPIRATORY REACTIONS INCLUDING WHEEZING,

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SHORTNESS OF BREATH AND DIFFICULTY BREATHING. ANIMAL TESTS INDICATE THAT SKIN CONTACT MAY PLAY A ROLE IN CAUSING RESPIRATORY SENSITIZATION. ANIMAL TESTS AND OTHER RESEARCH INDICATE THAT SKIN CONTACT WITH MDI MAY PLAY A ROLE IN CAUSING RESPIRATORY SENSITIZATION.

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Emergency overview

DANGER:

CONTAINS ISOCYANATES. INHALATION OF ISOCYANATE MISTS OR VAPORS MAY CAUSE RESPIRATORY IRRITATION, BREATHLESSNESS, CHEST DISCOMFORT AND REDUCED PULMONARY FUNCTION. OVEREXPOSURE WELL ABOVE THE PEL MAY RESULT IN BRONCHITIS, BRONCHIAL SPASMS AND PULMONARY EDEMA. LONG-TERM EXPOSURE TO ISOCYANATES HAS BEEN REPORTED TO CAUSE LUNG DAMAGE, INCLUDING REDUCED LUNG FUNCTION WHICH MAY BE PERMANENT. ACUTE OR CHRONIC OVEREXPOSURE TO ISOCYANATES MAY CAUSE SENSITIZATION IN SOME INDIVIDUALS, RESULTING IN ALLERGIC RESPIRATORY REACTIONS INCLUDING WHEEZING, SHORTNESS OF BREATH AND DIFFICULTY BREATHING. ANIMAL TESTS INDICATE THAT SKIN CONTACT MAY PLAY A ROLE IN CAUSING RESPIRATORY SENSITIZATION. AVOID CONTACT WITH SKIN AND EYES. SKIN OR EYE CONTACT MAY CAUSE IRRITATION.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
101-68-8	Diphenylmethane-4,4'-diisocyanate (MDI)	25.0 - 50.0
17589-24-1	1,3-Diazetidine-2,4-dione, 1,3-bis[4-[(4-isocyanatophenyl)methyl]phenyl]-	1.0 - 3.0
26447-40-5	Methylenediphenyl diisocyanate	3.0 - 7.0
57636-09-6	Isocyanic acid, polymethylenepolyphenylene ester, polymer with.alpha.-hydro-.omega.-hydroxypoly(oxy-1,2-ethanediyl)	1.0 - 3.0
9016-87-9	P-MDI	50.0 - 75.0

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Section 4 - FIRST AID MEASURES

General advice: Remove contaminated clothing.

EYES: In case of contact with the eyes, rinse immediately for at least 15 minutes with plenty of water. Immediate medical attention required.

SKIN: Wash affected areas thoroughly with soap and water. If irritation develops, seek medical attention.

INGESTION: Rinse mouth and then drink plenty of water. Do not induce vomiting. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions. Immediate medical attention required

INHALATION: Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary. Immediate medical attention required.

Most important symptoms and effects, both acute and delayed

Symptoms: The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11., Eye irritation, skin irritation, allergic symptoms

Hazards: Symptoms can appear later.

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Hazards: Respiratory sensitization may result in allergic (asthma-like) signs in the lower respiratory tract including wheezing, shortness of breath and difficulty breathing, the onset of which may be delayed. Repeated inhalation of high concentrations may cause lung damage, including reduced lung function, which may be permanent. Substances eliciting lower respiratory tract irritation may worsen the asthma-like reactions that may be produced by product exposures.

Indication of any immediate medical attention and special treatment needed

Note to physician

Antidote: Specific antidotes or neutralizers to isocyanates do not exist.

Treatment: Treatment should be supportive and based on the judgement of the physician in response to the reaction of the patient.

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media

Dry powder, foam, carbon dioxide, water spray.

Special hazards arising from the substance or mixture

Hazards during fire-fighting: nitrous gases, fumes/smoke, isocyanate, vapour

Fire Fighting Measures

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As in any fire, wear self-contained breathing apparatus and full protective gear.

Further information:

Keep containers cool by spraying with water if exposed to fire. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Clear area. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.

Environmental precautions

Do not discharge into drains/surface waters/groundwater.

Methods and material for containment and cleaning up

For small amounts: Absorb isocyanate with suitable absorbent material (see § 40 CFR, sections 260, 264 and 265 for further information). Shovel into open container. Do not make container pressure tight. Move container to a well-ventilated area (outside). Spill area can be decontaminated with the following recommended decontamination solution: Mixture of 90 % water, 8 % concentrated ammonia, 2 % detergent. Add at a 10 to 1 ratio. Allow to stand for at least 48 hours to allow escape of evolved carbon dioxide.

For large amounts: If temporary control of isocyanate vapor is required, a blanket of protein foam or other suitable foam (available from most fire departments) may be placed over the spill. Transfer as much liquid as possible via pump or vacuum device into closed but not sealed containers for disposal.

For residues: The following measures should be taken for final cleanup: Wash down spill area with decontamination solution. Allow solution to stand for at least 10 minutes.

Dike spillage.

Section 7 - HANDLING AND STORAGE

Precautions for safe handling

Provide suitable exhaust ventilation at the processing machines. Ensure thorough ventilation of stores and work areas. Avoid aerosol formation. When handling heated product, vapours of the product should be ventilated, and respiratory protection used. Wear respiratory protection when spraying. Danger of bursting when sealed gastight. Protect against moisture. If bulging of drum occurs, transfer to well ventilated area, puncture to relieve pressure, open vent and let stand for 48 hours before resealing.

Protection against fire and explosion:

Storage No explosion proofing necessary.

Conditions for safe storage, including any incompatibilities

Keep away from water. Segregate from foods and animal feeds. Segregate from acids and bases. Segregate from bases.

Suitable materials for containers: Carbon steel (Iron), High density polyethylene (HDPE), Low



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density polyethylene (LDPE), Stainless steel 1.4301 (V2)

Further information on storage conditions: Formation of CO₂ and build up of pressure possible. Keep container tightly closed and in a well-ventilated place. Outage of containers should be filled with dry inert gas at atmospheric pressure to avoid reaction with moisture.

Storage stability:

Storage temperature: 32 - 110 °F

Protect against moisture.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

Diphenylmethane-4,4'-diisocyanate (MDI)	101-68-8
OSHA PEL	CLV 0.02 ppm 0.2 mg/m ³
ACGIH TLV	TWA value 0.005 ppm
P-MDI	9016-87-9
OSHA PEL	CLV 0.02 ppm 0.2 mg/m ³
ACGIH TVL	TWA value 0.005 ppm
Isocyanic acid, polymethylene - polyphenylene ester (P-MDI)	57636-09-6
OSHA PEL	CLV 0.02 ppm 0.2 mg/m ³
ACGIH TLV	TWA value 0.005 ppm

Personal protective equipment

Respiratory protection:

When workers are facing concentrations above the occupational exposure limits they must use appropriate certified respirators. When atmospheric levels may exceed the occupational exposure limit (PEL or TLV) NIOSH-certified air-purifying respirators equipped with an organic vapor sorbent and particulate filter can be used as long as appropriate precautions and change out schedules are in place. For

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emergency or non-routine, high exposure situations, including confined space entry, use a NIOSH-certified full facepiece pressure demand self-contained breathing apparatus (SCBA) or a full facepiece pressure demand supplied-air respirator (SAR) with escape provisions.

Hand protection:

Chemical resistant protective gloves should be worn to prevent all skin contact., Suitable materials may include, chloroprene rubber (Neoprene), nitrile rubber (Buna N), chlorinated polyethylene, polyvinylchloride (Pylox), butyl rubber, depending upon conditions of use.

Eye protection:

Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.

Body protection:

Cover as much of the exposed skin as possible to prevent all skin contact., Suitable materials may include, saran-coated material, depending upon conditions of use.

