

Product Data Sheet

ZL-2C Zygl[®] Post Emulsifiable Penetrant

ZL-27A Zygl[®] Post Emulsifiable Penetrant

ZL-37 Zygl[®] Post Emulsifiable Penetrant

General Description

Zygl[®] ZL-2C, ZL-27A, ZL-37 are general purpose post emulsifiable fluorescent penetrants, used for a wide range of medium to high sensitivity applications. They are typically used on castings, turbine components, welds, forgings, rough and machined surfaces to find cracks, seams, laps, laminations and porosity.

They all exhibit outstanding penetrating and indication stability characteristics which provides for maximum reliability in locating surface-open flaws and discontinuities. They are safe to use on most engineering and aerospace alloys including aluminium, steel, nickel and titanium.

These post emulsifiable (post removable) penetrants are formulated to be immiscible with water, this property guards against over-removal from defects by over washing and allows the penetrant to separate readily from water, making effluent clean up easier.

ZL-2C, ZL-27A & ZL-37 are used in conjunction with a hydrophilic remover or lipophilic emulsifier to render them washable with water.

The penetrants fluoresce a bright green-yellow when exposed to ultraviolet radiation (UV-A) peak wavelength of 365 nm, and should therefore be used with a suitable U.V source such as the MAGNAFLUX ZB-100F.

Composition

ZL-2C, ZL-27A & ZL-37 contain a blend of petroleum distillates, oils, alkyl aryl phosphate and fluorescent dyes.

Typical properties (Not a specification)

Property	ZL-2C	ZL-27A	ZL-37
Colour	Yellow / Green	Yellow / Green	Yellow / Green
Odour	Bland	Bland	Bland
Flash point	> 93°C	> 93°C	> 93°C
Density	0.89 g/ml	0.93 g/ml	0.95 g/ml
Viscosity @ 38°C	6.0 cS	9.2 cS	14.0 cS
Corrosion	Meets AMS 2644	Meets AMS 2644	Meets AMS 2644
Sulfur Content	< 300 ppm	< 300 ppm	< 300 ppm
Chloride Content	< 300 ppm	< 300 ppm	< 300 ppm
Fluoride Content	< 50 ppm	< 50 ppm	< 50 ppm
Sodium Content	< 100 ppm	< 100 ppm	< 100 ppm
AMS 2644 Class	Type 1 Method B/D	Type 1 Method B/D	Type 1 Method B/D
AMS 2644 Sensitivity	Level 2 Medium	Level 3 High	Level 4 Ultra High

Like all MAGNAFLUX materials, Zygl[®] penetrant materials are closely controlled to provide unique batch to batch consistency & uniformity to assure optimum process control and inspection reliability.

Method of Application

Test parts must be clean & dry, free from oil grease or other foreign contaminating substances before penetrant is applied. Penetrants can be applied by immersion dip, brush, flow on, conventional or electrostatic spray.

Whichever method of application is used, the test area must be completely covered with penetrant.

Penetration Time and Temperature

The generally accepted minimum penetration time is 2 to 5 minutes. 10 minutes being adequate for most situations, although specific process specifications may require longer. Detailed processing parameters will normally be specified in the controlling process specification (If applicable).

Zyglo water washable penetrants should be used at temperatures between 10°C and 55°C.

Penetrant Removal

ZL-2C, ZL-27A & ZL-37 require the use of a lipophilic or hydrophilic emulsifier to render them water washable. The penetrant covered part under test is immersed in the emulsifier (Hydrophilic emulsifiers can be applied by spray) for a predetermined length of time then washed with a water spray. When using hydrophilic emulsifier it is preferable to pre-rinse the penetrant covered test part with plain water before the emulsifier is applied. This pre-rinse removes the bulk of the surface penetrant lowering the amount of penetrant entering and contaminating the emulsifier tank. The pre-rinse effluent can be easily treated to separate the penetrant and water. The water can be re-used in further pre-rinsing operations.

General method of use

①	<i>Apply penetrant to clean component and allow contact time.</i>
②	<i>For hydrophilic emulsifiers pre-rinse component with water spray.</i>
③	<i>Dip in emulsifier for predetermined time.</i>
④	<i>Remove excess penetrant by spraying the component under test with clean water.</i>
⑤	<i>Dry, develop and inspect under UV.</i>

Component drying & developer application

Once the surface penetrant has been removed, the component should be dried prior to developer application.

This is generally achieved by placing the component in a controlled recirculating warm air dryer at a temperature of between 50°C to 70°C, until just dry.

Zyglo developers should then be used to maximise the sensitivity of the penetrants.

Three types of developer are commonly used.

Dry powder developers are free flowing lightweight powders which are applied to the dry component by powder storm, dusting, electrostatic spray or by puffer.

Solvent based developers are quick drying materials which are applied by spraying. The component under test must be dry before developer application.

Aqueous or water based developers are applied **prior** to component drying, by dipping or spraying. After application the component must be dried before inspection.

Note : To maximise penetrant sensitivity, parts should not remain in aqueous developers for any length of time.

Allow a minimum of 10 minutes development time before inspecting the component in a darkened area under UVA (365 nm).

Recommended Cleaners / Emulsifiers / Developers.

PRE-CLEANERS		EMULSIFIERS		DEVELOPERS	
SKC-S	<i>Solvent</i>	ZR-10B	<i>Hydrophilic</i>	ZP-4B	<i>Dry</i>
MagnaVu	<i>Aqueous</i>	ZR-10C	<i>Hydrophilic</i>	ZP-5B	<i>Aqueous</i>
		ZE-4B	<i>Lipophilic</i>	ZP-14A	<i>Aqueous</i>
				ZP-9F	<i>Solvent</i>
				SKD-S2	<i>Solvent</i>

Post Cleaning

Post cleaning of the tested component can be carried out if required, by an appropriate Technique. Developer residues can be removed either by wiping with a cloth or by a water and detergent wash. Penetrant residues can be removed by vapour degreasing or solvent soak.

Penetrant Rinse Water Disposal

Dye penetrant process rinse waters should not be discharged to local authority waterways or sewers without some form of effluent treatment.

Magnaflux can advise on suitable equipment for this purpose, for further information please contact Magnaflux sales.

Specification compliance

Specification	ZL-2C	ZL-27A	ZL-37
<input type="checkbox"/> AMS 2644	✓	✓	✓
<input type="checkbox"/> PRATT & WHITNEY	✓	✓	✓
<input type="checkbox"/> ASME B & PV Code, Sec V	✓	✓	✓
<input type="checkbox"/> ROLLS ROYCE RPS 702	✓	✓	✓
<input type="checkbox"/> ASTM E 1417	✓	✓	✓
<input type="checkbox"/> ASTM E-165	✓	✓	✓
<input type="checkbox"/> MIL STD 271	✓	✓	✓

Coverage

1 It covers approximately 20 - 28 square metres.

ZL-2C, ZL-27A, ZL-37 is available in 25 It and 200 It drums.

ZL-27A is also available in packs of 10 X 400 ml aerosols

Safety

Safety data sheets for these product are available on request.

Read the relevant safety data sheets before use.