JM EPDM MEMBRANE ADHESIVE

(Low VOC)

Features and Components

Use: For adhering JM EPDM membrane to approved roofing substrates.

Type: One-part, synthetic polymer-based membrane adhesive, two-sided application.

Substrates: Compatible with approved insulations and cover boards; wood or concrete substrates.

Color: Amber

Component
AD
Adhesive

Type
M
Membrane
Single Ply

System Compatibility

This product may be used as a component in the following systems. Please reference product application for specific installation methods and information.

Multi-Ply	BUR		APP		SBS				
	HA	CA	CA	HW	HA	CA	HW	SA	
	Do not use in Multi-Ply systems								

Single Ply	TPO		PVC		EPDM		
	MF	FA	MF	FA	MF	FA	BA
	Used to adhere Membranes in EPDM Single Ply systems						

Key: **HA** = Hot Applied **CA** = Cold Applied **HW** = Heat Weldable **SA** = Self Adhered **MF** = Mechanically Fastened **FA** = Fully Adhered **BA** = Ballasted

Energy and the Environment

VOC	<250 g/L Calculated
This product may be used in jurisdictions limiting VOC (volatile organic compounds) content of single ply roofing adhesive to no greater than 250 g/l.	

Precautions

This product is flammable. Adhesive contains ingredients which could be harmful if mishandled. Contact with skin and eyes should be avoided, and the recommended personal protective equipment should be worn.

Installation/Application

Long Nap Roller

- Apply when the ambient and substrate temperature is 40° (5°C) and rising.
- Used in MF and BA systems as a flashing adhesive.
- Do Not Thin. Refer to the application instructions guidelines for proper utilization of this adhesive.

Packaging and Coverage

Container Size	5 gal (18.9 l) pail
Shipping Weight *(approx.)*	37 lb (17 kg)
Pails per Pallet	45
Pallets per Truck	22
Coverage Rate* *(two-sided)*	50 to 90 ft^2/gal (1.23 to 2.03 m^2/l) or 1.11 - 2.0 gal/sq (0.492 - 0.783 l/m^2)

* Coverage, open and dry time rates can vary dramatically depending on the particular substrate and environmental conditions. Coverage rates stated herein are approximate only. If FM Global® or UL® approval is required, consult specific RoofNav℠ or the UL Certifications Directory for specific application rates.

Storage

Shelf Life	12 months from manufacture date
Storage Conditions	Clean, dry, indoor environment, unopened container
Temperature Range	60°F – 80°F (16°C – 27°C) - Protect from freezing

Exposure Window

Johns Manville recommends immediate and complete use upon opening. Use open containers within 48 hours of opening. Replace lid on can when not in use. Adhesive that has changed color or viscosity is no longer usable.

Refer to the Safety Data Sheet and product label prior to using this product. The Safety Data Sheet is available by calling (800) 922-5922 or on the Web at www.jm.com/roofing.

JM EPDM Membrane Adhesive (Solvent Based)

Version 1.1 Revision Date 04/13/2015 Print Date 04/13/2015

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Trade name	:	JM EPDM Membrane Adhesive (Solvent Based)

Manufacturer or supplier's details

Company	:	Johns Manville
Address	:	P.O. Box 5108 Denver, CO USA 80127
Telephone	:	303-978-2000 8:00AM-5:00PM M-F
Emergency telephone number	:	1-800-424-9300 (Chemtrec, in English)
Prepared by	:	productsafety@jm.com

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquids	:	Category 2
Skin irritation	:	Category 2
Eye irritation	:	Category 2A
Reproductive toxicity	:	Category 2
Specific target organ toxicity - single exposure	:	Category 3 (Central nervous system)
Specific target organ toxicity - repeated exposure (Inhalation)	:	Category 2

GHS Label element

Hazard pictograms :

Signal word : Danger

Hazard statements :
H225 Highly flammable liquid and vapour.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.
H361 Suspected of damaging fertility or the unborn child.
H373 May cause damage to organs (Neurologic: other (neuropsychological effects, auditory dysfunction and effects on colour vision) through prolonged or repeated exposure if inhaled.