General safety and hygiene measures:

Wear protective clothing as necessary to prevent contact. Eye wash fountains and safety showers must be easily accessible. Observe the appropriate PEL or TLV value. Wash soiled clothing immediately. Contaminated equipment or clothing should be cleaned after each use or disposed of.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	liquid	Physical State	liquid
Odor	faint aromatic	Color	Clear to light yellow
Boiling Point (@ 5mmHg)	200°C(392°F)	Flammability Limit	Not flammable
Freezing Point (@ 1 ATM)	3°C (37.4°F)	Vapor Pressure (20°C)	0.00016 mmHg
Autoignition	>250 °C (482 °F)	Flash Point	220°C (428 °F)
Solubility in water	Reacts with water	Viscosity, Dynamic (20°C)	200 mPa.s
Vapor Density (air=1)	N/A	Molar Mass	360 g/mol
Density (20°C)	1.22 g/cm ³	pH	N/A
Relative Density(25°C)	1.22	Bulk Density (25°C)	10.17 lb/USg
Thermal decomposition	No decomposition if stored and handled as prescribed.	Evaporation rate:	Value can be approximated from Henry's Law Constant or vapor pressure.

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Other Information: If necessary, information on other physical and chemical parameters is indicated in this section

Section 10 - STABILITY AND REACTIVITY

Reactivity

Corrosion to metals: No corrosive effect on metal.

Oxidizing properties: Not fire-propagating

Chemical Stability

The product is stable if stored and handled as prescribed/indicated.

Possibility of Hazardous Reactions

Reacts with water, with formation of carbon dioxide. Risk of bursting. Reacts with alcohols. Reacts with acids. Reacts with alkalis. Reacts with amines. Risk of exothermic reaction. Risk of polymerization. Contact with certain rubbers and plastics can cause brittleness of the substance/product with subsequent loss in strength.

Conditions to Avoid

Avoid moisture.

Incompatible Materials

Acids, amines, alcohols, water, Alkalines, strong bases, Substances/products that react with isocyanates

Hazardous decomposition products: carbon monoxide, carbon dioxide, nitrogen oxide, hydrogen cyanide, nitrogen oxides, aromatic isocyanates, gases/vapors

Thermal decomposition: No decomposition if stored and handled as prescribed/indicated.

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Primary routes of exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity

Assessment of acute toxicity: Inhalation of vapours may cause irritation of the mucous membranes of the nose, throat or trachea, breathlessness, chest discomfort, difficult breathing and reduced pulmonary function. Inhalation exposure well above the PEL may result additionally in eye irritation, headache, chemical bronchitis, asthma-like findings or pulmonary edema. Isocyanates have also been reported to cause hypersensitivity pneumonitis, which is characterized by flu-like symptoms, the onset of which may be delayed.

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Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and the following selected endpoints are published:

Diphenylmethane-4,4'-diisocyanate (MDI) (101-68-8)

Oral LD50 Rat 2000 mg/kg

Dermal LD50 Rabbit >9,400 mg/kg

Inhalation LD50 Rat 2.0 (OECD Guideline 403)

An aerosol was tested

Assessment other acute effects

Assessment of STOT single:

Causes temporary irritation of the respiratory tract.

Irritation / corrosion

Assessment of irritating effects: Irritating to eyes, respiratory system and skin. Skin contact may result in dermatitis, either irritative or allergic.

Skin

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Species: rabbit

Result: Irritating.

Method: Draize test

Eye

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Species: rabbit

Result: Irritating.

Method: Draize test

Sensitization

Assessment of sensitization: Sensitization after skin contact possible. The substance may cause sensitization of the respiratory tract. As a result of previous repeated overexposures or a single large dose, certain individuals will develop isocyanate sensitization (chemical asthma) which will cause them to react to a later exposure to isocyanate at levels well below the PEL/TLV. These symptoms, which include chest tightness, wheezing, cough, shortness of breath, or asthmatic attack, could be immediate or delayed up to several hours after exposure. Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air, or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Chronic overexposure to isocyanates has also been reported to cause lung damage, including a decrease in lung function, which may be permanent. Prolonged contact can cause reddening, swelling, rash, scaling, or blistering. In those who have developed a skin sensitization, these symptoms can develop as a result of contact with very small amounts of liquid material, or even as a result of vapour-only exposure. Animal tests indicate that skin contact may play a role in causing respiratory sensitization.

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Buehler test

Species: guinea pig

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Result: sensitizing

Mouse Local Lymph Node Assay (LLNA)

Species: mouse

Result: sensitizing

Can cause skin sensitization

other

Species: guinea pig

Result: sensitizing

Studies in animals suggest that dermal exposure may lead to pulmonary sensitization. However, the relevance of this result for humans is unclear.

Chronic Toxicity/Effects

Repeated dose toxicity

Assessment of repeated dose toxicity: The substance may cause damage to the olfactory epithelium after repeated inhalation. The substance may cause damage to the lung after repeated inhalation. These effects are not relevant to humans at occupational levels of exposure.

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Experimental/calculated data: rat (Wistar) (male/female) Inhalation 2 yrs, 6 hr/day 0, 0.2, 1, 6 mg/m³, olfactory epithelium

NOAEL: 0.2 mg/m³

LOAEL: 1 mg/m³

The substance may cause damage to the olfactory epithelium after repeated inhalation. These effects are not relevant to humans at occupational levels of exposure. Repeated inhalative uptake of the substance did not cause damage to the reproductive organs.

Genetic toxicity

Assessment of mutagenicity: The substance was mutagenic in various bacterial test systems; however, these results could not be confirmed in tests with mammals.

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Genetic toxicity in vitro: OECD Guideline 471 Ames-test Salmonella typhimurium: with and without metabolic activation ambiguous

Information on: Diphenylmethane-4,4'-diisocyanate (MDI)

Genetic toxicity in vivo: OECD Guideline 474 Micronucleus assay rat (male) Inhalation negative.

No clastogenic effect reported.

Carcinogenicity

Assessment of carcinogenicity: A carcinogenic potential cannot be excluded after prolonged exposure to severely irritating concentrations. These effects are not relevant to humans at occupational levels of exposure.

Experimental/calculated data: OECD Guideline 453 rat Inhalation 0, 0.2, 1, 6 mg/m³

Result: Lung tumors

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Reproductive toxicity

Assessment of reproduction toxicity: Repeated inhalative uptake of the substance did not cause damage to the reproductive organs.

Teratogenicity

Assessment of teratogenicity: The substance did not cause malformations in animal studies; however, toxicity to development was observed at high doses that were toxic to the parental animals.

Development

OECD Guideline 414 rat Inhalation 0, 1, 4, 12 mg/m³

NOAEL Mat.: 4 mg/m³

NOAEL Teratog.: 4 mg/m³

The substance did not cause malformations in animal studies; however, toxicity to development was observed at high doses that were toxic to the parental animals.

Symptoms of Exposure

The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11., Eye irritation, skin irritation, allergic symptoms

Medical conditions aggravated by overexposure

The isocyanate component is a respiratory sensitizer. It may cause allergic reaction leading to asthma-like spasms of the bronchial tubes and difficulty in breathing. Medical supervision of all employees who handle or come into contact with isocyanates is recommended. Contact may aggravate pulmonary disorders. Persons with history of respiratory disease or hypersensitivity should not be exposed to this product. Preemployment and periodic medical examinations with respiratory function tests (FEV, FVC as a minimum) are suggested. Persons with asthmatic conditions, chronic bronchitis, other chronic respiratory diseases, recurrent eczema or pulmonary sensitization should be excluded from working with isocyanates. Once a person is diagnosed as having pulmonary sensitization (allergic asthma) to isocyanates, further exposure is not recommended.

Section 12 - ECOLOGICAL INFORMATION

Toxicity

Aquatic toxicity

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations. Based on long-term (chronic) toxicity study data, the product is very likely not harmful to aquatic organisms.

