



## INTRODUCTION

The TUFFLON and ELASTON range of two-component, spray-applied, pure polyurea, elastomeric, protective coatings exhibit outstanding abrasion and corrosion resistance, coupled with permanent elasticity, making them the perfect lining system for protecting and sealing steel and concrete surfaces. A continuous and seamless, thick-film lining is spray applied with a vice-like grip to well-prepared surfaces and is touch-dry within seconds. Unlike epoxy or cementitious coatings, TUFFLON and ELASTON exhibit permanent elasticity allowing them to expand and contract in harmony with substrate movement in such areas as expansion joints, wall floor joints and unintentional cracks that may form. They can be walked on, tiled, back-filled or rained on within a few minutes of application. Being more abrasion resistant than steel, there is nothing better at protecting expensive plant and equipment against wear from gravel, coal, mineral sands or other harsh abrasives. In addition ELASTON is widely used for waterproofing and tanking and certified for use with potable water. Both TUFFLON and ELASTON have a long and successful history in construction, civil and transport applications throughout Australia, New Zealand and other countries.

## MADE IN AUSTRALIA

Manufactured in Australia under ISO 9001, both TUFFLON and ELASTON are designed to suit Australia's unique environmental conditions. No partially soluble diluents, such as propylene carbonate, are used in any of the Tufflon or Elaston range. As authorised Graco Distributors and Service Agents, Liquimix offers on-going training, support and technical expertise to all applicators in the use of Graco Reactor spray equipment and Tufflon polyurea.

## WHO SHOULD APPLY TUFFLON PRODUCTS?

Only approved applicators who are competent in the use of plural component equipment may apply Tufflon or Elaston products.



## MAIN PROPERTIES OF TUFFLON AND ELASTON



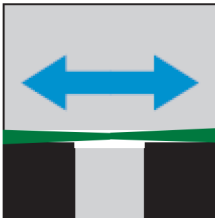
### Weather Resistance

Over time some colour change and surface chalking may occur which does not affect Tufflon's physical properties



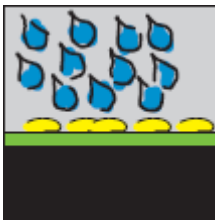
### Sealing Cracks

TUFFLON systems seal cracks to prevent penetration and attack by aggressive substances. Wider cracks and expansion joints can also be successfully treated using the correct methods



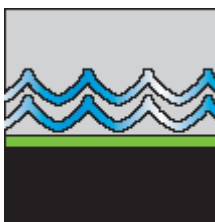
### Permanent Elasticity

Both Tufflon and Elaston cure to form a permanently elastomeric protective coating that bridges hairline cracks and moves in harmony with the substrate without cracking or peeling



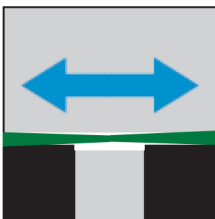
### Resistance to Hydrolysis and Microbial Attack

TUFFLON systems effectively resist hydrolysis and protect surfaces against microbial attack and mould growth.



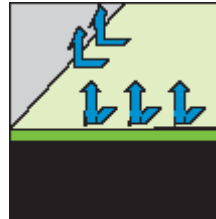
### Water Resistance

TUFFLON when properly applied forms a homogenous, seamless and watertight seal with no stress points.



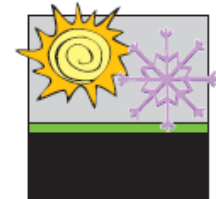
### Tear Propagation Resistance

Surfaces coated with TUFFLON systems demonstrate excellent resistance to tear propagation and mechanical stresses.



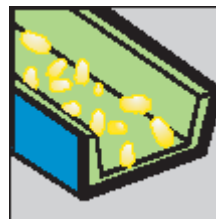
### Adhesion

TUFFLON systems display high adhesion to substrates including steel and concrete. Typically 3.5MPa for concrete and 10MPa for steel.



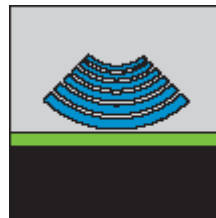
### Thermal Resistance

TUFFLON systems retain their elasticity at temperatures ranging from -40°C to +140°C, enabling them to withstand extreme climatic conditions.



