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SECTION IV - RISQUES D'INCENDIE OU D'EXPLOSION

POINT D'ECLAIR: 15 C
(TAGLIABUE C. C.)
CLASS 3, DIV. 2

LEL: 1.0%
UEL: 12.1%

MOYENS D'EXTINCTION: CO2 CHIMIQUES SECS LA MOUSSE

RISQUE PARTICULIER DE LUTTE CONTRE L'INCENDIE: LIQUIDE COMBUSTIBLE (POINT ECLAIR EST INFERIEUR A 100 F/38 C). PEUT FORMER DES MELANGES INFLAMMABLES. LES VAPEURS PEUVENT ETRE EXPLOSIVE DANS L'AIR. ELIMINER TOUTE SOURCE D'IGNITION. TOUT EQUIPMENT DOIT ETRE MIS A LA TERRE. GARDER LE RECIPIENT FERME.

PROCEDURE D'EXTINCTION: LES POMPIERS DOIVENT PORTER UN APPAREIL RESPIRATOIRE AUTONOME ET DES VETEMENTS DE PROTECTION COMPLETS. UTILISER DE L'EAU PULVERIZEE POUR REFROIDIR LES STRUCTURES ET LES CONTENANTS EXPOSES AU FEU.

SECTION V - DANGERS POUR LA SANTE

EFFETS DE LA SUREXPOSITION: *** INHALATION: LES VAPEURS PEUVENT IRRITER. L'EXPOSITION A DES VAPEURS TRES CONCENTREES PEUVENT CAUSER DES MAUX DE TETES, DES ETOURDISSEMENTS, DES NAUSEES, UNE DEPRESSION DU SYSTEME NERVEUX CENTRAL. L'EXPOSITION PROLONGEE A DES VAPEURS TRES CONCENTREES PEUT CAUSER L'EVANOUISSEMENT OU LA MORT. *** INGESTION: MODEREMENT TOXIQUE. LE PRODUIT EST NOCIF LORSQU'IL EST INGERE. L'INGESTION DE GRANDES QUANTITES PEUT CAUSER DES MAUX DE TETES, DES NAUSEES, DES VOMISSEMENTS, UNE DEPRESSION DU SYSTEME NERVEUX CENTRAL. UNE PETITE QUANTITE DE CE LIQUIDE ASPIREE DANS LES POUMONS SOIT PAR INGESTION OU PAR VOMISSEMENT, RISQUE D'AVOIR DE GRAVE EFFETS NOCIF POUR LA SANTE (P.EX., PROVOQUER UN OEDEM PULMONAIRE). *** PEAU: PEUT CAUSER DE L'IRRITATION MODEREE. PEUT CAUSER LE DEGRAISSMENT ET LA DERMATITE. UNE EXPOSITION PROLONGEE PEUT RESULTER A UNE SENSIBILITE DANS LA PEAU. PEUT PROVOQUER DES BRULURES CHIMIQUES. PEUT ETRE ABSORBER PAR LA PEAU ET PROVOQUER UN RISQUE POUR LA SANTE. *** YEUX: LES VAPEURS PEUVENT IRRITER. LE LIQUIDE ET LES BRUINES IRRITENT LES YEUX ET PEUVENT CAUSER DES BRULURES. *** EFFETS DE LA SUREXPOSITION: L'EXPOSITION PROLONGEES OU REPETEES PEUT CAUSER UNE SENSIBILITE DE LA PEAU ET/OU UNE SENSIBILITE RESPIRATOIRE. L'EXPOSITION PROLONGEES OU REPETEES PEUVENT CAUSER A LA LONGUE DES DOMMAGES AUX SYSTEME SANGUIN, GASTRO-INTESTINAL, NERVEUX, ET/OU REPRODUCTEUR. LE CIRC A CLASSE L'ETHYLBENZENE PARMI LES SUBSTANCES DU GROUPE 2B EN SE FONDANT SUR DES DONNEES SUFFISANTES DEMONTRANT SA CANCEROGENECITE POUR LES ANIMAUX DE LABORATOIRE, MAIS DE DONNEES INSUFFISANTES DEMONTRANT L'APPARITION DE CANCER CHEZ LES HUMAINS. SELON LES RESULTATS DE CERTAINES ETUDES MENEES SUR DES ANIMAUX, DE TRES GRANDES EXPOSITIONS AUX XYLENES ON ENTRAINE DES EFFETS NEFASTES SUR LE DEVELOPPEMENT DES EMBRYONS/FETUS. CES EFFETS SONT SOUVENT APPARUS A DES NIVEAUX D'EXPOSITION TOXIQUES POUR LA MERE. LA PORTEE DE CES RESULTATS POUR LES HUMAINS N'A PAS ETE ETABLIE.

CONDITIONS MEDICALES GENERALEMENT AGGRAVEES PAR L'EXPOSITION: LES PROBLEMES CUTANES. LES PROBLEMES RESPIRATOIRE CHRONIQUES.

VOIES PRIMAIRES DE PENETRATION: INHALATION CONTACT DERMIQUE

MESURES DE PREMIERS SOINS: *** INHALATION: TRANSPORTER A L'AIR FRAIS. AIDER LA RESPIRATION SI NECESSAIRE. GARDER LA VICTIME AU CHAUD ET CALME. CONSULTER UN MEDECIN. *** INGESTION: NE PAS FAIRE VOMIR OU BOIRE. FAIRE REPOSER. CONSULTER SANS DELAI UN MEDECIN. SI LE VOMISSEMENT SE PRODUIT, GARDER LA TETE DE LA VICTIME BAISSEE AU-DESSOUS DE SES HANCHES POUR EVITER L'ASPIRATION DANS LES POUMONS. *** PEAU: LAVER LA PEAU CONTAMINEE AVEC DE L'EAU. CONSULTER SANS DELAI UN MEDECIN. *** YEUX: RINCER DE L'EAU CLAIRE PENDANT AU MOINS 15 MINUTES ET FAIRE IMMEDIATEMENT APPEL A UN MEDECIN.

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SECTION VI - DONNEES SUR LA REACTIVITE

STABILITE: CE PRODUIT EST STABLE DANS DES CONDITIONS NORMALES D'ENTREPOSAGE.

POLYMERISATION DANGERUSE: NE SE PRODUIRA PAS DANS DES CONDITIONS NORMALES.

PRODUITS DE DECOMPOSITION DANGEREUX: OXYDES DE CARBONE. OXYDES D'AZOTE. VAPEURS TOXIQUES ET FUMEE.

CONDITIONS A EVITER: CHALEUR, ETINCELLES, FLAMMES.

PRODUITS INCOMPATIBLES: AGENTS OXIDABLE. ACIDES. ALCALINS. AGENTS REDUCTEURS. LES SULFURES. LES METAUX ACTIFS, IONS DE METAUX. LE CUIVRE. HALOGENES. L'EAU.

SENSIBILITE AUX DECHARGES ELECTROSTATIQUES: PRENDRE DES PRECAUTIONS CONTRE LES DECHARGES STATIQUES.

SECTION VII - MESURES POUR FUITE OU DEVERSEMENT

ACTION A PRENDRE EN CAS DE FUITE OU DE DEVERSEMENT: ELIMINER TOUTE SOURCE D'IGNITION. ARRETER LA SOURCE DE FUITE. EVACUER TOUT PERSONNEL NON-ESSENTIEL. PORTER LES VETEMENTS NECESSAIRE. ENDIGER L'ENDROIT POUR EMPECHER PROPAGATION. ABSORBER LE LIQUIDE AVEC UN PRODUIT ABSORBANT INERTE. TRANSFERER DANS UN CONTENANT A L'EPREUVE D'IGNITION.

METHODES D'ELIMINATION: NE PAS CONTAMINER LES COURS D'EAU POTABLE, LES LACS, LES ETANGS OU LES RUISSEAUX. SELON REGLEMENTS MUNICIPAUX, LES LOIS PROVINCIAL ET FEDERALES APPLICABLE A VOTRE LOCALITE.

SECTION VIII - PRECAUTIONS D'EMPLOI

PROTECTION RESPIRATOIRE: UTILISER UN MASQUE RESPIRATOIRE A HAUT RENDEMENT QUI PROTEGE CONTRE LES VAPEURS ORGANIQUES ET LES POUSSIERES TOXIQUES. POUR DES HAUTES CONCENTRATIONS, UTILISER UN MASQUE RESPIRATOIRE A ALIMENTATION D'AIR.

VENTILATION: VENTILATION EFFICACE SUR PLACE POUR EVACUER LA POUSSIERE. EMPLOYER UN APPAREILAGE DE VENTILATION ANTIDEFLATION.

GANTS PROTECTEURS: PORTER DES GANTS/VETEMENTS RESISTANTS AUX PRODUITS CHIMIQUES AFIN DE PROTEGER LA PEAU POTENTIELLEMENT EXPOSEE.

PROTECTION YEUX: EVITER LE CONTACT AVEC LES YEUX. PORTER DES LUNETTES PROTECTRICES CONTRE LES PRODUITS CHIMIQUES ET UN ECRAN FACIAL.

AUTRE EQUIPMENT PROTECTEUR: TABLIER ET BOTTES IMPERMEABLES. DOUCHE OCULAIRE ET DOUCHE D'URGENCE.

AUTRE MESURES DE PROTECTION: EVITER TOUT CONTACT AVEC LES YEUX, LA PEAU ET LES VETEMENTS. EVITER DE RESPIRER. NE PAS INGERER. CONSERVER LOIN DE TOUS ALIMENTS. BIEN LAVER LES MAINS APRES AVOIR MANIPULER LA MATIERE. CHANGER ET LAVER LES VETEMENTS CONTAMINES.

RENSEIGNEMENTS SPECAUX EN MATIERE D'EXPEDITION: PEINTURE. LIQUIDE INFLAMMABLE CLASSE:3 UN# 1263 LE GROUPE D'EMBALLAGE II. CANUTEC 24 HOUR EMERGENCY NUMBER: (613) 996-6666

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SECTION IX - PRECAUTIONS SPECIALES

PRECAUTIONS A PRENDRE A LA MANIPULATION ET L'ENTREPOSAGE: ENTREPOSER DANS UN ENDROIT FRAIS, SEC ET BIEN VENTILE, A L'ECART DES MATIERES INCOMPATIBLES. NE PAS LAISSER A PROXIMITE D'UNE SOURCE DE CHALEUR, D'ETINCELLES, OU D'UNE FLAMME. GARDER LE RECIPIENT FERME. TOUT EQUIPMENT DOIT ETRE MIS A LA TERRE.

AUTRES PRECAUTIONS: NE PAS UTILISER DE PRESSION POUR VIDER LE CONTENANT. NE PAS COUPER, BROYER, SOUDER OU PERCER SUR OU PRES DE CE CONTENANT. TOUS LES CONTENANTS CONTIENNENTDES RESIDUS ET DES VAPEURS. MANIPULER LES CONTENANTS VIDES COMME S'ILS ETAIENT PLEINS.

SECTION X - HMIS INFORMATION

HMIS RATIO: SANTE: 2 FLAMMABILITE: 3 REACTIVITE: 1 PROTECTION PERSONNELLE: E

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DATA SHEET

2.1 VOC ARP Primer

Automotive Primer

Industry Approvals		
Auto Refinish:	✓	Category 1
Env. Canada:		Exempt
MPI:		N/a
AWWA:		N/a

General Properties

A high performance epoxy primer for vehicle refinish applications requiring a primer with less than 250 gr/lt VOC. The 83030 primer has superior corrosion resistance when applied to prepared steel. No induction time required. 83030 has excellent sanding capability, but provides a finish so smooth that sanding is often not required.

Recommended Uses

For use in vehicle refinish applications, truck boxes & bodies, power distribution equipment, tanks, agricultural equipment, and general industrial priming.

Product Information

GENERIC TYPE
Amine Cured Epoxy

PIGMENT TYPE
Anti-corrosive

COLOR
Grey

BASES
N/a

FINISH
Flat

AVERAGE VOLUME SOLIDS
60.2%

AVERAGE WEIGHT SOLIDS
77.0%

RECOMMENDED FILM THICKNESS
Wet: 3.3-5.0 mils (82 - 125 microns)
Dry: 2-3 mils (50 - 75 microns)
See your Cloverdale Representative for project recommendations.

THEORETICAL COVERAGE
965 ft²/gal @1 mil (25 microns) DFT
23.7 m²/L @ 1 mil (25 microns) DFT
Actual coverage may vary depending on substrate and application methods.

MIXED RATIO
3 Parts 83030A; 1 Part 83030B

INDUCTION TIME
No induction time required

POT LIFE
7 hours at 25°C (77°F) (less at higher temperatures)

VISCOSITY MIXED
57 - 63 KU

TEMPERATURE RESISTANCE (DRY)
93°C (200°F) Continuous
120°C (250°F) Intermittent

V.O.C. MIXED
250 gm./lit. (2.1 lb./gal.)
**refer to MSD sheet for current VOC values*

THINNER
Use as supplied.

ACCELERATOR
A-65

Methods of Application

AIRLESS SPRAY	1500 - 200 psi with tip sizes .011" - .013" or equivalent
H.V.L.P.	Tip size 1.4 - 1.6 mm. 8 - 10 psi cap pressure
CONVENTIONAL	40 - 50 psi gun pressure
BRUSH / ROLLER	Not recommended

Drying Time - Temperature, Relative Humidity, and Film Thickness will affect dry and re-coat times.

Substrate Temperature	Touch Dry	Hard Dry	Overcoat Interval with Armourshield		
			Minimum	Maximum	Normal
25°C (77°F)	3.5 hours	6 hours	2 hours	3 days	4 hours

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Recommended Topcoats

Most Cloverdale Conventional and High Performance Coatings. Note: Only the 837 and 839 series urethanes should be used for ARP applications.

Surface Preparation

Area to be painted should be thoroughly cleaned with a detergent solution in water followed by a wash using a wax and grease remover. Sand the bare metal areas using 80-180 grit abrasive. Old, existing finishes should be sanded using 320 – 400 grit paper. Sanded areas should be re-cleaned and primed as quickly as possible after drying.

Limitations

Not recommended for immersion service. For best results apply when substrate temperature is above 10°C (50°F), and at a minimum of 3°C (5°F) above the dew point. Do not apply when the relative humidity is above 85%.

Mixing Instructions

Mix 83030 base A component and curing agent 83030 activator B separately with good agitation. Add curing agent to base component and mix thoroughly until homogenous. If thinning is necessary or required proceed only after recommended induction time has passed.

Safety Precautions

This product is for industrial use only. **Refer to Material Safety Data Sheet for proper health and safety information.**

Storage and Handling

FLASH POINT	-20°C (-4°F) TCC
PRODUCT WEIGHT	1.435 kg/lt mixed (container extra)
STORAGE	Cool, dry, secure location. See your Cloverdale Paint Representative.
PACKAGE SIZE	1 gal kit - 3 qts 83030A and 1 qt. 83030B 4 gal kit - 3 gal 83030A and 1 gal 83030B

Some package sizes or colors may be by special order only. Please check with your Cloverdale Representative when ordering.

Warranty Disclaimer

Cloverdale Paint Inc.
6950 King George Boulevard, Surrey, British Columbia, Canada V3W 4Z1
Web Site: www.cloverdalepaint.com **Email:** helpdesk@cloverdalepaint.com
Phone: 604 596 6261 **Fax:** 604 597 2677

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PERFORMANCE CRITERIA

1. Abrasion Resistance

Method: ASTM D4060 Abrasion Resistance of Organic Coating by Taber Abrader, 1000 gram load, CS-17 Wheel, 1000 Cycles

Coating System: 1 coat 83030

Results: 161 mg.

2. Adhesion

Method: ASTM D4541, method "E"

Coating System: 83030 primer, 839 Armourshield topcoat

Results: >900 psi

3. Chemical Resistance

Method: Covered spot test for 1 week at room temperature

Coating System: 1 coat 83030

Coating was exposed to - 5% Sodium Hydroxide Solution; 5% Sulfuric Acid Solution; 5% Hydrochloric Acid; 5% Mono Basic Sodium Phosphate Solution; 5% Sodium Hypochlorite Solution; Heavy Duty Liquid Detergent

Results: Unaffected - slight discoloration permitted

4. Recoating Window

Method: Internal method - Minimum = the time to >80% gloss @ 20 degree angle. Maximum = longest time tested with 5B adhesion of topcoat

Coating System: 83030 primer, 839 Armourshield topcoat

Results: 2 hrs to >72 hrs

5. Salt Spray (Fog)

Method: ASTM B117

Coating System A: 1 coat 83030

Results:>1000 hrs

Coating System B: 1 coat 83030, 1 coat 83904

Results: >1500 hrs

6. Flexibility

Method: ASTM D522 Cylindrical Mandrel Bend

Coating System: 1 coat 83030

Results: Not less than 9% elongation

7. Pencil Hardness

Method: ASTM D3363

Coating System A: 1 coat 83030

Results: pass 2H

Check for recent amendments to this data sheet at www.cloverdalepaint.com

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Phone: 604 596 6261 **Fax:** 604 597 2677

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MATERIAL SAFETY DATA SHEET

SECTION I - PRODUCT IDENTIFICATION AND USE

Product Identifier: 2.1 VOC ARP PRIMER BASE
Identification Number: 83030A
Product Use: PAINT
WHMIS Class: B2 D1B D2A

MANUFACTURER:
Cloverdale Paint Inc.
50 PANET ROAD
WINNIPEG, MB
R2J 0R9 204/237-0241

SUPPLIER:
Cloverdale Paint Inc.
50 PANET ROAD
WINNIPEG, MB
R2J 0R9 204/237-0241

PREPARED BY: Mr Robert Tinsley, 204-237-0241 DATE: 03/19/14

SECTION II - HAZARDOUS INGREDIENTS

CHEMICAL NAME	CAS NUMBER	WT. PERCENT RANGE	EXPOSURE LIMIT	LC50	LD50
TITANIUM DIOXIDE	13463-67-7	10.0-30.0	10 MG/M3	6.82MG/L RAT	>25G/KGORAL R
MAGNESIUM SILICATE(TALC)	13776-74-4	10.0-30.0	5 mg/m3 DUST	N/AV	N/AV
BISPHENOL A DIGLYCIDYL ETHER	25068-38-6	10.0-30.0	NO INFO	N/AV	N/AV
ALKYL GLYCIDYL ETHER	68609-97-2	1.0-5.0	NO INFO	N/AV	>19.2 G/KG RA
XYLENE; MIXED ISOMERS	1330-20-7	1.0-5.0	100 ppm	5000 PPM RAT	4G/KG RAT ORA
METHYL ISOBUTYL KETONE	108-10-1	1.0-5.0	50 ppm	5700 PPM RAT	2080MG/KG RAT
METHYL ETHYL KETONE	78-93-3	5.0-10.0	200 ppm	2000 PPM RAT	2737 MG/KG RA
ACETONE	67-64-1	1.0-5.0	750 ppm	16000 PPM RAT	7400 MG/KG RA
PROPYLENE GLYCOL MONOMETHYL ETHER	107-98-2	1.0-5.0	100 ppm	13000 MG/KG RAT	5660 MG/KG RA
FURFURYL ALCOHOL	98-00-0	1.0-5.0	NO INFO	233 MG/KG RAT	177 MG/KG RAT
TER-BUTYL ACETATE	504-88-5	1.0-5.0	NO INFO	2230 MG/M3 RAT	4100 MG/KG RA

N.A. - NOT APPLICABLE

SECTION III - PHYSICAL DATA

BOILING RANGE : 56-260 C
ODOR : AROMATIC
APPEARANCE : GREY LIQUID
VOLATILE BY WEIGHT: 18.6%
VOLATILE BY VOLUME: 35.7%
PH @ 0.00 % : 7.0
VAPOR PRESSURE : 184 mm Hg
VAPOR DENSITY : IS HEAVIER THAN AIR
EVAPORATION RATE: IS FASTER THAN BUTYL ACETATE
SOLUBILITY : 8% WATER SOLUBLE
SPECIFIC GRAVITY: 1.483
FREEZING POINT : -40 C

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SECTION IV - FIRE AND EXPLOSION DATA

FLASH POINT: -18 C
(TAGLIABUE C. C.)
CLASS 3, DIVISION 1

LEL: 1.0%
UEL: 16.3%

EXTINGUISHING MEDIA: DRY CHEMICAL CARBON DIOXIDE FOAM WATER FOG

UNUSUAL FIRE AND EXPLOSION HAZARDS: FLAMMABLE LIQUID (FLASH POINT LESS THAN 100 F/38 C). MAY FORM FLAMMABLE MIXTURES. VAPORS MAY BE EXPLOSIVE IN AIR. ELIMINATE IGNITION SOURCES. GROUND ALL EQUIPMENT. KEEP CONTAINER CLOSED.