The product may hydrolyse. The test result maybe partially due to degradation products. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Toxicity to fish

LC0 (96 h) > 1,000 mg/l, Brachydanio rerio (OECD Guideline 203, static)

Aquatic invertebrates

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EC50 (24 h) > 1,000 mg/l, *Daphnia magna* (OECD Guideline 202, part 1, static)

Aquatic plants

EC0 (72 h) 1,640 mg/l (growth rate), *Scenedesmus subspicatus* (OECD Guideline 201, static)

Microorganisms/Effect on activated sludge

Toxicity to microorganisms

OECD Guideline 209 aquaticaerobic bacteria from a domestic water treatment plant/EC50 (3 h): > 100 mg/l

Persistence and degradability

Assessment biodegradation and elimination (H₂O) Poorly biodegradable. The product is unstable in water. The elimination data also refer to products of hydrolysis.

Elimination information

0 % BOD of the ThOD (28 d) (OECD Guideline 302 C) (aerobic, activated sludge) Poorly biodegradable.

Assessment of stability in water

In contact with water the substance will hydrolyse slowly.

Information on Stability in Water (Hydrolysis)

t_{1/2} 20 h (25 °C)

Bioaccumulative potential

Assessment bioaccumulation potential

Significant accumulation in organisms is not to be expected.

Bioaccumulation potential

Bioconcentration factor: 200 (28 d), *Cyprinus carpio* (OECD Guideline 305 E)

Mobility in soil

Assessment transport between environmental compartments.

The substance will not evaporate into the atmosphere from the water surface. Adsorption to solid soil phase is not expected.

Section 13 - DISPOSAL CONSIDERATIONS

Waste disposal of substance:

Incinerate or dispose of in a licensed facility. Do not discharge substance/product into sewer system.

Container disposal:

DRUMS:

Steel drums must be emptied and can be sent to a licensed drum reconditioner for reuse, a scrap metal dealer or an approved landfill. Do not attempt to refill or clean containers since residue is difficult to



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remove. Under no circumstances should empty drums be burned or cut open with gas or electric torch as toxic decomposition products may be liberated. Do not reuse empty containers.

Section 14 - TRANSPORT INFORMATION

US DOT Information:

Not classified as a dangerous good under transport regulations

Sea transport IMDG

Not classified as a dangerous good under transport regulations

Air transportation IATA/ICAO

Not classified as a dangerous good under transport regulations

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations

Registration status:

Chemical TSCA, US released / listed.

EPCRA 311/312 (Hazard categories)

Acute; Chronic

EPCRA SECTION 313 SUPPLIER NOTIFICATION

Chemical Name	CAS
Diphenylmethane-4,4'-diisocyanate (MDI)	101-68-8
P-MDI	9016-87-9

CERCLA-RQ (COMPREHENSIVE RESPONSE, COMPENSATION, AND LIABILITY ACT)

Chemical Name	CAS	CERCLA RQ
Diphenylmethane-4,4'-diisocyanate (MDI);	101-68-8	5000 lbs
P-MDI	9016-87-9	5,000 lbs

Reportable Quantity for release: 13,157.9 lb

STATE REGULATIONS

Chemical Name	CAS	State RTK
Diphenylmethane-4,4'-diisocyanate (MDI);	101-68-8	MA, NJ, PA
P-MDI	9016-87-9	MA, NJ, PA
Methylenediphenyl diisocyanate	26447-40-5	NJ



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Section 16 - OTHER INFORMATION

HMIS Rating

Health: 2 Fire: 1 Physical Hazard: 1

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

NFPA Ratings

Health: 2 Fire: 1 Reactivity: 1

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes

New SDS: April 17, 2015

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH - Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States.

Other Information

Disclaimer:

The information contained herein is based upon data and information available to us, and reflects our best professional judgment. This product may be formulated in part with components purchased from other companies. No warranty of merchantability, fitness for any use, or any other warranty is expressed or implied regarding the accuracy of such data or information. The results to be obtained from the use thereof, or that any such use does not infringe any patent, since the information contained herein may be applied under conditions of use beyond our control and with which we may be unfamiliar, we do not assume responsibility for the results of such application. This information is furnished upon the condition



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that the person receiving it shall make his own determination of the suitability of the material for his particular use.



Safety Data Sheet

Material Name: FAST 5-Gallon Jug Part B

Product #: 329521

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name

FAST 5-Gallon Jug Part B

Synonyms

Urethane System Resin Component

Chemical Family

Resin

Product Use

Membrane and Insulation Adhesive

Restrictions on Use

For industrial use only.

Manufacturer Information

Carlisle SynTec

1285 Ritner Highway

Carlisle, PA 17013

USA

Phone: +1-800-479-6832

Emergency Phone #: +1-800-424-9300 (CHEMTREC)

Section 2 - HAZARDS IDENTIFICATION

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Classification of the product

No need for classification according to GHS criteria for this product.

Label elements

The product does not require a hazard warning label in accordance with GHS criteria.

Hazards not otherwise classified

No specific dangers known, if the regulations/notes for storage and handling are considered.

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Emergency overview

CAUTION:

MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION.



Safety Data Sheet

Material Name: FAST 5-Gallon Jug Part B

Product #: 329521

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

This product does not contain any components classified as hazardous under the referenced regulation.

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

CAS	Component Name	Percent
Trade Secret	Polyol	< 70.0
13674-84-5	tris(2-chloro-1-methylethyl)phosphate	< 30.0
Trade Secret	Catalyst	< 2.0
Trade Secret	Surfactant	< 1.0

The product contains:

CAS Number	Content (W/W)	Chemical name
13674-84-5	>= 20.0 - < 30.0 %	tris(2-chloro-1-methylethyl)phosphate

Section 4 - FIRST AID MEASURES

General advice:

Remove contaminated clothing.

Inhalation

Keep patient calm, remove to fresh air.

Skin

Wash thoroughly with soap and water.

Eyes

Rinse cautiously with water for 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention.

Ingestion

Rinse mouth and then drink plenty of water. Do not induce vomiting..

Most Important Symptoms/Effects

Information on: tris(2-chloro-1-methylethyl)phosphate

Symptoms: Overexposure may cause:, convulsions, depression, hypoxemia, tremors

Indication of any immediate medical attention and special treatment needed



Safety Data Sheet

Material Name: FAST 5-Gallon Jug Part B

Product #: 329521

Note to physician

Treatment: Symptomatic treatment (decontamination, vital functions).

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media

Water spray, dry powder, carbon dioxide, foam

Special Hazards Arising from the Chemical

Hazards during fire-fighting:

No particular hazards known.

Hazardous Combustion Products

Oxides of carbon, oxides of nitrogen

Advice for firefighters

Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

Further information:

Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Wear personal protective clothing and equipment, see Section 8.

Methods and Materials for Containment and Cleaning Up

Spills should be contained, solidified, and placed in suitable containers for disposal.

Environmental Precautions

Do not empty into drains. Do not discharge into the subsoil/soil.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling

Ensure thorough ventilation of stores and work areas. Protect against moisture.

Protection against fire and explosion:

No explosion proofing necessary.

Conditions for Safe Storage, Including any Incompatibilities



Safety Data Sheet

Material Name: FAST 5-Gallon Jug Part B

Product #: 329521

Segregate from foods and animal feeds. Segregate from acids. Segregate from oxidants. Suitable materials for containers: Carbon steel (Iron), High density polyethylene (HDPE), Low density polyethylene (LDPE), Stainless steel 1.4301 (V2)

Further information on storage conditions: No special precautions necessary. Avoid extreme heat.

Store protected against freezing

Storage stability:

Storage temperature: 60 - 80 °F. Protect against moisture.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Advice on system design:

Provide local exhaust ventilation to control vapors/mists.

Eye/face protection:

Wear face shield or tightly fitting safety goggles (chemical goggles) if splashing hazard exists.

Skin Protection:

Wear work clothes with long sleeves. Wear protective shoes.

Respiratory Protection:

Wear a NIOSH-certified (or equivalent) organic vapour/particulate respirator as needed.

Hand protection:

Chemical resistant protective gloves.