### Abrasion Resistance

TUFFLON pure polyurea is exceptionally resistant to abrasion and wear protecting assuring the asset owner of a long service life



### Sound Insulation

TUFFLON -P90 systems' damping properties reduce noise and vibration considerably. These properties can be used to enhance the acoustic qualities of sound systems in motor vehicles and to reduce noise from source.



### Chemical Resistance

TUFFLON is resistant to the chemicals commonly found in water / wastewater assets including H<sub>2</sub>S, Sulphuric Acid, Sodium Hypochlorite and most inorganic acids alkalis and salts.

## SOME OTHER CHARACTERISTICS OF TUFFLON & ELASTON

- Fast gel time of 8 seconds
- Can be walked on within 5 minutes of application
- Application rates of up to 1,000sqm per day per gun operator (dams, water reservoirs etc.)
- No Solvent, VOC's or Propylene Carbonate
- Non-flammable - safe for transportation
- Excellent waterproofing membrane
- Trafficable when used with TOPCOAT
- Resistant to mould and fungal growth
- Potable Water approved (AS/NZS 4020-2006)
- High abrasion resistance and toughness
- Ideal for use in harsh environments such as Sewerage Treatment Plants and chemical bunds
- Long term retention of flexibility and elasticity (over 400% elongation)
- Some colours may change with exposure to UV (can be over coated with Top Coat)
- Non carcinogenic
- Can be rained on within minutes of application
- Will not support combustion

## TYPICAL APPLICATIONS FOR TUFFLON & ELASTON

TUFFLON comes in three grades. D60 for coating steel. P90 for permanent immersion. P80 for general purpose and fast cure. ELASTON-W80 for waterproofing and general purpose use.



**Planter Boxes.** Many modern units and high density dwelling complexes have planter boxes built around them in which to plant gardens, palms and trees. These boxes must be waterproofed with a durable membrane tough enough to withstand penetration from roots, yet flexible enough to move slightly with the substrate. ELASTON-W80 is the perfect product. With elongation of more than 400%, it is classified as a Class III membrane (high extensibility) within the Australian Standard AS/NZS 4858-2004.



**Sealing Retaining Walls & Below Ground Structures.** Any below ground application requires that water doesn't penetrate through brickwork or concrete to the inside of the building. ELASTON-W80 has been used as a tough, durable and flexible lining that is applied rapidly. Being touch dry in seconds and with a fast cure, builders can back-fill after only one hour thereby allowing other trades to continue.



**Steel Panel Tanks.** TUFFLON-P90 was used to completely refurbish the inside of this 10 year old bolted steel panel tank used for storing drinking water. The old failed epoxy coating was removed using vapour abrasive grit blasting. Then using special techniques to treat the internal hex head bolts and internal corners, Tufflon-P90 was applied at 3mm thick to completely seal the inside of the tank with a continuous, seamless coating. The coating was continuously tested for pin-holes and DFT with defects being repaired immediately. 20 year service life is expected.



**Heavy Transport.** Whether you own an F150 utility or a million dollar rig you'll never regret applying TUFFLON-P90 to it. For long lasting protection against wear and tear as well as its sound deadening properties, a spray applied on polyurea lining, will give lasting protection. 42 tippers coated with Tufflon-P90 have been in service for 8 years in the mining industry with outstanding results and no failures. The coating will continue to work against corrosion and wear for many years. Mining companies, transport operators, sand and gravel companies will all benefit.



**Expansion Joints.** On roof tops, car parks and suspended concrete slabs, the cyclical day and night expansion and contraction of joints requires a tough and permanently elastomeric system. The "Bridging Method", using Elaston-W80, can be applied at a fraction of the cost of some other systems. With its amazing toughness and durability and over 400% elongation, Elaston-W80 has a long and proven track record of sealing and protecting joints for many years.



**Zoos and Animal Enclosures.** Australia Zoo on Queensland's Sunshine Coast has used ELASTON-W80 to line many of their animal enclosures including these concrete crocodile ponds. Being a rather difficult creature to handle with tough claws and jaws an equally tough lining was needed. Elaston-W80 was chosen for its long lasting "soft" feel and vice-like grip to the concrete substrate. In addition the tiger pens, cheetah pens and numerous other enclosures have been lined, taking full advantage of the amazing properties of Elaston-W80.



**Tanking.** Tufflon-P90 is the product of choice for lining of internal concrete walls and floors in large municipal drinking water reservoirs to protect them from attack by water and also to prevent water seepage. Used in conjunction with Civilox primer, a smooth cream coloured finish is achieved which will last for 20 years or more and be easy to clean and maintain.



