



Fast drying, hard wearing spray-on lining for fresh, treated and portable water storage reservoirs.

Aquaurethane Extreme has been approved by the Secretary of State for use in public water supplies.

AQUAURETHANE EXTREME

Aquaurethane Extreme is a revolutionary fast set, quick drying spray applied polyurea that has been specially formulated to meet the stringent regulations required for fresh, treated and potable water storage reservoirs.

Aquaurethane Extreme has been specially formulated by our team of chemists to meet/exceed the requirements for UK WRAS approval as well as approval under Regulation 31 of the Water Supply (Water Quality) Regulations, the UK's most stringent and highest standard for water containment. Aquaurethane Extreme has been approved by the Secretary of State for use in public water supplies.

Aquaurethane Extreme contains NO CFC's, NO VOC's and NO SOLVENTS and is 100% solids. It is also touch dry in 5 to 7 seconds making it easy and quick to apply. It is professionally applied by trained applicators using specialist high pressure plural component application equipment. The speed and ease of application allows large surface areas to be coated in a very short time allowing fast return to service.

TANK/UNDERGROUND RESERVOIR LINING

Aquaurethane Extreme has been designed to refurbish the inside of fresh, treated and potable water storage tanks and reservoirs that have become porous over the years thus losing valuable water supplies because of leaks and seepage.

As it is spray applied we are able to create a seamless monolithic membrane thus preventing water loss from the containment area into the surrounding structural walls and out into the surrounding land. Its excellent elasticity allows the membrane to expand and contract with the concrete and can withstand significant crack growth.

PIPE LINING

By using specialist application equipment, Aquaurethane Extreme can be applied to the inside of pipes used to carry the water from the reservoirs to the end user providing a seamless lining that helps prevent seepage and leaks from the pipes as well as sealing the joints.

EXTERNAL TANK COATING

Aquaurethane Extreme has also been applied on various projects as an external waterproofing membrane for potable water structures including underground reservoirs. By coating the external roofs, Aquaurethane Extreme prevents contaminants and pollutants penetrating the roof and contaminating the treated water and stored water.