Body protection:

Standard work clothes and shoes.

General safety and hygiene measures:

Avoid contact with skin. Handle in accordance with good industrial hygiene and safety practice. Wear protective clothing as necessary to prevent contact. Avoid inhalation of vapours/mists. Wash soiled clothing immediately.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	light yellow liquid	Physical State	liquid
Odor	musty	Color	Clear to light yellow
Odor Threshold	Not available	pH	>= 7
Freezing point	Not available	Evaporation Rate	3.8
Boiling Point	148.8 °C (> 300°F)	Flammability (solid, gas)	Not flammable
Autoignition	>250 °C (482°F)	Flash Point	Approx. >93°C (200°F)
Density (20 °C)	Approx. 1.1 g/cm ³	Decomposition	Not available
Self Igniting	Not self igniting	Vapor Pressure(25 °C)	< 0.1 hPa



Safety Data Sheet

Material Name: FAST 5-Gallon Jug Part B

Product #: 329521

Vapor Density (air=1)	N/A	Specific Gravity (water=1)	Not available
Water Solubility	Miscible	Partition coefficient: n-octanol/water	Not available

Other Information

No additional information available.

Section 10 - STABILITY AND REACTIVITY

Reactivity

No hazardous reactions if stored and handled as prescribed/indicated.

Corrosion to metals: No corrosive effect on metal.

Oxidizing properties: Not fire-propagating

Chemical Stability

Stable under normal conditions of use.

Possibility of Hazardous Reactions

No hazardous reactions if stored and handled as prescribed/indicated.

Conditions to Avoid

Temperature: < 0 degrees Celsius

Incompatible Materials

Acids, isocyanates, strong oxidizing agents

Hazardous decomposition products

Decomposition products:

Hazardous decomposition products: carbon monoxide, carbon dioxide, nitrogen oxide, hydrogen cyanide

Thermal decomposition: No decomposition if stored and handled as prescribed/indicated.

Section 11 - TOXICOLOGICAL INFORMATION

Primary Routes of Exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact.

Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute and Chronic Toxicity

Acute toxicity

Assessment of acute toxicity: No known acute effects.

Assessment other acute effects

Assessment of STOT single:

Based on the available information there is no specific target organ toxicity to be expected after a single exposure.

Origin of data: expert judgement



Safety Data Sheet

Material Name: FAST 5-Gallon Jug Part B

Product #: 329521

Irritation / corrosion

Assessment of irritating effects: No irritation is expected under intended use and appropriate handling.

Sensitization

Assessment of sensitization: The chemical structure does not suggest a sensitizing effect.

Aspiration Hazard

No aspiration hazard expected.

Chronic Toxicity/Effects

Repeated dose toxicity

Assessment of repeated dose toxicity: Repeated oral uptake of the substance did not cause substance-related effects. Repeated inhalative uptake of the substance did not cause substance-related effects. Repeated dermal uptake of the substance did not cause substance-related effects.

Genetic toxicity

Assessment of mutagenicity: The chemical structure does not suggest a specific alert for such an effect.

Carcinogenicity

Assessment of carcinogenicity: The chemical structure does not suggest a specific alert for such an effect.

Reproductive toxicity

Assessment of reproduction toxicity: The chemical structure does not suggest a specific alert for such an effect.

Teratogenicity

Assessment of teratogenicity: The chemical structure does not suggest a specific alert for such an effect.

Other Information

The product has not been tested. The statement has been derived from the properties of the individual components.

Symptoms of Exposure

Medical conditions aggravated by overexposure

Data available do not indicate that there are medical conditions that are generally recognized as being aggravated by exposure to this substance/product.

Section 12 - ECOLOGICAL INFORMATION

Ecotoxicity

Aquatic toxicity

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to aquatic organisms. The product has not been tested. The statement has been derived from the properties of the individual components.

Component Analysis - Aquatic Toxicity



Safety Data Sheet

Material Name: FAST 5-Gallon Jug Part B

Product #: 329521

Persistence and Degradability

Assessment biodegradation and elimination (H₂O)

Poorly biodegradable.

Elimination information

Poorly biodegradable.

Bioaccumulative Potential

Does not significantly accumulate in organisms..

Mobility in soil

Assessment transport between environmental compartments

Adsorption to solid soil phase is not expected.

Additional information

Adsorbable organically-bound halogen (AOX):

This product contains no organically-bound halogen.

Other ecotoxicological advice:

The product has not been tested. Do not discharge product into the environment without control.

Section 13 - DISPOSAL CONSIDERATIONS

Waste disposal of substance:

Incinerate in a licensed facility. Dispose of in a licensed facility. Do not discharge substance/product into sewer system.

Container disposal:

Steel drums must be emptied and can be sent to a licensed drum reconditioner for reuse, a scrap metal dealer or an approved landfill. Do not attempt to refill or clean containers since residue is difficult to remove. Under no circumstances should empty drums be burned or cut open with gas or electric torch as toxic decomposition products may be liberated. Do not reuse empty containers.

Section 14 - TRANSPORT INFORMATION

Land transport US DOT Information:

Not classified as a dangerous good under transport regulations

Air transport IATA/CAO Information:

Not classified as a dangerous good under transport regulations

Sea transport IMDG Information:

Not classified as a dangerous good under transport regulations

Section 15 - REGULATORY INFORMATION

Federal Regulations



Safety Data Sheet

Material Name: FAST 5-Gallon Jug Part B

Product #: 329521

Registration status:

Chemical TSCA, US released / listed

EPCRA 311/312 (Hazard categories): Not hazardous;

Section 16 - OTHER INFORMATION

HMIS Rating

Health: 1 Fire: 1 Physical Hazard: 1

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

NFPA Ratings

Health: 1 Fire: 1 Reactivity: 1

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes

New SDS: April 28, 2015

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States.

Other Information

Disclaimer:

The information contained herein is based upon data and information available to us, and reflects our best professional judgment. This product may be formulated in part with components purchased from other companies. No warranty of merchantability, fitness for any use, or any other warranty is expressed or implied regarding the accuracy of such data or information. The results to be obtained from the use thereof, or that any such use does not infringe any patent, since the information contained herein may be



Safety Data Sheet

Material Name: FAST 5-Gallon Jug Part B

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applied under conditions of use beyond our control and with which we may be unfamiliar, we do not assume responsibility for the results of such application. This information is furnished upon the condition that the person receiving it shall make his own determination of the suitability of the material for his particular use

Safety Data Sheet

Material Name: CAV-GRIP 3

Product #: 329902

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name: CAV-GRIP 3

Product Use: Adhesive

Manufacturer Information

Carlisle SynTec Systems
1285 Ritner Highway
Carlisle, PA 17013
USA
Phone: +1-800-479-6832
Emergency Phone #: +1-800-424-9300 (CHEMTREC)

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.

Acute Toxicity - Inhalation: Category 5
Skin Irritation: Category 2
Eye Damage: Category 2A
Reproductive Toxicity: Category 2
STOT Repeated Exposure: Category 2
Aspiration: Category 1
Flammable Liquid: Category 2
Aquatic Hazard – Acute: Category 1
Aquatic Hazard – Long-term: Category 1
Extremely Flammable Aerosol: Category 1

GHS Label Elements

Symbol(s)



Signal Word

Danger

Hazard Statement(s)

May cause respiratory irritation.
Causes skin irritation.
Causes serious eye irritation.
Suspected of damaging fertility or the unborn child.
May cause damage to organs through prolonged or repeated exposure.
May be fatal if swallowed and enters airways.
Highly flammable liquid and vapor.
Very toxic to aquatic life.
Very toxic to aquatic life with long lasting effects.



Safety Data Sheet

Material Name: CAV-GRIP 3

Product #: 329902

Contains gas under pressure; may explode if heated

Precautionary Statement(s)

Keep away from heat/sparks/open flames/hot surfaces – no smoking.

Avoid breathing dust/fume/gas/mist/vapors/spray.

Avoid release to the environment.