**Coal Mine Wash Plant.** There are many mining applications where the tough, elastic, durable and wear resisting properties of TUFFLON-P80 are utilised. No other area demonstrates this more than a coal mine wash plant where if left unprotected, steel tanks will wear away in no time. Tufflon-P80 is highly resistant to wear and corrosion and with its tenacious grip to almost any surface, will continue to protect expensive plant and equipment for many years in this extreme environment. Speak to LiquiMix about the right grade for your application.



**Pump Stations.** Many pump stations, man holes, sewerage treatment plants, launder channels, aeration basins and inlet towers have been lined with TUFFLON-P80. Because of its extreme chemical resistance to Sulphuric and other Acids coupled with high adhesion when used with Civilox primer, P80 is perfect for this type of application. Speak to LiquiMix's technical division for full details on how to specify large public works using Civilox primer and Tufflon-P80 as the primary protective coating.



**Horse Floats.** Horses love the soft feel of TUFFLON-P80 under their hooves. Applied with rubber chip bonded to the final coat makes the surface tough, washable and slip resistant. Throw away those heavy mats that trap moisture and waste underneath them. A seamless coating applied to the floor and part way up the walls will not only make your float last longer, it is so much easier to clean out at the end of long day



**Clarifier Launder Channels.** Sewerage assets such as inlet towers, aeration basins, clarifiers and launder channels need something special that's not going to crack, flake or peel. Tiles and epoxy coatings crack after some years allowing the water to attack the concrete substrate. Tufflon will never crack or peel away. Applied with a smooth cream or grey finish the lining is easy to clean and maintain.

## TYPICAL WET PROPERTIES

Property	Hybron-W90	Elaston-W80	Tufflon-P80	Tufflon-P90	Tufflon-D60
Density (kg/L) Part A	1.11	1.11	1.11	1.15	1.14
Density (kg/L) Part B	1.00	1.00	1.00	1.00	1.00
Viscosity (Cps@25°C) Part A	680-750	600	690-750	720-800	610
Viscosity (Cps@25°C) Part B	400	700	750-890	620-710	400
Pack Size - (drums) Part A (kg)	225	225	225	225	225
Pack Size - (drums) Part B (kg)	200	200	200	200	200

## TYPICAL CURED PROPERTIES

PROPERTY	TEST METHOD	Hybron W90	Elaston- W80	Tufflon- P80	Tuflon- P90	Tufflon- D60
Mix Ratio (v/v)		1:1	1:1	1:1	1:1	1:1
Typical uses		Ideal waterproofing Membrane - protective coatings	Jointing, Waterproof, Geofabric,	General purpose, protecting against wear and corrosion	Permanent immersion, general purpose	Steel assets such as pipelines and transport tippers
Tensile Strength (MPa)	ASTM D412 06ae2	18.6		16.5	16.0	21.6
Elongation (%)	ASTM D412 06ae2	450	>450	427	430	>200
Tear Strength kgf/cm <sup>2</sup>	ASTM D412 06ae2		>45	50	98	>119
Hardness - Shore A	ASTM D 2240-91 Shore A	90	50	78	90	
Hardness - Shore D	ASTM D 2240-91 Shore D	N/A	N/A	38	45	62
Abrasion Resistance (mg loss)	ASTM C501-84, H18 wheel @ 1,000rpm with 1,000g weight	11	61	80	58	15
Solids (%)		100	100	100	100	100
Flash Point	Pensky Martens	>149°C		>149°C	>149°C	
Theoretical Coverage		1mm / m <sup>2</sup> / L	1mm / m <sup>2</sup> / L	1mm / m <sup>2</sup> / L	1mm / m <sup>2</sup> / L	1mm / m <sup>2</sup> / L
Early Fire Hazard	AS1530 Part 3 (1989)	2mm sample	2mm sample	2mm sample	2mm sample	2mm sample
Properties	Ignitability Index (0-20)	16	16	16	16	16
	Spread of Flame Index (0-10)	8-9	8-9	8-9	8-9	8-9
	Heat Evolved	9-10	9-10	9-10	9-10	9-10
	Smoke Developed Index (0-10)	7	7	7	7	7
	ASTM D 1692-68	Self-Extinguish	Self-Extinguish	Self-Extinguish	Self-Extinguish	Self-Extinguish
	Glass Transition Temperature T <sub>g</sub> (approx) (°C)			-40°C - 240°C	-40°C - 240°C	-40°C - 240°C
	Safe upper limit of working temperature	120°C	130°C	130°C	100°C	100°C
Suitability for use with drinking water	AS 4020 – 2006	Not Tested	Passes all requirements at 7500mm <sup>2</sup> per litre exposure	Not Tested	Passes all requirements at 7500mm <sup>2</sup> per litre exposure	Not Tested
Cathodic Disbondment with 3mm thick coating	ASTM G8-90 Method B 60 days			Rating D		2mm
Water Vapour Permeability	ASTM E-96		.00045	.00045	0.00041	.00019

