



TECHNICAL MANUAL
for
DEMILEC HEATLOK XT
(Summer and Winter), for use as an
INSULATING THERMAL BARRIER

Rebain International (NZ) Limited

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Note: Always refer to this Technical Manual for correct supply and use of DEMILEC HEATLOK XT system for use as a thermal insulation barrier.

For any intended use outside of this Technical Manual specification, you must refer directly to the Supplier of the product 'HEATLOK XT' – Rebain International (NZ) Limited, for advice and written approval for 'Specific Design' prior to specification or installation of HEATLOK XT other than, as a thermal insulation barrier.

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Section A Introduction

1 COMPONENT LIST

Product	Description
HEATLOK XT	Polyol and MDI

2 PRODUCT OPTION LIST

Product	Description
HEATLOK XT	Summer
HEATLOK XT	Winter

3 PRODUCT SCOPE OF USE

DEMILEC HEATLOK XT - insulating Thermal Barrier is applied to residential housing and light commercial buildings complying with NZS 3604 or NASH 3405. HEATLOK XT (supplied in summer and winter versions) is applied to walls, underfloor and ceilings. If specifiers require additional details please contact Rebain International (NZ) Limited for written approval.

4 PRODUCT DESCRIPTION

DEMILEC HEATLOK XT is a two-part Spray Polyurethane Foam (SPF), used to provide an insulating thermal barrier applied in-situ insulation product. When installed into either interior or exterior timber and steel framing, (Walls, Underfloor, and Ceiling), HEATLOK XT significantly contributes to a building meeting the energy efficiency requirements set out in the New Zealand Building Code.

The cured product provides a light weight, moisture-resistant durable insulation thermal barrier solution suited to the needs of residential housing and commercial buildings.

This technical manual document outlines the technical specifications of the product, applicable New Zealand Building Code performance requirements and provides a description of the generic requirements of application of DEMILEC HEATLOK XT product.

Design and on-site installation procedures of DEMILEC HEATLOK XT shall be the responsibility of Rebain International (NZ) Limited, trained and approved applicators. Such approved applicators shall provide their own design, preparation and application document / manual which will describe the specific equipment and methodology of application developed by each applicator for each project. Every such document shall be reviewed and approved by Rebain International (NZ) Limited before approval is given to the applicator.

5 PRODUCT FEATURES

DEMILEC HEATLOK XT is a two component, closed cell spray applied, rigid polyurethane foam system. Specific product features include:

- The product uses recycled plastic materials and rapidly renewable soy oils.
- The blowing agent has zero ozone depleting potential.
- Commonly used as a thermal insulation
- Air barrier
- Vapour barrier
- Water resistive barrier
- Internal or protected external application
- Fire Retardant to ASTM E84 'Class 1'

6 TECHNICAL DATA SHEET (TDS)

TDS follows for DEMILEC HEATLOK XT - insulating thermal barrier*:



TECHNICAL DATA SHEET

Heatlok® XT is a two component, closed cell, spray applied, rigid polyurethane foam system. This product uses recycled plastic materials, rapidly renewable soy oils, and the blowing agent has zero ozone depleting potential. Heatlok XT complies with the intent of the International Code Council's residential and commercial building codes and is commonly used as a thermal insulation, air barrier, vapor retarder and water resistive barrier in above grade, below grade, interior and exterior applications.

PHYSICAL PROPERTIES			
ASTM D 1622	Core Density	Summer - 2.23 lb/ft³ Winter - 2.17 lb/ft³	Summer - 35.7 kg/m³ Winter - 34.8 kg/m³
ASTM C 518	Aged Thermal Resistance (R-value @ 1 inch) See CCRR for Heatlok XT-s (summer) and Heatlok XT-w (winter) Table 1, for additional R-value information.	Summer - 6.7 ft²h°F/BTU Winter - 6.9 ft²h°F/BTU	Summer - 1.18 Km²/W Winter - 1.22 Km²/W
ASTM E 283	Air Leakage @ 75 Pa @ 1"	< 0.02 L/sm²	
ASTM E 2178	Air Permeance @ 75 Pa @ 1"	< 0.02 L/sm²	
ASTM E 96	Water Vapor Permeance (Summer @ 1.625", Winter @ 1.1") Qualifies as a Class II vapor barrier per IBC Section 202	< 1 perm	< 57.2 ng/Pa·s·m²
ASTM D 2842	Water Absorption (volume)	Summer - 0.87% Winter - 0.81%	
ASTM D 1621	Compressive Strength at 10% Deformation	Summer - 18.0 psi Winter - 23.1 psi	Summer - 124 kPa Winter - 159 kPa
ASTM D 1623	Tensile Strength	Summer - 37.9 psi Winter - 53.7 psi	Summer - 261 kPa Winter - 370 kPa
ASTM D 2126	Dimensional Stability @ 158°F (70°C) 97% R.H. (168 hours)	Summer - 5.45% (% volume change) Winter - 4.14% (% volume change)	
VOC Emissions	UL Environment (Greenguard Gold)	Meets Criteria	
ASTM C 1338	Fungi Resistance	No fungal growth	
ASTM D 6226	Closed Cell Content	Summer - 93.1% Winter - 93.8%	