Use personal protective equipment as required.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lens, if present and easy to do. Continue rinsing.

POTENTIAL HEALTH EFFECTS

Acute Effects

EYES: Contact with eyes may cause irritation. Direct contact with liquid or vapors may cause stinging, tearing, redness, swelling, and eye damage.

SKIN: May cause skin irritation and/or dermatitis. Prolonged or repeated contact or exposure to vapors may cause redness, burning, and drying and cracking of the skin.

INHALATION: Breathing high concentrations of vapors may cause irritation of the nose and throat or signs of nervous system depression (i.e. – headache, nausea, drowsiness, dizziness, vomiting, loss of coordination and fatigue).

INGESTION: Ingestion may cause irritation of the digestive tract, nausea, vomiting, and signs of nervous system depression.

Chronic Effects

Avoid repeated exposure. May cause blood damage. Repeated contact may cause allergic reactions in very susceptible persons.

Aggravated Medical Conditions

Pre-existing eye, skin, or respiratory disorders may be aggravated by exposure to this product.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
79-20-9	Methyl acetate	22 – 40
142-82-5	Heptane	12 – 25
68476-86-8	Liquefied petroleum gas	5 – 15
115-10-6	Dimethyl ether	5 – 15
124-38-9	Carbon dioxide	1 – 7
108-88-3	Toluene	1 – 7

Any remaining ingredients (to comprise 100% of the product) should be considered a proprietary blend of non-hazardous substances, or materials below threshold reporting limits.

Safety Data Sheet

Material Name: CAV-GRIP 3

Product #: 329902

Section 4 - FIRST AID MEASURES

GENERAL ADVICE: Show this safety Data sheet to the doctor in attendance.

EYES: Flush with plenty of cool water for at least 15 minutes, holding eyelids apart for thorough irrigation. If irritation persists, get immediate medical attention.

SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and wash affected areas thoroughly with mild soap. If skin irritation persists, get immediate medical attention.

INGESTION: Do not induce vomiting – seek immediate medical attention. If vomiting occurs, keep head lower than hips to prevent aspiration.

INHALATION: Move to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen and get immediate medical attention.

NOTES TO PHYSICIAN: Treat symptomatically

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media

Carbon dioxide, dry chemicals, foam. Water may be helpful in keeping adjacent containers cool; avoid spreading the liquid with water used for cooling. Water-based sprinkler systems may help contain larger fires.

Specific Hazards arising from the Chemical

Closed containers may rupture if exposed to fire or extreme heat. May produce toxic fumes if burning.

Special protective Equipment: Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions

Use personal protective equipment. Remove all sources of ignition.

Environmental Precautions

Prevent further leakage or spillage if safe to do so. Do not allow material to contaminate ground water system. Prevent product from entering drains. Do not flush into surface water or sanitary sewer system. Local authorities should be advised if significant spillages cannot be contained.

Methods for Clean-up

Dam up. Soak up with inert absorbent material. Pick up and transfer to properly labeled containers. Clean contaminated surface thoroughly.

Other Information

None known.

Safety Data Sheet

Material Name: CAV-GRIP 3

Product #: 329902

Section 7 - HANDLING AND STORAGE

Handling

Use only in area provided with appropriate exhaust ventilation. Do not breathe vapors or spray mist. Wear appropriate personal protective equipment. Take precautionary measures against static discharges. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Keep away from open flames, hot surfaces and sources of ignition.

Storage

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from extremes of heat or cold. Keep in properly labeled containers.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

Hazardous Components	OSHA PEL	ACGIH TLV
Methyl acetate	200	200
Heptane	500	400
Liquefied petroleum gas	Not established	1000
Dimethyl ether	Not established	1000
Carbon dioxide	5000	5000
Toluene	200	20

Engineering Controls

Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye/face protection

Safety goggles or glasses, or full face shield.

Skin Protection

Protective gloves and impervious clothing. Consult the glove/clothing manufacturer for proper selection of materials.

Respiratory Protection

In operations where exposure limits are exceeded, use a NIOSH-approved respirator that has been selected by a technically qualified person for the specific work conditions.

Hygiene Practices

Avoid contact with skin, eyes and clothing. Remove and wash contaminated clothing before re-use. Wash thoroughly after handling. When using, do not eat, drink or smoke.

Safety Data Sheet

Material Name: CAV-GRIP 3

Product #: 329902

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Green liquid	Physical State	liquid
Odor	Solvent odor	Color	Green
VOC (g/L)	194	VOC (g/L) less exempt & water	248
Non-volatile (wt%)	30.05	Specific Gravity (g/l)	0.825
Bulk Density (lb/gal)	6.87	Solubility in Water	Insoluble
pH	Not available	Viscosity	Not available
Evaporation rate	Faster than nBuAc	Vapor Pressure (mmHg)	Not available
Vapor Density	Heavier than air	Boiling Point	-24.0°F [-31.1°C]
Freezing/Melting Point	Not determined	Flammability (solids)	No data
Partition Coefficient (n-octonal/water)	No data	Auto-ignition Temp	No data
Decomposition Temp	No data	Explosive Properties	No data
Oxidizing Properties	No data	Flash Point	156.0°F [104.4°C]
Flammable Limits	Lower: 2.23 Upper: 11.90		

Section 10 - STABILITY AND REACTIVITY

Chemical Stability

Stable under normal conditions. Hazardous polymerization does not occur.

Conditions to Avoid

Keep away from open flames, hot surfaces, static electricity and sources of ignition. Avoid extremes of heat or cold.

Materials to Avoid

Incompatible with strong acids and bases, alkali metals, halogens, and strong oxidizing agents.

Hazardous decomposition products

Thermal decomposition can lead to release of irritating gases and vapors. Carbon monoxide, carbon dioxide, smoke, and other unidentified organic compounds may be formed during combustion.

Possibility of Hazardous Reactions

None under normal conditions of use.

Safety Data Sheet

Material Name: CAV-GRIP 3

Product #: 329902

Section 11 - TOXICOLOGICAL INFORMATION

Reproductive Toxicity:	Category 2	Acute Toxicity:	Oral: No data; Skin: No data; Inhalation: Category 5
Mutagenicity:	No data	Irritation:	Skin: Category 2
STOT-single exposure:	No data	Corrosivity:	No data
STOT-repeated exposure:	Category 2	Sensitization:	Respiratory: No data; Skin: No data
Aspiration Hazard:	Category 1	Typical Routes of Entry:	Inhalation, skin absorption, eye contact

Chronic Toxicity / Carcinogenicity

No known classifications.

Section 12 - ECOLOGICAL INFORMATION

Aquatic Toxicity:	Acute and prolonged Toxicity to Fish:	No data
	Acute Toxicity to Aquatic Invertebrates:	No data
	Environmental Fate and Pathways:	No data
Persistence and Degradability:	No data	
Bioaccumulative Potential:	No data	
Mobility in Soil:	No data	
Other Adverse Effects:	No data	

Section 13 - DISPOSAL CONSIDERATIONS

Waste Disposal Methods

Dispose of in accordance with all applicable local, state, and federal regulations. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit, and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA.

Section 14 - TRANSPORT INFORMATION

US DOT Information:

Shipping Name: CHEMICAL UNDER PRESSURE, FLAMMABLE, N.O.S. (PROPANE, BUTANE)

Hazard Class: 2.1

UN/NA #: UN3501

ICAO / IATA: Contact the preparer for further information.

IMDG / IMO: Contact the preparer for further information.

Section 15 - REGULATORY INFORMATION

US TSCA: Yes – All components are listed or exempt

OSHA Regulatory Status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)



Safety Data Sheet

Material Name: **CAV-GRIP 3**

Product #: **329902**

SARA 313

Section 313 OF Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). If listed below, this product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

Chemical Designation	Cas No.	Weight %
Toluene	108-88-3	1 – 7%

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPS) (see 40 CFR 61)

Chemical Designation	Cas No.	Weight %
Toluene	108-88-3	1 – 7%

State Regulations

California Proposition 65

This product contains the following substance(s) known to the state of California to cause cancer or reproductive harm:

Chemical Name	CAS Number
Toluene	108-88-3
Ethylbenzene	100-41-4

Section 16 - OTHER INFORMATION

HMIS Rating

Health: 2 Fire: 3 Reactivity: 0 Personal Protection B

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States.



