EPDM Coatings LLC 105 Radcliffe Ave West Lawn, PA 19609 Phone 1-866-311-3736 Fax 702-977-2936 e-mail info@epdmcoatings.com
Website http://www.epdmcoatings.com Blog http://liquidroof.blogspot.com

Liquid Rubber®, which is the ONLY liquid form of EPDM in the world, is a unique form of EPDM rubber. As a liquid, it can conform to any shape of surface, flashing or protrusion, vertical or horizontal, and can be applied easily with a paint brush or roller. When mixed with a catalyst it cures by chemical reaction to form a self adhering solid seamless rubber sheet.

Liquid Rubber® is a versatile coating for a broad range of applications. Its superior protective quality is derived from a unique combination of physical and chemical properties. Its EPDM chemistry provides for long durability, water resistance, a broad temperature tolerance and chemical resistance. As a chemically curing Liquid Rubber® it can form a flexible membrane up to 25 mils thick in one coat.

These properties enable Liquid Rubber® to be used as a one coat system on:

- Metal roofs
- Single ply rubber
- Hypalon and PVC membrane
- Steel and fiberglass siding
- Storage tanks
- Structural steel
- Lumber and plywood
- Concrete and masonry

The exposure environment can vary from high humidity to total immersion; constant or cyclic temperature changes from minus -60 F to 300 F or corrosive environments consisting of vapors, liquids and salt solutions.

Liquid Rubber® is an extremely effective corrosion preventive coating for steel and aluminum. It does not contain any leachable or sacrificial components so its protection does not diminish overtime.

The time needed for the Liquid Rubber® to solidify after it has been catalyzed will vary depending on the temperature. At least two days of cure time should be allotted for most applications. Stationary structures are therefore the most suitable for coating with Liquid Rubber®.

ENVIRONMENTAL IMPACT

Liquid Rubber® meets EPA's limits for volatile organic compounds (VOC) and the solvent contained in the product is not photochemically reactive. There are no leachable components which could contaminate surface of ground water. The greatest beneficial environmental impact, however, can be attributed to the long term durability of the product. This necessitates fewer recoats which translates into less total VOC emissions over the lifecycle of the coating.

CURE MECHANISM

Cross linking takes place at ambient temperatures. Free radicals resulting from the decomposition of the organic peroxide cause cross linking to take place at the DCPD sites. The rate, at which the peroxide decomposes, therefore, determines the rate at which the system will cure. This rate is determined by temperature and the availability of oxygen. Oxygen is necessary to activate a catalyst which promotes peroxide decomposition at lower temperatures. The cure mechanism in EPDM Liquid Rubber® will vary from active to inactive, determined by temperature. Faster cures and slow cures over extended periods of time result in identical physical properties. Broad day-night temperature swings in spring and fall will not compromise the final physical properties of the Liquid Rubber® Membrane.

Outstanding Application Characteristics

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- Extremely high resistance to penetration of water
- Ultra Violet and Ozone stable
- Excellent long term aging properties (i.e. retains its flexibility and elongation longer than other elastomers);
- Very broad temperature tolerance range [from 300 degrees F to minus 62 degrees F]
- Acid and alkali resistant
- Resistant to polar solvents
- Withstands ponding water even when not cured
- *Caution: Oils, fats and waxes will swell the polymer.*

APPLICATION CHARACTERISTICS

The slow curing and non-polar nature of EPDM Liquid Rubber® give it outstanding surface wetting properties. The product does not fill cracks and crevices but will produce an even film penetrating even the smallest cracks and irregularities.