FIRE TEST RESULTS		
ASTM E 84	Surface Burning Characteristics, 4" thick Summer - Flame Spread Index Summer - Smoke Developed Winter - Flame Spread Index Winter - Smoke Developed	Class I 0 - 5 350 - 400 5 250 - 300
AC 377 Appendix X	Ignition Barrier - Compliant with 2009, 2012 & 2015 IBC and IRC, and ICC-ES AC-377 Appendix X, for use in attics and crawl spaces without a prescriptive ignition barrier or intumescent coating.	Pass
NFPA 286	Thermal Barrier - Compliant with the 2009, 2012 & 2015 IBC and IRC, as an interior finish without a 15 minute thermal barrier when coated with DC-315 at 18 mils wet film thickness, 12 mils dry film thickness.	Pass
ASTM D 1929	Ignition Properties (spontaneous ignition temperature)	Summer - 1010°F (543°C) Winter - 932°F (500°C)

RECYCLED & RENEWABLE CONTENT OF HEATLOK XT RESIN	
Finished Foam Renewable and Recycled Content	Summer - 22.7% Winter - 21.0%
Polyol Renewable Content	Summer - 8% Winter - 8%
Polyol Recycled Content	Summer - 37.4% Winter - 34%

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REACTIVITY PROFILE			
Cream Time	Gel Time	Tack Free Time	End of Rise
0 - 1 seconds	2 seconds	3 - 4 seconds	3 - 4 seconds

LIQUID COMPONENT PROPERTIES*		
PROPERTY	A-PMDI ISOCYANATE	HEATLOK XT RESIN
Color	Brown	Blue
Viscosity @ 77°F (25°C)	180 - 220 cps	Summer - 250 - 350 cps Winter - 200 - 300 cps
Specific Gravity	1.24	Summer - 1.17 - 1.21 Winter - 1.20 - 1.22
Shelf Life of unopened drum properly stored	12 months	6 months
Storage Temperature	50 - 100°F (10 - 38°C)	59 - 77°F (15 - 25°C)
Mixing Ratio (volume)	1:1	1:1

*See SDS for more information.

RECOMMENDED PROCESSING CONDITIONS*		
Initial Primary Heater Setpoint Temperature	Summer 100 - 105°F Winter 95 - 100°F	Summer 38 - 41°C Winter 35 - 38°C
Initial Hose Heat Setpoint Temperature	Summer 100 - 105°F Winter 95 - 100°F	Summer 38 - 41°C Winter 35 - 38°C
Initial Processing Setpoint Pressure	1200 - 1400 psi	8274 - 9653 kPa
Substrate & Ambient Temperature	Summer > 50°F Winter > 10°F	Summer > 10°C Winter > -12°C
Moisture Content of Substrate	≤ 19%	≤ 19%
Moisture Content of Concrete	Concrete must be cured, dry and free of dust and form release agents.	

*Foam application temperatures and pressures can vary widely depending on temperature, humidity, elevation, substrate, equipment and other factors. While processing, the applicator must continuously observe the characteristics of the sprayed foam and adjust processing temperatures and pressures to maintain proper cell structure, adhesion, cohesion and general foam quality. It is the sole responsibility of the applicator to process and apply Heatlok XT within specification.

General Requirements: Equipment must be capable of delivering the proper ratio (1:1 by volume) of polymeric isocyanate (PMDI) and polyol blend at adequate temperatures and spray pressures. Substrate must be at least 5 degrees above dew point, with best processing results when ambient humidity is below 80%. Substrate must also be free of moisture (dew or frost), grease, oil, solvents and other materials that would adversely affect adhesion of the polyurethane foam. Applicators should limit the application of this product to no more than a thickness of 2" (50mm) per pass (after expansion) to avoid fire hazards (including spontaneous combustion) resulting from excessive heat generation. A second 2" (50mm) layer may be applied immediately after the first one has fully risen. If subsequent passes are needed, applicators should wait until the core temperature of the foam has dropped below 100°F to allow any reaction heat to dissipate from the prior applications before attempting to reapply the product.

Heatlok XT must be separated from the interior of the building by an approved thermal barrier or an approved finish material equivalent to a thermal barrier in accordance with applicable codes. Heatlok XT must be sprayed at a minimum thickness of 1" per pass. This product must not be used when the continuous service temperature of the substrate or foam is below -60°F (-51°C) or above 180°F (82°C). Heatlok XT should not be used to cover flexible ductwork.

Disclaimer: The information herein is to assist customers in determining whether our products are suitable for their applications. We request that customers inspect and test our products before use and satisfy themselves as to contents and suitability. Nothing herein shall constitute a warranty, expressed or implied, including any warranty of merchantability or fitness, nor is protection from any law or patent inferred. All patent rights are reserved. The foam product is combustible and must be protected in accordance with applicable codes. Protect from direct flame and spark contact, around hot work for example. The exclusive remedy for all proven claims is replacement of our materials.



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***Note:** the information is supplied by the manufacturer.

7 PRODUCT LIMITATIONS

DEMILEC HEATLOK XT is not intended to be exposed to the weather for prolonged periods, and should be protected by cladding (or an approved coating system) within 6 months.

DEMILEC HEATLOK XT shall be installed only by trained and approved applicators.