Safety Data Sheet

Material Name: CAV-GRIP 3

Product #: 329902

Other Information

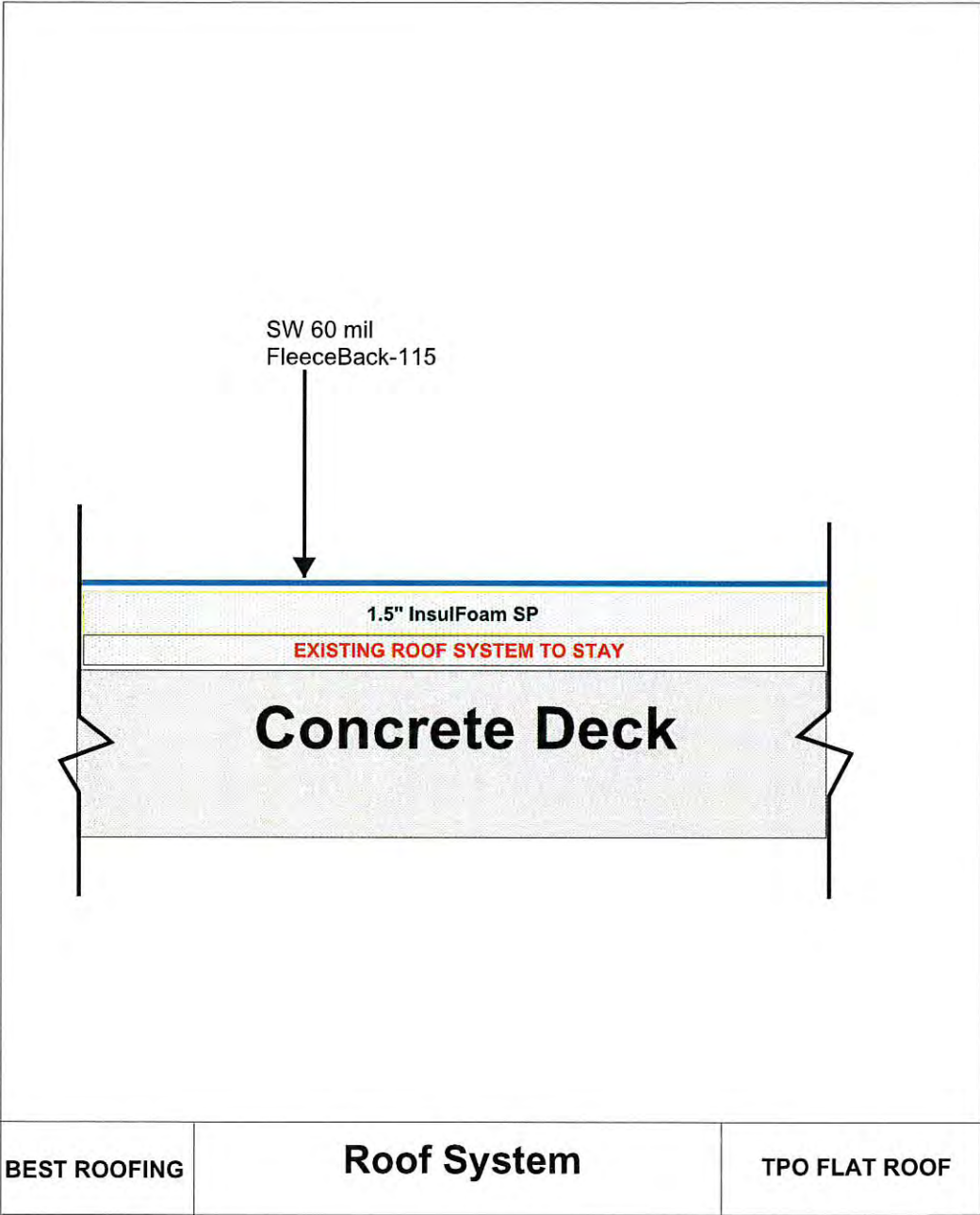
Disclaimer:

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Detail Report

35483 Hollywood Meter Shop

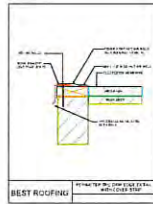
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Detail Report

35483 Hollywood Meter Shop

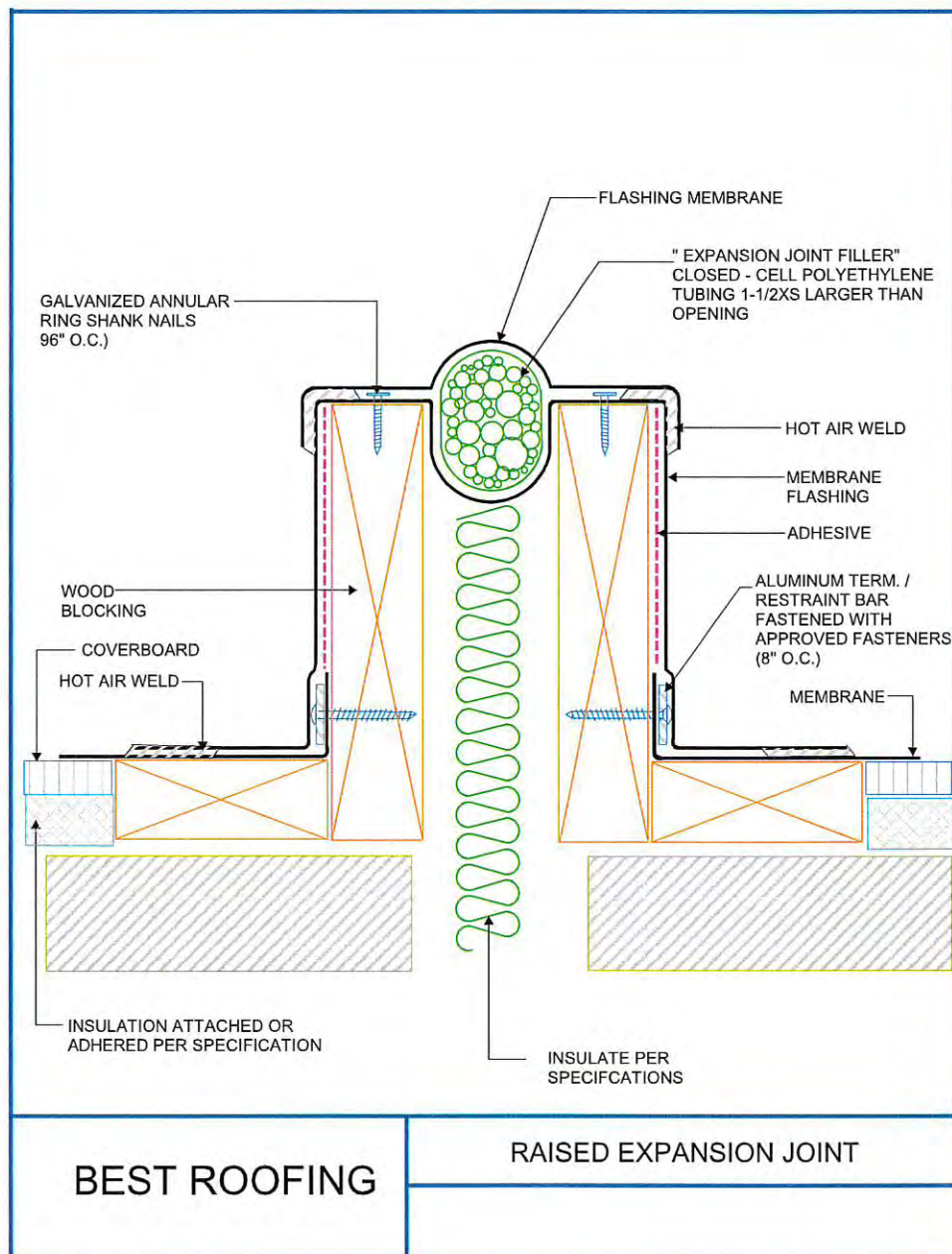
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Detail Report