Precautionary statements : **Prevention:**
P201 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/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ eye protection/ face protection.
Response:
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
Storage:
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous components

Chemical Name	CAS-No.	Concentration (%)
toluene	108-88-3	>= 30 - < 50
acetone	67-64-1	>= 20 - < 30
Solvent naphtha (petroleum), light aliph.	64742-89-8	>= 5 - < 10
n-hexane	110-54-3	>= 5 - < 10
cyclohexane	110-82-7	>= 1 - < 5

magnesium oxide	1309-48-4	>= 1 - < 5
heptane	142-82-5	>= 1 - < 5
ethylbenzene	100-41-4	>= 0.1 - < 1

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
Symptoms of poisoning may appear several hours later.
Do not leave the victim unattended.

If inhaled : Consult a physician after significant exposure.
If unconscious place in recovery position and seek medical advice.

In case of skin contact : If skin irritation persists, call a physician.
If on skin, rinse well with water.
If on clothes, remove clothes.

In case of eye contact : Remove contact lenses.
Immediately flush eye(s) with plenty of water.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear.
Do NOT induce vomiting.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Alcohol-resistant foam
Carbon dioxide (CO2)
Dry chemical

Unsuitable extinguishing media : High volume water jet

Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion products : No hazardous combustion products are known

Specific extinguishing methods : Standard procedure for chemical fires.

Further information : Standard procedure for chemical fires.
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
For safety reasons in case of fire, cans should be stored

separately in closed containments.
Use a water spray to cool fully closed containers.

Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	:	Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

SECTION 7. HANDLING AND STORAGE

Advice on safe handling	:	Avoid formation of aerosol. Do not breathe vapours/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.
Conditions for safe storage	:	No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
toluene	108-88-3	TWA	20 ppm	ACGIH
		TWA	100 ppm 375 mg/m3	NIOSH REL
		ST	150 ppm 560 mg/m3	NIOSH REL
		TWA	200 ppm	OSHA
		CEIL	300 ppm	OSHA
		Peak	500 ppm	OSHA
		TWA	100 ppm 375 mg/m3	OSHA
		STEL	150 ppm 560 mg/m3	OSHA
acetone	67-64-1	TWA	500 ppm	ACGIH
		STEL	750 ppm	ACGIH
		TWA	250 ppm 590 mg/m3	NIOSH REL
		TWA	1,000 ppm 2,400 mg/m3	OSHA
		TWA	750 ppm 1,800 mg/m3	OSHA
		STEL	1,000 ppm 2,400 mg/m3	OSHA
Solvent naphtha (petroleum), light aliph.	64742-89-8	TWA	500 ppm 2,000 mg/m3	OSHA
		TWA	400 ppm 1,600 mg/m3	OSHA
n-hexane	110-54-3	TWA	50 ppm	ACGIH
		TWA	50 ppm 180 mg/m3	NIOSH REL
		TWA	500 ppm 1,800 mg/m3	OSHA
		TWA	50 ppm 180 mg/m3	OSHA
cyclohexane	110-82-7	TWA	100 ppm	ACGIH
		TWA	300 ppm 1,050 mg/m3	NIOSH REL
		TWA	300 ppm 1,050 mg/m3	OSHA
		TWA	300 ppm 1,050 mg/m3	OSHA
magnesium oxide	1309-48-4	TWA (Inhalable fraction)	10 mg/m3	ACGIH
		TWA (fume, total particulate)	15 mg/m3	OSHA
		TWA (Fume - total particulate)	10 mg/m3	OSHA
heptane	142-82-5	TWA	85 ppm 350 mg/m3	NIOSH REL

		C	440 ppm 1,800 mg/m3	NIOSH REL
		TWA	500 ppm 2,000 mg/m3	OSHA
		TWA	400 ppm 1,600 mg/m3	OSHA
		STEL	500 ppm 2,000 mg/m3	OSHA
		TWA	400 ppm	ACGIH
		STEL	500 ppm	ACGIH
ethylbenzene	100-41-4	TWA	20 ppm	ACGIH
		TWA	100 ppm 435 mg/m3	NIOSH REL
		ST	125 ppm 545 mg/m3	NIOSH REL
		TWA	100 ppm 435 mg/m3	OSHA
		TWA	100 ppm 435 mg/m3	OSHA
		STEL	125 ppm 545 mg/m3	OSHA

Personal protective equipment

Respiratory protection : In the case of vapour formation use a respirator with an approved filter.

