



HYCHEM
EPOXY SYSTEMS

HYCHEM TL5

Ultra high build epoxy coating for the water industry

HYCHEM TL5 is a chemically resistant high build epoxy coating designed for use in environments where exposure to alkali and dilute mineral acids is required. HYCHEM TL5 is designed to protect water assets which are subject to sulphuric acid attack caused by microbial degradation of sulphur containing amino acids in sewage. The product is designed for application at a minimum of 2 mm using a wet on wet spray technique.

USE

HYCHEM TL5 is specifically designed for use in:

- The waste water industry:** Pipes, manholes, pump stations, drop structures, detention tanks and treatment plants.
- The mining industry:** Lining of walls in ammonium nitrate storage warehouses.
- The food industry:** Lining of bunds, pits, drains and effluent channels.
- The petroleum industry:** Corrosion protection of both concrete and steel assets.

The product meets Australian Standard AS 4020:2005 TESTING OF PRODUCTS FOR USE IN CONTACT WITH DRINKING WATER and can thus be used in pipelines and storage vessels for potable water.

TL5 is also compliant with the requirements of Sydney Water Standard Specification 204.

FEATURES AND BENEFITS

- Designed to be spray applied or by brush, roller and trowel to small areas.
- Fast cure, early return to service
- High acid resistance
- High caustic resistance
- High solvent resistance
- High fat resistance
- High hydrocarbon resistance
- Good intercoat adhesion
- Bonds to damp concrete
- High impact strength

LIMITATIONS

HYCHEM TL5 is not suitable for use with concentrated sulphuric (98%), 30% plus nitric acid, 20% plus acetic acid and 40% plus phosphoric acid. For exposure to these materials, contact the HYCHEM Technical Department.

TYPICAL PROPERTIES

Appearance	Resin: white paste Hardener: black paste Mixed: grey paste
Mix ratio	2 parts Resin to 1 part Hardener by volume
Specific gravity	Resin: 1.25 Hardener: 1.0 Mixed: 1.2
Working time @20°C	20 minutes
Gel time @20°C	30 mins
Tack free time	5 hours
Cure schedule @20°C	
4 hour cure	40 Shore D
8 hour cure	60 Shore D
24 hour cure	75 Shore D
7 day cure	75 Shore D
Cured performance	
Compressive strength	65 MPa
Tensile strength	25 MPa
Bond strength	3.8 MPa (concrete failure)
Impact strength	1.47 joules
Intercoat adhesion @24 hours	8 MPa substrate failure

CHEMICAL RESISTANCE

HYCHEM TL5 is formulated to have good resistance to dilute sulphuric acid. Immersion in the chemical results in a minimal absorption of 1% after 3 months exposure.

Organic acids	
Acetic acid 10%	Good
Lactic acid 10%	Good
Citric acid 15%	Very good
Mineral acids	
Hydrochloric acid 20%	Excellent
Sulphuric acid 20%	Excellent
Nitric acid 20%	Good
Phosphoric acid 20%	Good
Caustic materials	
Sodium hydroxide 20%	Excellent
Ammonium hydroxide 20%	Very good
Oxidizing materials	
Sodium hypochlorite 12%	Good
Hydrogen peroxide 10%	Good
Salts	
Ammonium nitrate	Excellent
Ammonium sulphate	Excellent
Ammonium phosphate	Excellent
Sodium chloride	Excellent
Ferric chloride	Excellent
Hydrocarbons	
Unleaded petrol	Good
Kerosine	Good
Turpentine	Good
Toluene	Fair
Xylene	Good
Oxygenated and chlorinated solvents	
Acetone	Limited to spillage
Methyl ethyl ketone	Limited to spillage
Methylene chloride	Poor
Carbon tetrachloride	Limited to spillage

APPLICATION GUIDELINES

Surface preparation

Prior to the application of TL5, the substrate must be thoroughly prepared.

- The concrete substrate must be firm, clean and dry with a minimum compressive strength of 25 MPa and a minimum surface tensile strength of 1.5 MPa.
- New concrete must be allowed to cure for a minimum of 28 days.
- Remove all surface laitance, contaminants, existing coatings, curing compounds and any weak or loose materials.

All organic matter, weak surfaces and poorly consolidated material must be removed. This is ideally carried out by water blasting with equipment delivering 4,000 PSI for new concrete and up to 10,000 PSI for badly deteriorated surfaces.

Cleaned, badly deteriorated surfaces are often ready for coating, providing a natural undulating profile. Cleaned, new concrete surfaces tend to produce a plethora of blow holes which when coated give rise to coating blisters.

Correct treatment of this problem involves a number of issues. Firstly, coating application must take place when substrate temperatures are falling and must not occur under direct sunlight.