35483 Hollywood Meter Shop

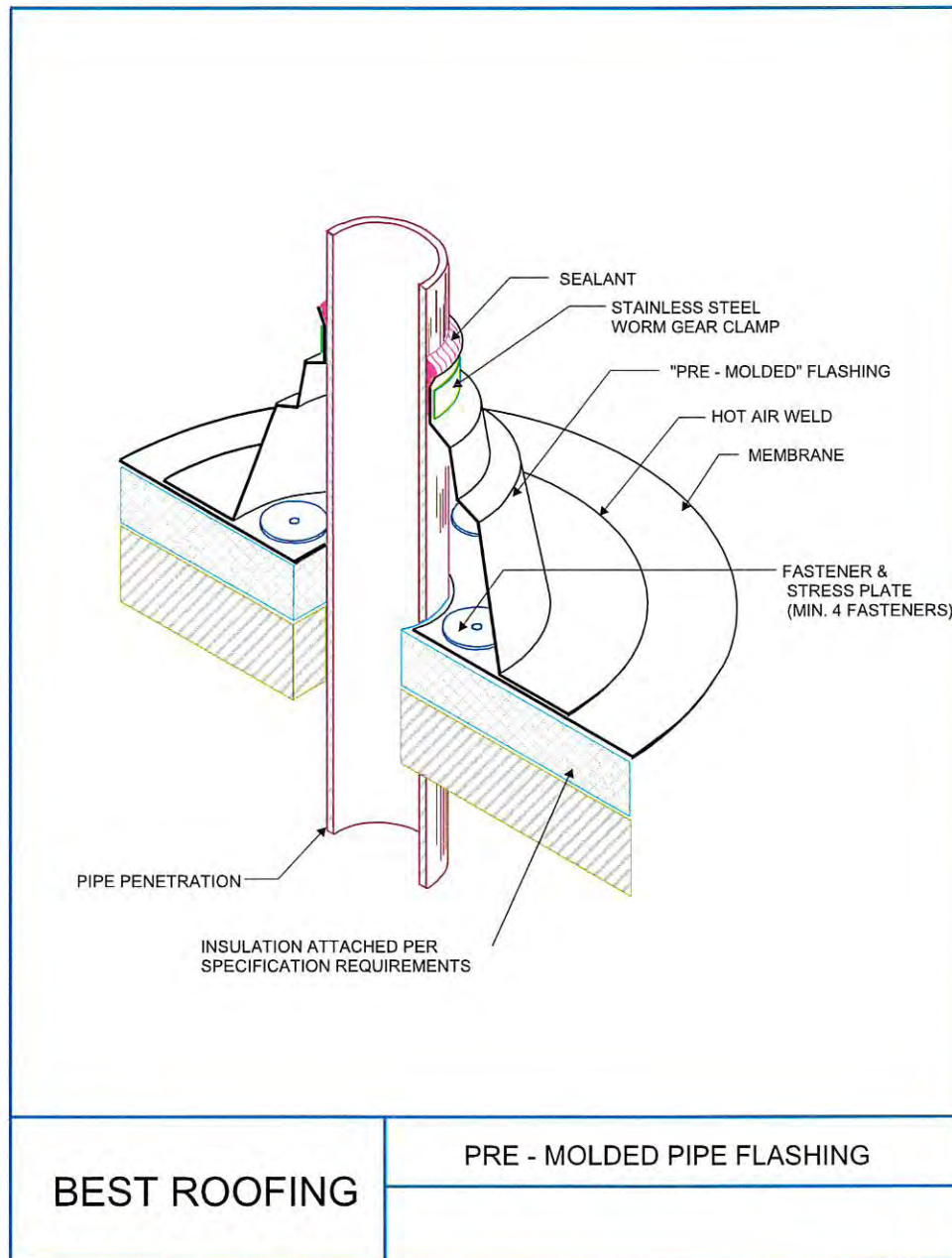
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Detail Report

35483 Hollywood Meter Shop

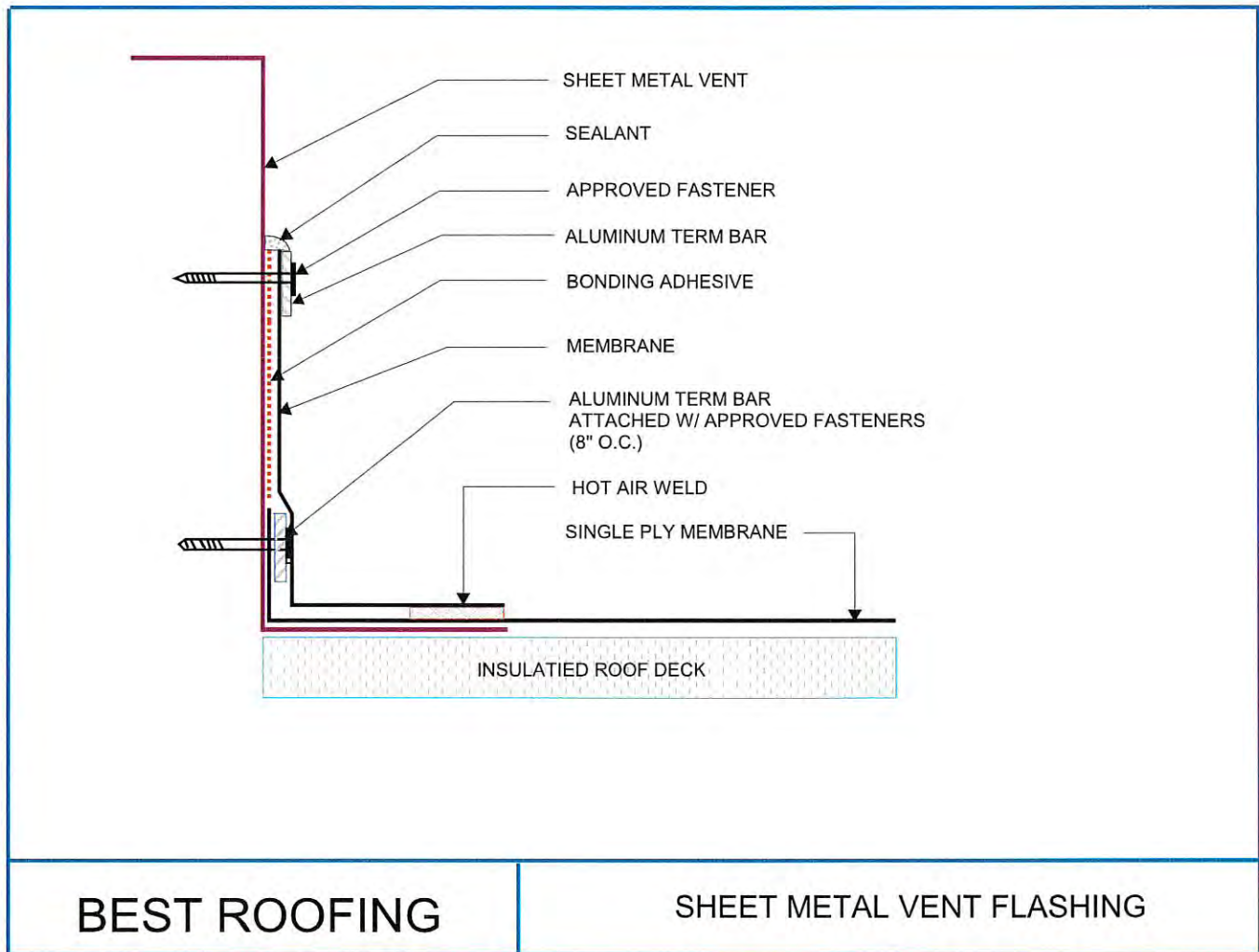
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Detail Report