Hand protection
Remarks : Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).

Eye protection : Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection : impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.
When using do not eat or drink.
When using do not smoke.
Wash hands before breaks and at the end of workday.
Written instructions for handling must be available at the work place.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

Colour : yellow

Odour : No data available

Odour Threshold	:	No data available
pH	:	No data available
Melting point/freezing point	:	No data available
	:	56 ℃
Flash point	:	-1.11 ℃ Method: closed cup
Evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Upper explosion limit	:	No data available
Lower explosion limit	:	No data available
Vapour pressure	:	No data available
Relative vapour density	:	No data available
Relative density	:	No data available
Density	:	0.872 g/cm3 (25 ℃)
Water solubility	:	No data available
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Auto-ignition temperature	:	No data available
Thermal decomposition	:	No data available
Viscosity		
Viscosity, dynamic	:	2.5 mPa.s (20 ℃)
Viscosity, kinematic	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No decomposition if stored and applied as directed.
Chemical stability	:	No decomposition if stored and applied as directed.
Possibility of hazardous reactions	:	No decomposition if stored and applied as directed.

Vapours may form explosive mixture with air.

Conditions to avoid : Heat, flames and sparks.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity : Acute toxicity estimate : > 5,000 mg/kg
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate : > 30000 ppm
Exposure time: 4 h
Test atmosphere: gas
Method: Calculation method

Acute dermal toxicity : Acute toxicity estimate : > 5,000 mg/kg
Method: Calculation method

Acute toxicity

Components:

toluene:

Acute oral toxicity : LD50 Oral (Rat): 5,580 mg/kg

Acute inhalation toxicity : LC50 (Rat): 28.1 mg/l
Exposure time: 4 h
Test atmosphere: vapour

Acute dermal toxicity : LD50 (Rabbit, male): > 5,000 mg/kg

Acute toxicity

acetone:

Acute oral toxicity : LD50 (Rat, female): 5,800 mg/kg

Acute inhalation toxicity : LC50 (Rat): 120 mg/l
Exposure time: 4 h
Test atmosphere: vapour

Acute dermal toxicity : LD50 (Rabbit): 20,000 mg/kg

Acute toxicity

Solvent naphtha (petroleum), light aliph.:

Acute oral toxicity : LD50 (Rat): > 8,000 mg/kg

Acute inhalation toxicity : LC50 (Rat): 3400 ppm
Exposure time: 4 h

Acute dermal toxicity : LD50 (Rat): > 4,000 mg/kg

Acute toxicity

n-hexane:

Acute oral toxicity	:	LD50 (Rat): 25,000 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): 48000 ppm Exposure time: 4 h
Acute dermal toxicity	:	LD50 (Rabbit): > 1,300 mg/kg

Acute toxicity

cyclohexane:

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): > 5540 ppm Exposure time: 4 h Test atmosphere: vapour
Acute dermal toxicity	:	LD50 (Rat): > 2,000 mg/kg

Acute toxicity

magnesium oxide:

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg

Acute toxicity

heptane:

Acute oral toxicity	:	LD50 (Rat): > 15,000 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): 103 mg/l Exposure time: 4 h
Acute dermal toxicity	:	LD50 (Rabbit): > 2,000 mg/kg

Acute toxicity

ethylbenzene:

Acute oral toxicity	:	LD50 (Rat): 3,500 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): 4000 ppm Exposure time: 4 h
Acute dermal toxicity	:	LD50 (Rabbit): 17,800 mg/kg

Skin corrosion/irritation

Product:

Remarks: May cause skin irritation in susceptible persons.