Spray applied Polyurethane Foam should **not** be installed under the following conditions;

- a) When the substrate to be sprayed is wet, or covered with frost or ice, oil or grease, or dust or presents loose scales, or rust, signs of degradation, which may make it unsuitable for application and result in adhesion failure.
It should be noted that foam will adhere to dust, rust, scale, etc., and will prevent the foam from adhering to the substrate. This should not be considered an adhesion failure of the foam but rather a lack of proper preparation.
- b) Around recessed lighting fixtures, which require large free air space lest they overheat and turn into a fire hazard. This space varies for different fixtures, which is reported by the fitting supplier. **In-service SPF temp is not to exceed 82°C.** Modern LED light fixtures create much less heat: consult manufacturers' instructions, or use a Light Barrier installed in accordance with AS/NZS 5110-A1
- c) Inside electrical outlets or electrical junction boxes.
- d) When filling confined cavities. A sprayed urethane system would cause excessive pressure and heat build-up.
(EXTREME CAUTION ALERT): Closed cell (32 – 36kg/m³) SPF is an exothermic reactive product. At no time should this material be sprayed in a confined cavity that will cause foam passes to be greater than the 50mm (2") per pass.

NOTE: SPF is a combustible material, (grade dependent) requiring all safety practices to be followed both during the design and installation.

8 NZBC RELEVANT PERFORMANCE CLAUSES

DEMILEC HEATLOK XT Spray Polyurethane Foam (SPF) insulation product, when installed as per the requirements set out in this technical manual, complies with the following clauses of the New Zealand Building Code:

B1 – Structure (Compressive strength)

B2 – Durability (Thermal performance over time)

F2 - Hazardous Building Materials (non-hazardous when cured)

H1 – Energy efficiency (contribution to energy performance of a building when cured)

B1.3.2 - STRUCTURE

DEMILEC HEATLOK XT spray foam applied insulation product when installed as per this manual is able to maintain its compressive strength over time.

B2.3.1 (a) - DURABILITY

DEMILEC HEATLOK XT spray foam applied insulation product when installed as per this manual is able to maintain its thermal performance over time.

F2 HAZARDOUS BUILDING MATERIALS

In reference to NZBC Clause F2.3.1 regarding Hazardous Building Materials, cured spray-applied DEMILEC HEATLOK XT - is non-hazardous, provided all application safety precautions adhered to as provided in this technical manual.

H1.3.1 – ENERGY EFFICIENCY

When DEMILEC HEATLOK XT - spray foam applied insulation product is installed as set out in this technical manual, the cured product significantly contributes to the energy performance of a building.

9 ENGINEER, DESIGNER AND SPECIFICATION CONSIDERATIONS

Designers are responsible for the framing design, and building contractors are responsible for the quality of construction of the framing.

DEMILEC HEATLOK XT is for use on new and existing timber and steel framing to provide a wind and moisture resistant thermal barrier when the building is situated in high to extra high wind zones.

Specification

It is advised that the Architect/Designer or Specifier denote on the building/design plans for the purpose of identifying product use as follows;

Example:

← **DEMILEC HEATLOK XT System**
BEAL CodeMark Certificate of Conformity No: BCS-152216-CMNZ

A note should also be included directing all parties to where information can be obtained:

For a copy of this Technical Manual, TDS and SDS for DEMILEC HEATLOK XT
email: customerservice@rebain.co.nz or Ph. 09 486 6637
Technical Information is also available from: www.demilec.com

10 TECHNICAL PHOTO GALLERY



Figure 1: HEATLOK XT applied to wall and ceiling

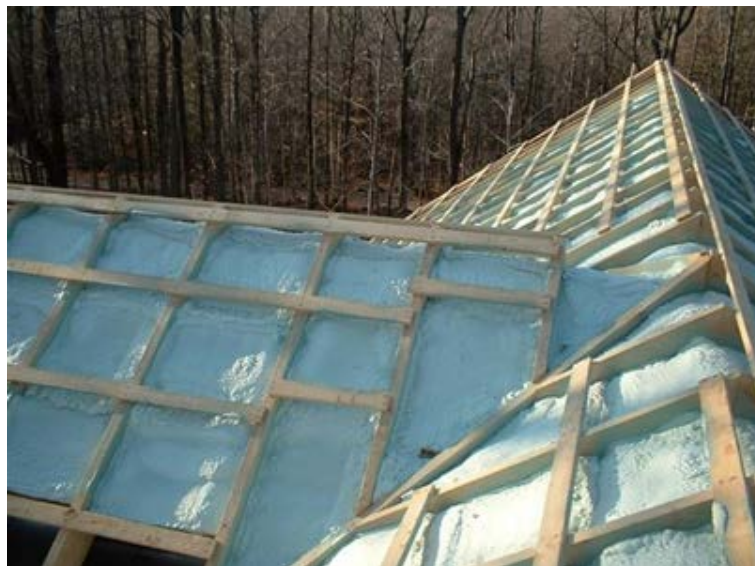


Figure 2: HEATLOK XT applied to a roof/ceiling prior to roofing



Figure 3: HEATLOK XT applied to under floor sub wall



Figure 4: HEATLOK XT applied to external facing wall with a Rigid Air Barrier installed.

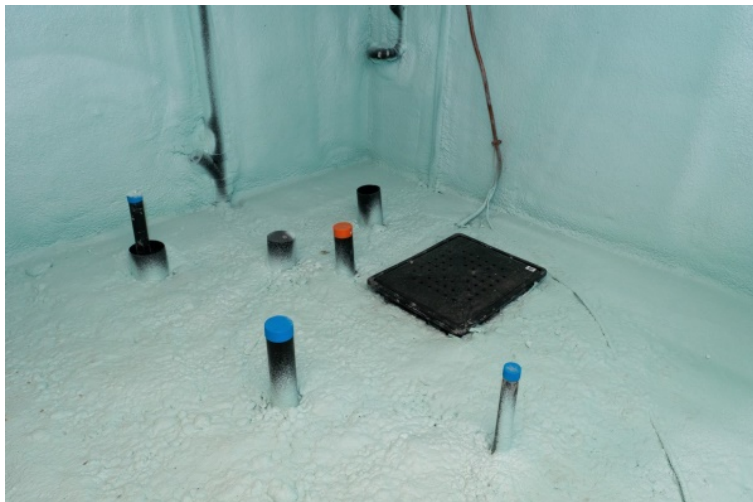


Figure 5: HEATLOK XT example of application around penetrations in a basement



Figure 6: HEATLOK XT applied between wall studs.