## STORAGE & PROCESSING

- Store in original tightly sealed containers until required. (MDI components suffer from moisture contamination).
- Don't leave part A (Iso component) for extended periods in the processing equipment. Flush with Xylene and fill with oil (See Graco equipment operating instructions)
- Part containers of part A should be topped with Nitrogen
- Store containers above 15°C to maintain them in good condition.
- The substrate should be clean and dry for best application results.

Description	Value
Mix ratio by VOLUME Iso to Amine	1:1
Mix ratio by WEIGHT Iso to Amine	100:92
Pot Life @ 25°C (seconds)	6 - 8

## SURFACE PREPARATION

- **Steel, Cast Iron, Stainless Steel, Galvanised Steel, Aluminium:** - Each application should have a detailed specification from Liquimix, especially where a warranty is required. Even though both Tufflon and Elaston will adhere directly to most substrates, Civilox primer is almost always recommended, especially for permanent immersion. The following is a general method...
  - Vapour Abrasive Blast metals to a "Near-White Metal" or Class 2½ blast
  - Apply Civilox-18 primer to specified DFT
  - Apply Tufflon or Elaston to required DFT
  - Both products may be applied directly to existing paintwork so long as it is clean and free of dust
- **Concrete:** - Patch bug holes and render exposed aggregate using a mixture of Civilox and Renderfill. Civilox seals the concrete and improves adhesion. Ensure the surface is sound, clean and dust free prior to application.
- **CAUTION:** - Dust will significantly reduce adhesion of both Tufflon and Elaston to the substrate.

## ADHERING TILES & CARPET TO TUFFLON

Tiles, artificial grass, paints and other coatings may be applied over Tufflon or Elaston.

- **Tiles.** Epoxy based tile adhesives are recommended for use in waterproofing applications. It is important that applicators carry out work to AS 3958 Part 1, 1991.
- **Artificial Grass and Outdoor Carpet.** Several companies have tested and approved the use of their artificial grass adhesive over TUFFLON-P90.

## APPLICATION THICKNESS

Minimum coating thickness of 1.5 mm is recommended. Use as many passes of the gun as necessary to immediately build lining to specification thickness.

Abrasive coatings - Light to Heavy duty	5 – 10 mm
Corrosion protection	2.5 – 4 mm
Waterproofing - Standard duty	1.5 – 3 mm

## RECOMMENDED SPRAY EQUIPMENT

Applicators must be competent and experience in the use of high-pressure, heated, plural-component, impingement-mix, airless spray equipment. Pressures should be set to a minimum of 2,000psi and temperature set to a minimum of 65°C. Correct choice of mix chamber and spray tip will determine the finished result. Speak to Liquimix for advice on how to achieve the finish you want. A smooth shiny finish is best for water reservoirs whilst a "stippled" finish is best for non-slip flooring applications.



## CURE DETAILS

The cure rate of both Tufflon and Elaston is unaffected by ambient or surface temperatures

Description	Approx @ 60°C
Gel Time	6-8 sec
Tack free time	60 sec
Cure (99%)	1 hour
Cure full (100%)	7 days
Recoat min	10 min
Recoat max	60 min

## APPROVALS & TESTING

### Australian Water Quality Council

1. POTABLE WATER. Both Tufflon-P90 and Elaston-W80 are approved for contact with drinking water to AS/NZS 4020-2002
2. CYTOTOXICITY test (readings in water taken every 24, 48, 72 hours). No cell damage when mixed with mammalian cells (monkey kidney cells)
3. AESTHETICS test – No colour transferred from either Tufflon or Elaston to water
4. MICRO ORGANISM test – Does not support growth of micro organisms
5. MUTAGENICITY test – Is not Carcinogenic in any way

## WEATHERING PROPERTIES

Both Tufflon and Elaston resist weathering, chalking and colour change better than polyurethanes or hybrids. However, some colours will change sooner than others with lighter colours such as white and light-grey changing sooner. Green and Black are the most resistant to colour change. The rate of colour change is also determined by the application DFT. If colour change is unacceptable, a UV stable top coat, such as Opalon polyaspartic, can be applied over the Tufflon or Elaston within 30 minutes of them having been applied.