Skin corrosion/irritation

Components:

toluene:

Species: Rabbit
Assessment: Irritating to skin.
Result: Irritating to skin.

Skin corrosion/irritation

n-hexane:
Result: Skin irritation

Skin corrosion/irritation

cyclohexane:
Assessment: Irritating to skin.
Result: Skin irritation
Remarks: Irritating to skin.

Skin corrosion/irritation

heptane:
Result: Skin irritation

Serious eye damage/eye irritation

Product:
Remarks: May cause irreversible eye damage.

Serious eye damage/eye irritation

Components:

toluene:
Species: Rabbit
Result: Mild eye irritation
Exposure time: 24 h

Serious eye damage/eye irritation

acetone:
Species: Rabbit
Result: Eye irritation
Exposure time: 24 h
Assessment: Irritating to eyes.
Method: Draize Test

Germ cell mutagenicity

Components:

Solvent naphtha (petroleum), light aliph.:
Germ cell mutagenicity- Assessment : In vivo tests showed mutagenic effects

Carcinogenicity

Components:

Solvent naphtha (petroleum), light aliph.:
Carcinogenicity - Assessment : Possible human carcinogen

Carcinogenicity

ethylbenzene:
Carcinogenicity - : Limited evidence of carcinogenicity in human studies

Assessment

IARC	Group 2B: Possibly carcinogenic to humans	
	ethylbenzene	100-41-4
ACGIH	Confirmed animal carcinogen with unknown relevance to humans	
	ethylbenzene	100-41-4
OSHA	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.	
NTP	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.	

Reproductive toxicity

Components:

toluene:
Reproductive toxicity - Assessment : Suspected of damaging the unborn child., Some evidence of adverse effects on development, based on animal experiments.

Reproductive toxicity

n-hexane:
Reproductive toxicity - Assessment : Suspected of damaging fertility.

STOT - single exposure

Components:

toluene:
Assessment: May cause drowsiness or dizziness.

STOT - single exposure

acetone:
Exposure routes: inhalation (vapour)
Target Organs: Nervous system
Assessment: May cause drowsiness or dizziness.

STOT - single exposure

n-hexane:
Assessment: May cause drowsiness or dizziness.

STOT - single exposure

cyclohexane:
Assessment: May cause drowsiness or dizziness.

STOT - single exposure

heptane:
Assessment: May cause drowsiness or dizziness.

STOT - repeated exposure

Components:

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

STOT - repeated exposure

n-hexane:
Assessment: May cause damage to organs through prolonged or repeated exposure.

STOT - repeated exposure

ethylbenzene:
Target Organs: Sensory organs
Assessment: May cause damage to organs through prolonged or repeated exposure.

Components:

cyclohexane:
Repeated dose toxicity - Assessment : Causes skin irritation.

heptane:
Repeated dose toxicity - Assessment : Causes skin irritation.

Aspiration toxicity

Components:

toluene:
May be fatal if swallowed and enters airways.

Solvent naphtha (petroleum), light aliph.:
May be fatal if swallowed and enters airways.

n-hexane:
May be fatal if swallowed and enters airways.

cyclohexane:
May be fatal if swallowed and enters airways.

heptane:
May be fatal if swallowed and enters airways.

Experience with human exposure

Components:

toluene:
Skin contact:

Remarks: Prolonged skin contact may defat the skin

and produce dermatitis.

n-hexane:
Repeated or prolonged exposure may cause irritation of eyes and skin.

ethylbenzene:
Skin contact:

Remarks: Prolonged skin contact may defat the skin and produce dermatitis.

Further information

Product:
Remarks: Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Concentrations substantially above the TLV value may cause narcotic effects. Solvents may degrease the skin.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity
No data available

Persistence and degradability
No data available

Bioaccumulative potential

Components:

toluene:
Partition coefficient: n-octanol/water : Pow: 2.7

acetone:
Partition coefficient: n-octanol/water : log Pow: 0.24

Mobility in soil
No data available

Other adverse effects
No data available

Product:

Regulation	40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks	This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Additional ecological information : No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Disposal of residual product : Do not dispose of waste into sewer.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.
Do not burn, or use a cutting torch on, the empty drum.