Secondly, visible blowholes can be sealed with a blend of HYCHEM TL5 and quartz aggregate. This can be applied as a surface screed or merely used to plug individual blow holes. Application of the subsequent HYCHEM TL5 should be after the screed has surface hardened and within a total period of 24 hours.

Thirdly, a coat of HYCHEM E500P primer can be used to seal the entire surface should the problem persist. Application in the late afternoon or at night can also be considered.

Pre-conditioning product

It is important to note that even when the application environment is warm, products which have been stored in cold or cooler conditions should always be pre-conditioned ideally to 20-25°C to ease mixing, application and help avoid other potential issues such as amine bloom or blushing.

Applying a cold product in a warm environment is not recommended.

Coating application

HYCHEM TL5 must be applied at surface temperatures in excess of 5°C and below 30°C. Air humidity must be below 85% to prevent possible surface whitening due to water condensation which can affect intercoat adhesion when using multiple coats.

Due to the rapid cure and resultant short potlife, it is recommended that the material is applied using a plural component airless spray with static mixing head. Consult your spray unit supplier for detailed specifications.

Applying HYCHEM TL5 to small surfaces such as encountered in manholes is best carried out using a trowel. The application of a thin first coat, using a resin mortar mix is recommended. This reduces shear adhesive stresses and blow holes.

The surface finish can be improved by rolling with a slightly damp short nap mohair roller.



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COVERAGE AND SPREAD RATE

With correct choice of equipment, the coating can be applied at 65 sqm/hour at a coating depth of 3mm, using a volume output of 200 litres/hour.

INSPECTION

The following can be considered as part of an inspection test plan.

Coating deficiencies should be quality controlled with a Holiday Tester and deficient areas cut out and resealed with a trowelled application of HYCHEM TL5.

Adhesion to be tested periodically after cure, using a suitable tensiometer such as an Elcometer.

As it is possible for the mixer to lose the correct mixing ratio, the coating should be periodically tested for hardness using a Shore D Hardness meter as well as a visual colour inspection.

CLEAN UP

Clean equipment with epoxy diluting solvents such as Xylene. Hard, cured material will need to be mechanically removed. Use soap and water to wash hands.

PACKAGING

HYCHEM TL5 is available in 60 litre and 600 litre packs.

HEALTH AND SAFETY INFORMATION

Part A: Irritating to eyes and skin.

Part B: Harmful by inhalation in contact with skin and if swallowed. Causes severe burns. Risk of serious damage to eyes. May cause SENSITISATION by skin contact. Harmful to aquatic organisms may cause long-term adverse effects in the aquatic environment. Vapours may cause drowsiness and dizziness.

If this product comes in contact with the eyes, immediately hold eyelids apart and flush the eye continuously with running water. If skin or hair contact occurs immediately wash thoroughly with soap and water. In case of accident or if you feel unwell IMMEDIATELY contact doctor or Poisons Information Centre (show label if possible).

Epoxy resin products are skin sensitizing and can have a caustic reaction. Wear protective gloves, clothing and protective eyewear when using. Wash hands before eating and avoid breathing vapours.

WARNING - ENVIRONMENTAL CONDITIONS

Temperature and the surrounding atmospheric conditions will play a part in the curing process of all epoxy products. Under conditions of low temperatures and high humidity the final cured surface finish can be adversely affected potentially resulting in poor gloss retention, discolouration over time, poor overcoatability and intercoat adhesion. Quite often these conditions will result in the formation of a white film over the surface often evident after contact with water. This chemical reaction with the atmosphere is commonly referred to as "amine bloom" or "amine blush".

If this occurs then the existing coating will need to be abraded to completely remove the affected surface to ensure the adhesion of subsequent applications. In some cases partial or complete re-priming may be necessary.

Attention also needs to be paid to the substrate temperature which should be at least 3°C and preferably 5°C above the dew point during the curing phase.

Industry standards recommend the accurate recording of times and dates, batch numbers, consumption rates and environmental conditions including substrate and air temperatures, humidity levels and dew point readings during both the application and curing processes. Full material warranties cannot be provided unless all the relevant data has been recorded accurately.

If in doubt consult the Hychem technical department for advice.

Field support

Field support where provided, does not constitute supervisory responsibility. Suggestions made by HYCHEM either verbally or in writing may be followed, modified or rejected by the owner, engineer or contractor since they and not HYCHEM are responsible for carrying out procedures appropriate to a specific application.

Customer responsibility

The technical information and application advice given in this publication is based on the best information available at the time of print. As the information herein is of a general nature, no assumption can be made as to the product suitability for a particular use or application and no warranty as to its accuracy, reliability or completeness either expressed or implied is given other than those required by Commonwealth or State Legislation. The owner, his representative or the contractor is responsible for checking the suitability of products for their intended use.



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