SPECIAL FIREFIGHTING PROCEDURES: FIREFIGHTERS SHOULD WEAR SELF CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. USE WATER SPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE.

SECTION V - HEALTH HAZARD DATA

EFFECTS OF OVER EXPOSURE: *** INHALATION: VAPORS MAY BE IRRITATING. EXPOSURE TO HIGH VAPOR CONCENTRATIONS MAY CAUSE HEADACHES, DIZZINESS, NAUSEA, AND CENTRAL NERVOUS SYSTEM DEPRESSION. PROLONGED EXPOSURE TO HIGH VAPOR CONCENTRATIONS MAY CAUSE UNCONSCIOUSNESS OR DEATH. *** INGESTION: MODERATELY TOXIC. HARMFUL IF SWALLOWED. SWALLOWING LARGE QUANTITIES CAUSES HEADACHES, NAUSEA, VOMITING, AND CENTRAL NERVOUS SYSTEM DEPRESSION. MAY CAUSE LIVER AND/OR KIDNEY DAMAGE. SMALL AMOUNTS OF LIQUID DRAWN INTO THE LUNGS FROM SWALLOWING OR VOMITING MAY CAUSE SEVERE HEALTH AFFECTS (E.G.PULMONARY EDEMA). *** SKIN: CAN CAUSE MODERATE IRRITATION. CAN CAUSE DEFATTING AND DERMATITIS. PROLONGED EXPOSURE MAY CAUSE SKIN SENSITIZATION. CAN CAUSE CHEMICAL BURNS. CAN BE ABSORBED THROUGH THE SKIN CAUSING A HEALTH HAZARD. *** EYES: VAPORS MAY IRRITATE. LIQUID AND MISTS WILL IRRITATE AND MAY BURN THE EYES. *** CHRONIC AFFECTS OF OVEREXPOSURE: CONTAINS SILICA. LONG TERM EXPOSURE TO SILICA DUST MAY CAUSE SILICOSIS AND CARDIOPULMONARY IMPAIRMENT. REPEATED OR PROLONGED EXPOSURES MAY CAUSE SKIN AND/OR RESPIRATORY SENSITIZATION. REPEATED OR PROLONGED EXPOSURES MAY CAUSE LIVER, KIDNEY, AND/OR NEURAL DYSFUNCTION. REPEATED OR PROLONGED EXPOSURES MAY CAUSE DELAYED EFFECTS INVOLVING BLOOD, GASTRO-INTESTINAL, NERVOUS AND/OR REPRODUCTIVE SYSTEMS. LONG TERM EXPOSURE TO DUSTS CAN LEAD TO RESPIRATORY IMPAIRMENT. HIGH EXPOSURES TO XYLENES IN SOME ANIMAL STUDIES HAVE BEEN REPORTED TO CAUSE HEALTH EFFECTS ON THE DEVELOPING EMBRYO/FETUS. THESE EFFECTS WERE OFTEN AT LEVELS TOXIC TO THE MOTHER. THE SIGNIFICANCE OF THESE FINDINGS TO HUMANS HAS NOT BEEN DETERMINED. LONG-TERM EXCESSIVE EXPOSURES MAY CAUSE TALCOSIS, PULMONARY FIBROSIS, WHICH IN TURN MAY LEAD TO SEVERE AND PERMANENT DAMAGE TO THE LUNGS. IN A LIFETIME INHALATION STUDY, EXPOSURE TO 250 MG/M3 TITANIUM DIOXIDE DUST RESULTED IN THE DEVELOPMENT OF LUNG TUMOURS IN RATS. THESE TUMOURS OCCURRED ONLY AT DUST LEVELS THAT OVERWHELMED THE ANIMALS' LUNG CLEARANCE MECHANISMS AND WERE DIFFERENT FROM COMMON HUMAN LUNG TUMOURS IN BOTH TYPE AND LOCATION. THE RELEVANCE OF THESE FINDINGS TO HUMANS IS UNKNOWN. THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) HAS CLASSIFIED TITANTIUM DIOXIDE AS POSSIBLY CARCINOGENIC TO HUMANS (GROUP 2B) BASED ON INADEQUATE EVIDENCE OF CARCINOGENICITY IN HUMANS AND SUFFICIENT EVIDENCE OF CARCINOGENICITY IN EXPERIMENTAL ANIMALS. ACCORDING TO THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC), METHYL ISOBUTYL KETONE IS POSSIBLY CARCINOGENIC TO HUMANS (GROUP 2B)

MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: SKIN DISORDERS. EYE DISORDERS. CHRONIC RESPIRATORY DISORDERS.

PRIMARY ROUTE(S) OF ENTRY: DERMAL INHALATION INGESTION

EMERGENCY AND FIRST AID PROCEDURES: *** INHALATION: REMOVE TO FRESH AIR. ASSIST

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SECTION V - HEALTH HAZARD DATA

BREATHING IF NECESSARY. KEEP VICTIM WARM AND QUIET. SEEK MEDICAL ATTENTION. *** INGESTION: DO NOT INDUCE VOMITING OR GIVE FLUIDS. KEEP AT REST. GET PROMPT MEDICAL ATTENTION. IF VOMITING OCCURS, KEEP VICTIM'S HEAD BELOW HIPS TO PREVENT ASPIRATION INTO THE LUNGS. *** SKIN: FLUSH CONTAMINATED SKIN WITH WATER. GET PROMPT MEDICAL ATTENTION. *** EYES: FLUSH WITH CLEAN WATER FOR AT LEAST 15 MINUTES AND IMMEDIATELY GET MEDICAL ATTENTION.

SECTION VI - REACTIVITY DATA

STABILITY: THIS PRODUCT IS STABLE UNDER NORMAL STORAGE CONDITIONS.

HAZARDOUS POLYMERIZATION: COULD OCCUR UNDER NORMAL CONDITIONS. CARE MUST BE EXERCISED.

HAZARDOUS DECOMPOSITION PRODUCTS: OXIDES OF CARBON. TOXIC FUMES AND SMOKE. FLAMMABLE FUMES.

CONDITIONS TO AVOID: HEAT, SPARKS OR FLAME.

INCOMPATABILITY: OXIDIZING AGENTS. ACIDS. ALKALIES. AMINES. SULFIDES. ALDEHYDES. HALOGENS. CHLORINATED COMPOUNDS.

SENSITIVITY TO STATIC DISCHARGE: TAKE PRECAUTIONARY MEASURES AGAINST STATIC DISCHARGES.

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: ELIMINATE IGNITION SOURCES. STOP SOURCE OF SPILL. VENTILATE AREA. EVACUATE ALL NON ESSENTIAL PERSONNEL. WEAR APPROPRIATE PROTECTIVE EQUIPMENT. DIKE SPILL TO KEEP FROM SPREADING. COVER WITH INERT ABSORBENT. REMOVE TO DISPOSAL CONTAINER.

WASTE DISPOSAL METHOD: DO NOT CONTAMINATE ANY LAKES, PONDS, STREAMS, OR UNDERGROUND WATER SUPPLIES. DISPOSE OF IN ACCORDANCE WITH LOCAL, PROVINCIAL AND FEDERAL REGULATIONS IN YOUR AREA.

SECTION VIII - SAFE HANDLING AND USE INFORMATION

RESPIRATORY PROTECTION: USE A COMBINATION ORGANIC VAPOR/TOXIC PARTICULATE HIGH EFFICIENCY FILTER RESPIRATOR. FOR HIGH CONCENTRATIONS, USE AIR SUPPLIED RESPIRATOR.

VENTILATION: EFFICIENT LOCAL EXHAUST VENTILATION IS REQUIRED. USE EXPLOSION PROOF VENTILATION EQUIPMENT.

PROTECTIVE GLOVES: WEAR APPROPRIATE CHEMICAL RESISTANT GLOVES/CLOTHING TO PREVENT SKIN CONTACT.

EYE PROTECTION: DO NOT GET IN EYES. WEAR SAFETY GLASSES/GOGGLES OR A FACE SHIELD.

OTHER PROTECTIVE EQUIPMENT: IMPERMEABLE APRON AND BOOTS. EYE BATH AND SAFETY

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SECTION VIII - SAFE HANDLING AND USE INFORMATION

SHOWER.

HYGENIC PRACTICES: DO NOT GET IN EYES, SKIN OR CLOTHING. AVOID INHALING. DO NOT SWALLOW. KEEP AWAY FROM FOOD PRODUCTS. WASH HANDS THOROUGHLY AFTER HANDLING. CHANGE AND WASH CONTAMINATED CLOTHING.

SPECIAL SHIPPING INFORMATION: PAINT. FLAMMABLE LIQUID CLASS:3 UN#1263 PACKING GROUP II. CANUTEC 24 HOUR EMERGENCY NUMBER: (613) 996-6666

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: STORE IN A COOL, DRY, WELL VENTILATED AREA, AWAY FROM ALL INCOMPATIBLE MATERIALS. KEEP AWAY FROM HEAT, SPARKS AND FLAME. KEEP CONTAINER CLOSED. GROUND ALL EQUIPMENT.

OTHER PRECAUTIONS: DO NOT USE PRESSURE TO EMPTY CONTAINERS. DO NOT CUT, GRIND, WELD OR DRILL ON OR NEAR THIS CONTAINER. CONTAINERS WILL RETAIN PRODUCT RESIDUES AND VAPORS. HANDLE EMPTY CONTAINERS AS IF THEY WERE FULL. DO NOT PUNCTURE, INCINERATE, BURN OR STORE ABOVE 45 C. SOME OR ALL OF THE LISTED COMPONENTS OF THIS PRODUCT MAY PRESENT A HEALTH THREAT IN THE FORM OF DUSTS.

SECTION X - HMIS INFORMATION

HMIS: HEALTH: 2 FLAMMABILITY: 3 REACTIVITY: 1 PERSONAL PROTECTION: K

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MATERIAL SAFETY DATA SHEET

SECTION I - PRODUCT IDENTIFICATION AND USE

Product Identifier: 2.1 VOC ARP PRIMER ACTIVATOR
Identification Number: 83030B
Product Use: PAINT ADDITIVE WHMIS Class: B2 D1AD2AE

MANUFACTURER:
Cloverdale Paint Inc.
50 PANET ROAD
WINNIPEG, MB
R2J 0R9 204/237-0241

SUPPLIER:
Cloverdale Paint Inc.
50 PANET ROAD
WINNIPEG, MB
R2J 0R9 204/237-0241

PREPARED BY: Mr Robert Tinsley, 204-237-0241 DATE: 02/03/16

SECTION II - HAZARDOUS INGREDIENTS

CHEMICAL NAME	CAS NUMBER	WT. PERCENT RANGE	EXPOSURE LIMIT	LC50	LD50
XYLENE: MIXED ISOMERS	1330-20-7	1.0-5.0	100 ppm	5000 PPM RAT	4G/KG RAT ORAL
METHYL ISOBUTYL KETONE	108-10-1	1.0-5.0	50 ppm	5700 PPM RAT	2080MG/KG RAT
ACETONE	67-64-1	5.0-10.0	750 ppm	16000 PPM RAT	7400 MG/KG RAT
N-BUTYL ALCOHOL	71-36-3	1.0-5.0	100 ppm	8000 PPM RAT	790 MG/KG RAT
2-BUTOXYETHANOL	111-76-2	1.0-5.0	50 ppm SKIN	925 PPM MOUSE	470 MG/KG RAT
DIMETHYLAMINOMETHYL PHENOL	90-72-2	1.0-5.0	NO INFO	N/AV	1200 MG/KG RAT
ETHYLBENZENE	100-41-4	1.0-5.0	100 ppm	>4000 PPM RAT	3.5 G/KG RAT
BENZYL ALCOHOL	100-51-6	10.0-30.0	NO INFO	1400 PPM RAT	1230 MG/KG RAT
ALIPHATIC POLYAMIDE	106906-26-1	10.0-30.0	NO INFO	N/AV	N/AV

N.A. - NOT APPLICABLE

SECTION III - PHYSICAL DATA

BOILING RANGE : 56-206 C
ODOR : AROMATIC
APPEARANCE : CLEAR LIQUID
VOLATILE BY WEIGHT: 13.2%
VOLATILE BY VOLUME: 20.8%
PH @ 0.00 % : 7.0
VAPOR PRESSURE : 184 mm Hg
VAPOR DENSITY : IS HEAVIER THAN AIR
EVAPORATION RATE: IS FASTER THAN BUTYL ACETATE
SOLUBILITY : 7% WATER SOLUBLE
SPECIFIC GRAVITY: 1.295
FREEZING POINT : -40 C

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SECTION IV - FIRE AND EXPLOSION DATA

FLASH POINT: -18 C
(TAGLIABUE C. C.)
CLASS 3, DIVISION 1

LEL: 1.0%
UEL: 12.8%

EXTINGUISHING MEDIA: DRY CHEMICAL CARBON DIOXIDE FOAM WATER FOG

UNUSUAL FIRE AND EXPLOSION HAZARDS: FLAMMABLE LIQUID (FLASH POINT LESS THAN 100 F/38 C). MAY FORM FLAMMABLE MIXTURES. VAPORS MAY BE EXPLOSIVE IN AIR. ELIMINATE IGNITION SOURCES. GROUND ALL EQUIPMENT. KEEP CONTAINER CLOSED.

SPECIAL FIREFIGHTING PROCEDURES: FIREFIGHTERS SHOULD WEAR SELF CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. USE WATER SPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE.

SECTION V - HEALTH HAZARD DATA

EFFECTS OF OVER EXPOSURE: *** INHALATION: VAPORS AND MISTS ARE EXTREMELY CORROSIVE. BRONCHITIS, PULMONARY EDEMA, AND CHEMICAL PNEUMONITIS MAY OCCUR. *** INGESTION: HIGHLY TOXIC. MAY BE FATAL. SWALLOWING LARGE QUANTITIES CAUSES HEADACHES, NAUSEA, VOMITING, AND CENTRAL NERVOUS SYSTEM DEPRESSION. MAY CAUSE LIVER AND/OR KIDNEY DAMAGE. VAPORS, MISTS, AND LIQUID ARE CORROSIVE. SWALLOWING CAN CAUSE DEATH. SMALL AMOUNTS OF LIQUID DRAWN INTO THE LUNGS FROM SWALLOWING OR VOMITING MAY CAUSE SEVERE HEALTH AFFECTS (E.G.PULMONARY EDEMA). *** SKIN: VAPORS, MISTS AND LIQUID ARE EXTREMELY CORROSIVE. CAN CAUSE DEFATTING AND DERMATITIS. PROLONGED EXPOSURE MAY CAUSE SKIN SENSITIZATION. CAN CAUSE CHEMICAL BURNS. CAN BE ABSORBED THROUGH THE SKIN CAUSING A HEALTH HAZARD. *** EYES: VAPORS, LIQUID AND MISTS ARE EXTERMELY CORROSIVE. BRIEF CONTACT WILL BE SEVERELY IRRITATING AND MAY DAMAGE THE EYES AND CAUSE PEMANENT INJURY OR BLINDNESS. *** CHRONIC AFFECTS OF OVEREXPOSURE: REPEATED OR PROLONGED EXPOSURES MAY CAUSE SKIN AND/OR RESPIRATORY SENSITIZATION. REPEATED OR PROLONGED EXPOSURES MAY CAUSE LIVER, KIDNEY, AND/OR NEURAL DYSFUNCTION. REPEATED OR PROLONGED EXPOSURES MAY CAUSE DELAYED EFFECTS INVOLVING BLOOD, GASTRO-INTESTINAL, NERVOUS AND/OR REPRODUCTIVE SYSTEMS. ETHYL BENZENE HAS BEEN CLASSIFIED BY THE IARC AS A GROUP 2B SUBSTANCE ON THE BASIS OF SUFFICIENT EVIDENCE FOR CARCINOGENICITY IN LABORATORY ANIMALS BUT INADEQUATE EVIDENCE FOR CANCER IN HUMANS. HIGH EXPOSURES TO XYLENES IN SOME ANIMAL STUDIES HAVE BEEN REPORTED TO CAUSE HEALTH EFFECTS ON THE DEVELOPING EMBRYO/FETUS. THESE EFFECTS WERE OFTEN AT LEVELS TOXIC TO THE MOTHER. THE SIGNIFICANCE OF THESE FINDINGS TO HUMANS HAS NOT BEEN DETERMINED. CARCINOGENICITY IN EXPERIMENTAL ANIMALS. ACCORDING TO THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC), METHYL ISOBUTYL KETONE IS POSSIBLY CARCINOGENIC TO HUMANS (GROUP 2B) 2-BUTOXYETHANOL MAY CAUSE REPRODUCTIVE EFFECTS BASED ON STUDIES IN LABORATORY ANIMALS AT HIGH GENERALLY TOXIC DOSES. 2-BUTOXYETHANOL MAY CAUSE TERATOGENIC/EMBRYTOXIC EFFECTS BASED ON IN STUDIES IN LABORATORY ANIMALS

MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: ALLERGIES. SKIN DISORDERS. EYE DISORDERS. CENTRAL NERVOUS SYSTEM DISORDERS. CHRONIC RESPIRATORY DISORDERS.

PRIMARY ROUTE(S) OF ENTRY: INHALATION DERMAL INGESTION

EMERGENCY AND FIRST AID PROCEDURES: *** INHALATION: REMOVE TO FRESH AIR. ASSIST BREATHING IF NECESSARY. KEEP VICTIM WARM AND QUIET. SEEK MEDICAL ATTENTION. *** INGESTION: DO NOT INDUCE VOMITING OR GIVE FLUIDS. KEEP AT REST. GET PROMPT MEDICAL ATTENTION. IF VOMITING OCCURS, KEEP VICTIM'S HEAD BELOW HIPS TO PREVENT ASPIRATION INTO THE LUNGS. *** SKIN: FLUSH CONTAMINATED SKIN WITH WATER. GET PROMPT MEDICAL ATTENTION. *** EYES: FLUSH

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SECTION V - HEALTH HAZARD DATA

WITH CLEAN WATER FOR AT LEAST 15 MINUTES AND IMMEDIATELY GET MEDICAL ATTENTION.