SECTION 14. TRANSPORT INFORMATION

International transport regulations

US DOT: UN1133 Adhesive, 3, II

SECTION 15. REGULATORY INFORMATION

TSCA list : Not relevant

Not relevant

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
toluene	108-88-3	1000	2857

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

toluene	108-88-3	35 %
n-hexane	110-54-3	8 %
cyclohexane	110-82-7	3 %
ethylbenzene	100-41-4	0.3 %

Clean Air Act

The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 12 (40 CFR 61):

toluene	108-88-3	35 %
n-hexane	110-54-3	8 %

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489):

toluene	108-88-3	35 %
acetone	67-64-1	25 %
cyclohexane	110-82-7	3 %

California Prop 65 WARNING! This product contains a chemical known to the State of California to cause cancer.

ethylbenzene 100-41-4

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

toluene 108-88-3

The components of this product are reported in the following inventories:

TSCA : On TSCA Inventory

DSL : All components of this product are on the Canadian DSL.

SECTION 16. OTHER INFORMATION

Further information
Revision Date : 04/13/2015

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

CANNONDESIGN

SUBMITTAL IDENTIFICATION SHEET

To be completed by Contractor/CM

WEBSTER UNIVERSITY ISB
PROJECT NAME

8274 BIG BEND BLVD
ADDRESS

NUMBER

WEBSTER UNIVERSITY
OWNER

CANNON DESIGN
ARCHITECT / ENGINEER

DEVIN D GATES
SUBMITTED BY

075323-001
CONTRACTOR / CM SUBMITTAL NO.

CANNON DESIGN SUBMITTAL NO.

DRAWING / DETAIL REFERENCE

075323
SPECIFICATION SECTION / PARAGRAPH

MANUFACTURER / SUPPLIER

ITEM / PRODUCT ID

REQUIRED DATE

PRIORITY

CRITICAL

ITEM BEING SUBMITTED (check only one)

- ○ Shop Drawings
- ○ Samples (_____ copies)
- ○ LEED Submittal
- ○ Certification / Qualifications
- ○ Record Documents
- ○ Product Data
- ○ Coordination Drawing
- ○ Calculations
- ○ Schedules
- ○ O&M Manuals
- ○ Other _____

ITEM BEING SUBMITTED FOR (check only one)

○ Action ○ Information Only ○ Record

REMARKS OR DEVIATIONS

Email correspondence with KWA provided clarifications for requested information and warranty letter attached.

CONTRACTOR / CM CERTIFICATION
(SUBMITTALS NOT CERTIFIED WILL BE RETURNED WITHOUT REVIEW)

PARIC

PARIC CORPORATION
SUBMITTAL STAMP

THIS SHOP DRAWING HAS BEEN REVIEWED BY PARIC CORPORATION

Subcontractor remains responsible for dimensions, quantities, coordination with other trades and compliance with contract documents.

By:
Devin D. Gates

DEVIN D GATES — 10/11/16
REVIEWED BY — DATE

To be completed by Reviewer

07 5323-001 REV002
CANNON DESIGN SUBMITTAL NUMBER

10/11/16
RECEIVED DATE

- ○ A. No Exceptions Taken
  No further review of submittal is required.
- ● B. Make Corrections Noted
  Incorporate corrections in work; resubmission is not required.
- ○ C. Revise and Resubmit
  Revise as noted, and resubmit for review.
- ○ D. Rejected
  Submittal is not in compliance with Contract Documents; provide new submittal.
- ○ E. For Record / Information Only
  Submittal was reviewed for Record / Information purposes only.
- ○ F. Not Required for Review
  Submittal is not required by Contract Documents and has not been reviewed.

Review is for conformance with the design concept of this project and for general compliance with contract documents. Contractor is responsible for quantities, dimensions and compliance with contract documents and for information that pertains to fabrication processes, construction techniques and coordination of this work with all trades which will be af
This review is null and void if submittal deviates from contra
and does not indicate or note deviations.

