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Monroe Library Project B-99-01-12 Solar Electric System Submittals Div. 48 14 00 8/16/2012

Index

Section 1 - (55) Solar Modules: Lumos LSX190

Section 2 – Inverter: SMA 9000TLUS

Section 3 - Roof Top Layout Drawing

Sec comment on eighth sheet of Submittel

NO EXCEPTIONS NOTED MAKE CORRECTIONS NOTED REVISE AND RESUBMIT SUBMIT ITEMS AS NOTED

Checking is only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Any Action shown is subject to the requirements of the plans and specifications. Contractor is responsible for: dimensions which shall be confirmed and correlated at the jobsite, fabrication processes and techniques of construction, coordination of the work with that of all other trades and the satisfactory performance of the work.

By Dated: CH2MHILL

 SUBMITTAL REVIEW

 REVIEW IS FOR GENERAL COMPLIANCE WITH CONTRACT DOCUMENTS NO RESPONSIBILTY IS ASSUMED FOR CORRECTNESS OF DIMENSIONS OR DETAILS

 NO EXCEPTIONS
 MAKE CORRECTIONS NOTED

 AMEND AND
 REJECTED - SEE RESUMBIT

 DATE
 8 - 17 - 12
 BY

 2G Construction
 2G Construction

LUMOS



LSX200 Series

A true systems approach to photovoltaic module and racking integration

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Ba	no	fits
De	ne	

Frameless Module		No aluminum = lower embodied energy Lower profile
No Module Grounding		No ground lugs No continuous module equipment ground
Constrained Module Positioning		Perfect alignment Speeds installation time
Integrated Wireway		UV and rodent protection Speeds installation time
Tamper Resistant Stainless Fasteners		Keeps your investment working for you
Available with black, white or clear back shee	ets	Aesthetic options for different applications



LSX Racking System

Our LSX Rail is the proprietary racking solution for the LSX Module System.

LSX Rail is sold with the insulating rubber strip and preinstalled, pre-positioned fasteners.

LSX Rail •

Features:

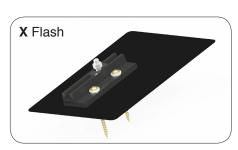
- Integrated wireway provides rodent
 and UV protection
- Shortens installation time by an estimated 10%
- Sold perforated or unperforated
- Black powdercoated finish
- · Insulating rubber strip

LSX Splice -

MC4 Connector •



- Perforated or Unperforated
- Integrated Wireway
- Black Powdercoated Finish



- · Compatible with all racking systems
- Low profile and easily adjustable
- IRC and IBC Code Compliant

Insulating Rubber Strip



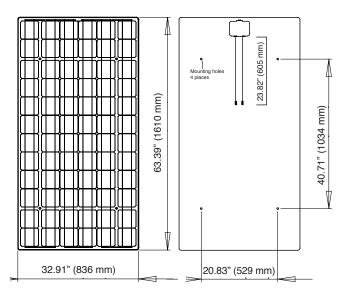


3550 Frontier Ave Ste C-2 Boulder, Colorado 80301 877-301-3582 www.lumossolar.com

LSX200 Series

Mechanical Specifications

Solar Cell	Monocrystalline 5" x 5" (125 mm x 125 mm)
Number of Cells	72 (6 x 12)
Internal Bypass Diodes	3
Module Dimensions	63.39" x 32.91" x 1.38" (1610 mm x 836 mm x 35 mm)
Module Area	14.49 ft² (1.35 m²)
Module Weight	49.8 lbs (22.4 kg)
Front Glass	.24" (6 mm) Tempered Glass
Backsheet	Black, White, and Clear
LSX Rail Assembly Options	1-7 Portrait Module Lengths (Black Powdercoated Finish) 1-3 Landscape Module Lengths (Black Powdercoated Finish)
Output Cables	12 Awg. 21.65" (550 mm) PV Wire with MC4 Connectors
Static Load	50 PSF (2400 Pa) Portrait/113 PSF (5400 Pa) Landscape
Hail	Maximum Diameter 1" (25 mm) at 52 mph (23 m/s)
Warranty	12 years at 90% of the rated power output 25 years at 80% of the rated power output
Certifications	ETL per UL-1703 & CEC listed