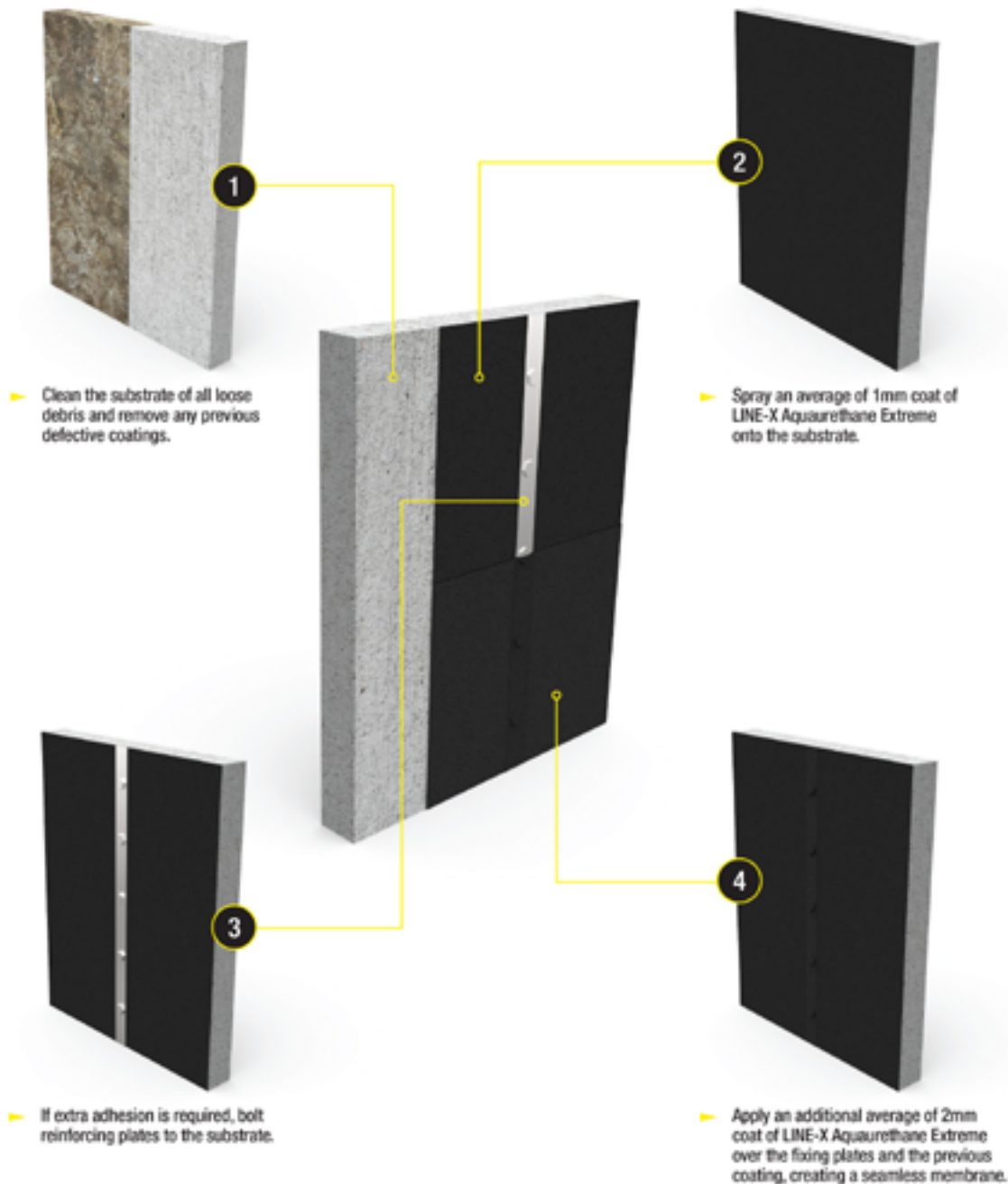
PRODUCT USE DESCRIPTION

LINE-X Aquaurethane Extreme is designed to be used to coat existing substrates that have become porous. For example, by coating the external concrete surface of underground reservoirs that are starting to leak you will be able to prevent untreated rainwater from leaking into the reservoirs. This product can also be used to line the internal walls of the reservoirs to prevent the water from leaking out into the groundwater whilst also preventing the ground water from penetrating the sidewalls into the drinking water.

APPLICATION METHOD

LINE-X Aquaurethane Extreme is a two component, pure polyurea aromatic sprayed-on elastomer material. This coating must be applied via high pressure impingement mixing, with a two-component, 1:1 volume ratio spray machine such as the Graco Reactor EXP series. The Graco Reactor EXP series has built-in, internal, in-line heating capability for the material as well as process setting parameter data logging.

Graco Reactor EXP series is a fixed 1:1 by volume ratio therefore material is delivered to the spray gun with a fixed amount of volume each time the pump cycles. Additionally, this equipment is set up to shut down in the event that the pressure between the A-side and B-side is outside the preset pressure range.



MECHANICAL FIXINGS

In the event extra adhesion is required on the vertical substrate, mechanical fixings may be used in the following way:

- Spray an average of 1 mm coat of LINE-X Aquaurethane Extreme onto the substrate, bolt reinforcing plates to the substrate (the plates can vary between 10 cm to 20 cm square depending on application).
- Once fixed, apply an additional average of 2 mm of coating to the previous coating and over the fixing plates, completely sealing the plate and creating a seamless membrane. A Hilti gun with large washers can be used in the same way with the same effect.

