Product Data Sheet

ZL-60D Zyglo® Water Washable Penetrant

ZL-67 Zyglo® Water Washable Penetrant

ZL-56 Zyglo® Water Washable Penetrant

General Description

ZL-60D, ZL-67, ZL-56 are general purpose water washable fluorescent penetrants, used for a wide range of medium to high sensitivity applications. They are typically used on castings, forgings and machined surfaces to find cracks, seams, laps, laminations and porosity.

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

The penetrants have been formulated to give excellent controlled washability over a wide temperature range and variable dwell times and will produce stable fluorescent indications under normal drying conditions.

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-60D, ZL-67 & ZL-56 are surfactant based penetrants and contain non ionic surfactants, solvents and fluorescent dyes.

Typical properties *(Not a specification)*

Property	***ZL-60D***	***ZL-67***	***ZL-56***
Colour	Yellow / Green	Yellow / Green	Yellow / Green
Odour	Bland	Bland	Bland
Flash point	> 93°C	> 93°C	> 93°C
Density	0.92 g/ml	0.99 g/ml	1.0 g/ml
Viscosity @ 38°C	10.6 cS	23.0 cS	17.0 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	
AMS 2644 Class	Type 1 Method A	Type 1 Method A	Type 1 Method A
AMS 2644 Sensitivity	Level 2 Medium	Level 3 High	Level 4 Ultra High

Like all MAGNAFLUX materials, Zyglo 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

Excess surface penetrant is removed by thoroughly spraying the components under test with clean water. The washing process is usually carried out under a UV-A source so that penetrant removal can be monitored.
The wash water temperature should generally be between 10°C to 40°C.

General method of use

①	***Apply penetrant to clean component and allow contact time.***
②	***Remove excess penetrant by spraying the component under test with clean water***.
③	***Dry, develop and inspect under UV.***

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 / Developers

PRE-CLEANERS	
SKC-S	*Solvent*
MagnaVu	*Aqueous*

DEVELOPERS	
ZP-4B	*Dry*
ZP-5B	*Aqueous*
ZP-14A	*Aqueous*
ZP-9F	*Solvent*
SKD-S2	*Solvent*

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-60D*	*ZL-67*	*ZL-56*
❑ AMS 2644	✓	✓	✓
❑ PRATT & WHITNEY	✓	✓	
❑ ASME B & PV Code, Sec V	✓	✓	✓
❑ ROLLS ROYCE	✓	✓	✓
❑ ASTM E 1417	✓	✓	✓
❑ ASTM E-165	✓	✓	✓
❑ MIL STD 271	✓	✓	✓

Coverage

1 lt covers approximately 20 - 28 square metres.
ZL-60D, ZL-67, is available in 25 lt and 200 lt drums.
ZL-56 is available in 25 lt drums.

Safety

Safety data sheets for these product are available on request.
Read the relevant safety data sheets before use.

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Non Destructive Testing

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