A/E COMMENTS ○ See attached sheet(s) for additional comments

Final warranty must meet specification section 1.10. 2. requirements: wind speed coverage of that indicated on structural drawings (90 mph minimum), hail coverage for up to 2 inch diameter, and accidental puncture coverage of 16 man hours per year of warranty.

see comments below

Kathy Williams — 10/11/16
REVIEWED BY — DATE

Gates, Devin

From: Scott Klingsick <scott@kwastl.com>
Sent: Friday, October 07, 2016 7:00 AM
To: Gates, Devin
Cc: kpatel@cannondesign.com
Subject: RE: Clarifications on returned EPDM shop drawings

Follow Up Flag: Follow up
Flag Status: Flagged

Yes this will be acceptable. We need the rest of the information revised and it to be resubmitted so we can approve submittal 075323-001. Thanks

Scott Klingsick, LEED Green Associate
Project Manager
9721 Litzsinger Rd.
St. Louis, MO 63124
(p) 314.962.2560 (f) 314.962.4057
scott@kwastl.com

KWA architecture / landscape architecture / interiors
KWA Architects

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From: Gates, Devin [mailto:ddgates@paric.com]
Sent: Thursday, October 06, 2016 4:59 PM
To: Scott Klingsick
Cc: kpatel@cannondesign.com
Subject: RE: Clarifications on returned EPDM shop drawings

Kelvin/Scott,

Were you able to take a look at this and does this resolve the impact resistance needs? I can resubmit formally as needed but with the back and forth I wanted to ensure we are all on the same page.

Thanks,

DEVIN GATES
SENIOR PROJECT ENGINEER

Cell: 314-348-8828
Main: 636-561-9500

- - - - - -
77 Westport Plaza, Suite 250
St. Louis, MO 63146

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From: Aaron Hammerstone [mailto:aaron.hammerstone@kirberg.com]
Sent: Tuesday, October 04, 2016 7:10 AM
To: Gates, Devin; scott@kwastl.com
Cc: kpatel@cannondesign.com
Subject: FW: Clarifications on returned EPDM shop drawings

All,

Please see the two attachments, as well as the information in the below email in regards to the ASTM testing on JM EPDM membrane.

Thanks

Aaron Hammerstone | Project Manager

314.333.4710 Direct | aaron.hammerstone@kirberg.com

314.792.3777 Mobile

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From: Mark Tucker [mailto:Mark@D7Reps.com]
Sent: Monday, October 03, 2016 4:12 PM
To: Aaron Hammerstone

Cc: James Nunns; zac.stallings@jm.com; Jim Schriefer
Subject: RE: Clarifications on returned EPDM shop drawings

Aaron,

This JM EPDM 90NR data sheet shows we meet ASTM 4637 for EPDM. It's the same testing All EPDM is to meet, requiring minimum test results for numerous categories. There are three major manufacturers of EPDM: Johns Manville, Firestone, and Carlisle. NOTE: of the three, the latter two, have private label products, targeting a different market segment of contractors. The 3 major manufacturers are also, the only three members of the EPDM Roofing Association (ERA): http://www.epdmroofs.org/about-era/members . The goal of this organization is collectively establish current and accurate data documenting of EPDM. http://www.epdmroofs.org/about-era/who-we-are .

Inside of **ASTM D 4637**, are individual tests for certain criteria. As a whole, make up ASTM D 4637.
Of which include the following:
ASTM D 5635 – Dynamic Puncture Resistance, 5J, Type 1 – Passes
ASTM D 5602 Static Puncture Resistance, 44.1 lbf, Type 1 – Passes

There are only two hail tests for the Single Ply Membranes (according to Jim D. Koontz- Crenshaw and Koontz). Of which, the one most recognized, is FM's test, for approved Roof Nav assemblies per FM 4470.
For this project, we supplied the following two FM Nav #'s:

Assembly Properties

Assembly #:	**392147-0-0**	Slope:	1.0000
Roof System:	Single-Ply System	Wind Uplift*:	90
Application:	New Roof	Internal Fire:	1
Cover Securement:	Adhered	Exterior Fire:	A
Deck Type:	Steel	Hail:	SH
	For Use With Non-Combustible Walls:		No

AND

Assembly #:	**374588-0-0**	Slope:	1.0000
Roof System:	Single-Ply System	Wind Uplift*:	270
Application:	New Roof	Internal Fire:	NC
Cover Securement:	Adhered	Exterior Fire:	A
Deck Type:	Structural Concrete	Hail:	SH
	For Use With Non-Combustible Walls:		No

The roofing specification for this project, states in Part 1, paragraph 1.5, line 3, That the manufacturer must meet "Tested and listed by FM for class specified in "Performance Requirements" Article in Part 2 of this Section". In Part 2, **we met** Part 2, paragraph 2.2, A1. As noted, A2 criteria is for Modified Roofing. As such, A2 should be eliminated from requirements of the submittal, as **Part 2, 2.2, D.2** requires a Hail Resistance: SH. Of which, is met with both of the approved JOHNS MANVILLE Roof Nav Assembly numbers provided.

As for UL 2818, again is not a test used in the Single Ply industry. It is used primarily in the residential steep slope roofing market (shingles, tile, slate, metal roofs). The test requirementfor this, is to test roof slopes at 6" in 12" or greater. This test was a realized in 1996, by Major Property Insurers, the Institute of

Business and Home Safety (IBHS), and with United Laboratory. They developed ASMT 2218, to set a national standard, for roof impact resistance, for the residential steep slope market.

-
- A scope/ description, for the use of ASTM 2218, from the UL ASTM 2218 web page: http://www.comm-2000.com/ProductDetail.aspx?UniqueKey=20884 click on “scope”.
- 1 Scope

  1.1 This test method provides impact resistance data for the evaluation of prepared roof covering materials. For purposes of this Standard prepared roof covering materials are considered to be small units, sheets or panels designed for installation with multiple layers of such materials installed in **overlapping rows normally on inclines exceeding 25 percent**.

We did a quick research of other manufacturers web sites, and on hand manufacturers data. Not one in the Single Ply manufacturing business, list or utilize the UL 2218 test. In fact, all manufacturers use the same testing, as it relates to the ASTM (see above for Static and Dynamic Puncturing) for that membrane. In this project instance, is EPDM (ASTM D 4637).

It appears to us, that there seems to be a mix of an EPDM specification, and a Modified/ Residential specification.

If this information does not satisfy the needs of the BID Documents, please let me know.

Mark

From: Aaron Hammerstone [mailto:aaron.hammerstone@kirberg.com]
Sent: Friday, September 30, 2016 2:25 PM
To: Mark Tucker <Mark@D7Reps.com>
Subject: Fwd: Clarifications on returned EPDM shop drawings

Thanks,

Aaron Hammerstone

Project Manager
Kirberg Company
(314)792-3777

Begin forwarded message:

> **From:** Scott Klingsick <scott@kwastl.com>
> **Date:** September 30, 2016 at 2:24:29 PM CDT
> **To:** Aaron Hammerstone <aaron.hammerstone@kirberg.com>, "Gates, Devin" <ddgates@paric.com>
> **Cc:** "Szachnieski, Jason" <JRSzachnieski@paric.com>, Kathy Williams <kathy@kwastl.com>
> **Subject: RE: Clarifications on returned EPDM shop drawings**
>
> Aaron,

Sorry for the confusion. The wrong ASTM number listed in the specification. It should have been ASTM D 4637-08 “Specification for EPDM Sheet Used in Single-ply Roof Membrane” and/or UL 2218 Standard for Impact Resistance of Prepared Roof Covering Materials. We need testing and product data to show compliance with the requirements impact resistance for the hail requirements on this project.