HEADINGLY WATER TREATMENT WORKS LEEDS NORTH: INTERNAL RESERVOIR REGULATION 31 LINING

APPLICATION

Headingley water treatment works had to remove an existing cementitious lining from their water tank that was failing, and re-line the tank with a superior coating that was Regulation 31 approved and would enhance the lifetime of the reservoir.

SOLUTION

The tank had to have the correct preparation prior to application, which included; Drain and dry the tank, Remove any loose cementitious coating with scrapper, Blast complete internal walls with Garnet media to completely remove old lining product and vacuum and clean the whole area, removing any dust and fallout from this initial preparation.

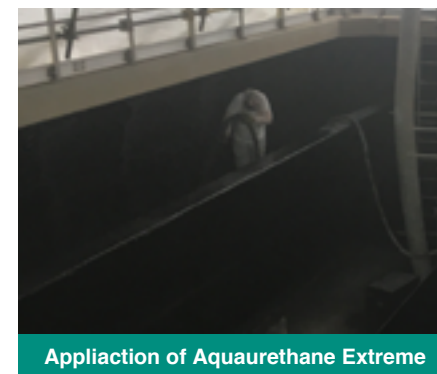
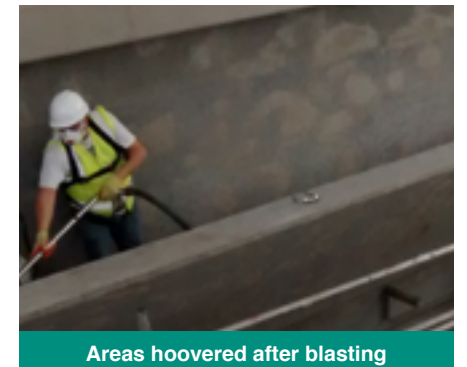
The next stage is inspect walls and repair any surface damage due to decaying substrate with and approved screed.

Once the remedial works have been carried out, the areas to be lined are primed. This process includes; Masking to protect any apparatus that does not need a coating applied i.e. Ladders, floor, piping etc, Check for any dust and remove accordingly, then apply a Waterbase 2K concrete primer. Leave to air dry over-night.

The final stage is applying the regulation 31 approved LINE-X Aquaurethane Extreme to internal walls, (3mm on all surfaces) and the Header tank wall (5mm for water surge protection).

RESULTS

The 420m² tank application was carried out by an approved LINE-X applicator with many years of site contractual experience and the relevant certification to carry-out this work on-site. Adhering to contractual plans and process with site project engineer at each stage to quantify and guarantee all the work carried out by the applicator. Each tank takes around 8-10 working days from start to finish. There has currently been 10 tanks refurbished in total for Headingley Water.



SCOTTISH WATER : INTERNAL RESERVOIR REGULATION 31 LINING

APPLICATION

Furnace SR is an underground, concrete drinking water storage tank located in Dumfries & Galloway. The SR was leaking and Scottish Water were looking for a cost effective solution to seal the reservoir and prevent further water loss.

SOLUTION

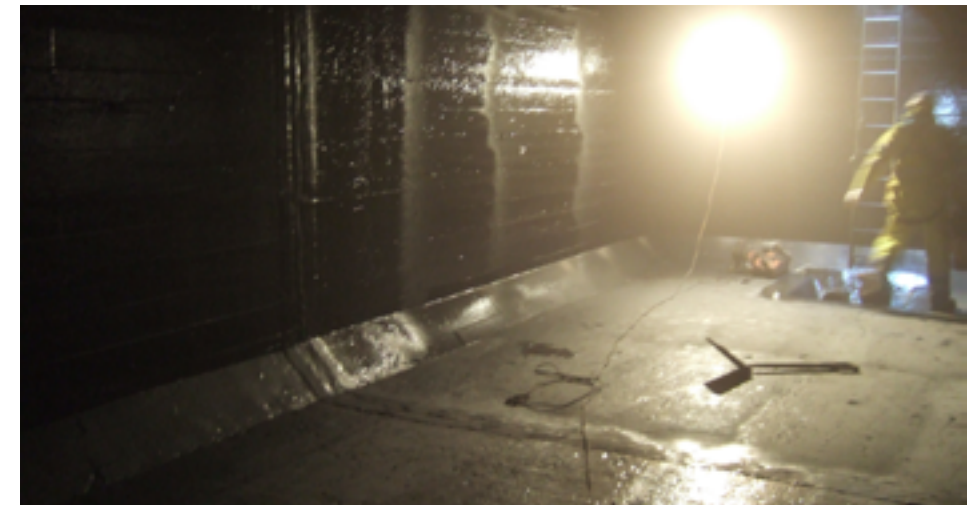
LINE-X Aquaurethane Extreme, the Regulation 31 approved, high pressure spray applied polyurea to line the inside of the tank. Aquaurethane Extreme is touch dry in 5-9 seconds and offers immense strength almost immediately to seal the reservoir and prevent further water loss.