Packaging Configuration

Quantity/Pallet, Quantity/40' Container

36 pcs/pallet -792 pcs/40' HQ

Temperature Coefficients

Nominal Operating Cell Temperature (NOCT)	46±2 °C
Power Temperature Coefficient	-0.47 % / °C
Voltage Temperature Coefficient (Voc)	-0.35 % / °C
Current Temperature Coefficient (Isc)	+0.05 % / °C

Electrical Specifications

Model	LSX 180-72M-B/W/C*	LSX 185-72M-B/W/C*	LSX 190-72M-B/W/C*	LSX 195-72M-B/W/C*	LSX 200-72M-B/W/C
Rated Power @ STC	180 W	185 W	190 W	195 W	200 W
Black/Clear PTC	160.9 W	165.5 W	170.1 W	174.7 W	179.3 W
White PTC	161.3 W	165.9 W	170.5 W	175.1 W	179.7 W
Nominal Voltage	24 V	24 V	24 V	24 V	24 V
Peak Power Voltage (Vmp)	35.3 V	35.4 V	35.8 V	36.2 V	36.5 V
Maximum Power Current (Imp)	4.96 A	5.09 A	5.17 A	5.25 A	5.34 A
Open Circuit Voltage (Voc)	44.5 V	44.6 V	44.8 V	45.0 V	45.1 V
Short Circuit Current (Isc)	5.34 A	5.40 A	5.48 A	5.50 A	5.53 A
Operating Temperature	-40 ℃ to 85 ℃	-40 ℃ to 85 ℃	-40 °C to 85 °C	-40 ℃ to 85 ℃	-40 ℃ to 85 ℃
Max System Voltage (UL / IEC)	600 V / 1000 V	600 V / 1000 V			
Max Series Fuse Rating	15 A	15 A	15 A	15 A	15 A
Power Tolerance	±3%	±3%	±3%	±3%	±3%
Module Efficiency	13.4%	13.7%	14.1%	14.5%	14.9%

*B-Black Backsheet

*W-White Backsheet

*C-Clear Backsheet

PATENTS PENDING



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SUNNY BOY 8000TL-US / 9000TL-US / 10000TL-US





Efficient

- Maximum efficiency of 98.3%
- Transformerless, with H5 topology

High Yields

- Superior yield with OptiTrac MPP tracking
- OptiCoolTM active temperature management

SMA Power Balancer for three-

Safe

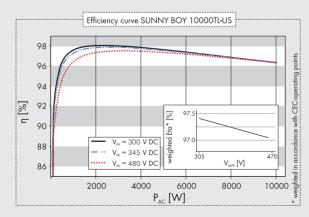
- phase grid connection
- Integrated DC load disconnect and combiner box
- UL 1741/IEEE-1547 compliant

SUNNY BOY 8000TL-US / 9000TL-US / 10000TL-US

Transformerless design, maximum yields

The new Sunny Boy TL-US series is UL-listed for North America and features SMA's innovative H5 topology, resulting in superior efficiencies of up to 98 percent and unmatched solar yields. The transformerless design reduces weight, increases the speed of payback and provides optimum value for any decentralized, commercial PV system. The Sunny Boy TL-US series for North America is the ideal choice for mid-size and large plants from 24 kWp up to the megawatt range.