An example of this is, when EPDM Liquid Rubber® is applied over porous surfaces such as poured concrete, pinholes will appear on the surface as the material slowly displaces the air in the pores. This surface wetting feature enables the product to be applied in a single coat over non porous surfaces and still result in complete film integrity. EPDM Liquid Rubber® is hydrophobic in its liquid as well as the cured state and will withstand water immersion at any stage of its cure cycle. Liquid Rubber® should not be used where the material does not have exposure to oxygen such as between two impervious materials. When oxygen is available curing takes place from both top and bottom of film. There is sufficient oxygen available on most surfaces to initiate cure from the bottom. Oxygen readily penetrates films 20 mils thick. Curing is considerably retarded in thick films, however, cures do take place in thicknesses up to 75-80 mils within a three month period at temperatures over 70 degrees F. EPDM Liquid Rubber® can be applied to hot roof surfaces encountered during summer. The solvent in the system will flash off rapidly but the polymer will remain soft long enough to permit overlapping even after 1-2 hours.

On some materials, such as EPDM rubber sheets, some swelling may occur due to solvent absorptions after applying *EPDM Liquid Rubber*®. This is normal. Swelling will recover with time and heat. In 80° F or so, allow 7 to 14 days to recover. In colder temperatures, recovering will take several weeks, as much as 6 to 8 weeks in 60° F.

COMMERCIAL & INDUSTRIAL APPLICATIONS

EPDM rubber is an excellent recoat product for roll formed steel siding which is starting to corrode at the bends. The rubber can be applied as one coat system with no corrosion inhibitive primer needed.

Steel Siding for Buildings

Fabricated steel in marine environments
Cranes, tanks and support structures at dock facilities experience accelerated corrosion rates due to salt water exposure. EPDM rubber coatings are not affected by salt and are ideal for this type of environment.

Steel storage tanks
Elevated or on ground steel storage tank can be effectively protected with a rubber coating. Surface condensation, cathodic protection nor thermal stresses between sun and shady areas present problems for the coating.

Concrete pipe and spill containments

EPDM rubber coatings are very effective for protecting concrete pipe against salt water corrosion. They can tolerate higher temperatures, exposure to strong sun, and have 2.5 times higher solids than liquid Neoprene coatings.

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Corrosive environments

Corrosive environments are created by many industrial operations where acids are used. Similar conditions can also be produced organically in poultry and hog production operations which generate high volumes of manure. EPDM coatings can protect the steel and other construction materials from rapid deterioration in these environments.

Liquid Rubber® should not be applied directly over an asphalt based coating. Water based acrylic elastomeric coatings can be used as intermediate coat before applying Liquid Rubber®. Asphalt's based applications should be considered as being unstable materials and are excluded from warranty coverage since the asphalt will over time work its way into the EPDM material. Caution-Latex house paints can not be substituted in place of the acrylic elastomeric coatings. EPDM Coatings has a system specifically designed for petroleum-based surface adhesion.

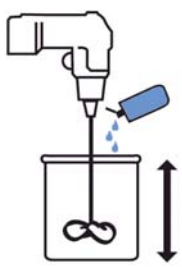
One component thermoset. Non thermoplastic materials, regardless of shape can now be coated with EPDM rubber as a protection against corrosion or chemical attack. The coating can be applied by spray, dip or flow coat methods and then cured in an oven at temperatures from 250-300 F (120-150 C). These single component products are custom formulated for a specific application, have good storage stability and are very easy to apply. Viscosity and solids content can be controlled and make it possible to apply thin as well as thick coatings of EPDM rubber.

WHAT YOU NEED

Gallon containers	Four and five gallon pails
3/8 inch electric drill	1/2 inch electric drill
Gallon mixing shaft	Pail mixing shaft
Short nap roller(6 inch)	rubber edged squeegee
brush	Short nap roller(6 inch)
rubber edged squeegee	brush
masking tape	masking tape
paint thinner for clean-up	paint thinner for clean-up

BUTYL TAPE, POLYESTER FABRIC OR BUTYL TAPE-To strengthen damaged roof skin

TOOLS EQUIPMENT and MIXING INSTRUCTIONS (Electric drill, mixer shaft, pop rivets, wire brush, sandpaper (60grits), spatula, paint brush). The container is under filled to allow for the addition of the pre-measured catalyst that is included. A drill and a mixer (shown below) will be needed to incorporate the catalyst. For a 1 gallon can a short mixer will suffice. For 4 or 5 gallon pails you MUST use a long shaft mixer. The catalyst will be inside the box for 1 gallon and 1 gallon repair kits. The catalyst will be located under the lid in 4 and 5 gallon pails.