SECTION VI - REACTIVITY DATA

STABILITY: THIS PRODUCT IS STABLE UNDER NORMAL STORAGE CONDITIONS.

HAZARDOUS POLYMERIZATION: COULD OCCUR UNDER NORMAL CONDITIONS. CARE MUST BE EXERCISED.

HAZARDOUS DECOMPOSITION PRODUCTS: OXIDES OF CARBON. OXIDES OF NITROGEN. TOXIC FUMES AND SMOKE.

CONDITIONS TO AVOID: HEAT, SPARKS OR FLAME.

INCOMPATABILITY: DIRECT SUNLIGHT AVOID EXTENDED CONTACT WITH AIR OR OXYGEN HEATING IN AIR MAY PRODUCE IRRITATING ALDEHYDES, ACIDS AND KETONES BASES. SODIUM HYDROXIDE ALUMINUM AND ITS ALLOYS OXIDIZING AGENTS. ACIDS. ALKALIES. AMINES. CYANIDES, ISOCYANATES. SULFIDES. ALDEHYDES. HALOGENS. WATER

SENSITIVITY TO STATIC DISCHARGE: TAKE PRECAUTIONARY MEASURES AGAINST STATIC DISCHARGES.

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: ELIMINATE IGNITION SOURCES. STOP SOURCE OF SPILL. VENTILATE AREA. EVACUATE ALL NON ESSENTIAL PERSONNEL. WEAR APPROPRIATE PROTECTIVE EQUIPMENT. DIKE SPILL TO KEEP FROM SPREADING. COVER WITH INERT ABSORBENT. REMOVE TO DISPOSAL CONTAINER.

WASTE DISPOSAL METHOD: DO NOT CONTAMINATE ANY LAKES, PONDS, STREAMS, OR UNDERGROUND WATER SUPPLIES. DISPOSE OF IN ACCORDANCE WITH LOCAL, PROVINCIAL AND FEDERAL REGULATIONS IN YOUR AREA.

SECTION VIII - SAFE HANDLING AND USE INFORMATION

RESPIRATORY PROTECTION: USE A COMBINATION ORGANIC VAPOR/TOXIC PARTICULATE HIGH EFFICIENCY FILTER RESPIRATOR. FOR HIGH CONCENTRATIONS, USE AIR SUPPLIED RESPIRATOR.

VENTILATION: EFFICIENT LOCAL EXHAUST VENTILATION IS REQUIRED. USE EXPLOSION PROOF VENTILATION EQUIPMENT.

PROTECTIVE GLOVES: WEAR APPROPRIATE CHEMICAL RESISTANT GLOVES/CLOTHING TO PREVENT SKIN CONTACT.

EYE PROTECTION: DO NOT GET IN EYES. WEAR SAFETY GLASSES/GOGGLES OR A FACE SHIELD.

OTHER PROTECTIVE EQUIPMENT: OVERALLS, APRON. EYE BATH AND SAFETY SHOWER.

HYGENIC PRACTICES: DO NOT GET IN EYES, SKIN OR CLOTHING. AVOID INHALING. DO NOT

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SECTION VIII - SAFE HANDLING AND USE INFORMATION

SWALLOW. KEEP AWAY FROM FOOD PRODUCTS. WASH HANDS THOROUGHLY AFTER HANDLING. CHANGE AND WASH CONTAMINATED CLOTHING.

SPECIAL SHIPPING INFORMATION: PAINT RELATED MATERIAL. FLAMMABLE LIQUID CLASS:3 UN#1263 PACKING GROUP II. CANUTEC 24 HOUR EMERGENCY NUMBER: (613) 996-6666

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: STORE IN A COOL, DRY, WELL VENTILATED AREA, AWAY FROM ALL INCOMPATIBLE MATERIALS. KEEP AWAY FROM HEAT, SPARKS AND FLAME. GROUND ALL EQUIPMENT.

OTHER PRECAUTIONS: DO NOT CUT, GRIND, WELD OR DRILL ON OR NEAR THIS CONTAINER. DO NOT PUNCTURE, INCINERATE, BURN OR STORE ABOVE 45 C.

SECTION X - HMIS INFORMATION

HMIS: HEALTH: 3 FLAMMABILITY: 3 REACTIVITY: 1 PERSONAL PROTECTION: K

Polyisocyanurate Foam Sheathing Continuous Insulation

AP™ FOIL-FACED

PRODUCT DATA SHEET

DESCRIPTION

Johns Manville AP™ Foil-Faced Foam Sheathing board consists of a uniform closed-cell polyisocyanurate foam core bonded on each side to a foil facer. One side has a reflective foil facer and the other side has a white non-reflective foil facer to suit your building needs.

Polyiso provides one of the highest R-values per inch of any rigid insulation (R-6.0 at 1 inch). Furthermore, when properly installed, AP Foil-Faced Foam Sheathing functions as a water-resistive barrier, vapor barrier and air barrier, eliminating the need to install additional components.

AP Foil-Faced Foam Sheathing is produced with an EPA-compliant hydrocarbon-based blowing agent that has zero Ozone Depletion Potential (ODP) and virtually no Global Warming Potential (GWP); it also meets both CFC- and HCFC-free specification requirements. Polyiso is one of North America's most widely used insulation products and has been cited by the EPA for its responsible impact on the environment.

AP Foil-Faced Foam Sheathing provides exceptional heat, moisture and air control to protect your building's exterior wall assembly.

INSTALLATION

AP Foil-Faced Foam Sheathing is lightweight and can be easily cut with a utility knife or saw. Use maximum board lengths to minimize the number of joints. Vertical joints should be staggered. Butt joints should be centered over framing. To create a water-resistive barrier or an air barrier, treat seams and penetrations as instructed in the installation guide and in accordance with manufacturer's guidelines. Once installed, AP Foil-Faced Foam Sheathing may be left exposed for up to 60 days. Consult your local building department for code requirements.

COMPLIANCES

- ASTM C1289 Type 1, Class 1
- CAN/ULC S704, Type 1, Class 1
- ICC-ES Evaluation Report ESR-3398
- Canadian Construction Materials Centre 13104-L
- Air Barrier Association of America Evaluated Air Barrier Material, Assembly & Water Resistive Barrier
- International Building Code
- International Residential Code
- International Energy Conservation Code
- ENERGY STAR
- ASHRAE 90.1
- California State Insulation Quality Standards

PERFORMANCE STANDARDS

- ASTM C1289, Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
- CAN/ULC-S704, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Faced
- ASTM E84, Test for Surface Burning Characteristics of Building Materials
- CAN/ULC S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
- NFPA 259, Standard Test Method for Potential Heat of Building Materials
- NFPA 285, Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components
- AC 71, Acceptance Criteria for Foam Plastic Sheathing Panels Used as Water-Resistive Barriers
- ASTM E331, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
- AATCC Test Method 127, Water Resistance: Hydro Static Pressure Test
- ASTM E1233, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Cyclic Air Pressure Differential
- ASTM E2178, Standard Test Method for Air Permeance of Building Materials
- ASTM E2357, Standard Test Method for Determining Air Leakage of Air Barrier Assemblies

AVAILABILITY

AP Foil-Faced Foam Sheathing is available in the sizes shown in Table 1 (see reverse). For additional information or special size inquiries, please consult a sales representative at 800-654-3103.

PERFORMANCE ADVANTAGES

Thermal Insulation: inch for inch, polyiso has one of the highest energy efficiencies. R-values for AP Foil-Faced Foam Sheathing are shown in Table 1, and physical properties are shown in Table 2 (see reverse). R means resistance to heat flow. The higher the R-value, the greater the insulating power.

Water-Resistive Barrier: when properly installed as part of a Johns Manville Wall System, AP Foil-Faced Foam Sheathing meets the ICC-ES AC71 acceptance criteria for foam plastic sheathing used as a water-resistive barrier. Please see the installation guide for qualifying assemblies and detailed instructions.

Vapor Barrier: at a minimum thickness of one inch, AP Foil-Faced Foam Sheathing has a vapor permeance of 0.05 perms and qualifies as a Class I vapor retarder.

Air Barrier: when properly installed as part of a Johns Manville Wall System, AP Foil-Faced Foam Sheathing meets the Air Barrier Association of America boardstock criteria for materials and assemblies. Please see installation guide for qualifying assemblies and detailed instructions.

Noncorrosive: does not accelerate corrosion of pipes, wiring or metal studs.

Lightweight: easy to handle, can be cut with a utility knife or saw.

ENERGY, QUALITY & ENVIRONMENT

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POLYISO™ The top performer.

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Polyisocyanurate Foam Sheathing Continuous Insulation

PRODUCT DATA SHEET **AP™ FOIL-FACED**

STORAGE
Store AP Foil-Faced Foam Sheathing elevated above the floor or ground and standing water. If stored outdoors, keep dry by covering completely with a waterproof tarpaulin.

LIMITATIONS
AP Foil-Faced Foam Sheathing is nonstructural. The walls must be braced in accordance with the requirements of the applicable code.

WARRANTY
All Johns Manville products are sold subject to Johns Manville's Limited Warranty and Limitation of Remedy. For a copy of these documents, call 800-654-3103.

WARNING
AP Foil-Faced Foam Sheathing is combustible and shall only be used as specified by the local building code with respect to flame spread classification and to the use of a suitable thermal barrier when required.

TECHNICAL SERVICES
Johns Manville can provide technical information to assist in addressing questions regarding AP Foil-Faced Foam Sheathing. Please call 800-654-3103 for technical assistance.

PERFORMANCE DATA

THERE ARE 2 LAYERS OF 2" THICK INSULATING PANELS, FOR A TOTAL OF 4" ALL AROUND. APPLIED ON WALLS, CEILING AND FLOOR.

Table 1: Thermal Performance

THICKNESS (inches)	R-VALUE U.S.[1] (°F•ft²•h/BTU)	THICKNESS (mm)	RSI-VALUE[1] (°K•m²/W)	BOARD SIZE (ft)	R-VALUE WITH REFLECTIVE AIR SPACE[2]		
					½" Air Space	¾" Air Space	1" Air Space
0.50	2.7	13	0.48	4 x 8, 9, or 10	5.2	5.5	5.4
0.625	3.5	16	0.62	4 x 8, 9, or 10	6.0	6.3	6.2
0.75	4.4	19	0.77	4 x 8, 9, or 10	6.8	7.1	7.0
0.85	5.0	22	0.91	4 x 8, 9, or 10	7.4	7.7	7.6
1.00	6.0	25	1.06	4 x 8, 9, or 10	8.5	8.8	8.7
1.50	9.3	38	1.63	4 x 8, 9, or 10	11.7	12	12
1.65	10	42	1.82	4 x 8, 9, or 10	12	12	12
2.00	13	51	2.21	4 x 8, 9, or 10	15	15	15
2.50	16	64	2.79	4 x 8, 9, or 10	18	19	19
3.00	19	76	3.36	4 x 8, 9, or 10	22	22	22
3.50	22	89	3.94	4 x 8, 9, or 10	25	25	25
4.00	26	102	4.52	4 x 8, 9, or 10	28	28	28
4.50	28	114	5.09	4 x 8, 9, or 10	30	31	31

[1]Aged R-value at 75° F in accordance with ASTM C1289.
[2]Only applies when an ideal reflective air space and horizontal heat flow conditions exist. The shiny foil side of product must face the air space. Determined in accordance with FTC 16 CFR Part 460 requirements and published ASHRAE air space R-values. Refer to the 2009 ASHRAE Handbook of Fundamentals, Chapter 26, Table 3, for details.

Table 2: Physical Properties

PROPERTY	UNITS	TEST METHOD	RESULT
Thermal Resistance, 1 inch	°F•ft²•hr/BTU	ASTM C518*	6.0
Compressive Strength	psi	ASTM D1621	≥ 16
Flexural Strength	psi	ASTM C203	≥ 40
Water Absorption	% by volume	ASTM C209	0.1
Water Vapor Permeance	perms	ASTM E96	0.05
Surface Burning Characteristics**			
Flame Spread[†]	index	ASTM E84	≤ 25
Smoke Developed[†]	index	ASTM E84	≤ 450
Service Temperature	°F		-100 to 250

**Aged R-value at 75° F in accordance with ASTM C1289.*
***Numerical ratings are not intended to reflect hazards present in actual fire conditions.*
[†]Foam core tested at 4 inches.

Visit our website at **www.JM.com** or call **800-654-3103** | **Building Insulation Division** P.O. Box 5108 | Denver, CO 80217-5108

BID-0151 7/15

3. Fabrication characteristics (continued)

Manufacturier de produits CVAC sur mesure

Project : 6515-403, Pumping station
Client : Promec

Fabrication characteristics (continuation)

Identification tag

FABRICATION MEP	
TAG NO:	6515-403, Pumping station
MODEL:	AMP-PFB-2-320-E
SERIE:	AMP00380

Pedestrian door

Description:

(1x) 42'' x 84''

4'' insulated freezer style

Warning informations

☒ Risk of electrocution

Entrance®

GLACE-GUARD
Cold Storage Doors

ISO 9001 2008 CERTIFIED

The high performance entrance door!

The Glace-Guard™ Entrance door combines insulation performance and durability, while being attractive and virtually maintenance free. This entrance door, available in 3" or 4" thickness, is made of high quality metal skins. Its panels are insulated with a rigid polyurethane foam core, providing the highest insulation value. Its hardware is engineered to withstand an intensive usage, while providing safety and smoothness of operation.

The Glace-Guard™ Entrance door is operated by industrial cam-lift hinges, heavy duty pull handle and heavy gauge steel automatic door closer, ensuring trouble-free operation and effortless firm closing.

The Glace-Guard™ Entrance door is suitable for coolers and freezers, for both interior and exterior applications. It is your best door investment when performance, durability and low maintenance costs are criteria of selection.

The Glace-Guard™ Entrance door is ideal for applications such as:

- Supermarkets
- Restaurants
- Cold storage distribution warehouses
- Grocery distribution warehouses
- Food processing plants

Cold storage entrance door
Model Glace-Guard™ Entrance ET-300

Entrance®/ Glace-Guard™

ET-300, ET-400 Series

Section 08326

Well insulated:

The Glace-Guard™ Entrance ET-300 (3" thick) and ET-400 (4" thick) doors are insulated with a rigid polyurethane foam core.

Designed for energy savings:

Full perimeter magnetic vinyl gasket and bottom double U-shaped rubber gasket to ensure airtight joints.

Built to last with superior quality materials:

Proven experience and expertise achieve a perfect adherence of the polyurethane foam to the metal skins, ensuring panel strength, rigidity and preservation of insulation value over time. The high quality 26 gauge galvanized steel with superior 25-micron polyester top coat, ensures durability and resistance to corrosion.

Heavy duty hardware for long lasting use and smooth operation:

Industrial cam-lift hinges, heavy duty pull handle and heavy gauge steel door closer, combined with a variety of accessories, provide trouble-free operation, safety and durability.

THERMOSTOP
Tradition of quality

CFC-FREE 3"/4" POLYURETHANE INSULATION

Entrance®

GLACE-GUARD Cold Storage Doors

Entrance ET-300	3" (75mm) thick
Entrance ET-400	4" (100mm) thick

Technical specifications

Section 08326

Reference product:
Glace-Guard™ Entrance ET-300 or Glace-Guard™ Entrance ET-400, as manufactured by Thermostop Inc., www.thermostop.com

Temperature range:
-20ºF to +120ºF (-29ºC to +49ºC)

Standard dimensions:
- 36" x 84" (914mm x 2134mm)
- 60" x 84" (1524mm x 2134mm)

Other dimensions available upon request.

Thickness:
- Glace-Guard™ Entrance ET-300: 3" (75mm) thick
- Glace-Guard™ Entrance ET-400: 4" (100mm) thick

Panels:
Insulated with rigid polyurethane, foamed in place under high pressure between two metal skins. Standard 26ga. steel skins, white stucco finish. For other skin options, please consult ***Metal skins options.*** Panel frame is made with heavy duty aluminum extrusions.

Door frame and thermal barrier:
Door frame is made of shock-proof 5/32" (4mm) thick exterior and interior extruded aluminum angles. The exterior aluminum angle has an incorporated resin thermal break.

Hinges:
- For doors with width under 60" (1524mm): Self-closing and reversible high pressure die-cast zinc hinges with self-lubricating nylon cams. Brushed chrome finish.

- For doors with width of 60" (1524mm) and greater: Heavy duty self-closing and reversible high pressure die-cast zinc flanges, 3/16" (5mm) thick steel strap. Gray finish.

Pull handle:
High pressure die-cast zinc cylinder locking handle, complete with emergency inside release system. Brushed chrome finish.

Door closer:
Heavy gauge steel mechanical door closer, complete with extra-wide hook. Chrome finish.

Perimeter magnetic gasket:
A full perimeter magnetic vinyl gasket insures that the door is airtight and vapour-proof on the perimeter joint.

Bottom door gasket:
Extruded aluminum retainer with two U-shaped rubber gaskets to insure airtight joints.

Heat trace (optional):
For freezer applications, the door is equipped with a heat trace on four (4) sides of the door, preventing ice or frost accumulation and eliminating the need to have a heated threshold.

Kick plate (optional):
36" (914mm) high steel kick plate, on full door width, to protect the door bottom against forklift impacts.
- 16ga. galvanized steel, smooth finish
- 18ga. stainless steel, #304 finish

Metal skins options:

Steel	Finish
26ga. (0.41mm)	stucco, white
20ga. (0.86mm)	smooth, white
16ga. (1.42mm)	smooth, painted

Aluminum	Finish
24ga. (0.60mm)	stucco, white or grey RAL-9006
16ga. (1.30mm)	smooth, clear anodized

Door frame details

THERMOSTOP
Tradition of quality

3775 Losch Blvd.
Longueuil (Quebec)
Canada
J3Y 5T7

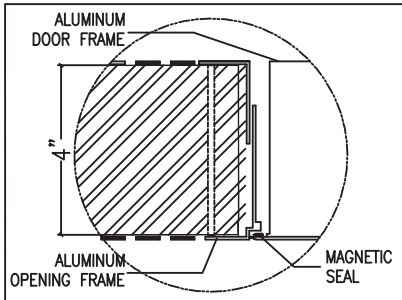
Phone: **450.678.8666**
Toll free: 866.678.0123
Fax: 450.678.7765
thermostop.com

Warranty

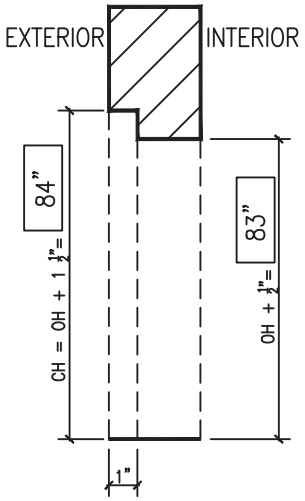
Thermostop doors and hardware carry a warranty of one (1) year against any defects or faulty workmanship. The door panels carry a ten (10) year limited warranty against perforation due to rusting, and a five (5) year limited warranty on delamination, under normal operational conditions.