RESULTS

LINE-X Aquaurethane Extreme provided a seamless monolithic membrane preventing water loss as well as water ingress eliminating cross contamination. The 173 m² application was completed in less than a day offering a fast return to service.



Before Aquaurethane Extreme Application



During Aquaurethane Extreme Application

EPOXY TANK LINING REPAIR

APPLICATION

The existing epoxy tank lining in the GAC filter had reached the end of its service life, with extensive corrosion present. In addition to this, the existing tank lining material was no longer approved for use in the public supply (Regulation 31).

SOLUTION

Corroless Eastern was requested to apply LINE-X Aquaurethane Extreme as a suitable tank lining for the water tank due to its long service life and regulation 31 approval. The tender included;

Removal of the existing filtration system, suspended floor and all associated pipe work and weir.

Removal of the existing tank lining which involved preparing the exposed steel to SA2.5 with a minimum surface profile of 100 microns with the use of Sponge Jet blasting technology. This micro encapsulated blasting uses polyurethane sponge embedded with abrasive agents to prepare the steel, whilst being 95% dust free. When combined with minimal extraction and encapsulation this prevented the contamination of the neighbouring water tanks.

Repairing the tank, various areas of pitting and perforation were exposed during the preparation works. These were either plated or welded, then prepared as required.

Applying Aquaurethane Extreme, this was a complex polyurea tank linings application due to the restricted access and close proximity of the work piece to the sprayer. Due to this complexity and short overcoat window of the polyurea tank lining, the tank lining process had to be carefully planned to ensure the correct adhesion and application of the new tank lining. This included the segregation of the tank into separate bays that could be completed in one shift, which allowed a single edge to be prepared to overcome the overcoat limitations of the fast curing polyurea tank lining.

RESULTS

LINE-X Aquaurethane Extreme was applied to a thickness of 2mm throughout. The material applied to each bay was spark tested twice in the same shift and repairs made where necessary before the overcoat window was exceeded.

The floor plates were manufactured and coated off site using the same LINE-X polyurea. This material proved particularly suitable for this methodology as the high strength and durability of the polyurea material meant that it withstood the rigorous refitting without damage.

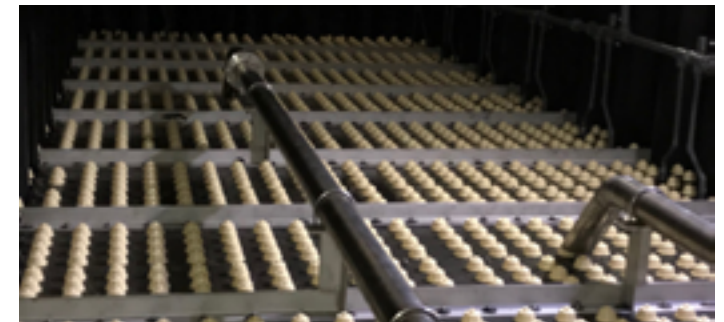
Overall whilst a sometimes challenging project, the commitment shown to the quality of installation by Corroless Eastern was particularly impressive and the end result shows this.