Mix rubber material in can/pail until uniform; center mixer shaft in pail or can and begin mixing until a vortex is formed. Slowly pour all of catalyst into vortex. Move mixer up and down and in a circular motion for 2-3 minutes until all portions of can/pail are uniformly mixed.

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APPLICATION PROCEDURES

1) Incorporate supplied catalyst using drill and mixer shaft by following label directions. Let stand at least 1/2 hour before using.

2) Apply masking tape to perimeter of roof or wherever straight edges are desired. Tape can also act as catch basin for sags if only one edge is attached to roof and rest is formed into shape of a gutter.

3) Pour some material on roof and use squeegee to distribute over surface. Follow with roller to even out the wet film. Product will self level. Use brush around vents, ladder, and antenna. Brush and roller marks will disappear when sufficient material is applied. Work from front to rear.

4) Masking tape should be left on until rubber is solid enough to be touched.

To Stop Leaks

1. Use wire brush to clean edge-strip, seams and flashings. Use sharp edged spatula to remove cracked or brittle caulk. Rough up and smooth surfaces with sand paper.
2. Apply masking tape where straight edge is desired leaving 1 1/2" neither side of seam for coating.
3. Apply 1 coat Liquid Rubber®. (catalyzed) with a brush to all seams, flashings and remaining caulk
4. Remove masking tape the following day after rubber has undergone a partial cure

To Repair Cracks

1. Sand area to 3" around crack.
2. Cut butyl tape to overlap tear. Center over tear and press on with release film attached.
3. Remove film. Cut polyfabric to fit and press into butyl tape.
4. Coat over fabric with LIQUID RUBBER®

To Repair Reaps and Tears

1. Trim ragged edges of damage.
2. Cut new aluminum plate to overlap damaged area by 3".
3. Drill rivet holes 1/2" from edge 1 1/2 apart.
4. Remove plate and apply rubber over holes
5. Pop rivet plate and coat over with LIQUID RUBBER®

CHEMICAL COMPOSITION

Liquid Rubber® is based on a low molecular weight polymer of Ethylene and Propylene with a pendant group of Dicyclopentadiene. The Ethylene-Propylene backbone is saturated and cross linking takes place via the DCPD group. The cure rate is still controlled even

at temperatures up to 120 degrees F and will not result in a porous film. The product can, therefore, be safely applied on the hottest day. The controlled cure rate also results in long pot life, giving the applicator more than an adequate length of time [6 hours depending on temperature] to use the mixed quantity of material.

ADHESION: Adhesion will increase over time. Polar surfaces such as metal, concrete and wood result in stronger adhesion than non-polar surfaces such as asphalts and single ply EPDM sheet. Most weathered surfaces including single ply and thermoplastic membranes will have enough of a surface profile to anchor the Liquid Rubber®.

DURABILITY

By itself, the Liquid Rubber® membrane will exhibit the characteristics of its EPDM chemistry, i.e. U.V. and ozone stability, excellent ponding water resistance and long-term retention of flexibility. However, since it is always applied to an existing roof surface, the condition of that surface will determine overall life expectancy. Liquid Rubber® applied over generally sound single ply EPDM can extend its life another 20 years. The useful life of metal roofs also benefits greatly when Liquid Rubber® is applied. BUR systems often have existing problems such as delamination between layers, buckling and stress cracking. These are further aggravated by wet insulation which often results in severe corrosion and weakening of the metal supporting deck. Projecting a life expectancy for the EPDM Liquid Rubber® membrane ultimately comes down to a case by case determination. When the EPDM membrane is compared to urethanes, acrylics and other elastomers in accelerated weathering and heat aging tests, the EPDM shows itself to be superior.

To recoat weathered metal, sheet rubber, urethane foam, and modified asphalt roll roofing. Excellent for waterproofing concrete roof decks and roof tiles. Can be applied directly to plywood and lumber. Liquid Rubber® is also a very effective coating for steel especially where it is exposed to a salt environment.