THERMOSTOP

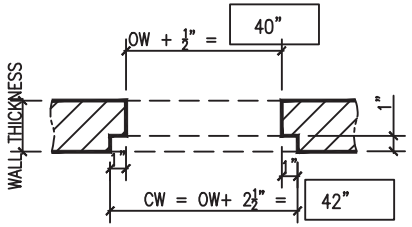
SHOP DRAWING - COOLER ENTRANCE DOOR GLACE-GUARD ET-400



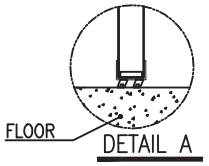
DOOR FRAME DETAIL



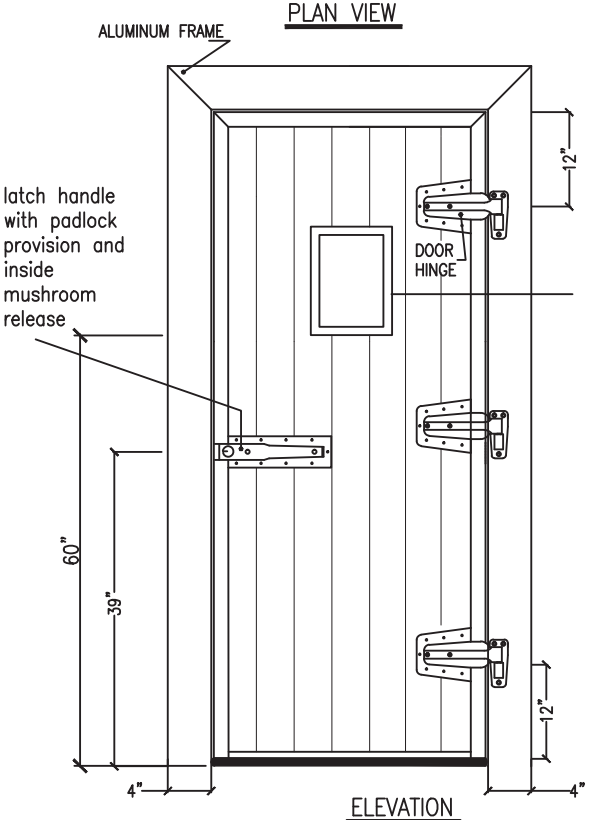
SECTION



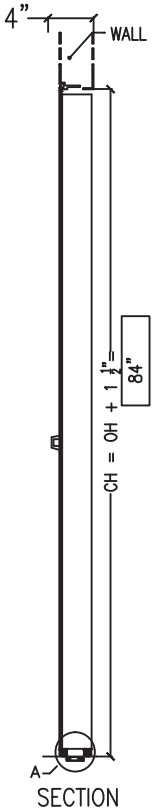
PLAN VIEW



DETAIL A



ELEVATION



SECTION

Specifications:

☒ ET–400: 4"(100mm)
☒ Cooler application (36°F and above)

Standard Features:

*Polyurethane insulated panels
*20ga galvanized steel, white, smooth finish with ribs
*Heavy–duty mirror frame 5/32" (4mm) in two extruded angles. Aluminium mill finished.
*Magnetic seals on door frame perimeter.
*Bottom double blade seal on door panel.
* 3 (three) 10" cam–lift hinges.
* 1 (one) LATCH handle with padlock provision (padlock by others) & inside MUSHROOM release

Latch handle is chrome finished steel. Hinges are brush chrome finished steel

Others features:

* Exterior chain with S hook and eye bolt
* Interior storm door chain with spring

DIMENSIONS	QTY	FINISHED OPENING		REQUIRED CLEARANCE		APPROVED FOR MANUFACTURING BY:
		WIDTH (OW)	HEIGHT (OH)	WIDTH (CW)	HEIGHT (CH)	Name: Date:
	4	39.50"	82.50"	42"	84"	Signature:

Legend

OW = OPENING WIDTH
OH = OPENING HEIGHT
CW = CLEARANCE WIDTH
CH = CLEARANCE HEIGHT

GLACE–GUARD
Cold Storage Doors

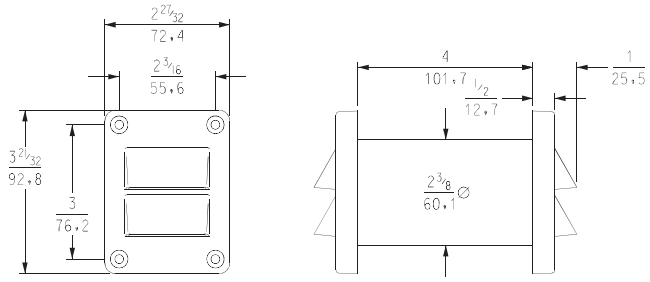
THERMOSTOP INC.

3775, boulevard Losch, Longueuil (Québec), Canada J3Y 5T7,
Tel.: (450) 678-8666, Fax: (450) 678-7765,www.thermostop.com

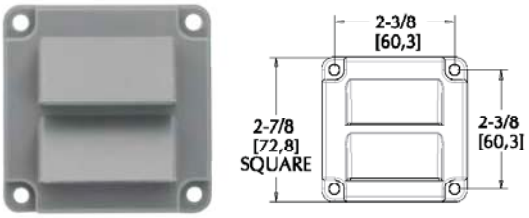
Distributor: AIRMP INC.	Date: 05–09–2017	Drawn by:	Verify by:	Page:	**Note :**
Customer:	Revision:	F.L.	L.H.	1/2	*Drawings not to scale

ITEM # 1825

STANDARD LOUVER



SQUARE LOUVER



US Patent No. 6,176,776

1825 NARROW JAMB HEATED VENT

- Exclusive, patented Kason ventilator seals tight and opens at lowest pressure of any competitive vent.
- Lightweight, springless valves provide greater air flow at lower pressure than spring-loaded valves.
- Lower pressure allows doors to open and close with ease and reduces stress on walk-in enclosure joints, reducing chance of leaks.
- Computer-designed heater eliminates valve freezing.
- Narrow profile unit mounts in door jamb.
- Port installs through 2 1/2" (63.5mm) diameter hole with minimal wiring.
- Poppet valves close tightly to prevent air leakage.
- Engineered to optimize the self-closing potential of Kason Walk-in hinges, latches and door closers.

PERFORMANCE TESTED

Comprehensive performance tests show that Kason 1825 pressure relief ports provide better air flow at lower pressure and greater frost resistance than competitive ventilators.

SPECIFICATIONS

MATERIAL:
Gray ABS plastic valve body and louvers, PVC tube, internal aluminum and stainless steel parts.

POWER:
.04 amp @ 120 VAC; 4W heater.
.02 amp @ 230 VAC; 4W heater.

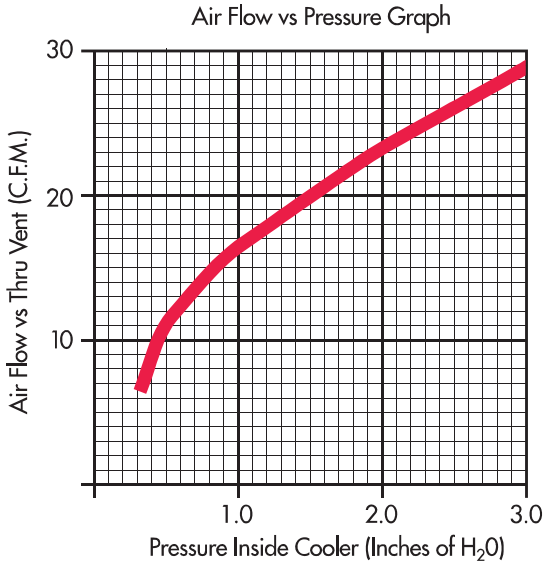
UL LISTING:
File No. E57306

SELECTION:
See Quantity Selector Chart, page B-59.

MOUNTING:
No. 1825 only mounts horizontally. Drilled for No. 10 (5.0mm) screws. Requires 2-1/2" (63.5mm) diameter hole.

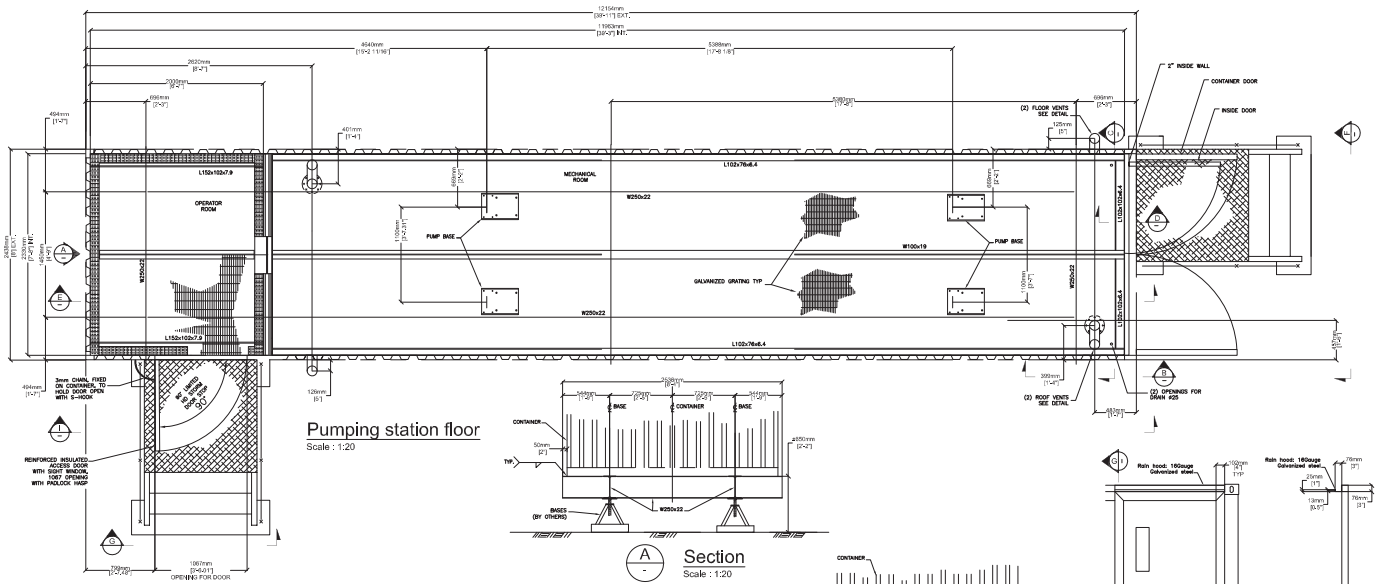
Model No.	Item	Qty/Carton	Wgt./Carton
11825000004	Heated Vent, 120 VAC, 4" Wall	10	7 lb. (3.2 kg)
11825000006	Heated Vent, 230 VAC, 4" Wall	10	7 lb. (3.2 kg)
11825S00004	Heated Square Louver Vent, 120 VAC, 4" Wall	10	7 lb. (3.2 kg)
11825S00006	Heated Square Louver Vent, 230 VAC, 4" Wall	10	7 lb. (3.2 kg)
11825000008	Unheated Vent, 4" Wall	10	7 lb. (3.2 kg)

*Other thicknesses available. Contact factory.



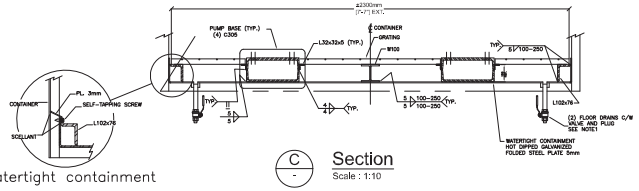
4. General arrangement drawings

Imprimé le : 2017-06-13 09:31:06



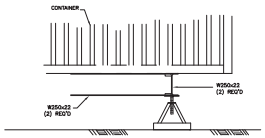
Pumping station floor
Scale : 1:20

A Section
Scale : 1:20

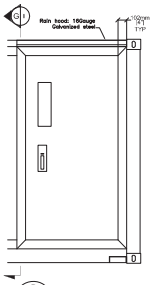


C Section
Scale : 1:10

Watertight containment

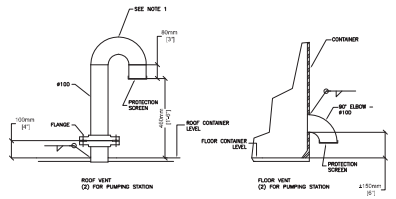


B Section
Scale : 1:20

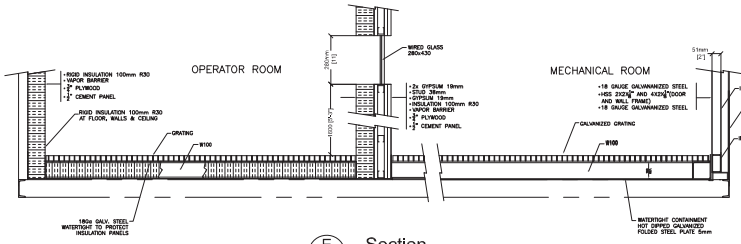


G Section
Scale : 1:10

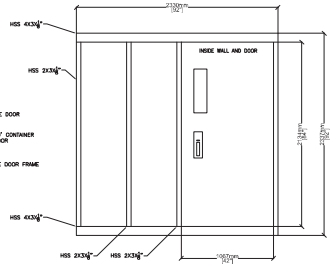
H Section
Scale : 1:10



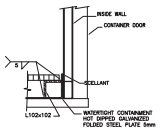
Vent for pumping station
Scale : 1:10



E Section
Scale : 1:10



F VIEW
Scale : 1:10



D SECTION
Scale : 1:10

PAINTING SPECIFICATION:
1 - SOLVENT CLEANING, SSPC-SP1
2 - APPLICATION OF "DEUTHANE 359" POLYURETHANE, 2 TO 3 MILS DRY
3 - COLOR: SLATE BLUE, QC 8260

NOTES:
1 - ALL VENTS, RAIN HOODS AND FLOOR DRAINS WILL BE PREPARED IN OUR SHOP AND SHIPPED LOOSE. HOLES ON THE CONTAINER WILL BE MADE IN OUR SHOP AND BLANKED FOR TRANSPORTATION.

# Rev.	Emission	By	Date
3	Released for contruction	F.S.	2017-05-23
2	For approval	F.S.	2017-05-04
1	For approval	F.S.	2017-05-02

AIRMP
Custom HVAC manufactured products
750, rue Saguenay, Rouyn-Noranda, Québec, Canada, J9X 7B5
Tél. : (819) 762-2818 Télec. : (819) 762-3801
www.airmp.com

Client : Groupe PROMEC Inc.

Project : 65-403-245-200, Pumping station

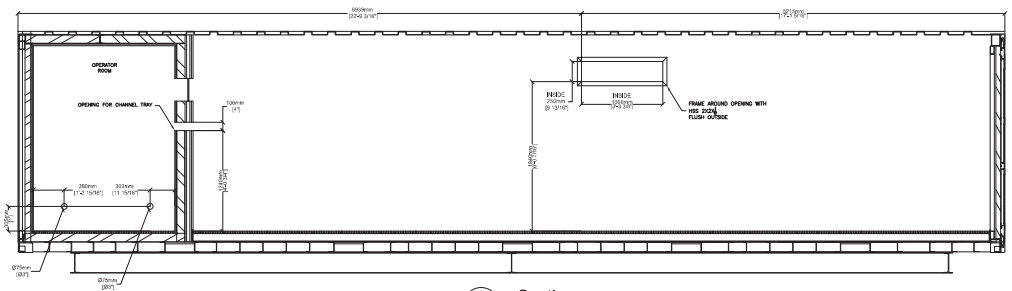
Title : General arrangement drawing

Designed by : WSP	# Quote : 17-0062	Sheet : 1 de 2
Drafted by : Francis St-Pierre	# Project : AMP17-17	
Verified by : Groupe PROMEC Inc.	# Drawing : AMP17-17 PS2	

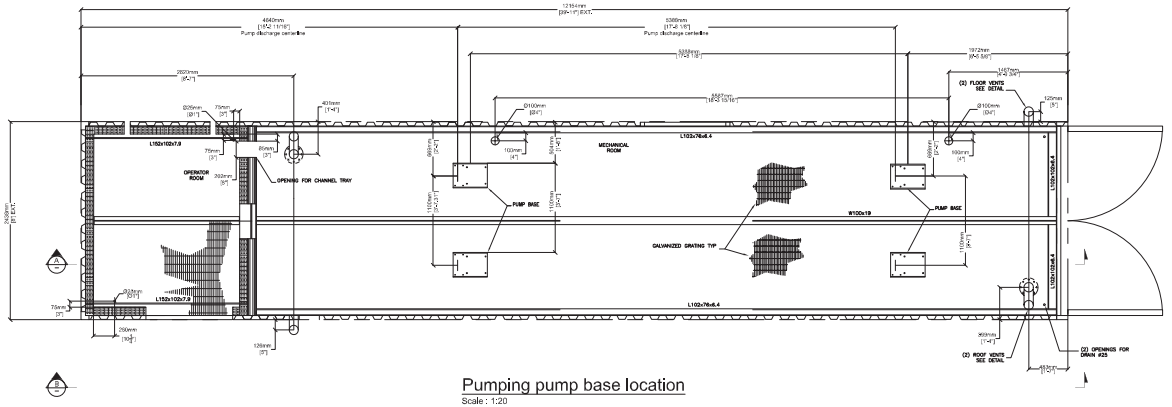
R:\Projets\AMP\17-17\3 Dessins\Dessins d'approbation\PS2 - 403\AMP17-17 PS2.dwg

Format : 11"x17" (Paysage)

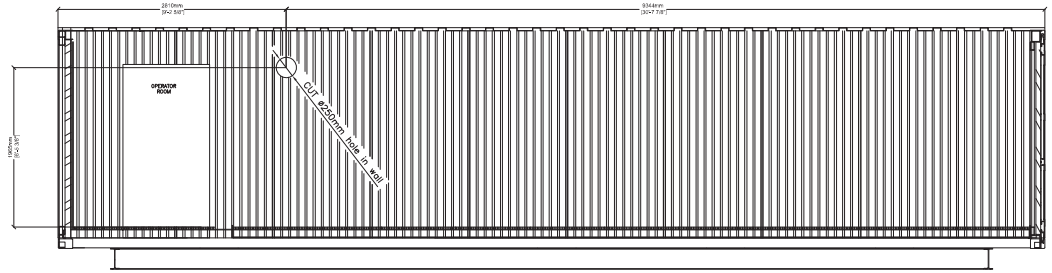
Imprimé le : 2017-06-13 09:34:57



A — Section
Scale : 1:20



Pumping pump base location
Scale : 1:20



B — Section
Scale : 1:20

# Rev.	Emission	By	Date
2	For construction	F.S.	2017-06-01
1	For approval	F.S.	2017-05-31

AIRMP
Custom HVAC manufactured products
750, rue Saguenay, Rouyn-Noranda, Québec, Canada, J9X 7B5
Tél. : (819) 762-2818 Télec. : (819) 762-3801
www.airmp.com

Client : Groupe PROMEC Inc.