Scott Klingsick, LEED Green Associate
Project Manager
9721 Litzsinger Rd.
St. Louis, MO 63124
(p) 314.962.2560 (f) 314.962.4057
scott@kwastl.com

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From: Aaron Hammerstone [mailto:aaron.hammerstone@kirberg.com]
Sent: Friday, September 30, 2016 12:13 PM
To: Gates, Devin; Scott Klingsick
Cc: Szachnieski, Jason
Subject: Re: Clarifications on returned EPDM shop drawings

ASTM D 3746 is for bituminous roofing. ASTM D 4272 is for plastic films.

This is an EPDM roof system. I think I'm missing something here.

Thanks,

Aaron Hammerstone

Project Manager
Kirberg Company
(314)792-3777

On Sep 30, 2016, at 11:26 AM, Gates, Devin <ddgates@paric.com> wrote:

> Aaron,
>
> See convo below regarding the shop drawing markups.
>
> DEVIN GATES
> SENIOR PROJECT ENGINEER
>
> **Direct:** 636-561-9592
> **Main:** 636-561-9500

Cell: 314-348-8828
- - - - - -
77 Westport Plaza, Suite 250
St. Louis, MO 63146

Sent from my iPhone

Begin forwarded message:

> **From:** "Patel, Kelvin" <kpatel@CANNONDESIGN.COM>
> **Date:** September 30, 2016 at 11:21:32 AM CDT
> **To:** "Gates, Devin" <ddgates@paric.com>, "Szachnieski, Jason" <JRSzachnieski@paric.com>
> **Cc:** "Grossman, Lynn" <lgrossman@CANNONDESIGN.COM>
> **Subject: FW: Clarifications on returned EPDM shop drawings**
>
> Devin,
>
> See clarification from KWA below.
>
> Thanks,
>
> Kelvin Patel, CDT, LEED AP BD+C
> Associate
> T 314.425.8756
>
> ---
>
> **From:** Scott Klingsick [mailto:scott@kwastl.com]
> **Sent:** Friday, September 30, 2016 11:13 AM
> **To:** Patel, Kelvin <kpatel@CANNONDESIGN.COM>; Kathy Williams <kathy@kwastl.com>
> **Cc:** Grossman, Lynn <lgrossman@CANNONDESIGN.COM>
> **Subject:** RE: Clarifications on returned EPDM shop drawings
>
> Kelvin,
>
> It is fine to show the building taller than 60' information. We do need submittal for the 2.2 A.2. Impact Resistance: Test reports and product data showing compliance with ASTM D 3746 or ASTM D 4272. Thanks
>
> **Scott Klingsick,** LEED Green Associate
> Project Manager
> 9721 Litzsinger Rd.
> St. Louis, MO 63124
> (p) 314.962.2560 (f) 314.962.4057
> scott@kwastl.com

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From: Patel, Kelvin [mailto:kpatel@CANNONDESIGN.COM]
Sent: Thursday, September 29, 2016 1:14 PM
To: Scott Klingsick; Kathy Williams
Cc: Grossman, Lynn
Subject: FW: Clarifications on returned EPDM shop drawings

Kathy / Scott,

Please review Paric's questions and provide comments.

Thanks,

Kelvin Patel, CDT, LEED AP BD+C
Associate
T 314.425.8756

From: Gates, Devin [mailto:ddgates@paric.com]
Sent: Thursday, September 29, 2016 1:04 PM
To: Patel, Kelvin <kpatel@CANNONDESIGN.COM>
Cc: Szachnieski, Jason <JRSzachnieski@paric.com>
Subject: Clarifications on returned EPDM shop drawings

Kelvin,

I have a couple of clarifications on two items from the attached rejected submittal.

1. On page 3 the perimeter and corner dimensions are crossed out for buildings taller than 60' however this building is higher than 60' in locations, is this note correct?
2. Can you please be more specific on what is being requested in the note "submit information for A2"? Johns Mansville did not feel like any of this section applies to the EPDM roof.

Thank you,

DEVIN GATES
SENIOR PROJECT ENGINEER

Cell: 314-348-8828
Main: 636-561-9500

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St. Louis, MO 63146

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