Technical data	Sunny Boy 8000TL-US	Sunny Boy 9000TL-US	Sunny Boy 10000TL-
	208 V AC	208 V AC	208 V AC
Input (DC)	1000014/	1105014	10500.14
Max. recommended PV power (@ module STC)	10000 W	11250 W	12500 W
Max. DC power (@ $\cos \varphi = 1$)	8400 W	9400 W	10500 W
Max. DC voltage	600 V	600 V	600 V
DC nominal voltage	345 V	345 V	345 V
MPP voltage range	300 V - 480 V	300 V - 480 V	300 V - 480 V
Min. DC voltage / start voltage	300 V / 360 V	300V / 360 V	300 V / 360 V
Max. input current / per string (at DC combiner box)	28 A / 28 A	31 A / 31 A	35 A / 35 A
Number of MPP trackers / fused strings per MPP tracker	1 / 6 (@ Combiner Box)	1 / 6 (@ Combiner Box)	1 / 6 (@ Combiner Bo
Output (AC)			
AC nominal power	8000 W	9000 W	10000 W
Max. AC apparent power	8000 VA	9000 VA	10000 VA
Nominal AC voltage / adjustable	208 V /	208 V / -	208 V / -
AC voltage range	183 V - 229 V	183 V - 229 V	183 V - 229 V
AC grid frequency; range	60 Hz; 59.3 - 60.5 Hz	60 Hz; 59.3 - 60.5 Hz	60 Hz; 59.3 - 60.5 H
Max. output current	40 A	44 A	48 A
Power factor (cos φ)	1	1	1
Phase conductors / connection phases	1 / 2	1 / 2	1/2
Harmonics	< 4%	< 4%	< 4%
Efficiency			
Max. efficiency	98.3%	98.3%	98.3%
CEC efficiency	98%	98%	97.5%
Protection devices			
DC reverse-polarity protection	•	•	٠
AC short circuit protection	•	•	•
Galvanically isolated / all-pole sensitive monitoring unit	-/•	_/●	_/●
Protection class / overvoltage category	1 / IV	I / IV	I/IV
General data			
Dimensions (W / H / D) in mm (in)	4	70 / 615 / 240 (18.5 / 24 / 9	
DC Disconnect dimensions (W / H/ D) in mm (in)		87 / 297 / 190 (7 / 12 / 7.5)	
Packing dimensions (W / H / D) in mm (in)	30	0 / 580 / 800 (16 / 23 / 31.5	
DC Disconnect packing dimensions (W / H / D) in mm (in)		370 / 240 / 280 (15 / 9 / 11)	,
Weight / DC Disconnect weight		35 kg (77 lb) / 3.5 kg (8 lb)	
Packing weight / DC Disconnect packing weight		40 kg (88 lb) / 4 kg (9 lb)	
Operating temperature range / full power range	-25 °C +60 °C (-13	°F +140 °F) / -25 °C +45	°C (-13 °F +113 °
Noise emission (typical)	≤ 46 dB(A)	≤ 46 dB(A)	≤ 46 dB(A)
Internal consumption at night	≤ 0.25 W	≤ 0.25 W	≤ 0.25 W
Topology	transformerless H5	transformerless H5	transformerless H5
Cooling concept	OptiCool	OptiCool	OptiCool
Electronics protection rating / connection area	NEMA 3R / NEMA 3R	NEMA 3R / NEMA 3R	NEMA 3R / NEMA 3
Features			HENRY ON / HENRY
Display: text line / graphic	•/-	●/-	●/-
Interfaces: RS485 / Bluetooth	•/- 0/0	0/0	•/- 0/0
Warranty: 10 / 15 / 20 years	●/0/0	●/0/0	●/0/0
Certificates and permits (more available on request)	ULI741, ULI998, IEEE 132	.7, FCC Part 15 (Class A & B), CS	A CZZ.Z INO. 107.1-20
NOTE: US inverters ship with gray lids.			
• Standard features O Optional features – Not available			
Revised August 2010 Data at nominal conditions			
Revised August 2010 Data at nominal conditions			