Project : 65-403-245-200, Pumping station

Title : Pump base and wall opening location

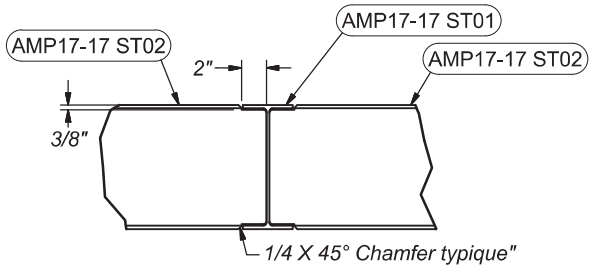
Designed by : WSP	# Quote : 17-0062	Sheet : 2 de 2
Drafted by : Francis St-Pierre	# Project : AMP17-17	
Verified by : Groupe PROMEC Inc.	# Drawing : AMP17-17 PS2	

R:\Projets\AMP\17-17\3 Dessins\Dessins d'approbation\PS2 - 400\AMP17-17 PS2.dwg

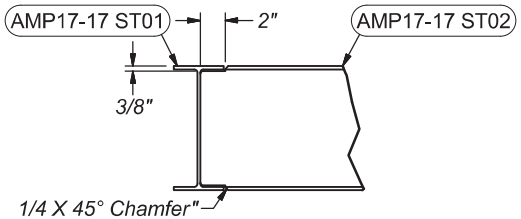
Format : 11"x17" (Paysage)

Liste de matériel (Pour 1 assemblage)

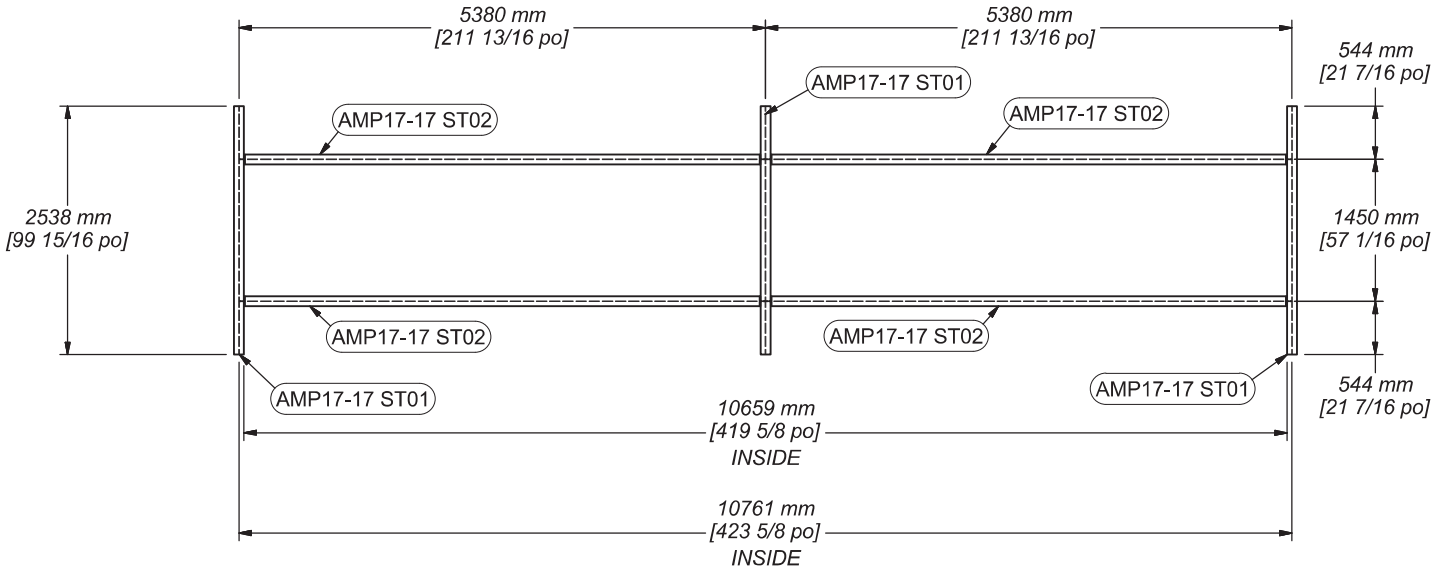
# Pièces	Description	Grade	Détail	Epais.	Largeur	Hauteur	Longueur	Qté	Poids (lb)
AMP17-17 ST01	W250x22 X 8'-3 15/16" LG				10 in	4 in	99 15/16 in	3	124
AMP17-17 ST02	W250x22 X 17'-7 5/8" LG				10 in	4 in	211 5/8 in	4	261

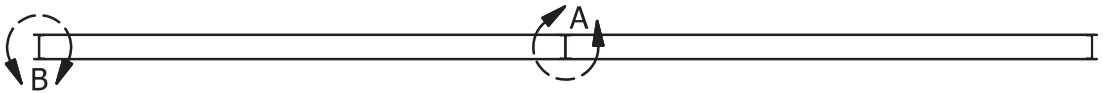


Détail A
Échelle 1 / 10



Détail B
Échelle 1 / 10





AIRMP.CA
Manufacturier de produits CVAC sur mesure

NOTES GÉNÉRALES :
GENERAL NOTES :

PROJET :
PROJECT # : **AMP17-17**

CLIENT :

TITRE :
TITLE :

PIECE :
PARTS : 40' pumping station - Under structur

QTÉ :
QTY : req.

POIDS :
WEIGHT : 1415 lb

SCEAU & SIGNÉ :
SEAL & SIGNED :

DESSINÉ :
DRAWN : Francis St-Pierre, Ing.

VÉRIFIÉ :
CHECKED : Richard Piquette

DATE : 2017-06-01

FEUILLE :
SHEET : 1 / 1

DESSIN REFERENCE :
REFERENCE DRAWING :

No. DESSIN :
DRAWING No. : **AMP17-17 ST_2**

REV: **0**

R:\Projets\AMP17-17\3 Dessins\Dessins de fabrication\ST - Structure\AMP17-17 ST_2.idw

AIRMP.CA
Custom HVAC manufactured products

Inspection report – As built unit dimensions

Contract number : Amp17-17 (ER2-403) 1/2
Client : Groupe promec inc.

CLIENT IDENTIFICATION:					
Monitored points	**C**	**NC**	**NN**	**Comments**	**Reference documents**
Validation of dimensions according to plans	☑	☐	☐		
					C : complying NC : non-complying NN : not-needed

Verified by : Karen Gendreau-Lacoste **Signature :** Karen G. lacoste **Date :** 24 mai 2017

Reviewd by : Richard Piquette, Operations director **Signature :** _____ **Date :** _____

AIRMP.CA
Custom HVAC manufactured products

Inspection report - General

Contract number : Amp17-17 (ER2-403) 1/2
Client : Groupe promec inc.

CLIENT IDENTIFICATION:

1. General look of the container

Points subject to monitoring	C	NC	NN	Comments	Reference dosumentation
1,1 State of the doores (joints, windows, etc.)	☑	☐	☐		
1,2 General structure state	☑	☐	☐		
1,3 Inside finnish	☑	☐	☐		
1,4 Sticker installation (Coils, units, etc.)	☐	☐	☑		
1,5 Cleanliness	☑	☐	☐		
1,6 Sealant joints	☑	☐	☐		

C : complying NC : non-complying NN : not-needed

2. OTHER INTEGRATED EQUIPMENTS & TESTS						
	Points subject to monitoring	**C**	**NC**	**NN**	**Comments**	**Reference dosumentation**
2,1	Insulation (Installation as per specification)	☑	☐	☐		
2,2	Vents and piping	☐	☐	☑		
2,3	Watertight containment and drains	☐	☐	☑		
2,4	Filters and framing (state, type, number, arrangements, etc.)	☐	☐	☑		
2,5	Lights, sockets, switches (type, number, etc.)	☐	☐	☑		
2,6	Instrumentation (pressure, flow, temperature, etc.)	☐	☐	☑		
2,7	The state and disposition of other components (burner, water seperator, special filters, humidifier, electrical coils, etc.)	☐	☐	☑		
2,8	Silencers, valves, air scrubbers, etc.	☐	☐	☑		
2,9	Detailed pictures	☑	☐	☐		
2,10	Nameplates	☑	☐	☐		
					C : complying NC : non-complying NN : not-needed	

Verified by : Karen Gendreau-Lacoste **Signature :** Karen G. Lacoste **Date :** 24 mai 2017

Reviewed by : Richard Piquette, Operations director **Signature :** _____ **Date :** _____

AGNICO EAGLE

Vendor Document Status

1 ☐ Proceed to next submission and status.

2 ☐ Proceed with exceptions as noted to next submission and status.

3 ☐ Do not proceed.
Revise as noted and resubmit next submission and status.

4 ■ Complete, no further submission required.

By: LUC SÉNÉCAL Date: 2017-06-09

Review and authorization to fabricate are only for general conformance with the design concept of the Project as expressed in the Contract Documents. Sole responsibility for the accuracy and completeness of this document, including but not limited to dimensions and quantities, remains with the Supplier/Contractor. Agnico Eagle does not warrant the accuracy or completeness of any of the information contained herein, nor does Agnico Eagle authorize or approve any construction means, methods, techniques, sequences or any safety precautions or procedures.

Agnico Eagle No. 6515-C-270-007-265-EDS-0031 R: Sub002

DOCUMENT FOR INFORMATION

AIRMP.CA
Manufacturier de produits CVAC sur mesure

750, rue Saguenay
Rouyn-Noranda (Québec) J9X 7B5

Téléphone : 819 797-1234
Télécopieur : 819 762 3801

PRE FABRICATED BUILDING

TECHNICAL SPECIFICATION

Equipment: **6515-403, Electrical room**

Date: **May** 23 **2017**

Client : **PROMEC**

Responsable: **Eric Poulin, piping Director**

Contract: **AMP17-17**

Revision : For fabrication

Submitted by : **Francis St-Pierre, Ing.**

Serial number : **AMP00379**

Table of Contents

Manufacturier de produits CVAC sur mesure

Project : 6515-403, Electrical room
Client : Promec

Nomenclature

AMP -	PFB	2	160	E

BRAND

AMP- AIR MP

MODEL

PFB- PRE FABRICATED BUILDING

AHU- AIR HANDLING UNIT

INSTALLATION

1- INTERIOR

2- EXTERIOR

FT²

TYPE OF BUILDING

E- E-HOUSE

M- MECHANICAL ROOM

1. General characteristics

AIRMP.CA
Manufacturier de produits CVAC sur mesure

Project : 6515-403, Electrical room
Client : Promec

General characteristics

Type of unit

- ☐ Recirculation
- ☐ Cooling
- ☐ Filtration
- ☐ Heating
- ☒ Shelter
- ☐ Evacuation
- ☐ Air compensation

Emplacement

- ☐ Interior
- ☒ Exterior

Dimensions

	Length	Width	Height
Building (mm)	6058	2438	2591
Estimated weight	5 500 kg		

By others

- ☒ Support pilars
- ☒ On site assembly
- ☒ Electrical integration
- ☒ HVAC
- ☒ Lighting services

Notes :

Standard 20’ container

2. Fabrication characteristics

Manufacturier de produits CVAC sur mesure

Project : 6515-403, Electrical room
Client : Promec

Fabrication characteristics

Structure : 20 foot standard container

	Tôle				Gauge				Insulation		Thickness			R value
	AL	CP	GA	P	1/8	1	20	26	AI	TI	2"	4"	10"	
Interior finish	☐	☒	☐	☒	☐	☐	☐	☐	☐	☒	☐	☒	☐	26
Exterior finish	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	--
Ceiling	☐	☒	☐	☒	☐	☐	☐	☐	☐	☒	☐	☒	☐	26
Roof	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	--
Floor	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒	☐	☒	☐	26

Finish

	Specification
Structural steel	Prep: Sandblast SSPC6 / Paint: Epoxy Barust 235, 8 to 12 mils dry
Exterior finish	Paint: Solvent clean SSPC1 / Polyurethane “Decthane 359” 2 to 3mils dry, Color: Slate Blue (QC 8260)
Inside finish	Galvanized grating on floor. Cement panels on walls.

AL:	ALuminum checker plate	CP:	Cement panel ½’’	GA:	Galv. sheet metal	P:	Plywood ¾’’
AI:	Acoustic insulation	TI:	Thermal insulation				

5/10/17 16:31:26

EMAIL PAGE COUVERTURE

==========

Société: Acier Leroux - Amos

5/10/17 16:31:26 Document Sommaire

Page couverture 1

Objet: MILL TEST CERTIFICATE

NO.COMMANDE :89337400

No.Bc Du Client :AIR-1822

City : ROUYN-NORANDA State/Province . QC

Séquence correspondant au(x) MTR imprimé(s):

Description item:	Coulée	MTR
1/8 X 1 19-4 CAILLEBOTIS GALV	LETTRE CONFORME	089026959

FISHER & LUDLOW
A NUCOR Company

CERTIFICAT DE CONFORMITÉ 2017

ACIER LEROUX
1331 Graham Bell
Boucherville, Qc
J4B 6A1

ATTN: Chantal Boisvert

A qui de droit,

Fisher & Ludlow certifie que le matériel utilisé pour la fourniture et/ou la fabrication du caillebotis soudé en acier, décrit ci-dessous, selon votre commande, est conforme à la norme de NAAMM MBG 531-00, NAAMM MBG 532-00.

DESCRIPTION	SPECIFICATION
Caillebotis et attaches	
Non peint, peint noir et galvanisé	ASTM -A1011/A1011M
Aluminium	ASTM -B221/B221M
Acier inoxydable	ASTM - A666
Planches de sécurité Grip Span & Shur Grip	
Pre-galvanise	(G90) - (ASTM - A653)
Aluminium	5052-H32 (ASTM-B209)
Acier inoxydable	(ASTM - A666)
Barreaux d'echelles et feuilles "Shur Step"	
H.R.P.O.	(ASTM - A569/A569M)
Alumnium	5052-H32 (ASTM-B209)
Acier inoxydable	(ASTM - A666)

Fisher & Ludlow Division Nucor
12450, Boul. Industriel Montreal, Pointe-aux-Trembles, Qc H1B 5M5
Tel: 514.640.5085 1.800.268.6277 *Télécopieur/Fax:* 514.640.1115

LEROUX

089026959

PermaBase[MD] BRAND

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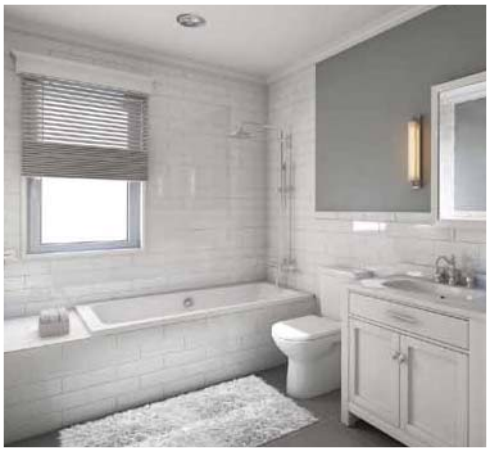
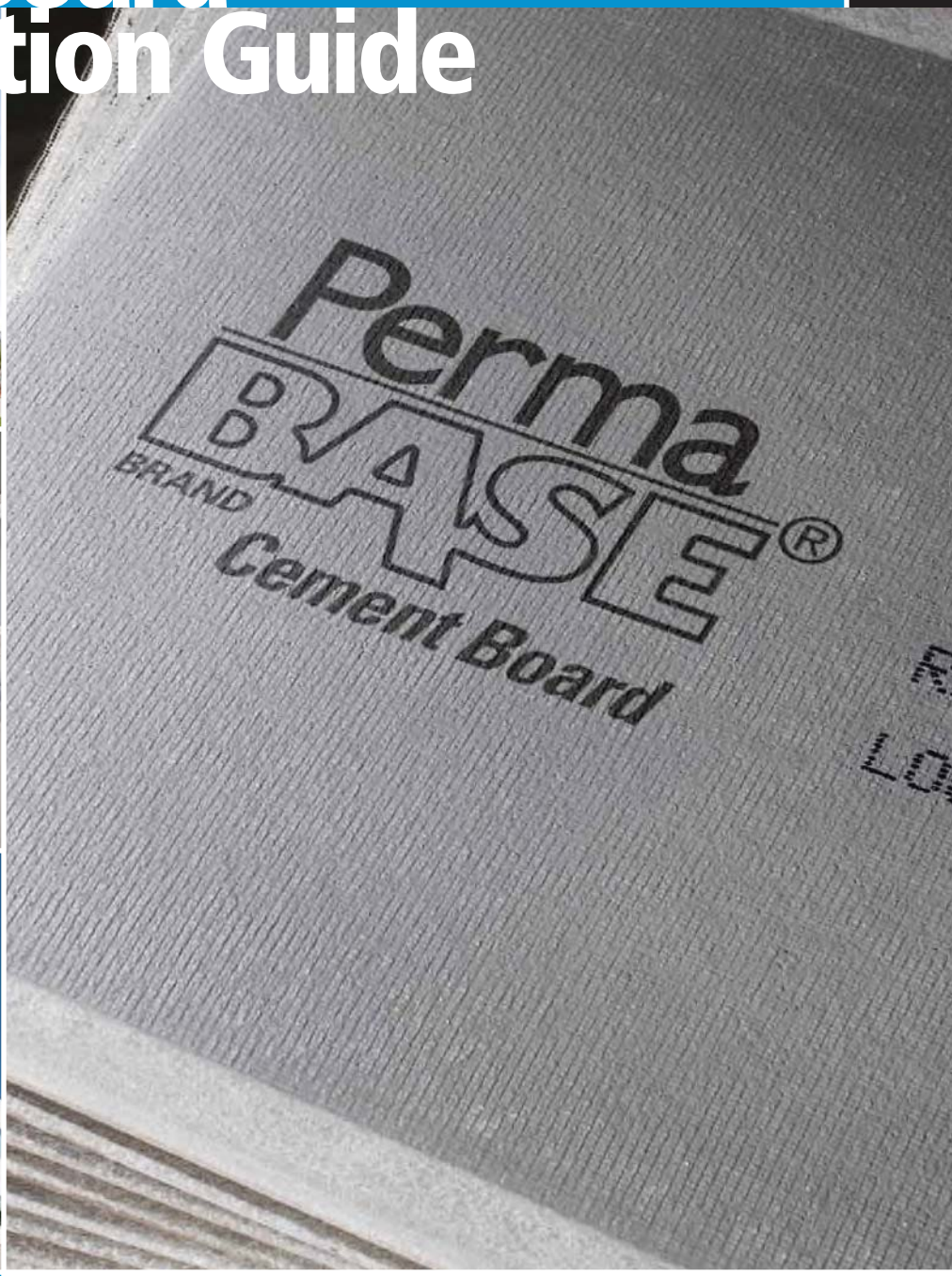
Cement Board Construction Guide





UNIFIX INC.®

A Subsidiary Of National Gypsum Company

Helping You Build Better

Look Closer At The Best Cement Board Substrate

With High-Quality Products And Resources

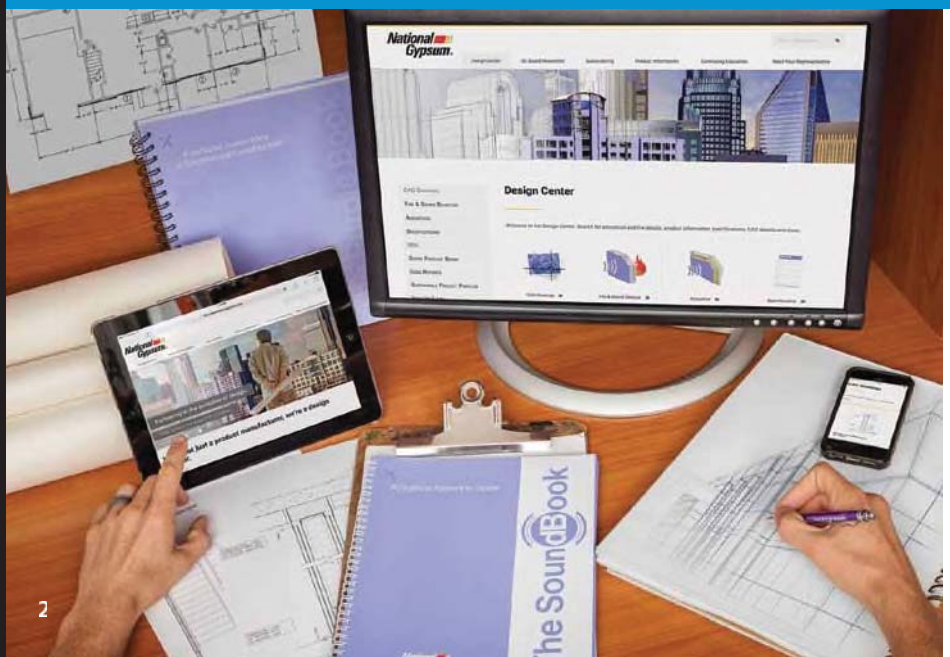
Founded in 1925, National Gypsum is one of the world's largest producers of quality building products. For nearly a century, customers like you have looked to us for the best products, service and technical support. With a focus on sustainability, we strive to bring you the finest in construction products, education and resources to meet and exceed your expectations.