Tank prior to lining



Tank during application



Completed tank

RESERVOIR TOP WATERPROOF MEMBRANE – SOUTH WEST WATER

APPLICATION

Milber SR is located close to Newton Abbot, Devon. As part of their on-going maintenance and refurbishment policy, South West Water required the 750 m² concrete roof to be sealed to prevent any water and contaminants from penetrating the roof and entering the potable water storage tank below.

SOLUTION

Using specialist spray equipment the WRAS approved XS-350 was applied to the roof area forming a seamless membrane thus preventing any water ingress into the porous concrete slab and offering South West Water the ideal solution.

RESULTS

The WRAS approved XS-350 has a twelve second drying time which allows for large areas to be coated in a relatively short time making it one of the most cost effective solutions with regards to downtime.



Before LINE-X Application



During LINE-X Application

RESERVOIR INSULATION AND WATERPROOF MEMBRANE

APPLICATION

The Goytre Reservoir Reservoir is located near Port Talbot in southern Wales. Welsh Water repaired the aging roof but was concerned that these repairs could not withstand the weight of stone and soil used to insulate the tank. Poor quality construction of a roof slab on the concrete tank reduced the effective depth of the slab, reducing its structural capability, resulting in moderate cracks over a large section of the slab, particularly around column heads.

Welsh Water needed an innovative and cost-effective solution to reduce the loading on the structure and better seal the tank from water ingress.

SOLUTION

LINE-X came up with the solution to use their WRAS approved Insu-Prime spray applied foam to the surface of the reservoir and then top coat with the WRAS approved XS-350 polyurea in green to blend in with the surrounding countryside.

RESULTS

The Insu-Prime foam provided the insulation required to eliminate the need for heavy topsoil, and the WRAS approved XS-350 offered a seamless membrane to prevent any water or contaminants from leaching into the reservoir. The 1,100m² application was completed in under three days offering a fast return to service.

LINE-X effectively solved the problem, and regular maintenance checks show that four years later there are no leaks.



RESERVOIR INSULATION AND WATERPROOF MEMBRANE

WELSH WATER

“The LINE-X product specified and applied performed to its expectations. Four years ago [2013], we had a unique challenge of sealing a water tank in the Port Talbot area from external water ingress. Poor quality construction of a roof slab on the concrete tank reduced the effective depth of the slab, reducing its structural capability, resulting in moderate cracks over a large section of the slab, particularly around column heads. It was recommended the soil and stone drainage placed over the top of the tank was removed to reduce the loading on the structure and a lighter membrane applied to seal the tank from water ingress.

The soil and stone offered insulation qualities and it was decided to apply an insulation layer beneath the membrane to limit the effects of heat transference during hot weather. A thermal layer was to be included in the storage tank membrane application.

Application of the membrane and thermal coating had to conform to WRAS regulations. The insulation was not for thermal efficiencies and cost savings but to stop the reservoir getting too warm, causing the chlorine in the water to evaporate, thus giving water quality issues and disinfection failures.

Other products weren't an option due to either the quality or weight. LINE-X solved our problem and regular maintenance checks show that four years later there are no leaks. LINE-X saved us time and money refurbishing our tanks, removing the need to reconstruct the concrete reservoir tank roof.”

Lynn Holloway BEng (Hons) CEng MICE Senior Chartered Civil Design Engineer
Welsh Water Engineering Delivery Team.