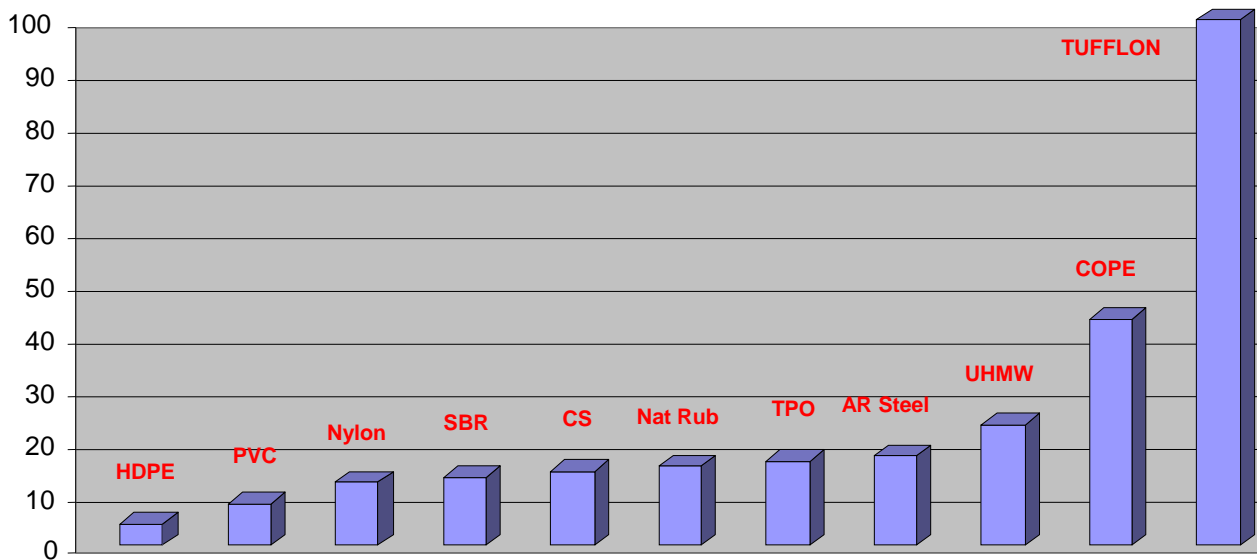
All the physical properties displayed in this brochure are typical and don't imply specification tolerances. The applicator should assess the products for suitability based on the individual project. Many tests on both Tufflon and Elaston have been conducted by registered NATA approved laboratories such as those of the CSIRO, the AWQC and our own. All material was processed at 65°C and 2,100psi through standard Graco Reactor equipment fitted with a Fusion-AP gun and AR2929 mix chamber.



***Tufflon-P90 is the leading Australian made brand for re-lining the inside of Bolted Steel Panel Tanks and their Components. No Propylene Carbonate or other partially soluble diluents. This means long service life under immersion without blistering.***

Civilox-18 primer and Tufflon-P90 protective coating system achieves adhesion greater than 7.5MPa (verified by hydraulic adhesion testing) and provides an inert, smooth and easy-to-clean surface that will not blister when used in immersion.

### Generic polyurea abrasion resistance Comparison



#### LEGEND:

- **HDPE** High Density Polyethylene
- **PVC** Polyvinyl Chloride
- **Nylon** Nylon
- **SBR** Styrene Butadiene Rubber
- **CS** Carbon Steel
- **Nat Rub** Natural Rubber
- **TPO** Thermoplastic Olefin
- **AR Steel** Hardened Steel
- **UHMW** Ultra High Molecular Weight Polymer
- **COPE** Copolyester/Ether



The single most important property that truly makes Tufflon and Elaston Spray Elastomers stand out from all other materials is their ABRASION RESISTANCE.