Figure 7: HEATLOK XT applied to underside of cathedral roof/ceiling

Section B Product Application Requirements

1 INSTALLATION PROCEDURES

Pre-Installation

Installation of DEMILEC HEATLOK XT must be completed by Rebain Approved and trained installers who have experience in the installation of DEMILEC HEATLOK two part spray foams.

It is the responsibility of the DEMILEC HEATLOK XT installer to inspect their work place prior to beginning the installation of DEMILEC HEATLOK XT to ensure the installed work will meet the owner / contractors requirements.

Special Note: Notify owner / general contractor of any concerns prior to the start of DEMILEC HEATLOK XT installation.

The moisture content of any timber framing must be no higher than 19% EMC (Equilibrated Moisture Content).

Install DEMILEC HEATLOK XT to steel or timber framing members as agreed by Rebain International (NZ) Limited as set out in the Product Scope of Use and Limitations.

Every applicator will provide to Rebain International (NZ) Limited a copy of their own design, **preparation and application document / manual.**

Such document / manual shall contain appropriate information covering the following –

- a) Name and contact details of the applicator
- b) Title of the document
- c) Version number and date of the document e.g. Ver. 1.02 Jan 2017
- d) Index of contents
- e) Introduction covering the purpose of the document
- f) Indicate the requirement that the document meets the requirements set out in this DEMILEC HEATLOK XT technical manual
- g) Describe all relevant safety requirements and procedures including the names of persons or title of persons responsible for ensuring their compliance
- h) Describe all equipment necessary for the proper installation of the product
- i) Describe all relevant safety, maintenance and use of the equipment procedures
- j) Describe all relevant site pre-installation checks and relevant documentation
- k) Describe all relevant design procedures and relevant documentation
- l) Describe all relevant site-specific safety design procedures with relevant site documentation
- m) Describe all relevant onsite test and verification of application procedures, together with relevant records of these results.

2 SUBSTRATES

SPF can be applied to a wide range of substrate materials. The key consideration is that adequate adhesion between the substrate and the SPF be achieved by proper surface preparation prior to the

application of the SPF. All substrates need to be clean, dry and free of grease, oil, water, ice, sawdust, etc. Surfaces should be physically tested that the surface area is sound and solid to support HEATLOK XT foam once applied.

If there is any doubt about the suitability of a substrate for application of SPF, consult Rebain International (NZ) Ltd. for advice, prior to application of SPF.

2.1 Galvanised Steel & Roll Formed Steel:

Over time delamination may happen from galvanised steel. To ensure full and secure adhesion one must properly prepare the surface then treat it with a primer or binder. Newly galvanised steel should be washed with a solvent, then with water, before priming. Weathered galvanised steel may not need the first washing step with solvent, and may only require a wash with water prior to priming. When spraying steel buildings it is a good idea to first use a glue binder before installing SPF. Many engineered buildings will have oil covered steel from the manufacturing of the metal. These oils challenge the proper adhesion of SPF. In some installations there will be sufficient mechanical interlocking with the light gauge steel framing, that a perfect chemical bond to the framing member is not required (provided there is good adhesion to a rigid backing substrate).

2.2 Bare Steel (Pre-Primed):

Polyurethane foam can usually be sprayed directly on pre-primed bare steel after the standard removal of any loose scale, rust or oils. It is important, however, when insulating tanks, that the steel be sand blasted and primed. It is recommended that the SPF manufacturers' specification on the application of polyurethane foam on storage tanks be followed fully.

2.3 Copper, Gypsum Board, and Fibre Cement Board:

Such surfaces require no special treatments other than ensuring they are clean, sound and dry.

2.4 Aluminium

Aluminium should be cleaned with a solvent, (never with a caustic solution). **Aluminium must always be primed prior to the application of polyurethane foam** to prevent corrosion of the aluminium by acids forming at the interface of the SPF and the aluminium

2.5 Wood:

The maximum moisture content for wood to be sprayed with SPF is 19%. Special care should be taken with laminates, such as plywood, due to their potential for higher moisture content and the presence of matter from surface treatments, which may adversely affect the adhesion of the SPF to this substrate. Test with Wood-Moisture meter, do not guess!

2.6 Concrete:

Potential high moisture content in concrete makes this material one of the most challenging materials to spray on. It is suggested that the **maximum moisture content for concrete to be sprayed with SPF is 10%.** A hygrometer will check the moisture content.

If there is excessive salt precipitation on the concrete (efflorescence), the best way to clean the concrete is by using muriatic acid. This liquid will have a double action as it will remove the salt residue and will also help seal the surface, thus preventing further efflorescence. One can sand blast or wire brush the surface, then seal it prior to spraying it with foam.