PRODUCT MANUFACTURER:

LINE-X LLC
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Huntsville, AL 35816
877-330-1331

GENERAL PRODUCT DESCRIPTION:

LINE-X Aquasurethane Extreme is a two-component, high-performance aromatic polyurea spray elastomer system. Zero VOC (Volatile Organic Compounds), 100% solids, LINE-X Aquasurethane Extreme offers outstanding performance and superior elastomeric protective coating for various substrates. LINE-X Aquasurethane Extreme is a user-friendly product suitable for use in damp environments. Because of its pure polyurea chemistry, it is insensitive to moisture. LINE-X Aquasurethane Extreme also offers exceptional adhesion properties to properly prepared substrates. The high-performance chemical formulation of LINE-X Aquasurethane Extreme produces an excellent skin formation for chemical resistance and moisture protection.

APPLICATION GUIDELINES:

Precondition the Iso "A" Side and Resin "B" Side between 15 - 38 °C before application. Apply LINE-X Aquasurethane Extreme using high-pressure, plural component, heated, 1:1 by volume, spray equipment with a minimum of 138 bars fluid pressure capability. LINE-X Aquasurethane Extreme material (both Iso "A" Side and Resin "B" Side) should be heated between 54-65 °C. Spray equipment must generate adequate fluid pressure for proper mixing and best polymerization results.

APPLICATION EQUIPMENT:

Spray LINE-X Aquasurethane Extreme through high-pressure impingement mixing equipment. Plural component spray equipment must have material heat-control capability, 1:1 by volume, and sprayable with round or flat tip. Refer to equipment manufacturer for equipment specifics and accessories.

EQUIPMENT SETTING PARAMETERS:

Iso "A" and Polyol "B" components must be pumped by low-pressure transfer pumps to high-pressure proportional pumping equipment.

Temperature Settings

Iso "A" Block Heater: 60 - 71°C
Resin "B" Block Heater: 60 - 71°C
Hoses (Iso and Polyol): 54 - 65°C

Pressure Setting

Equipment Pressure: 138 - 172 bars

EQUIPMENT/MATERIAL CLEAN-UP:

Clean spray equipment immediately after use following equipment manufacturer's recommended procedures. Please refer to spray equipment operating and maintenance procedures for further details. Use environmentally safe urethane-grade cleaners to clean LINE-X Aquasurethane Extreme. Cleaning materials must be free of reactive contaminants such as water and alcohol. Use and dispose of all gun cleaners and spray equipment cleaning materials as permitted under local rules and regulations.

MATERIAL STORAGE:

LINE-X Aquasurethane Extreme has a shelf life of twelve (12) months from manufacture date in factory-sealed containers. The material should be stored between 18-27 °C. Do not expose unused materials to high humidity conditions. Always provide airtight re-seal conditions to unused materials. For materials that are currently connecting to the pumps, always provide as much airtight and moisture-free conditions to unused materials as possible to ensure proper chemical performance. Drums should be stored on pallets to avoid direct contact with the warehouse floor/ground.

SAFETY AND HANDLING:

Please refer to Safety Data Sheets (SDS) for safety and handling of this material. All personnel working with this material are expected to read and understand all safety recommendations per SDS. All Personal Protection Equipment must be properly worn to comply with worker health and safety requirements.

CHEMICAL TECHNICAL DATA:

Mix Ratio by Volume: 1A:1B
Gel Time: 3-6 Sec
Tack Free Time: 6-9 Sec
Viscosity @ 23 °C
"A" Iso Side: 870 mPa-s
"B" Resin Side: 500 mPa-s
Material Density
"A" Iso Side: 1.17 kg/L
"B" Resin Side: 1.01 kg/L