Toll Free +1 888 4 SMA USA www.SMA-America.com

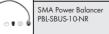


Accessories

SOLAR DEPOT

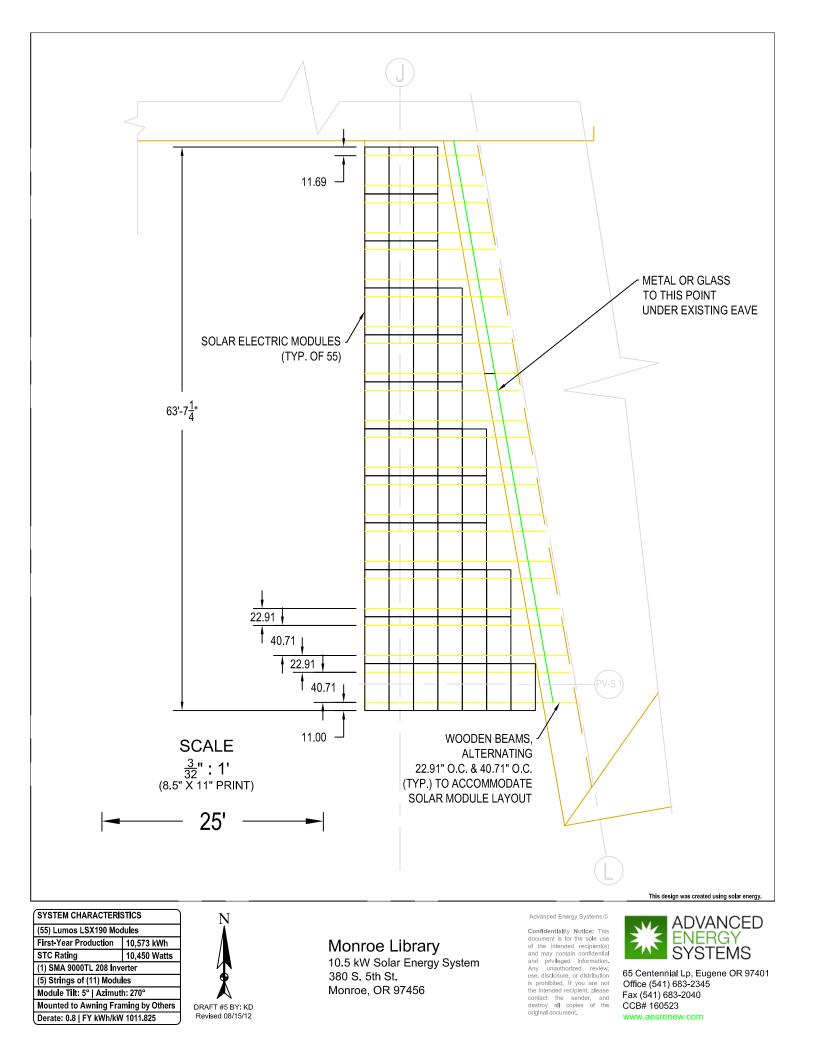


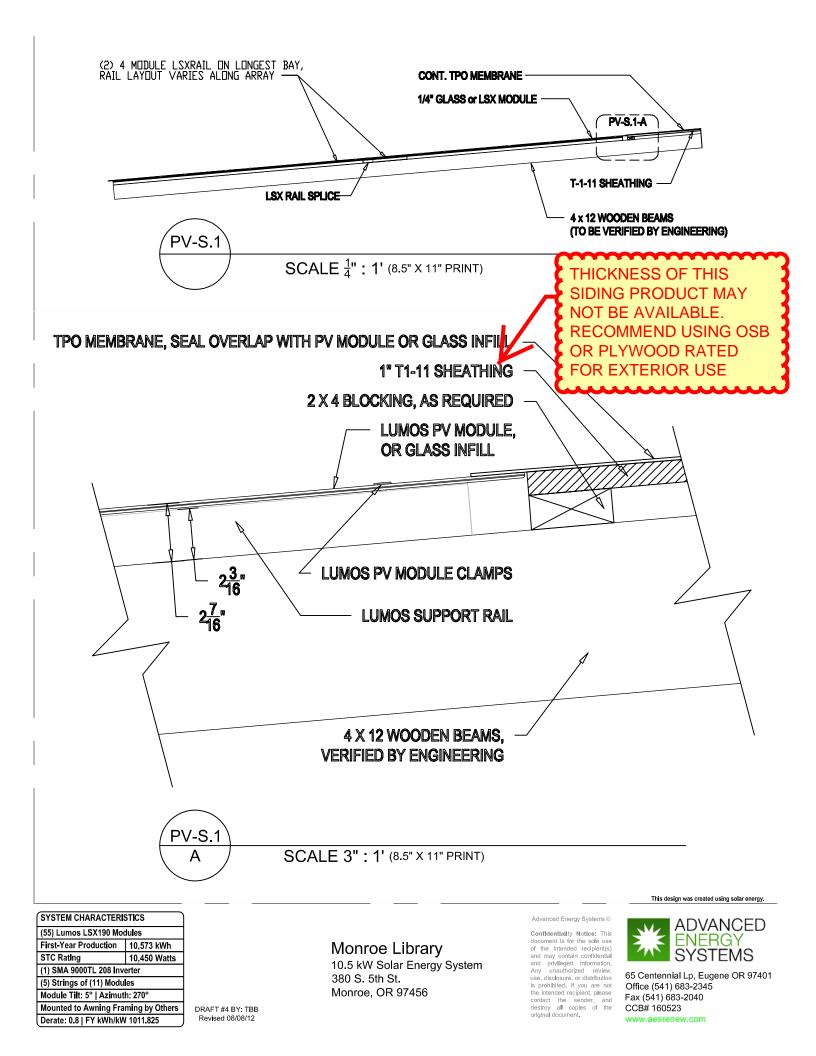
Bluetooth® Piggy Back BTPBINV-NR



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ETERNABOND® is the only MicroSealant® in a tape form available virtually any leak or water proof any surface in minutes.