With Design That Considers The Environment

Together, we can attain the highest level of ecological responsibility and resource-efficient technology. National Gypsum is committed to developing and implementing sustainable green building policies, standards and practices. Beyond offering products that can help contribute to healthier environments and have achieved GREENGUARD Certification for indoor air quality, we can help you meet the criteria for green programs and LEED credits.

GREENGUARD GOLD

PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS: UL.COM/GG UL 2818



With Technical Support You Can Count On

Great products are nothing without great customer service. For detailed technical information about product applications, installation requirements, code requirements or roof and wall assemblies, call 1-800-NATIONAL[MD]. Talk directly to a technical expert with up-to-date knowledge of products, specifications, building codes and more. Our technical experts can even review your plans and drawings and get back to you with answers to your questions within 48 hours.

Working Wherever Your Project Takes You

Choose From Four Types Of PermaBase[MD] BRAND Cement Board:

More Hard-Working Varieties With Qualities You Can Depend On

With four types of PermaBase[MD] BRAND Cement Board to choose from, you'll find a match for most any project. This durable substrate withstands prolonged exposure to moisture in both interior and exterior applications. Lightweight and easy to install, PermaBase promises to deliver for the long run – with the industry's best warranties. It is also GREENGUARD Certified for low-chemical emissions, which can contribute to healthier indoor environments.

Saving You Time And Money

These exclusive PermaBase features translate to cost savings for you:

EdgeTech[MD] Technology – This patented, reinforced edge allows fasteners to be installed closer to the board's edge and reduces damage from handling.

Polystyrene Beads – Embedded in the PermaBase core, these beads help to lighten the board's weight, improve the ease of cutting, and create lower water absorption, preventing the mortar/finish adhesive from drying prematurely.

Our PermaBase[MD] Product Family

1 PermaBase[MD] Cement Board

The original that set the industry standard.

2 PermaBase PLUS[MD] Cement Board

Weighs 25% less than other cement boards on the market.

3 PermaBase UltraBacker[MD] Cement Board

Provides excellent rigidity for special applications with the lowest water-absorption rate.

4 PermaBase Flex[MD] Cement Board

Very flexible yet strong, and ideal for use around archways, columns, stairwells – wherever an evenly curved surface is required.

APPLICATIONS

Product	Floors	Countertops	Walls	Ceilings	Exteriors
1/4" PermaBase	●	●	○	○	○
1/4" UltraBacker	●	●	○	○	○
7/16" PermaBase PLUS	●	●	●	●	●
1/2" PermaBase	●	●	●	●	●
1/2" PermaBase PLUS	●	●	●	●	●
5/8" PermaBase	●	●	●	●	●
5/8" PermaBase PLUS	●	●	●	●	●
1/2" PermaBase FLEX	○	○	●	●	●

Recommended: ● Yes ○ No

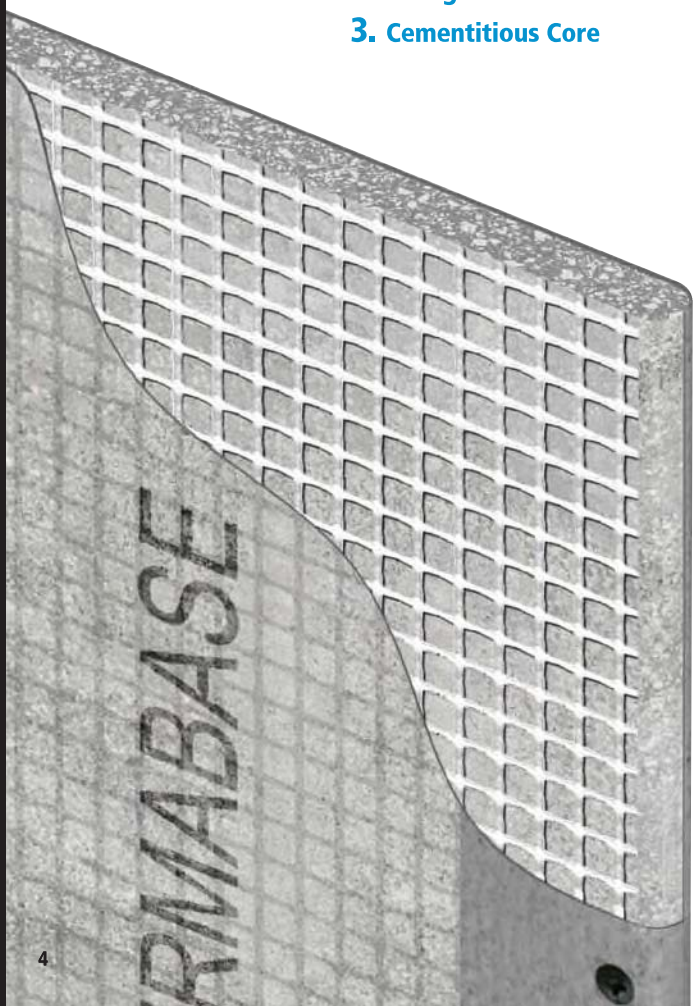
Building In Strength And Quality

Reinforce With The Best Rigid Substrate: PermaBase[MD] BRAND Cement Board

PermaBase[MD] provides a durable surface designed to withstand prolonged exposure to moisture. Made with Portland cement, aggregate and fiberglass mesh, it works well as an underlayment for tub and shower surrounds, countertops, flooring and a variety of other interior and exterior applications. Lightweight and easy to install, our patented EdgeTech[MD] Technology allows a closer nail or screw application.

Quality To The Core

1. **Patented Reinforced Edge**
2. **Fiberglass Mesh**
3. **Cementitious Core**



Resists Moisture Better

- Stays intact when exposed to water: will not rot, disintegrate or swell – built for the long run.
- Achieves the industry's lowest water-absorption rating (ASTM C473) – offering better installation.
- Helps inhibit mold growth with the highest possible score on mold tests (ASTM D3273 and ASTM G21).

Stays Strong And Lasts Long

- Resists impact and remains dimensionally stable – extending the life of your project.
- Holds up to the toughest conditions.

Installs Quickly

- Lightweight and easy to cut – speeding up installation.
- Reduces jobsite waste – easier, cleaner cut.
- Patented EdgeTech[MD] Technology allows for a closer edge fastening and reduces damage from handling.

Works For Interior And Exterior Projects

– One Panel, Many Applications

- Adhere tile, stone or thin brick directly to PermaBase in exterior applications – saving time and money.
- Durable substrate for direct-applied coating systems.
- Meets UL & ULC classifications for one- and two-hour fire-rated assemblies.
- Building code approved – one substrate that does the job of many.

Offers Best In Class Warranty

- Lifetime Limited Warranty: Interior applications.
- 15-Year Limited Warranty: Exterior applications.

What Sets PermaBase[MD] Apart From The Rest?

Physical Feature Benefits	PermaBase Cement Board	Other Cement Boards	Fiber Cement Boards
Low Weight Glass Mesh Cement Board	✓	○	○
Reinforced Edge	✓	○	○
Fastens Near Edge With No Breakout	✓	○	○
Highest Damage Resistancy From Handling	✓	○	○
Cleanest To Score And Snap	✓	○	○
Lowest Water Absorption	✓	○	○
Meets 40 psf Rating Wind Load Test Results (Stud spacing 16" o.c.)	✓	○	○
Cuts With Utility Knife Vs. Power Tools	✓	✓	○
Standard Fasteners Countersink Into Board	✓	✓	○
Can Be Used In Both Residential And Commercial Steam Rooms And Saunas	✓	✓	○
Inorganic Vs. Organic Core	✓	✓	○
Lifetime Limited Warranty For Interior Use	✓	✓	○
15-Year Warranty For Exterior Use	✓	○	○

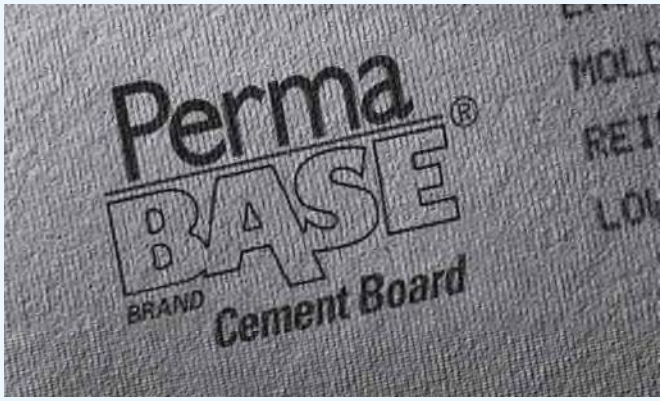
Product Feature: ✓ Yes ○ No

Expanding Your Project Horizon

Dream Up Your Designs – Interior And Exterior

Install Fast, Cut Costs And Improve Quality With PermaBase[MD] BRAND Cement Board

- Stays strong – manufactured from cement and fiberglass reinforcement.
- Provides consistent quality – produced in a factory controlled environment and meets ASTM C1325.
- Remains dimensionally stable.
- Resists moisture and mold.
- Cuts and handles easily – patented EdgeTech[MD] Technology allows fasteners to be installed closer to the board's reinforced edge and reduces damage from handling.
- Absorbs less water – providing greater open time and increased workability of adhering materials.
- Offers performance enhancement options – stronger and lighter alternative to traditional methods.



Interior Applications

PermaBase[MD] is a superior underlayment for many interior applications, including:

- **Kitchens**
  - Countertops
  - Backsplashes
- **Bathrooms**
  - Shower and tub enclosures
  - Garden and whirlpool tubs
  - Steamrooms and saunas
- **Special Additions**
  - Swimming pool and whirlpool decks and enclosures
- **Flooring**
  - For kitchens and bathrooms
  - For entryways and foyers
  - For laundry rooms
- **Walls**
  - For bathrooms
  - For accent walls
  - For fireplaces

Exterior Applications

PermaBase provides an excellent substrate for many in-demand exterior applications, including Cement Board Masonry Veneer Wall System (CBMV), Cement Board Stucco System (CBSS), Continuous Insulation (CI), and Exterior Insulation and Finish System (EIFS). PermaBase allows the combination of exterior finishes on one continuous wall sheathing, providing greater design flexibility.

- Commercial exteriors
- Residential exteriors
- Outdoor kitchens
- Decks

Cement Board Masonry Veneer Wall System (CBMV)

Combine the strength and durability of PermaBase with the popular beauty of stone and thin brick veneers. Use in residential and low-rise commercial applications.

Cement Board Masonry Veneer Wall System is designed to:

- Offer a complete, engineered solution for installation.
- Provide increased performance by utilizing polymer modified adhesive mortars (designed for hanging materials) vs. type S and N mortars (developed for stacking materials).
- Speed up your schedule – faster, easier and cleaner than traditional metal lath/scratch coat method.
- Offer the ability to incorporate an effective water-management system (type and placement of water barrier will vary based on local codes and/or warranties).

Designs you can achieve with this system:

- Use for a variety of building exteriors with manufactured or natural stone and thin brick veneers.

Note: A code-approved Water/Air Resistive Barrier (WRB) must first be installed to protect the cavity. For limitations, please see page 17 (Installation Guide).

Cement Board Stucco Wall System (CBSS)

Combine the strength and durability of PermaBase with the performance and aesthetics of reinforced base coats and textured finishes. Use in residential and low-rise commercial applications.

Cement Board Stucco Wall System is designed to:

- Provide increased impact and weather resistance (appropriate for all climates).
- Resist dirt, fading, cracking and peeling.
- Speed up your schedule – easier, cleaner installation than traditional stucco.
- Provide drainage system to help prevent water from penetrating behind cladding in frame construction.
- Comply with ASTM D226, protecting approved sheathings/structural components and helping to evacuate incidental water.

Designs you can achieve with this system:

- Attachment of special pre-molded shapes.
- Variety of finishes – many texture and color options.

Note: A code-approved Water/Air Resistive Barrier (WRB) must first be installed to protect the cavity. See page 17 (Installation Guide).

More Reasons PermaBase Is Excellent For Exterior Applications

- Allows multiple finishes on one substrate.
- Saves time and labor when compared with field-applied metal lath, brown and scratch coat installations.
- Works rain or shine – less affected by jobsite weather conditions.
- Scores and snaps for quick installation.
- Qualifies for multiple-year system warranties.

PHYSICAL PROPERTIES

Property Method	Test	1/4"	7/16" PLUS	1/2"	5/8"
Water Absorption % By Weight/24 Hours	ASTM C473	<8	10	<8	<8
Flexural Strength (psi)	ASTM C47	>1750	750	750	>1000
Fastener Holding (Wet And Dry, lbs.) (0.400" head diameter)	ASTM D1037	>85	>90	>90	>90
Weight (psf)	ASTM C473	1.8	2.1	2.9	3.65
Freeze/Thaw (Cycles) Per ASTM C666 Procedure B	ASTM C666	100	100	100	100
Flame Spread/Smoke Developed	ASTM E84 CAN/ULC-S102	0/0	0/0	0/0	0/0
Compressive Strength (psi) (Indentation)	ASTM D2394	N/A	N/A	1250	1250
Wind Load (psf, Studs 16" o.c.)	ASTM E330	N/A	30	40	40
Thermal "R"/k Value	Property of Material	0.2/2.7	0.28/2.7	0.37/2.7	0.47/2.7
Bending Radius (ft.)	Property of Material	N/A	5	5	5
Falling Ball Impact (12" Drop)	ASTM D1037	Pass	Pass	Pass	Pass
Linear Variation (Due to change in moisture content)	ASTM D1037	<0.07%	0.05%	0.05%	0.05%
Fungus Resistance	ASTM G21	(No growth)	(No growth)	(No growth)	(No growth)
Mold Growth On Surface	ASTM D3273*	10	10	10	10

*When tested by an independent laboratory per ASTM D3273 ("Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber"), PermaBase achieved a panel score of 10, the highest score possible, indicating no mold growth under the laboratory test conditions. The use of PermaBase in actual installations may not produce the same results as were achieved in controlled laboratory conditions. No material can be considered "mold proof," nor is it certain that any material will resist mold indefinitely.

SIZES AND PACKAGING

Size: Thickness, Width And Length	# Of Pcs Per Unit
PermaBase Cement Board	
1/2" x 32" x 5' (12.7 mm x 813 mm x 1524 mm)	50
1/2" x 32" x 8' (12.7 mm x 813 mm x 2438 mm)	30
1/2" x 36" x 4' (12.7 mm x 914 mm x 1219 mm)	50*
1/2" x 36" x 5' (12.7 mm x 914 mm x 1524 mm)	50
1/2" x 36" x 6' (12.7 mm x 914 mm x 1829 mm)	50*
1/2" x 36" x 8' (12.7 mm x 914 mm x 2438 mm)	30
1/2" x 48" x 8' (12.7 mm x 1219 mm x 2438 mm)	30
5/8" x 36" x 5' (15.9 mm x 914 mm x 1524 mm)	40
5/8" x 48" x 8' (15.9 mm x 1219 mm x 2438 mm)	24
3/8" x 48" x 8' (9.5 mm x 1219 mm x 2438 mm)	40*
3/4" x 48" x 8' (19.0 mm x 1219 mm x 2438 mm)	20*
PermaBase Underlayment	
1/4" x 48" x 4' (6.4 mm x 1219 mm x 1219 mm)	60
1/4" x 36" x 5' (6.4 mm x 914 mm x 1524 mm)	60

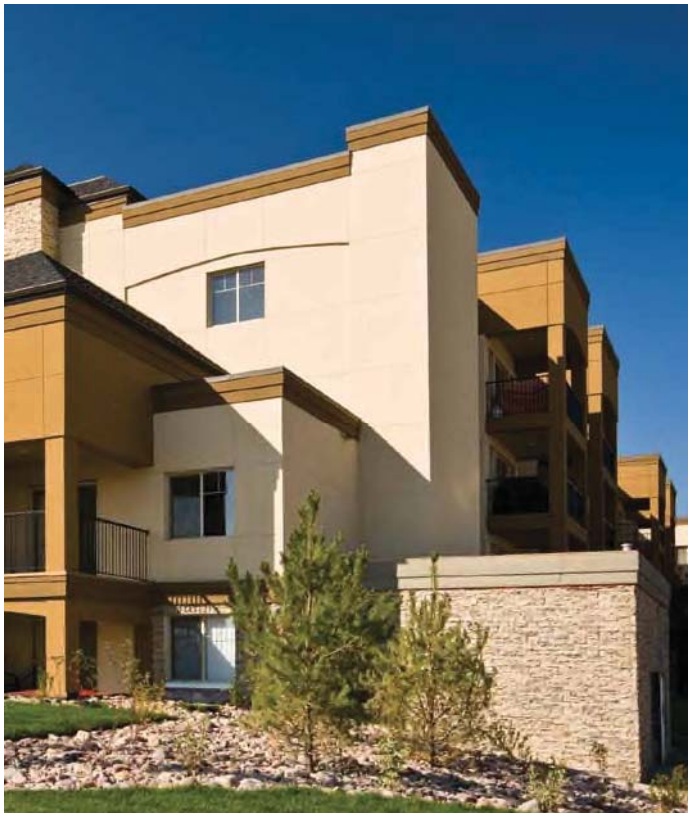
* Special Order

For installation instructions and accessories, see page 12.