3 SPECIAL CARE FOR APPLICATION

3.1 Downlight Barrier

All lighting that breach the ceiling lining like downlights must conform to barrier installed in accordance with AS/NZS 5110-A1

3.2 Moisture/Humidity

Care should be taken whenever the relative humidity rises above 80%. High relative humidity can negatively affect the performance of the SPF such as adhesion and can also result in a high water vapour or moisture content in the SPF and therefore a lower thermal performance R-value. Additionally it can potentially result in **OFF-RATIO foam** due to some of the isocyanate component reacting with atmospheric moisture, thus changing the polyol : MDI ratio of the finished SPF.

3.3 Thickness of Passes:

Passes should be no less than 12.5 mm. This is due to the possibility of low exotherm resulting in reversion of the foam creating a thin layer of improperly reacted foam, which adversely affects the adhesion of the whole polyurethane to the substrate. To avoid excessive exothermic reaction passes should be no more than 50 mm depending on the recommendation of the specific systems manufacturer. Not following the standard guidelines from the manufacturer and supplier will VOID any warranty.

4 STORAGE

The chemical drums should be stored and maintained between 10°C and 29°C before processing at the job site. If the drums are bulged due to excessive heat, do not open the drum. Cool the drum for 24 to 48 hours to allow the reacted blowing agent to return to a liquid state.

All product should be stored on pallets off the floor and kept free of dampness until required. Refer to Rebain International (NZ) Limited for additional recommendations.

5 WORKPLACE HEALTH AND SAFETY

Materials shall be delivered in manufacturer's original containers clearly labelled with manufacturer's name, product identification, safety information, net weight of contents and expiration date.

Material shall be stored in a safe manner and where the temperatures are in the limits specified by the material manufacturer.

Empty containers shall be removed from site on a daily basis.

Store and dispose of any solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

All products must be stored inside, in a well ventilated area, up off concrete floors, kept dry, out of direct sunlight and away from freezing conditions. The SPF products, in the original unopened containers, have a shelf life of 12 months from date of manufacture.

6 APPLICATOR SAFETY REQUIREMENTS

6.1 Safety Data Sheets (SDS)

The HSNO compliant SDS for Heatlok XT and its components is available from Rebain International (NZ) Ltd. Phone **09 486-6637** or email customerservice@rebain.co.nz to get the latest version.

It is mandatory to keep a copy of the SDS in the job site or in the spray rig, at all times during application and transport of SPF.

6.2 Approved Handler

Approved Handler Certificate: **An Approved Handler Certificate is required in New Zealand for all contractors handling MDI.** It is recommended that at least one team member also hold a current First Aid Certificate.

6.3 Inhalation:

Breathing vapours or mists of isocyanates must be strictly controlled at all times. Persons affected by inhalation of isocyanates should immediately seek medical attention.

6.4 Skin Contact:

Persons who have significant skin contact with isocyanates should wash with soap and water. The affected areas must subsequently be washed with alcohol.

Persons who have skin contact with the resin component should thoroughly wash the affected area with soap and water.

6.5 Eye Contact (Eye Wash Stations)

For eye contact with either resin or isocyanate, the **eye(s) should be flushed immediately for at least 20 minutes of continuous flush with water.**

6.6 Personal Protection

Ensure you have adequate supplies of PPE!

Personal Protective Equipment (PPE) supplies should include:

- Gloves
- Coveralls
- Face masks
- Filter cartridges

6.6.1 Face Masks:

Applicators can choose a mask to suit their situation. We recommend a full face air fed mask, however there are many other varieties available that will work, including Cartridge masks fitted with the appropriate filter (for VOC).

For “Compressor supplied Air” an Activated Carbon filter setup must be installed to remove oil mist and carbon monoxide produced by the compressor, also the air inlet to the compressor must be >6 meters away from any engine exhaust so as to intake fresh air.

Low pressure air supply pumps are also available that do not require an activated Carbon filtration, **however Fresh air for the intake is even more important.**

Refer Appendix 1: A Guide to Respirators – Extract

Bottled air is also an option, however may not be commercially viable on many jobs.

7 MAINTENANCE

Once DEMILEC HEATLOK XT has been installed as per this technical manual and as required by the NZBC, no further maintenance is required.

8 QUALITY MANAGEMENT SYSTEM

Rebain follows a Quality System as set out in the Rebain Building Product Quality Plan (BPQP).

Refer to: Rebain BPQP Heatlok Systems (check latest version)

9 INDEX OF TERMS AND WORDING

NZS: New Zealand Standard

SPF: Spray Polyurethane Foam

TDS: Technical Data Sheet

SDS: Safety Data Sheet - (previously known as MSDS)

BPQP: Building Quality Product Plan

10 WARRANTY



LIMITED LIFETIME WARRANTY

Demilec (Manufacturer) warrants Heatlok® XT (Product) when installed by certified contractors using factory trained applicators and applied in accordance to the product specification, will perform as stated in the Product Technical Data Sheet. This warranty is in effect throughout the life of the building provided the original purchaser registers with the Warranty Department of the Manufacturer within thirty days of occupancy. Manufacturer's sole responsibility under this Limited Lifetime Warranty shall be to repair or replace any defective Product at the cost of the material only. Manufacturer shall not be responsible for labor cost or any other costs whatsoever related to, or in connection with, the removal or installation of either the original or replacement product.

Manufacturer shall not be held liable under this Warranty for defects or failure caused by improper installation of Product (not in strict adherence with the Manufacturer's written instructions) or damage due to fire, storms, floods, acts of God, abuse, neglect, or defects, failure or damage caused by materials adjacent to the Product, or damage caused by alteration after completion of the installation of the Product. Statements made by contractors and installers about the performance qualities of the Product or contained in advertising literature do not constitute an expressed warranty.