From the manufacturer to the tradesman to the homeowner, more and more people are trustir permanent repairs on non pressurized leaks. EternaBond®'s MicroSealant® adhesive provide virtually all surfaces. By following our easy 3 step instructions, you too will be amazed at the si bonding strength of EternaBond® tapes.

EternaBond® is available at over 600 commercial distributors and retail stores coast to coast. click on the EternaBond® Distributors link (to the left) or you can order direct from our website tab (above).

EternaBond Announces New Product: Primerless Safety Tape

Roofing Solutions for Residential &

Commercial Roofing Professionals







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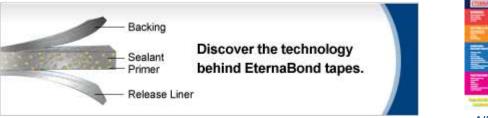
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What is Eter

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MicroSealant Technology®





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RoofSeal/OneStep

Description

For use on virtually all roofs, **RoofSeal/OneStep** features a UV stable backing that is available in Black, Gray, Tan and White. With the exception of surface prep, **RoofSeal/One-Step** is a one-step permanent repair system for virtually all roof types, and roof accessories. **RoofSeal/OneStep** creates a watrproof, moisture, and air tight barrier with no additional sealing required. **RoofSeal/OneStep** remains flexible to temperatures as low as -70° F making it virtually impossible to thermally shock the seam causing a leak.

RoofSeal/OneStep bonds to a wide range of surfaces including difficult roof materials such as EPDM, TPO, most PVC, CSPE/Hypalon, CPE, SBS, APP modifieds, asphalt BURs, coal tar BURs, all metal roofs, tiles, shingle, aluminum, gavanized steel, gypsum board, wood, polyethylene, propylene, polystyrene, fiberglass, brick, concrete, masonry, OSB, etc.

Basic Use

RoofSeal/OneStep tape is used to seal roof joints (seams) and tears, flashings, copings, skylights, gutters, etc. Perfect for repairing and restoring roofs on mobile homes and RVs. **RoofSeal/OneStep** seals to itself so it can be cut and folded arounded an object.

Composition

RoofSeal/OneStep utilizes **EternaBond's** advanced **MicroSealant™ Technology**, a 100% solids formulation of synthetic resins, thermoplastics and non-curing rubber with a built-in primer. It is bonded to a UV stable backing. The adhesive coating is protected by a silicone release liner, to be removed prior to application.

Surface Preparation

Surface must be clean and dry. Moisture, dust, dirt or other foreign matter should be removed. Remove oil and grease, etc. with **EternaClean** or a non-residue cleaner such as acetone or lacquer thinner. Remove salt and other contaminents.

Technical Data		
Adhesion	20 lbs.+/in width	
Application temperature	150° F to - 20° F ambient	
Available widths	Up to 48 "	
Colors	Black, Gray, Tan, White	
Elongation	>700% +/- 100	
Low temperature flexibility	1/2" radius at -30° F	
Permanence	.001 perms maximum	
Pliability	No cracks in membrane	
Shelf Life	Up to 5 years	
Standard case quantity	100 sq. ft. per case	
Standard roll size	2", 4", 6", 8", 12", 24", 36" x 50'	
Temperature flexibility range	-70° F - >200° F	
Tensile break PSI	4500 PSI +/- 500 PSI	
Total thickness	35 mils (+/- 2 mils)	
Water vapor test (ASTME 96B)	.005 grms / 100″ sq. / 24 hrs. / 100° F	
Values are typical performance properties and characteristics based on		

Values are typical performance properties and characteristics based on laboratory testing. This is intended as a guide for comparison purposes and does not constitute a specification or specification range.

Application

Install **RoofSeal/OneStep** over the repair area, removing the release liner gradually to prevent contamination of the adhesive prior to application. Rub or roll with pressure using your hand or a steel roller to activate bonding process. This material may be applied to clean dry surfaces from 150° F to -20° F ambient. Treat surface with **EternaPrime** for installations from 40° F to -20° F ambient.