BASIC PHYSICAL PROPERTIES:

| Test Name | Test Methods | Value |
|--|--------------|----------------------------------|
| Hardness Shore D | ASTM D2240 | 60±1 |
| Coefficient of Friction | ASTM D1894 | |
| Static | | 0.305 |
| Kinetic | | 0.127 |
| Dielectric Const. | ASTM D150 | 3.6 |
| Dissipation Factor | ASTM D150 | 0.031 |
| Volume Resistance | ASTM D257 | 2.3x10 ¹⁴ ohm-cm |
| Elongation | ASTM D412 | 162% |
| Flexural Strength | ASTM D790 | 18.1 MPa |
| Fungus Resistance | MIL-STD 810F | Pass |
| Pull-off Test-Adhesion (Positest) | ASTM D4541 | |
| On Concrete Substrate (Concrete Broke) | | ≥2.0 MPa |
| Pull-off Test-Adhesion | ASTM D297 | |
| To Metal – No Primer | | 12.4 MPa |
| To Metal – XPM Primer | | 13.2 MPa |
| To Metal – LX SF-515 Primer | | 12.9 MPa |
| Taber Abrasion (gm Loss/1000 cycles) | ASTM D4060 | 0.0698 |
| Tear Strength | ASTM D624 | 150 kg/cm |
| Tensile Strength | ASTM D412 | 19.2-22.75 MPa |
| Water Vapor Trans. | ASTM E96 | 0.499 Grains/Ft ² /Hr |

ADDITIONAL PRODUCT CERTIFICATIONS:

- USFDA Coatings for Incidental-Food-Contact Applications Certified by Keller and Heckman LLP
- BS 6920 Certified for potable water
- UK WRAS Approval
- Regulation 31 Approval

LIMITATIONS:

Consult the chemical resistance chart prior to application; this is an exhaustive chemical

compatibility list quantifying pre- and post-physical properties for chemicals exposure per ASTM D543. Application-specific processing parameters such as temperature and operating pressure of coated objects must be considered before installing LINE-X Aquasurethane Extreme coating systems.

PRODUCT USER RESPONSIBILITIES:

Users of LINE-X Aquasurethane Extreme product are responsible for reading the general guidelines, product data sheets, specifications and safety data sheets (SDS) before using this material. Printed technical data and instructions are subject to change without notice. Contact your local LINE-X representative or visit our website www.LINE-X.com for current technical data instructions.

PRODUCT DISCLAIMER:

All guidelines, recommendations, statements, and technical data contained herein are based on information and tests we believe to be reliable and correct, but accuracy and completeness of said tests are not guaranteed and are not to be construed as a warranty, either expressed or implied. It is the user's responsibility to satisfy himself, by his own information and test, to determine the product's suitability for his own intended use, application and job situation. User assumes all risk and liability resulting from his use of the product. We do not suggest or guarantee that any hazards listed herein are the only ones which may exist. Neither seller nor manufacturer shall be liable to the buyer or any third person for any injury, loss or damage directly or indirectly resulting from the use of, or inability to use, the product. Recommendations or statements, whether in writing or oral, other than those contained herein shall not be binding upon the manufacturer, unless in writing and signed by a corporate officer of the manufacturer. Technical and application information is provided for the purpose of establishing a general profile of the material and proper application procedures. Test performance results were obtained in a controlled environment and LINE-X makes no claim that these tests or any other tests accurately represent all environments.

CHEMICAL RESISTANCES PER ASTM D543 FOR IMMERSION IN FLUIDS METHODS

LINE-X Aquarethane Extreme materials are immersed in the chemicals below for a period of seven (7) days; physical properties of pre- and post-immersion were measured to quantify the changes in product physical properties.