This Limited Lifetime Warranty gives the building owner specific legal rights, and the building owner may also have other rights, which can vary from state to state. Building owners making claims under this Limited Lifetime Warranty must notify Demilec in writing of the defect promptly following its discovery and must submit with this notice proof of the date of purchase, contractor who applied the Product and the date, location and description of the circumstances under which the defect occurred or was first noticed. Notice shall be given in writing to the address below.

THIS WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, WHETHER AT LAW OR IN EQUITY, OR WHETHER ARISING OR EXISTING UNDER STATUTE. MANUFACTURER DISCLAIMS ALL OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. UNDER NO CIRCUMSTANCES WILL MANUFACTURER FOR SPECIAL, INCIDENTAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES, ARISING FROM OR IN CONNECTION WITH THE PRODUCT OR ITS USE. MANUFACTURER SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING FROM BREACH OF THE EXPRESS WARRANTY OR FOR THE COST OF REMOVING, INSTALLING, OR REINSTATING ANY REPAIR OR REPLACEMENT.

Warranty and Claims Department
Demilec
3315 E. Division Street
Arlington, TX 76011
Phone: 817-640-4900
Toll Free: 877-336-4532
Fax: 817-633-2000
Email: Info@Demilec.com
Website: www.Demilec.com

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Section C Onsite Requirements

1 INSTALLER / APPLICATOR (APPROVED TRAINING AND REGISTER)

Each Rebain Approved Applicator shall be responsible for the on- site application of DEMILEC HEATLOK XT as it applies to their work and shall be responsible for having periodic reviews of their documentation and diary notes that are related to DEMILEC HEATLOK XT application. In addition each Approved Applicator will complete a full daily report for each installation carried out. Checklists on site for each job will include the following information:

- Address of the site to be sprayed
- Name and address of the customer
- Name of operator
- Type of application (Ceiling/Walls/Underfloor), and the substrate sprayed onto
- Temperature of substrate
- Weather conditions including relative humidity and ambient temperature during installation. (record periodically in changeable conditions)
- Names of Polyol and MDI used, including batch numbers and comments on temperature of drums (as stored prior to the job)
- Type of machine and gun used
- Temperature and dynamic pressure settings used during spraying
- A photograph of the installed foam per job per day.
- a record of the final volume used and confirmation that a core sample has been taken

The following checklist can be used for this purpose:

2 CHECKLIST – PRE AND POST INSTALLATION, AND FINAL

 ON SITE CHECKLIST FOR DEMILEC APPLICATORS v2.1		Job number:			
		Date:			
		Supervisor:			
		Applicator:			
Assistant:					
Building consent #:					
Owner/Applicant:					
Architect/Designer/Engineer:					
Site address:					
Weather conditions:		Relative Humidity (RH): ____%			
Substrate:		Wood <input type="checkbox"/>		Steel <input type="checkbox"/> Concrete <input type="checkbox"/> Other: _____	
Prep work complete:		<input type="checkbox"/> Comment: _____			
Air Temperature:		Start temperature		Finish temperature	
Limit(s): _____					
Substrate Moisture (%):		Start moisture		N/A	
Limit(s): _____					
Substrate Temperature (°C):		Start temperature		Finish temperature	
Limit(s): _____					
Rise time:		Start rise time		Finish rise time	
Spec: _____					
Pump pressure (psi)	MDI:		Polyol:		
Temperature (°C)	MDI:		Polyol:		Hose:
Spray pattern OK?	Time: _____		Time: _____		Time: _____
	Yes <input type="checkbox"/> No: _____		Yes <input type="checkbox"/> No: _____		Yes <input type="checkbox"/> No: _____
Spray sample collected, bagged and labelled for density testing:			<input type="checkbox"/>		
	Unit Size	Batch Number(s)	Qty. Brought to Site	Quantity Returned	Quantity Used
MDI Product name:					
Polyol Product name:					
Total Volume sprayed (m³):	Weight of MDI Used (kg):	Weight of Polyol Used (kg):	Total Weight of System Used (kg):	Post-Application Inspection: <input type="checkbox"/>	
				Post- 24 hours Inspection: <input type="checkbox"/>	
Comments:					
Signed:			Signed:		
(Applicator)			(Supervisor)		

Section D Appendix 1

1 A GUIDE TO RESPIRATORS – EXTRACT

(Occupational Safety and Health Service, Department of Labour, Wellington, New Zealand, November 1992)

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6 Airline Respirators

There are two groups of airline respirators: fresh air hose respirators and compressed airline respirators.

Fresh air hose respirators draw air at atmospheric pressure through an air hose. (Electrically-operated air blowers may be used.) Compressed airline respirators supply air under pressure through an airline.



FRESH AIR HOSE RESPIRATORS

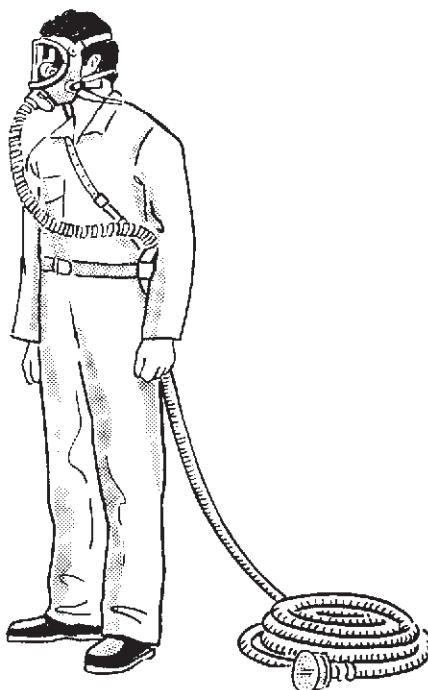
Air hose respirators consist of a facepiece connected to an air hose which has its free end anchored in an uncontaminated atmosphere. Air at atmospheric pressure is drawn through the hose by normal breathing. The resistance of the hose to the passage of air limits the length of the hose to about 15 metres. All connections should be tight to prevent contaminated air leaking into the air hose. See your supplier for more detailed information.