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ADCO Products, Inc Michigan Center MI 800.248.4010 phone 517.764.0334 phone 517.764.6697 fax www.adcocorp.com

EternaBond, Inc.

Mundelein IL, USA 888-336-2663 phone 847-837-9449 fax www.eternabond.com

EternaBond RoofSeal/OneStep R1 02/15/12

WARRANTY: ADCO warrants its products to conform to ADCO's specifications at the time of sale when tested according to ADCO standards. If a product is proven to be defective when tested according to ADCO standards, ADCO will, at its option, refund the purchase price or replace or repair the defective product. THIS LIMITED WARRANTY IS THE BUYERS SOLE AND EXCLUSIVE REMEDY AGAINST ADCO AND IS IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. In no event shall ADCO be liable for any special, incidental, consequential, or punitive damages arising out of any claims whether based on negligence, contract, warranty, strict liability or otherwise.



Product Information

ETERNABOND

RoofSeal PLUS

Description

Designed specifically for granulated roofs and surfaces that require a deeper seal. **RoofSeal PLUS** features a UV stable backing that is available in White and Black. It also features **EternaBond's** advanced **MicroSealant[™] Technology**. Therefore, with the exception of cleaning the repair surface, **RoofSeal PLUS** is literally a one-step permanent repair system. **RoofSeal PLUS** creates a waterproof, moisture and air tight barrier. **RoofSeal PLUS** remains flexible to temperatures as low as -70° F.

RoofSeal PLUS features **EternaBond's** self-sealing advanced **MicroSealant[™] Technology**, a sealant so advanced it permanently bonds to a wide range of surfaces including difficult roof materials such as : EPDM, TPO, most PVC, CSPE/Hypalon, CPE, SBS, APP modified, asphalt BURs, coal tar BURs, all metal roofs, tiles, shingle, aluminum, galvanized steel, gypsum board, wood, polyethylene, propylene, polystyrene, fiberglass, brick, concrete, masonry, OSB, etc.

Basic Use

EternaBond RoofSeal PLUS is used whenever a thicker layer of **EternaBond's** self-sealing advanced **MicroSealant™** is needed to reach deeper into a surface. Designed to seal granulated roof joints (seams) and tears, it is also extremely effective on flashings, copings, skylights, gutters, etc. **RoofSeal PLUS** seals to itself so it can be cut and folded around an object, as if wrapping a present.

Technical Data		
Standard roll size	2", 4", 6" X 25'	
Standard case quantity	50 sq. ft. per case	
Available widths	Up to 48"	
Colors	Black and White	
Total thickness	65 mils (+/- 2 mils)	
Adhesion	20 lbs +/in width	
Low temp flexibility	1/2" radius at -30° F	
Application temp	>150° F to -25° F with optional primer	
Temperature range	-70° F - >200° F	
Pliability	No cracks in membrane	
Water vapor test (ASTME 96B)	.005 grms/100″ sq. / 24 hrs / 100° F	
Permeance	.001 perms maximum	
Elongation	<700 % +/- 100	
Tensile break PSI	4500 PSI +/- 500 PSI	
Shelf life	Up to 5 years	

Values are typical performance properties and characteristics based on laboratory testing. This is intended as a guide for comparison purposes and does not constitute a specification or specification range.

Composition

EternaBond RoofSeal PLUS utilizes **EternaBond's MicroSealant[™] Technology**, a 100% solids formulation of synthetic resins, thermoplastics and non-curing rubbers with a built in primer, bonded to a tough UV stable backing. Designed not to harden under even the most rigorous conditions. **MicroSealant[™]** is protected (while in a roll) by a tough, easily removed siliconized polymer release liner, which prevents contamination prior to its use.

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Surface Preparation

Surface must be clean and dry; free of loose rust and scale, dust, talc and dirt. Oil, grease and other contaminants should be removed with a suitable solvent/cleaner. Use of EternaPrime reduces clean up. For older plastic roofs, score surface with sand cloth and wipe away dust.

Application

Install EternaBond RoofSeal PLUS over the repair area, removing the plastic release liner gradually to prevent contamination of the adhesive prior to application. Rub or roll with pressure with and or steel roller to activate bonding process. This material may be applied to clean dry surfaces from 150° F to -20° F. Treat surface with EternaPrime for installations from 40° F to -20° F.

ETERNABOND, Inc.

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EternaBond RoofSeal PLUS R2 02/15/12

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