Liquid Rubber®® Application Tips for Contractors

Liquid Rubber® is a two component solvent solution version of the single ply EPDM membrane rubber. Its physical properties and method of cure make it unique among liquid applied coatings. The unique combination of properties of Liquid Rubber® include:

- Can apply an up to 35 mil dry film in one coat.
- Penetrates into cracks and crevices.
- Can go directly over a tightly rusted surface without a primer.
- Cure is not affected by relative humidity.
- Freezing does not damage uncured coating.
- Can withstand ponding water or immersion indefinitely.
- Tolerates a wide temperature range from minus 60°F to 300°F.

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Liquid Rubber® has application and spray characteristics that are considerably different from other types of liquid coatings. Although Liquid Rubber® has a heavy consistency, it will self level and penetrate small crevices and pores. It is also harder to brush and more difficult to atomize for spray. The two efficient methods of application are:

For Flat Surfaces (flat or low slope)

First, catalyze the rubber: Pour a quantity on the surface and broadcast with a rubber edged squeegee. Follow this with a short-nap roller to evenly distribute the wet film. Spread rubber at no more than 45 sq. ft. per gallon.

SPRAY APPLICATION

Air atomized or airless spray, roller, squeegee or brush. A combination of methods may be most effective. For example, on a flat roof; pour serpentine bead of material from pail; distribute with squeegee; finish with short nap roller to press air out of cracks and even out the wet film.

A.) Equipment: Use a 3.0 gallon per minute airless spray pump capable of developing a minimum 3,000 psi outlet pressure; 3/8 inch ID hose or larger with a max length of 100 ft. Tip size of .015 or .017 for smaller pumps and a .019 tip for larger capacity pumps. Use a 100 mesh strainer at the outlet of pump or in handle of gun. Use a swivel fitting at the gun in place of a "whip" in order to reduce the pressure drop through a smaller ID hose.

B.) Thinning: It will be necessary to thin Liquid Rubber® with xylene solvent before it can be sprayed. The amount of xylene needed will vary depending on pump size and material temperature. The following is a recommended starting point procedure for thinning a 5-gallon pail:

1.) Add one gallon xylene to pail and mix until uniform.
2.) Add entire amount of catalyst supplied. Mix thoroughly.
3.) Transfer ½ contents to another pail.
4.) Start pump and check spray pattern. If spray is too coarse, try a .015 tip. If this still isn't enough improvement, then add another quart of xylene to the 2 1/2 gallons of rubber in the pail.
Once an acceptable spray pattern is achieved, use the same amount of xylene to dilute each succeeding pail. Pour newly mixed rubber into pail under the pump as needed.

TROUBLE SHOOTING PROCEDURES

Poor spray pattern and clogging of the tip are the most frequently encountered problems during application. These can invariably be traced to inadequate flushing and poor maintenance of the equipment. Check to make certain the 100 mesh strainer is clean before starting.

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Problem: Poor spray pattern.
Solution: Follow thinning procedure in B.)

Problem: Still getting a poor spray pattern, even after thinning rubber with 1 ½ gal of xylene per 5 gallon pail.

Solution: Starting at gun, successively remove one component at a time, (i.e. tip, tip extension, gun filter, gun, strainer at pump, etc.) and check flow. With tip removed, the material flow should be steady and strong (discharge into pail at pump.)

If tip extension is removed and flow increases notice-ably, the ID of the extension is too small. Remove or replace.

If discharge stream is weak and pulsating, attach gun and open drain cock at strainer to see if condition is the same there. If pulsation persists, the problem is in the pump. (The balls are not seating properly or are dented and need replacing.)

HOW TO ACHIEVE MINIMUM DRY FILM THICKNESS

Liquid Rubber® must be applied at a rate that will produce a minimum dry film of 20 mils. This can be accomplished in one coat by applying the rubber at a rate of 200-220 sq.ft. per 5 gallon pail if undiluted. (6 or 6½ gallons when thinned with xylene.) The actual (expanded) surface area must be used for this calculation.