When longer hoses are used, air is supplied under slight pressure by a pump, blower or bellows which can be operated by an attendant. Leakage into the apparatus is prevented by a positive-pressure effect.



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The blower should be sited so it supplies clean fresh air, through a strainer on the inlet end. Before the facepiece is put on, the blower should be operated rapidly to ensure that dust inside is blown out and clean air is being delivered to the facepiece. The ends of the hose should be sealed after use.



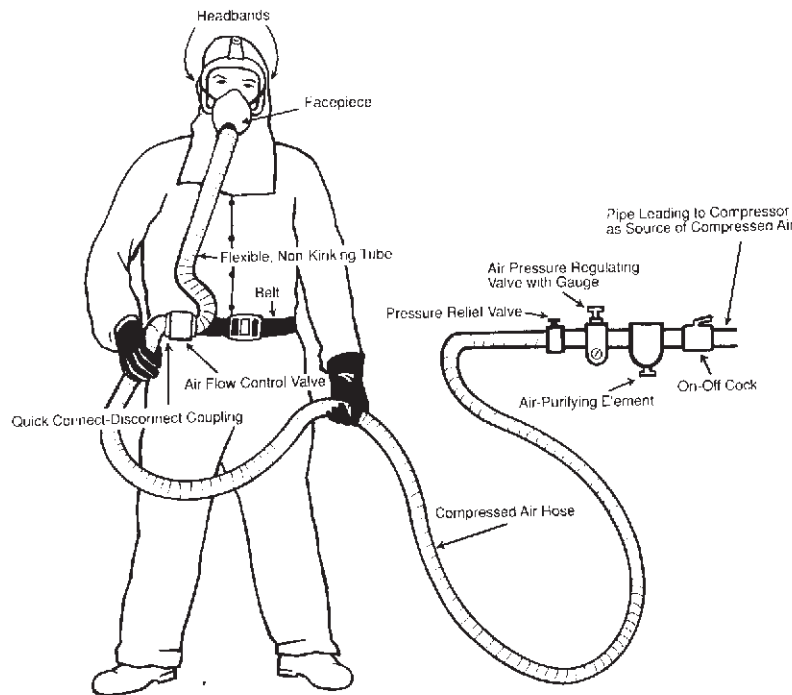
An air hose respirator provides clean air from a source remote from the contaminated area.



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COMPRESSED AIRLINE RESPIRATORS

These consist of an airline from a compressed air source to a breathing tube attached to a facepiece on a wearer. The breathing tube connects with either a half facepiece, a full facepiece, a hood or a helmet. The flow of air to the half and full facepiece types may be either continuous or controlled by a demand valve. Where the air supply is also used in the industry process, the compressor should be capable of supplying 300 litres/minute to the first wearer and 170 litres /minute for each additional person. This is extra to the requirement for air-operated equipment.



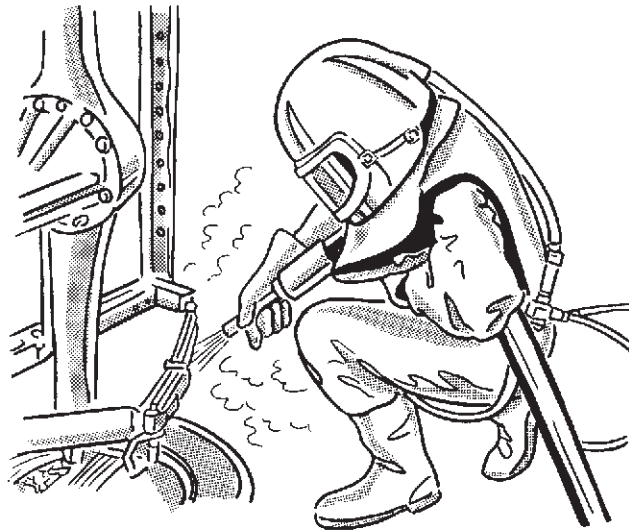
In the compressed airline respirator, a compressor creates a continuous flow of air to the facepiece or helmet.

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The continuous flow of air creates a positive pressure inside the facepiece or helmet, which gives greater protection than a demand-type respirator. It also reduces fogging and cools the wearer's face. The flow rate can be adjusted by a belt-mounted regulator.

The demand-flow type lets air into the facepiece only when the worker is breathing in, which conserves compressed air.

Hood and helmet airline respirators are used when the head and neck must be protected. Because the efficiency of this type of respirator depends on maintaining a positive pressure inside the hood, the respirator must fit closely round the neck. Drawstrings or elasticised neckbands should be as tight as comfort allows. Simply tucking the cape or inner bib part of the hood inside your shirt or other garment is not recommended.



Sand blasting is one job that requires a helmet airline respirator.