Because of this, it is useful to compare TUFFLON-P90 to other commonly used materials as shown in the table above. This comparison is a GUIDE ONLY and results may vary in the field. To achieve the best results using Tufflon or Elaston, the material should be applied by a fully trained operator, using Graco Reactor plural spray equipment fitted with the correct gun, mix chamber and tip. To achieve the highest possible abrasion resistance talk to LiquiMix. Australian made grades are Tufflon-P80 (fast early cure), Tufflon-P90 (immersion), Tufflon-D60 (steel), Elaston-W80 (waterproofing). Speak to Liquimix about which grade best suits your next project.

## TUFFLON - Chemical Resistance

Our range of Australian made, pure-polyurea products, free of soluble and partially soluble diluents such as propylene carbonate, provide one of the best candidates for coating applications in harsh environments. There are many factors which affect the chemical resistance of elastomer systems as shown below...

- Application design (surface preparation, primer application, applied DFT)
- Elastomer system formulation
- Service and exposure temperature
- Length of time of exposure or immersion
- Type and concentration of chemicals the coating will be exposed to

Because of the simplicity of these tests and due to the factors listed above, which are beyond the control of Liquimix, no guarantee or warranty concerning the use of these polyurea elastomer systems is either intended or implied. These test results are to be used as a guide only to the suitability of Tufflon or Elaston in a variety of applications. It is the responsibility of the user to assess the suitability for specific applications.

Acetic Acid 10%	A	Ferric Chloride	A	Olive Oil	A
Acetone	A	Freon – 12 (54(C)	A	Oxygen – cold	A
Ammonium Hydroxide 20%	A	FREON – 113	B	Ozone	A
Ammonium nitrate	A	Gasoline (unleaded)	A	Palmitic acid	A
Ammonium persulphate	X	Gelatine	A	Phosphoric acid 20%	A
Animal fats	A	Glucose	A	Phosphoric acid 45%	A
ASTM oil #1 (70°C)	A	Glue	A	Potassium chloride	A
ASTM reference fuel	A	Glycerine	A	Potassium cupro-cyanide	A
Benzene	C	Hexane	A	Potassium cyanide	A
Benzene <1,000ppm	A	Hydraulic Oil	A	Potassium dichromate	A
Barium chloride	A	Hydrochloric acid 5%	A	Potassium hydroxide 20%	B
Barium hydroxide	A	Hydrochloric acid 37%	X	Potassium nitrate	A
Barium sulphate	A	Hydrofluoric acid conc. (cold)	X	Potassium sulphate	A
Barium sulphide	A	Hydrofluoric acid conc. (hot)	X	Producer gas	
Borax	A	Hydrogen gas	A	Radiation	A
Brake Fluid	B	Isopropyl acetate	A	Soap Solutions	A
Butane	A	Kerosene	B	Sodium Chloride	A
Calcium bisulphate	A	Liquefied petroleum gas	A	Sodium hydroxide (50%)	A
Calcium Chloride	A	Magnesium chloride	A	Sodium hydroxide (20%)	B
Calcium Hydroxide	A	Magnesium hydroxide	A	Sodium hypochlorite (1%)	A
Calcium nitrate	A	Methanol	A	Sodium phosphate	A
Calcium sulphide	A	Mercury	A	Sodium sulphate	A
Carbon dioxide	A	Mineral oil	A	Sodium thiosulfate	A
Carbon monoxide	A	Motor Oil	B	Stearic acid	A
Castor oil	A	Natural gas	B	Sulphuric acid conc.	X
Citric acid	A	Nickel sulphate	A	Sulphuric acid (20%)	A
Copper cyanide	A	Nitric acid conc.	X	Tannic acid (10%)	A
Copper sulphate	A	Nitric acid dilute	C	Tartaric acid	A
Cottonseed oil	A	Nitric acid red fuming	X	Toluene	C
Cyclohexane	B	Nitrogen	A		
Diesel	A	Octadecane	A		

**Key:** A: Recommended, Little or No Effect  
C: Moderate to Severe Effect

B: Minor to Moderate Effect  
X: Not Recommended

This information is given in good faith and is not a recommendation or guarantee. Properties may be typical and don't imply specification tolerances. LIQUIMIX cannot accept liability for loss or damage through use. The information contained in this document is based upon our knowledge, practical experience and laboratory testing. However, users must test and evaluate the products for their own application. Refer to the Liquimix website for the latest product Technical and Safety Data sheets.

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