Lighter, Faster And Easier

When You Want The Best Lightweight Rigid Substrate: PermaBase BRAND PLUS Cement Board

This board has the same exceptional qualities built into PermaBase Cement Board but weighs 25% less. When you need to lighten your load, consider PermaBase PLUS for all interior and exterior applications.



Resists Moisture Better

- Stays intact when exposed to water: will not rot, disintegrate or swell – built for the long run.
- Achieves the industry's lowest water-absorption rating (ASTM C473) – offering better installation.
- Helps inhibit mold growth with the highest possible score on mold tests (ASTM D3273 and ASTM G21).

Stays Strong And Lasts Long

- Resists impact and remains dimensionally stable – extending the life of your project.
- Holds up to the toughest conditions.

Installs Fast And Easy

- Lightweight and easy to cut – speeding up installation.
- Reduces jobsite waste – easier, cleaner cut.
- Patented EdgeTech[MD] Technology allows for a closer edge fastening and reduces damage from handling.

Works For Interior And Exterior Projects

– One Panel, Many Applications

- Great for all interior applications, as well as exterior decks and outdoor kitchens.
- Meets UL & ULC classifications for one- and two-hour fire-rated assemblies.
- Building code approved – one substrate that does the job of many.
- Adhere tile, stone or thin brick directly to PermaBase PLUS in exterior applications – saving time and money.
- Durable substrate for direct-applied coating systems.

Offers Best In Class Warranty

- Lifetime Limited Warranty: Interior applications.
- 15-Year Limited Warranty: Exterior applications.

PermaBASE BRAND PLUS® Cement Board

SIZES AND PACKAGING

Size: Thickness, Width And Length	# Of Pcs Per Unit
7/16" x 36" x 5' (11.1 mm x 914 mm x 1,524 mm)	60
1/2" x 48" x 8' (12.7 mm x 1,219 mm x 2,438 mm)	40
5/8" x 48" x 8' (15.9 mm x 1,219 mm x 2,438 mm)	32

For installation instructions and accessories, see page 12.

PermaBase BRAND UltraBacker Cement Board

Smoother, Stronger, More Stable

When You Want The Best Rigid 1/4-Inch Underlayment That Buys You More Open Time: PermaBase BRAND UltraBacker Cement Board

UltraBacker features a smooth mesh and mat surface. The 1/4-inch thickness eliminates the need to modify adjacent thresholds when abutting it to carpet, hardwood and other common flooring materials.

Resists Moisture Better Than Any Other Cement Board

- Features the *lowest water-absorption rating of <8%* (ASTM C473) – offering better installation.
- Stays intact when exposed to water: will not rot, disintegrate or swell – built for the long run.
- Helps inhibit mold growth with the highest possible score on mold tests (ASTM D3273 and ASTM G21).

Stays Strong And Lasts Long

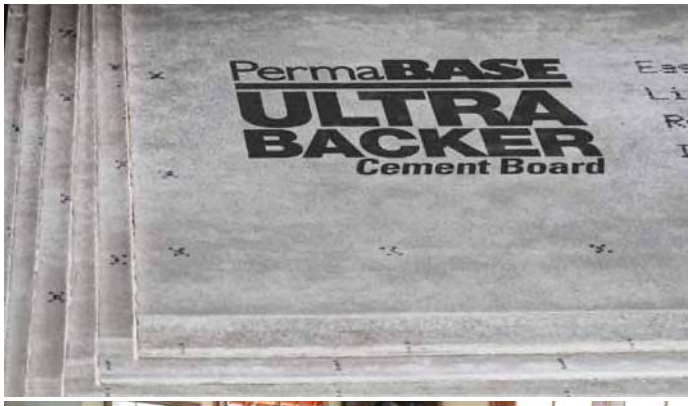
- Resists impact and remains dimensionally stable – extending the life of your project.
- Holds up to the toughest conditions.
- 30% stronger and four times more rigid than competitive 1/4-inch cement board.

Installs Fast And Easy

- Can be applied over new or existing countertops or as a flooring underlayment – pre-manufactured panels save you time.
- Reduces jobsite waste – easier, cleaner cut.
- Patented EdgeTech[MD] Technology allows for a closer edge fastening and reduces damage from handling.

Offers Best In Class Warranty

- Lifetime Limited Warranty: Interior applications.



PermaBASE BRAND ULTRA BACKER Cement Board

SIZES AND PACKAGING

Size: Thickness, Width And Length	# Of Pcs Per Unit
1/4" x 36" x 5' (6.4 mm x 914 mm x 1524 mm)	60

For installation instructions and accessories, see page 12.

PermaBase BRAND Flex Cement Board

Easy To Bend, Yet Stays Strong

When You Want The Best Substrate That Bends Like No Other: PermaBase[MD] BRAND Flex Cement Board

This very flexible PermaBase substrate is ideal to use around archways, columns, beams, or anywhere you need an evenly curved surface. Consider this also for radius shower walls, tub step-ups and stair construction – the possibilities are almost endless.

Resists Moisture Better

- Stays intact when exposed to water: will not rot, disintegrate or swell – built for the long run.
- Achieves the industry's lowest water-absorption rating (ASTM C473) – offering better installation.
- Helps inhibit mold growth with the highest possible score on mold tests (ASTM D3273 and ASTM G21).

Stays Strong Yet Flexes Like No Other Cement Board

- Holds up to the toughest conditions yet bends like no other.
- Resists impact and remains dimensionally stable – extending the life of your project.

Installs Fast And Easy

- Pre-manufactured panels save you time.
- Bends easily – 6" radius at 90°.
- Reduces jobsite waste – easier, cleaner cut.

Offers Best In Class Warranty

- Lifetime Limited Warranty: Interior applications.
- 15-Year Limited Warranty: Exterior applications.

Installation

Installation recommendations for PermaBase Flex are the same as for PermaBase Cement Board with this exception: framing must be spaced a maximum of 8"o.c. (See page 12 for more information.)

Limitations

PermaBase Flex has the same limitations as PermaBase with the following additions:

- For convex surfaces, PermaBase Flex must be applied with the rough surface and tapered edges exposed.
- For concave surfaces, PermaBase Flex must be applied with the smooth surface exposed.
- PermaBase Flex Cement Board should not be used for fire-rated assemblies.
- Maximum framing spacing should not exceed 8"o.c.
- Maximum fastener spacing should not exceed 8"o.c. for wall and 6"o.c. for ceiling applications.

PermaBASE BRAND FLEX® Cement Board

SIZES AND PACKAGING

Size: Thickness, Width and Length	# Of Pcs Per Unit
1/2" x 36" x 6' (12.7 mm x 914 mm x 1829 mm)	25
1/2" x 48" x 8' (12.7 mm x 1219 mm x 2438 mm)*	30

* Special Order

For installation instructions and accessories, see page 12.

Installation Guide

Interior Applications

An ideal substrate for interior applications, such as:

- Shower and tub enclosures
- Garden/whirlpool tubs
- Countertops
- Backsplashes
- Steamrooms and saunas
- Swimming pool and whirlpool decks and enclosures
- Floor underlayment
  - Entryways
  - Kitchens
  - Bathrooms
  - Foyers
  - Laundry rooms

Installation

General: All framing should comply with local building code requirements and be designed to provide support with a maximum allowable deflection of L/360 under all intended loads. Framing members should be spaced a maximum of 16" o.c.

Cut or score PermaBase on printed side of panel. Use a straightedge and pencil to mark line. Use utility knife to score/cut the glass mesh. Snap the board and cut through the now visible glass mesh on the other side. Install tile and tile setting materials in accordance with current ANSI specifications and Tile Council of North America (TCNA) guidelines.

Control Joints: For interior installations, allow a maximum of 30 lineal feet between control joints. A control joint must be installed but not limited to the

following locations: where expansion joints occur in the framing or building (discontinue all cross furring members located behind joint); when boards abut dissimilar materials; where framing material changes; at changes of building shape or structural system; at each story separation. Place control joints at corners of window and door openings, or follow specifications of architect. Control joint cavity shall not be filled with coating or other materials.

Walls And Ceilings

Wall Framing: Edges of PermaBase parallel to framing should be continuously supported. Provide additional blocking when necessary to permit proper PermaBase attachment.

Do not install PermaBase directly over protrusions from stud plane, such as heavy brackets and fastener heads. Studs above a shower floor should either be notched or

Installation Accessories

For a seamless installation, we recommend PermaBase[MD] Tape and PermaBase[MD] Screws.

Fasteners

PermaBase corrosion resistant screws or equivalent, 1-1/4" or 2" long, for use with wood framing. Type S-12 screws or equivalent, 1-1/4" or 1-5/8" long, for use with 20 gauge or heavier steel framing.

Galvanized roofing nails, 1-1/2" long with hot dipped galvanized coating for use with wood framing. Nails should meet Federal Specification #FF-N105B/type 2 style 20.

Joint Reinforcement

PermaBase mesh tape must be used on all edges and cuts made to size. Use 2" wide polymer-coated (alkali resistant) mesh tape for interior applications and 3" wide polymer-coated (alkali resistant) mesh tape for exterior applications.

Bonding Materials

Treat joint and set facing material, preferably with latex-Portland cement mortar or with dry-set (thin-set) mortar. All mortars should comply with ANSI A118.1, A118.4 or A118.15 standards. Type 1 organic adhesive meeting ANSI A-136.1 may be utilized for interior use only.

furred to accommodate the thickness of the waterproof membrane or pan. The surround opening for a tub or precast shower receptor should not be more than 1/4" longer than unit to be installed.

Ceiling Framing: The deflection of the complete ceiling assembly due to dead load (including insulation, PermaBase, bonding material and facing material) should not exceed L/360. The dead load applied to the ceiling frame should not exceed 10 psf. Ceiling joist or furring channel should not exceed 16" o.c. (Edges of PermaBase parallel to framing should be continuously supported.) Provide additional blocking when necessary to permit proper PermaBase attachment.

PermaBase Cement Board: Apply PermaBase with ends and edges closely butted but not forced together. Stagger ends joints in successive courses. Drive fasteners into field of cement board first, working toward ends and edges. Space fasteners maximum 8" o.c. for walls, 6" o.c. for ceilings with perimeter fasteners at least 3/8" and less than 5/8" from ends and edges. Ensure PermaBase is tight to framing.

Fasteners must be installed into framing members. Select proper fastener type and length for the application.

Joint Reinforcement: Trowel bonding material to completely fill the tapered recessed board joints and gaps between each panel. On non-tapered joints apply a 6" wide, approx. 1/16" thick coat of bonding material over entire joint. For all joints, immediately embed 2" alkali resistant fiberglass mesh tape fully into applied bonding material and allow it to cure. For outside corners, 3" wide mesh tape is recommended. Same bonding material should be applied to corners, control joints, trims and other accessories. Feather bonding material over fasteners to fully conceal.

Divider Wall Installation

1. **PermaBase Cement Board**
2. **Membrane**
3. **Latex-Portland Cement Mortar**
4. **Alkali-Resistant Mesh Tape**

Shower Installation

1. **Support Framing 1/4" / 12" slope toward drain**
2. **Plywood, Min. 1/2"**
3. **PermaBase^{MD} Cement Board**
4. **Membrane**
5. **Latex-Portland Cement Mortar**
6. **Alkali-Resistant Mesh Tape**
7. **Sealant**
8. **Tile and Grout**

Floors And Counters

Subfloor Or Base: For flooring applications with 16" o.c. floor joists, 5/8" tongue and groove exterior grade plywood or 3/4" tongue and groove exterior grade OSB may be used. For 19.2" o.c. and 24" o.c. floor joists, 3/4" tongue and groove exterior grade plywood or OSB must be used. Tile size for floors with 24" o.c. floor joists must be 12" x 12" or larger. The joist and subfloor assembly must meet L/360 as well as the appropriate code tables for live and dead loads.

Underlayment: Using a 1/4" square-notched trowel, apply a setting bed of polymer-modified mortar (or thin-set mortar) to the subfloor or counter base. Immediately laminate PermaBase to subfloor or base leaving a 1/8" space between boards at all joints and corners. Leave a 1/4" gap along walls. Stagger all joints so that they do not line up with underlying substrate joints. Fasten PermaBase every 8" o.c. throughout board field and around all edges while setting bed mortar is still workable. Around perimeter of each board, locate fasteners 2" from corners and not less than 3/8" from the edges. Fill all joints solid with bonding material. On non-tapered joints such as butt ends, apply a 6" wide, 1/16" thick coat over the entire joint. For all joints, immediately embed 2" fiberglass mesh tape fully into applied bonding material; ensure that tape is centered over joint. Apply bonding material over fasteners to fully conceal. Remove all excess bonding material and allow to cure.

Limitations

- Joints should be treated with alkali resistant fiberglass mesh tape set in a polymer modified mortar.
- Conventional paper drywall tape, joint compound and drywall nails or screws should not be used.
- Maximum wall framing spacing should not exceed 16" o.c. and must be designed to limit deflection to L/360 under all live and dead loads.
- Steel framing must be 20 gauge (galvanized) or heavier – 16" o.c.
- 1/4" PermaBase and 1/4" UltraBacker should not be used on walls or ceilings.
- PermaBase is not a water barrier. Consult local building code for moisture barrier requirements.
- Not recommended for use with vinyl flooring or carpets.
- For exterior and interior finishes applied directly to PermaBase, reinforcing mesh must be embedded in basecoat. Consult finish manufacturer for additional requirements.
- PermaBase should not be exposed to temperatures over 220°F (105°C).
- PermaBase is not a nailing base for other finishes.

Countertop Installation

1. **Plywood**
2. **Latex-Portland Cement Mortar**
3. **PermaBase^{MD} Cement Board**
4. **Fiberglass Mesh Tape (Alkali-Resistant) Embedded in Mortar**
5. **Latex-Portland Cement Mortar**
6. **Tile and Grout**

Floor Underlayment

1. **Joists**
2. **Subfloor**
3. **Latex-Portland Cement Mortar**
4. **PermaBase^{MD} Cement Board**
5. **Fiberglass Mesh Tape (Alkali-Resistant)**
6. **Latex-Portland Cement Mortar**
7. **Tile**

Exterior Applications

An ideal substrate for exterior applications such as:

- Tile applications
- Stucco applications
- Cement board stucco
- Thin brick
- Adhered stone veneer
- Thin porcelain tile
- Ventilated rainscreen facade
- EIFS
- Soffit panels
- Sheathing panels
- Outdoor kitchens/grills

Installation

General: All framing should comply with local building code requirements and be designed to provide support with a maximum allowable deflection of L/360 under all intended live including wind) and dead loads.

Some applications may require stricter deflection requirements. Consult finish manufacturer for recommendations.

Note: Cut or score PermaBase on rough side of panel.

Control Joints: For exterior installations, allow a maximum of 16 lineal feet between control joints. Consult finish manufacturer for other requirements. For exterior tile applications, control joints should be spaced a maximum of every 12'. A control joint must be installed but not limited to the following locations: where expansion joints occur in the framing or building (discontinue all cross furring members located behind joint); when boards abut dissimilar materials; where framing material changes; at changes of building shape or structural system; at each story separation. Place control joints at corners of window and door openings, or follow specifications of architect. Control joint cavity shall not be filled with coating or other materials.

Walls And Ceilings

Wall Framing: Studs should be spaced a maximum of 16" o.c. Edges/ends of PermaBase parallel to framing should be continuously supported. Provide additional blocking when necessary to permit proper PermaBase attachment. Do not install PermaBase directly over protrusions from stud plane such as heavy brackets or fastener heads.

Ceiling Framing: The deflection of the complete ceiling assembly due to dead load (including insulation, PermaBase, bonding material and facing material) should not exceed L/360. The dead load applied to the ceiling frame should not exceed 10 psf. Ceiling joist or furring channel should not exceed 16" o.c. (Edges of PermaBase parallel to framing should be continuously supported.) Provide additional blocking when necessary to permit proper PermaBase attachment.

Water Barrier: While PermaBase is unaffected by moisture, a Water/Air Resistive Barrier (WRB) must be installed to protect the cavity. The type and specific placement or location of the water barrier will vary based on local building codes and/or manufacturers warranties. Consult the WRB manufacturer's recommendations for specific installation guidelines.

PermaBase Cement Board: Apply PermaBase with ends and edges closely butted but not forced together. Stagger end joints in successive courses. Drive fasteners into field of cement board first, working toward ends and edges. Space fasteners maximum 8" o.c. for walls, 6" o.c. for ceilings with perimeter fasteners at least 3/8" and less than 5/8" from ends and edges.

Joint Reinforcement: Trowel bonding material to completely fill the tapered recessed board joints and gaps between each panel. On non-tapered joints apply a 6" wide, approximately 1/16" thick coat of bonding material over entire joint. For all joints, immediately embed 3" alkali resistant fiberglass mesh tape fully into applied bonding material and allow to cure. Same bonding material should be applied to corners, control joints, trims or other accessories. Feather bonding material over fasteners to fully conceal.

Decks

Subfloor: Plywood should be securely glued and fastened to floor joists spaced a maximum of 16"o.c. Subfloor should be sloped at a minimum pitch of 1/4" per foot. The floor surface should be true to plane within 1/8" in 10'.

Underlayment: Using a 1/4" square-notched trowel, apply a setting bed of Latex-Portland cement mortar to the subfloor. Immediately laminate PermaBase to subfloor leaving a 1/8" space between boards at all joints and corners. Leave a 1/4" gap along walls. Stagger joints so they do not line up with underlying substrate joints. Fasten PermaBase every 8" o.c. throughout board field and around all edges while setting bed mortar is still workable. Around perimeter of each board, locate fasteners 2" from the corners and not less than 3/8" from the edges. Fill all joints solid with bonding material. On non-tapered joints such as butt ends, apply a 6" wide, 1/16" thick coat over the entire joint. For all joints, embed alkali-resistant fiberglass mesh tape fully into applied bonding material; ensure that tape is centered over joint. Apply bonding material over fasteners to fully conceal. Remove all excess bonding material and allow it to cure.

Waterproof Membrane: Trowel apply waterproof membrane to the entire surface of the cement board, following membrane manufacturer's installation instructions in detail.

Water-Managed, High-Impact Resistant Wall System

Cement Board Ventilated Rainscreen Façade System

Description

The Cement Board Ventilated Rainscreen Facade System is a water managed exterior cladding wall system designed to provide increased high impact and weather resistance and improved dimensional stability.

The Cement Board Ventilated Rainscreen Facade System combines the strength and durability of PermaBase Cement Board with the performance and beauty of reinforced base coats and textured finishes. It includes specific components such as wood or metal furring, latex-modified Portland cement base coat, glass fiber mesh, trims, primer and acrylic textured finish coat. It provides unequaled protection against water penetration and weathering.

The Cement Board Ventilated Rainscreen Facade System allows you to enclose and finish a project in as little as two days, speeding occupancy. It has already been satisfactorily used for over 25 years on thousands and thousands of square meters of exterior walls.

Uses

For all your exterior walls needing high-impact and weather resistance in commercial, institutional and residential applications.