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Increasing the air pressure above the manufacturer's recommendations will not necessarily increase the protection. In fact, it may create vortex currents and local areas of negative pressure within the hood, causing inward leakage of the contaminated atmosphere. Also, the extra noise the wearer is subjected to may be unacceptable.

The air intake to the compressors should be sited in an uncontaminated atmosphere. Particular care should be taken to ensure that this requirement is met if a portable air compressor is used to supply breathing air. Compressed air for breathing should comply with Appendix A (*Requirement for air quality compressors or cylinders for air-supplied respirators*) of NZS AS 1715:1991 (reproduced on pp. 49-51 of this booklet). Oil and water traps by themselves are not sufficient to make compressed air respirable. Seek advice from suppliers.



PRECAUTIONS FOR NORMAL USE

- All fresh air hose intakes should be supervised to ensure a continuous supply of fresh air.
- Compressor air intakes should be sited to avoid contamination (particularly by exhaust gases from internal combustion engines).
- Don't let the compressor run hot, as decomposition of the lubricating oils may produce dangerous amounts of carbon monoxide and other harmful substances.
- Remove water and pockets of stagnant air before you use an airline.



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- If the air supply is used in a manufacturing process as well as for supplying an airline, take particular care to avoid contamination.
- A pressure regulator must be used with a compressed airline respirator.

Airline respirators provide reliable respiratory protection only if the air supply is continuous and efficient. An airline respirator should only be used in an atmosphere not immediately dangerous to life or health because failure of the air supply will expose the wearer to contaminated air. An exception to this is where the wearer carries an emergency air supply to allow enough time to escape (e.g. self-contained breathing apparatus).



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Requirements for Air Quality (Compressors or Cylinders) for Supplied Air Respirators

(Appendix A from NZS AS 1715: 1991 Selection, use and maintenance of respiratory protective devices)

A1 AIR SUPPLY The necessary capacity of any air service for personal protection shall be calculated on a minimum requirement of 300 litres per minute for the first person and at least 170 litres per minute for each subsequent person.

Air used to supply respirators shall-

- (a) have no objectionable or nauseous odour; and
- (b) contain no less than 19.5 percent and not more than 22 percent by volume of oxygen.

Additionally, at 15°C and 100 kPa absolute the air shall-

- (i) contain not more than 11 mg/m³ (10 p.p.m. by volume) of carbon monoxide;
- (ii) contain not more than 1400 mg/m³ (800 p.p.m. by volume) of carbon dioxide;
- (iii) contain not more than 1mg/m³ (1 p.p.m) of oil; and
- (iv) for cylinders, contain not more than 100 mg/m³ of water when sampled from a cylinder initially filled to a pressure of at least 12 MPa.

A1.2 Air temperature. Air supplied from a compressor to a facepiece, hood or helmet should be at a comfortable breathing temperature within the range 15 to 25°C.

A1.3 Avoidance of stale air or moisture. Arrangements should be made to avoid the pocketing of stale air in pipelines. The use of ring circuits and controlled draining helps to guard against this hazard.



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Couplings should be of the 'snap type' and should be of different design to those used for other compressed air services.

Provision should also be made, at appropriate places, to drain away water from any pipeline. Water traps should be drained prior to using the apparatus.

A1.4 Warning device. Where an 'inline' auxiliary (secondary) air supply has not been provided to guard against primary supply failure, the user of an air-supplied respirator shall be warned by an automatic device whenever an inadequacy in the air supply may represent an immediate hazard to the user.

A1.5 Compressors. Systems shall incorporate a receiver of sufficient capacity to reduce pulsations from compressor action and reduce compressor overheating. Compressors shall be well maintained and shall not be allowed to run hot, as harmful substances may be produced by the decomposition of the lubricating oils. Filters should be purged or replaced at regular intervals in accordance with the manufacturer's instructions. Consideration should also be given to the use of oil-free compressors.

The air intake to the compressors should be sited in an uncontaminated atmosphere. Particular care should be taken to ensure that this requirement is met if a portable air compressor is being used to supply breathing air.

The use of filters on any air intake should be of secondary importance when compared with the foregoing requirements.

A1.6 General works air supply systems. When the air supply is used in the manufacturing process as well as in the supply of respirable air, particular care should be taken to avoid the risk of contamination.

Where the air supply is used in the manufacturing process and there is a risk of contamination, the air supply should not



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be used for personal protection unless it has been filtered to provide the air quality defined in paragraph A1.

In every instance it should be ensured that any back pressures from operating plants using the air supply will not cause contamination of the air used for personal protection.

Provision should be made to ensure that the airlines supplying the breathing apparatus receive an adequate supply of respirable air under all plant operating conditions.

Plant air supplies are not suitable for airline respirators unless special precautions have been taken for the elimination of scale, rust, water, oil mist, irritating ingredients and odours. It is preferable that a separate installation be provided for respiratory air purposes, and that it be designed to eliminate the above mentioned contaminants.

A2 COMPRESSED OXYGEN SUPPLY. Compressed oxygen of the dry breathing type should be odourless and contain not less than 99.5 percent by volume of oxygen.

At 15°C and 100 kPa absolute; it should contain-

(a) less than 11mg/m³ (10 p.p.m. by volume) carbon monoxide; and

(b) less than 1400 mg/m³ (800 p.p.m. by volume) carbon dioxide.

When sampled from a cylinder initially filled to at least 12 MPa, it should contain-

(i) less than 20 mg/m³ water; and

(ii) less than 1 mg/m³ (1p.p.m. by volume) oil.