35483 Hollywood Meter Shop

Section:
Page:
Condition: AP Vent Flashing



Detail Report

35483 Hollywood Meter Shop

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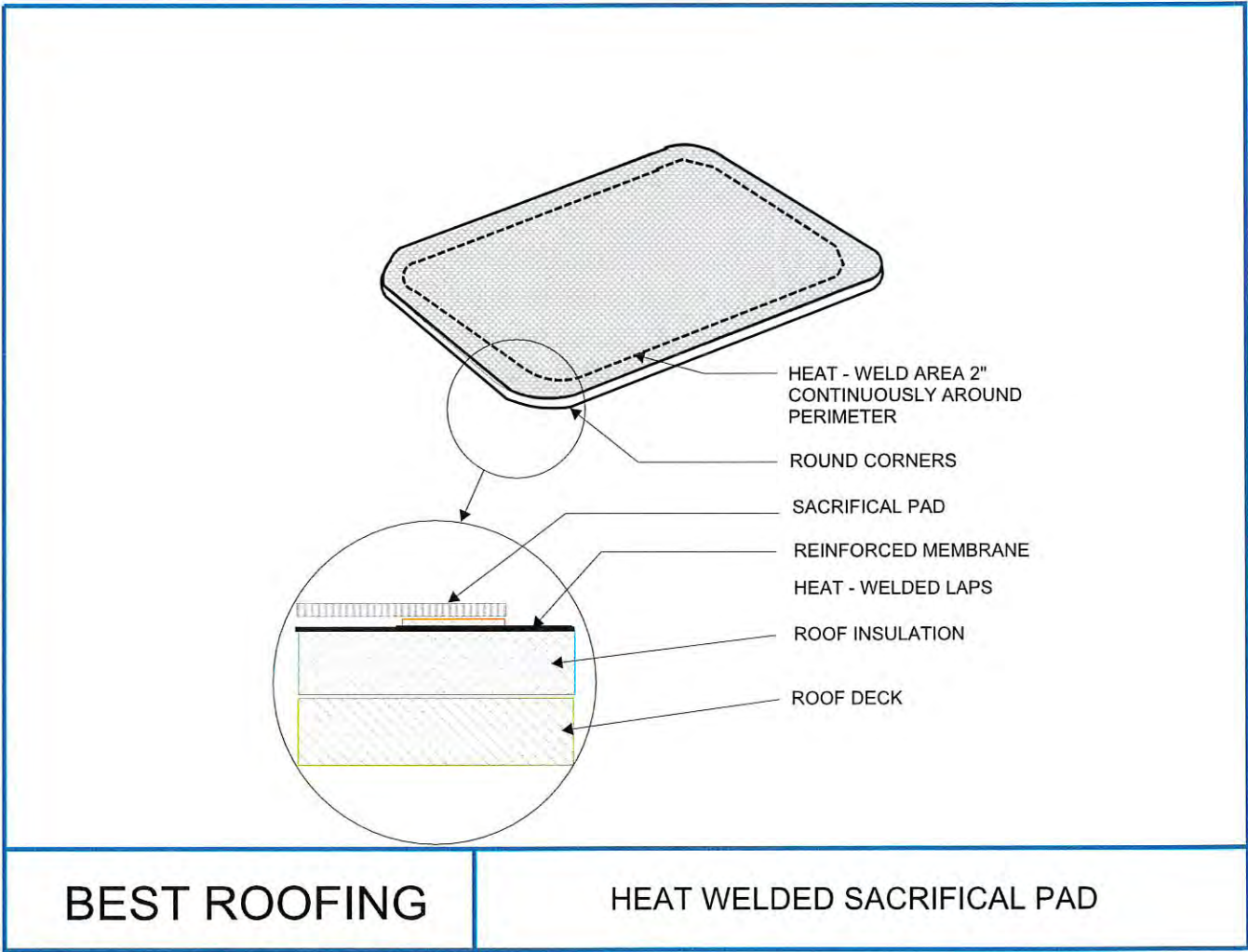


TABLE 7A: RECOVER APPLICATIONS
SYSTEM TYPE A-1: BONDED INSULATION, BONDED ROOF COVER

System No.	Substrate (Note 12)	Base Insulation Layer		Top Insulation Layer		Roof Cover (Notes 15 & 17)		MDP (psf)
		Type	Attach	Type	Attach	Type	Application	
R-11	Existing asphaltic BUR or mineral surface cap sheet	(Optional) Polyiso HP-H, InsulBase, HP-N, or HP-W, ENRGY 3, H-Shield, SecurShield, H-Shield CG, or AC Foam II	FAST 100, FAST 100 LV (FULL)	Polyiso HP-NB, StormBase, H-Shield NB (plywood only)	FAST 100, FAST 100 LV (FULL)	Sure-Weld FleeceBACK	FAST 100, FAST 100 LV, Flexible FAST (FULL)	-187.5*
R-12	Existing gravel-surfaced asphaltic BUR	Min. 1-inch Insulfoam SP	Flexible FAST (FULL)	None	N/A	Sure-Weld FleeceBACK	Flexible FAST (FULL)	-222.5*
R-13	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.5-inch Polyiso HP-H, InsulBase, HP-N, HP-W, ACfoam II, H-Shield, SecurShield, H-Shield CG, ENRGY-3	FAST 100, FAST 100 LV, Flexible FAST (FULL)	(Optional) Additional layers of base insulation	FAST 100, FAST 100 LV, Flexible FAST (FULL)	Sure-Weld FleeceBACK	Aqua Base 120 BA, HydroBond Water-Based	-232.5*
R-14	Existing asphaltic BUR or mineral surface cap sheet	Min. 1-inch Insulfoam SP	FAST 100 LV (FULL)	None	N/A	Sure-Weld FleeceBACK	FAST 100 LV (FULL)	-232.5*
R-15	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.5-inch SecurShield HD Composite, H-Shield HD Composite	FAST 100, FAST 100 LV	None	N/A	Sure-Weld FleeceBACK	FAST 100 LV (FULL)	-232.5*
R-16	Existing asphaltic BUR or mineral surface cap sheet	Min. 19/32-inch APA rated plywood or min. 0.25-inch Dens Deck or Dens Deck Prime	FAST 100, FAST 100 LV (FULL)	(Optional) One or more layers min. 19/32-inch APA rated plywood or min. 0.25-inch Dens Deck or Dens Deck Prime	FAST 100, FAST 100 LV (FULL)	Sure-Weld FleeceBACK	FAST 100, FAST 100 LV, Flexible FAST (FULL)	-232.5*
R-17	Existing asphaltic BUR or mineral surface cap sheet	Polyiso HP-H, InsulBase, HP-N or HP-W, ENRGY 3, H-Shield, SecurShield, H-Shield CG, or AC Foam II	FAST 100, FAST 100 LV (FULL)	Min. 19/32-inch APA rated plywood or min. 0.25-inch Dens Deck or Dens Deck Prime	FAST 100, FAST 100 LV (FULL)	Sure-Weld FleeceBACK	FAST 100, FAST 100 LV, Flexible FAST (FULL)	-232.5*
R-18	Existing asphaltic BUR or mineral surface cap sheet	Min. 1.0-inch Polyiso HP-H, InsulBase, H-Shield, SecurShield, H-Shield CG	FAST 100, FAST 100 LV (FULL)	(Optional) Additional layers of base insulation	FAST 100, FAST 100 LV (FULL)	Sure-Weld FleeceBACK	FAST 100, FAST 100 LV, Flexible FAST (FULL)	-300.0*
R-19	Existing gravel-surfaced asphaltic BUR	Min. 1-inch Insulfoam SP	FAST 100 LV (FULL)	None	N/A	Sure-Weld FleeceBACK	FAST 100 LV (FULL)	-395.0*