Advantages

Durability/Strength: PermaBase Cement Board provides an exceptionally hard, durable surface that is able to withstand prolonged exposure to moisture and has a proven durability in cold climates.

PermaBase offers a competitive advantage over similar products on the market with its patented EdgeTech[MD] technology. The tapered, reinforced edge design allows for closer nail or screw application to the edge.

Weather Resistance: Acrylic finishes repel weather at the system's surface.

Water-Managed Design: The water-managed design of the system provides positive drainage directly behind the cladding, enabling the escape of incidental water that might enter around or through window or door openings and penetrate behind the cladding in frame construction. It also provides air pressure equilibrium, minimizing the chances of water being driven into the wall cavity by incidental building envelope pressure differential.

Design Options: Cement Board Stucco provides the popular stucco look, including the attachment of special pre-molded shapes and a wide variety of finish texture and color options in standard colors and custom colors.

Contact exterior coatings manufacturer for color and installation instructions.

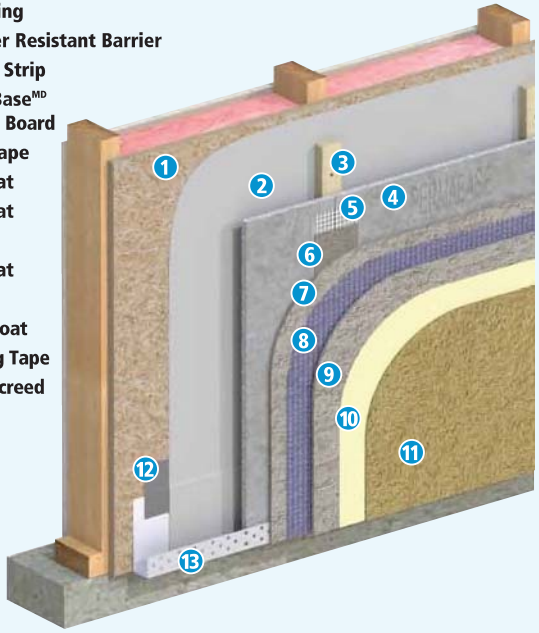
Some exterior wall assemblies including the PermaBase boards were tested according to CAN/ULC-S101. Consult ULC's online directories for details.

Limitations

- Boards shall never be fastened directly on studs.
- Thin veneer construction will tend to reveal planar irregularities in the frame construction.
- Minor cracking at joints might become visible in the finished exterior surface.
- For exterior finishes applied direct to PermaBase, reinforcing mesh must be embedded in basecoat. Consult Unifix's website to get the latest exterior cladding system complete architectural specifications and for detailed installation instructions.
- The cavity between the PermaBase Cement Board and the intermediate sheathing or the insulation board must allow for venting to the exterior, at the bottom and at the top of the wall, in order to provide efficient water drainage and humidity management.

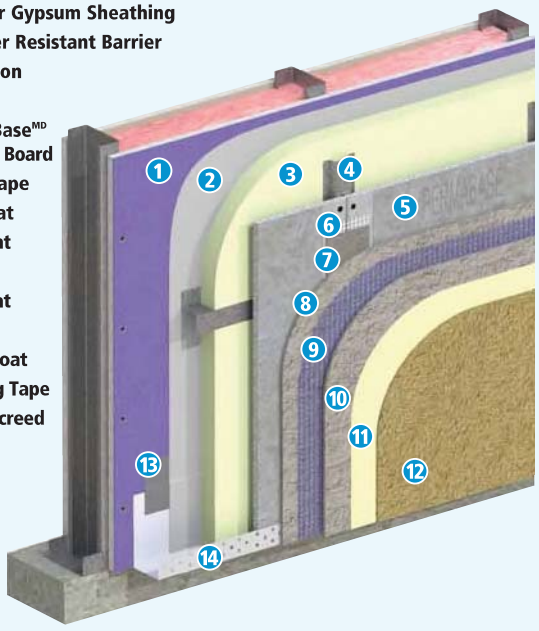
Residential Ventilated Rain Screen Installation

1. Sheathing
2. Weather Resistant Barrier
3. Furring Strip
4. PermaBase[MD] Cement Board
5. Mesh Tape
6. Basecoat
7. Basecoat
8. Mesh
9. Basecoat
10. Primer
11. Finish Coat
12. Flashing Tape
13. Weep Screed



Commercial Ventilated Rain Screen Installation

1. Exterior Gypsum Sheathing
2. Weather Resistant Barrier
3. Insulation
4. Furring
5. PermaBase[MD] Cement Board
6. Mesh Tape
7. Basecoat
8. Basecoat
9. Mesh
10. Basecoat
11. Primer
12. Finish Coat
13. Flashing Tape
14. Weep Screed



Cement Board Masonry Veneer Wall System (CBMV)

PermaBase as a component of CBMV Systems

The use of adhered manufactured stone and thin brick masonry veneers is increasing in popularity. Cement Board Masonry Veneer Wall Systems (CBMV) have been designed to offer complete, engineered solutions for the installation of manufactured and natural stone masonry veneer, as well as thin brick veneers.

These systems have been developed and are marketed by various manufacturers of the adhering materials used to install them as well as the veneer manufacturers themselves. CBMV Systems offer increased performance by utilizing polymer modified adhesive mortars which have been designed for hanging materials versus type S and N mortars that were primarily designed for stacking materials. In some cases these systems offer warranties.

Several of these systems call for the use of an ASTM C1325 cement board. In addition to meeting this requirement, the features and benefits of PermaBase Cement Board make it an ideal component for use in these systems.

Advantages

Durability/Strength: PermaBase Cement Board provides an exceptionally hard, durable surface that is able to withstand prolonged exposure to moisture and has a proven durability in cold climates.

Consistency: PermaBase is produced in a factory controlled environment which provides for a consistent product produced within tighter tolerances than can be achieved with field fabricated substrates.

Cutting and Handling: PermaBase is produced with its patented EdgeTech technology. The tapered, reinforced edge design allows for fastening of nails or screws closer to the edge without crumbling or spinout. The homogeneous core provides a very clean score and snap using a standard drywall knife.

Low Water Absorption: PermaBase has the lowest water absorption of any cement board which provides greater open time and increased workability of the adhering materials used in the application of veneer products.

Limitations

The system shall be engineered to withstand all applicable loads, including live, dead, seismic, positive and negative, etc. CBMV Systems utilize a primary sheathing beneath the PermaBase Cement Board to provide required structural performance. The selection and installation of this sheathing varies according to the type of wall construction.

In the case of exterior walls only, the CBMV Wall System shall not exceed 3 meters (9.8') in height above the foundation walls. Do not use the CBMV System to make soffits or use underground or in frequently submerged areas. Make sure to follow the latest national, provincial or local building code regulations.

Consult Unifix's website to get the latest exterior cladding system complete architectural specifications and for detailed installation instructions.

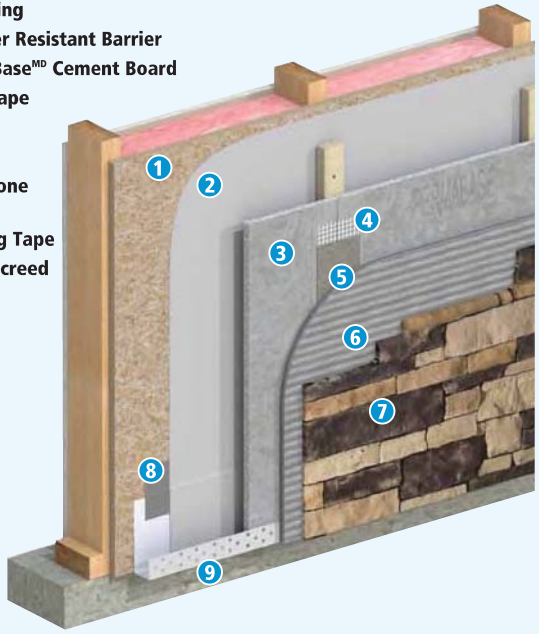
The details provided give a general sense of representative CBMV Systems only.

Water Resistant Barriers (WRB)

While PermaBase is unaffected by moisture, a water resistant barrier (WRB) must be installed to protect the cavity. One of the advantages of CBMV Systems is the ability to incorporate an effective, accountable water management system. The type and specific placement of the water barrier will vary based on local building codes and/or manufacturers warranties.

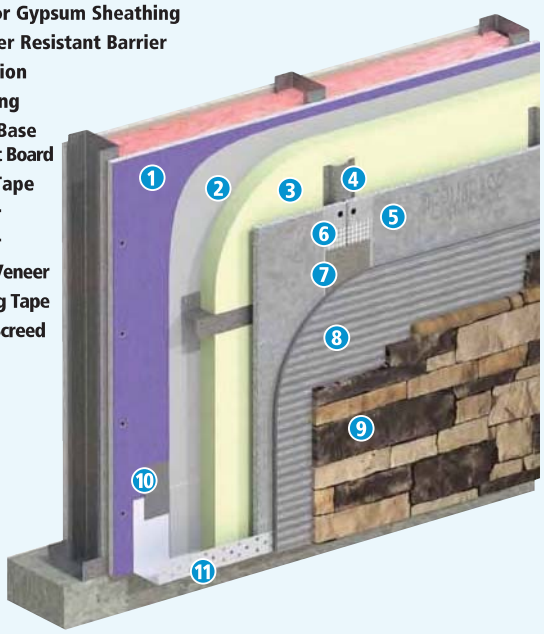
Residential Manufactured Stone Veneer Wall Installation

1. Sheathing
2. Weather Resistant Barrier
3. PermaBase[MD] Cement Board
4. Mesh Tape
5. Mortar
6. Mortar
7. Thin Stone Veneer
8. Flashing Tape
9. Weep Screed



Commercial Manufactured Stone Veneer Wall

1. Exterior Gypsum Sheathing
2. Weather Resistant Barrier
3. Insulation
4. Z-Furring
5. PermaBase Cement Board
6. Mesh Tape
7. Mortar
8. Mortar
9. Stone Veneer
10. Flashing Tape
11. Weep Screed



This section of the PermaBase Construction Guide provides information on how to utilize PermaBase within both a CBMV System and a Ventilated Rainscreen Facade System. While some typical examples are shown (right) for reference purposes, the specifications and details on how to design and construct individual systems should be obtained from the design professional, or the adhering material or veneer manufacturer of the materials that are being used to complete the system.

For more information go to: **unifixinc.com/applications**

Heat Shield Applications

Features/Benefits

- Protects walls and floors.
- Reduces clearance in back up to 40%.
- Lightweight and easy to install.
- CAN/ULC- S632 & UL1618 tested.

Limitations: Do not apply combustible finishes, such as wallpaper, on the panel surface.

Installation

The heat shield made with PermaBase boards can reduce the required clearance between a heat producing appliance and the wall by up to 40%, except where the clearance includes provision for access or ventilation.

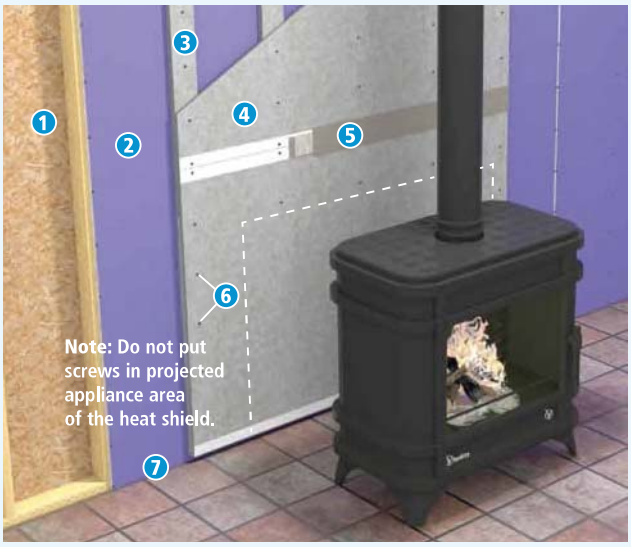
Furring is made by cutting a full PermaBase panel into 4" (100 mm) wide strips. Attach a double layer of these furring strips to the wall studs using cement board screws which provide a minimum penetration of 3/4" (19 mm) into the framing. When installing the panels, leave a minimum 2" (50 mm) gap at the ceiling and a 1"- 2" (25-50 mm) gap at the floor.

Fasten the PermaBase panels to the studs with galvanized roofing nail or cement board screws spaced 8" (200 mm) o.c. Be sure your cement board screws are long enough to go through the furring and into the studs at least 3/4" (19 mm). Do not put any nails or screws into the wall area directly behind the proposed location of the appliance.

Finish the joints with polymer modified Portland cement mortar and alkali resistant fiberglass tape. Cover fasteners with the same mortar. The mortar should be dry before applying any decorative coating.

Heat build-up is reduced by allowing air to enter and exit the cavity between the wall and the heat shield. This air space is required for the good functioning of the heat shield. Do not close or block these openings.

Heat Shield Installation



1. **Studs Spaced 16 in. o.c.**
2. **Existing Gypsum Board**
3. **Two Layers 4 in. wide Furring Strips**
4. **PermaBase[MD] Heat Shield**
5. **Joint Treatment**
6. **Fasteners Spaced 8 in. o.c. Maximum**
7. **1-2 in. Minimum Clearance from the Floor**

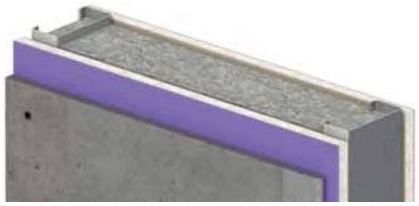
PermaBase[MD] heat shielding permits clearance reduction up to 40 percent of the manufacturer's suggested clearance.

UL Listed PermaBase[MD] Cement Board Partitions – Steel Framing

1-hour Fire Rating
V452 UL Design

7/16" PermaBase PLUS or 1/2" PermaBase applied vertically or horizontally to one side of 3-5/8" steel studs 16" o.c. 5/8" Fire-Shield Gypsum Board applied vertically to opposite side. 3" mineral wool insulation in stud cavities.

1-hour Fire Rating
U425 UL Design



7/16" PermaBase PLUS or 1/2" PermaBase applied vertically or horizontally over 5/8" Fire-Shield Gypsum Board applied vertically to each side of 3-1/2", 20-gauge steel studs 16" o.c. PermaBase secured to studs with cement board screws of adequate length to penetrate studs 3/8" spaced 8" o.c.

1-hour Fire Rating
V438 UL Design

7/16" PermaBase PLUS or 1/2" PermaBase applied vertically or horizontally over 5/8" Fire-Shield Gypsum Board applied vertically to each side of 3-5/8" steel studs 16" o.c. PermaBase secured to studs with cement board screws of adequate length to penetrate studs 3/8" spaced 8" o.c.

2-hour Fire Rating
V452 UL Design

7/16" PermaBase PLUS or 1/2" PermaBase applied vertically over 1/2" Fire-Shield C or 5/8" Fire-Shield Gypsum Board, applied vertically to one side of 3-5/8" steel studs 16" o.c. 2 layers 1/2" Fire-Shield C or 5/8" Fire-Shield Gypsum Board applied vertically to opposite side. 3" mineral wool insulation in stud cavities.

PermaBase Over Foundation Walls

Installation

The 1/2" PermaBase boards can be installed below ground level over extruded polystyrene boards that are themselves installed over a foundation wall, under the following conditions.

1. That the PermaBase boards be fully supported, over their entire surface, by the polystyrene boards.

2. That the PermaBase boards be installed using our specially designed PermaBase screws, every 8" o.c. (200 mm), over furring channels (wood or galvanized metal 20 gauge or thicker) that comply with the following requirements:

a. That the furring strips be spaced at a maximum of 24" (610 mm) o.c.

b. That the furring strips have the same thickness (or depth) as the polystyrene board.

c. That the furring strips be in full contact with the foundation wall.

d. That the furring strip be affixed to the foundation wall with the proper fasteners and in sufficient number to provide an adequate support for the board, its finish and other building loads.

e. That the furring strips be corrosion or rot proof.

3. That the extruded polystyrene boards be approved for exterior use, below ground and that they have a compressive strength of 20 psi (140 kPa) or higher when tested according to ASTM D1621.

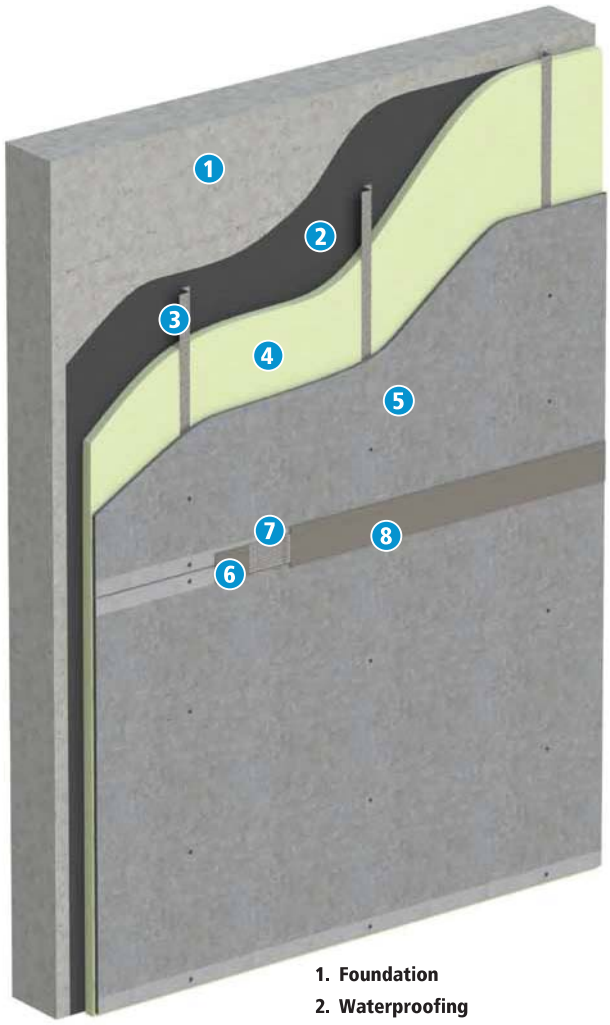
4. That the PermaBase boards are installed below ground at a maximum depth of 10' (3 m).

5. That the water table level be at all times be below the base of the foundation wall.

6. That the base of the foundation wall be properly drained in order to avoid any accumulation of water and consequently an added pressure on the wall.

7. That the wall design be in conformance with the applicable and most up to date local, provincial, and federal building codes where the project is located.

Limitations: The PermaBase boards are resistant to water but are not water impermeable or waterproof and cannot be considered a vapor barrier. Where a wall or cavity must be kept dry, use proper water resistant membranes, in conformance with the applicable and most up to date local, provincial, and federal building codes where the project is located. Some waterproofing compounds, sealants, or adhesives may contain solvents or petroleum distillates. These may damage the polystyrene. Please contact the manufacturers of these products to verify their compatibility with polystyrene and concrete. The PermaBase boards are not structural boards.



1. **Foundation**
2. **Waterproofing**
3. **Furring Strips**
4. **Insulation**
5. **PermaBase^{MD} Cement Board**
6. **Mortar**
7. **Mesh Tape**
8. **Mortar**