Example

If expanded area of a ribbed or standing seam roof is 1.2 times the length and width area calculation and 1.5 gallons of xylene thinner was used per 5 gallons of rubber, how much material will a 3,000 sq.ft. roof require?

3,000 sq.ft. X 1.2 = 3,600 = 16.36 pails X 5 gal = 82 gallons
220 sq.ft./pail 220 undiluted

16.36 pails X 1.5 gal xylene/pail = + 24.5 gal xylene
106.5 gal
Diluted rubber

SPREAD RATE

The spread rate of 220 square feet. Expanded area per 6.5 gallons of diluted rubber (5 gal rubber + 1.5 gal xylene) is adjusted to the length X width roof dimension.

220 = 183 sq.ft of roof area (L X W) therefore:
1.2

When 6.5 gal of diluted Liquid Rubber® are applied to183 sq.ft. (LXW) of roof, an average dry film of 20 mils will result.

Liquid Rubber® is designed to recoat structurally sound existing roofs and protective materials. They should not be used in place of roofing membranes".

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The following are recommended substrates to coat:

Metal – Coated or Galvanized Steel
Weathered Aluminum
Weathered Copper
EPDM Rubber membrane
Concrete (except foot traffic surfaces)
Urethane Foam
Primed Wood
Fiberglass
PVC Sheet and Pipe
Acrylic Sheet
Sponge Rubber insulation
EPDM Rubber Membrane on flat or sloped Roofs
Weathered Steel Siding
Weathered Fiberglass
Weathered standing seam and corrugated metal roofs
Weathered Vinyl, PVC and Polycarbonate plastic
Foam insulation for pipe
Cast Concrete foundations

Do Not use Liquid Rubber® on the following substrates: For the below we have solutions you can find at our other site http://www.fixallroofs.com or at http://www.liquid-roof.com/product_elastomeric.html

Built up asphalt roofs
Asphalt shingles
Modified asphalt roll roofing
Stainless steel
Glass
Silicone caulk
Foot traffic surfaces
Hypalon Membrane
(Contact EPDM Coatings for other product lines for a solution to these roof types)

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Technical Data Sheet

Volume Solids:	63.5%
Spreading Rate:	A 20 mil dry film will result when liquid is applied at the rate of 50 sq ft per gallon on a smooth surface. A rate of up to 45 sq ft per gallon allows for average surface roughness.
Theoretical Coverage:	1020 sq ft per gallon at 1 mil dry
Weight/ Gallon:	8 pounds (mixed)
Elongation:	180-200%
Brittle Point:	-62 degrees F.
Permeability:	0.1 perm
Weatherometr:	2000 hours (ASTM D4459-8-03)
Peel Adhesion:	4.85 pounds per linear inch on Firestone EPDM.
Pot Life:	4-10 hours depending on temperature.
Cure rate at 70° F:	7-8 hours to touch 24-30 hours to walk on 5-7 days full cure
Thinner:	Most aliphatic and aromatic hydrocarbon solvents (Mineral Spirits, VMaP Naphtha, Xylol). Weaker solvents should be used when coating EPDM rubber sheet to minimize distortion.
Chemical Resistance:	Cured EPDM rubber is resistant to acids, alkalis and polar solvents (Alcohols, Ketones, Glycols). Oils and fats will soften the rubber and should be avoided.
Cure System:	Two component Peroxide initiated free radical cure
Heat Resistance:	302° F (150 C) continuous exposure
VOC:	2.46 pounds per gallon (295/ grams liter)

Cure Conditions: The cure rate of Liquid Rubber® is temperature dependent; i.e. higher temperatures will accelerate the cure and lower temperatures will retard it. Contact with air is another requirement. If, for example, a rain shower develops before material has cured [material may still be wet] and water collects on the surface the following condition will prevail. Material that is still wet will prevent water from penetrating the film; however, the curing process will not begin unless material is exposed to air. The material under water will remain uncured until the water has evaporated and the surface again becomes exposed to air, at which time the curing process will begin.

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