| Chemical Name | Volume Change (%) | Hardness Change (%) | Elongation ASTM D412 Change (%) | Tensile Strength ASTM D412 Change (%) | Recommendations |
|------------------------------------|-------------------|---------------------|---------------------------------|---------------------------------------|---------------------------|
| Acetic Acid 10% | 6% | -13% | 56% | -13% | Yes |
| Ammonium Chloride 30% | 2% | -1% | 76% | 40% | Yes |
| Ammonium Hydroxide | 2% | -1% | 59% | 22% | Yes |
| Automotive Gasoline | 11% | -13% | -14% | -39% | Yes |
| Automotive Oil | 13% | -14% | 74% | 45% | Yes |
| Aviation J.P. Fuel | 8% | -8% | 39% | -5% | Yes |
| Baking Soda 25% | 3% | -4% | 68% | 30% | Yes |
| Benzene | 13% | -16% | -37% | -72% | Yes |
| Bleach (Chloride) 6% concentration | 2% | -7% | 50% | 12% | Yes |
| Boric Acid 3% | 6% | -12% | 65% | 22% | Yes |
| Brake Fluid (DOT 3) | 30% | -39% | 7% | -48% | Yes-Secondary Containment |
| Calcium Chloride 50% | 2% | -8% | 71% | 50% | Yes |
| Calcium Hypochloride 5% | 4% | -5% | 48% | 11% | Yes |
| Citric Acid 10% | 2% | -4% | 71% | 30% | Yes |
| Club Soda | 3% | -5% | 49% | 13% | Yes |
| Crude Oil (Heating) | 7% | -4% | 35% | 11% | Yes |
| Diesel Fuel | 5% | -6% | 48% | 33% | Yes |
| Ethylene Glycol | 3% | -7% | 55% | 19% | Yes |
| Formic Acid 10% | 12% | -23% | 60% | -29% | Yes-Secondary Containment |
| Formic Acid 5% | 14% | -26% | 61% | -31% | Yes-Secondary Containment |
| Hydraulic Fluid (Oil) | 2% | -2% | 45% | 47% | Yes |
| Hydrogen Peroxide 30% | 4% | -6% | 55% | 13% | Yes |
| Hydrogen Peroxide 10% | 4% | -7% | 80% | 22% | Yes |
| Isopropyl Alcohol | 32% | -34% | 40% | -50% | Yes |
| Kerosene | 8% | -6% | 53% | 9% | Yes |
| Lactic Acid 20% | 4% | -7% | 79% | 18% | Yes |
| Lactic Acid 45% | 7% | -13% | 55% | 5% | Yes |
| Methylene Chloride | 12% | -22% | -51% | -84% | Yes |
| Mineral Spirits | 4% | -1% | 37% | 13% | Yes |
| Phosphoric Acid 50% | 4% | -5% | 46% | 27% | Yes |
| Potassium Hydroxide 50% | 2% | -3% | 65% | 47% | Yes |
| Saline Solution 30% | 3% | -8% | N/A | N/A | Yes |
| Sea Water | 3% | -7% | 79% | 24% | Yes |
| Sodium Carbonate 10% | 4% | -8% | 57% | 23% | Yes |
| Sodium Chloride 30% | 2% | -4% | 63% | 31% | Yes |
| Sodium Hydroxide 50% | 0% | 4% | -9% | 49% | Yes |

| Chemical Name | Volume Change (%) | Hardness Change (%) | Elongation ASTM D412 Change (%) | Tensile Strength ASTM D412 Change (%) | Recommendations |
|---------------------------|-------------------|---------------------|---------------------------------|---------------------------------------|-----------------|
| Sodium Hydroxide 10% | 2% | -8% | 74% | 26% | Yes |
| Sodium Sulfate 30% | 5% | -7% | 54% | 6% | Yes |
| Sodium Sulfate 20% | 2% | -1% | 74% | 30% | Yes |
| Sugar Solution 30% | 2% | -6% | 62% | 23% | Yes |
| Sulfuric Acid 25% | 2% | -2% | 67% | 39% | Yes |
| Sulfuric Acid 10% | 2% | -8% | 54% | 28% | Yes |
| Tannic Acid 40% | 4% | -7% | 47% | 30% | Yes |
| Toluene | 17% | -18% | -29% | -63% | Yes |
| 1,1,1 - Trichloroethylene | 8% | -13% | -53% | -79% | Yes |
| Xylene | 17% | -24% | -3% | -59% | Yes |
| Water (H2O) | 2% | -9% | 77% | 29% | Yes |





Aquaurethane Extreme

CONTACT DETAILS

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