

## ZL-2C, ZL-27A, and ZL-37

### FLUORESCENT POST-EMULSIFIABLE PENETRANTS

**CLASSIFICATION**

- Type 1 Method B Penetrant: when using ZE-4E lipophilic emulsifier.
- Type 1 Method C Penetrant: when using SKC-S solvent cleaner/remover.
- Type 1 Method D Penetrant: when using ZR-10B (20%) hydrophilic remover.

**GENERAL DESCRIPTION**

Post-emulsifiable fluorescent penetrants are used for a wide range of sensitive applications and are formulated to be impervious to water to assure against being over-washed from defects. They require the application of a lipophilic emulsifier or a hydrophilic emulsifier to render them washable with water and meet OSHA requirements for Class III B liquids due to their high flash point, allowing them to be used in open dip tanks.

Zyglo post-emulsifiable fluorescent penetrants fluoresce a bright greenish-yellow color under ultraviolet radiation. Use of a black light source with a peak wavelength of 365nm is required.

**APPLICATIONS**

**ZL-2C (Level 2, Normal Sensitivity):** Typically used on castings, forgings, extrusions and rough machined surfaces to find cracks, seams, laps, laminations and porosity.

**ZL-27A (Level 3, High Sensitivity):** Typically used on castings, forgings, extrusions and rough machined surfaces to find cracks, seams, laps, laminations and porosity.

**ZL-37 (Level 4, Ultra-High Sensitivity):** Ideal for titanium turbine components, investment castings and other high stress critical components where detection of fine, tight and broad open shallow discontinuities is required.

**TYPICAL PROPERTIES (Not a specification)**

Typical Properties	ZL-2C	ZL-27A	ZL-37
Sensitivity	Level 2 (normal)	Level 3 (high)	Level 4 (ultra-high)
Viscosity @ 100°F (cs)	6.6	9.5	14.8
Flash Point (PMCC)	>200°F	>200°F	>200°F
Sulfur (ppm)	<1000	<1000	<1000
Chlorine (ppm)	<400	<400	<400
Halogen Content (ppm)	<1000	<1000	<1000
Sodium (ppm)	<100	<100	<100
Fluorine (ppm)	<50	<50	<50
VOC	540g/l	539 g/l	191 g/l
NPE-Free	Yes	Yes	Yes

## **METHOD OF APPLICATION**

Test parts must be clean, free of all oil, grease or other foreign contaminating substances and dry before penetrant is applied. Penetrants may be applied by immersion, dip, brush or flow-on, conventional or electrostatic spray. The area to be inspected must be completely covered with penetrant.

Warning! Penetrants attack and even dissolve many kinds of plastic pipe. Polyvinyl chloride (PVC) pipe is especially vulnerable, and can crumble after only a few days of exposure. Even diluted penetrant rinsings attack it rapidly. ABS plastic pipe is nearly as sensitive. When installing plumbing to handle penetrant rinsings, use metal pipe.

## **PLASTICS COMPATABILITY**

Penetrant materials are typically compatible with nylon, teflon, acetal, polypropylene, and epoxies. However, it is still recommended that the penetrant be evaluated for compatibility on actual test pieces. Penetrants may stain, soften, or even dissolve plastic materials.

## **PENETRANT REMOVAL**

Post emulsifiable penetrants require the use of a lipophilic or hydrophilic emulsifier to render them water washable. For inspection of small areas, the solvent wipe technique (Method C) is commonly employed using SKC-S solvent cleaner/remover. Moisten a clean wiping media with SKC-S and wipe the inspection area free of surface penetrant. Do not flood the inspection surface with cleaner/remover because the sensitivity may be impaired.

## **DEVELOPER APPLICATION**

Developers should be used to maximize the sensitivity of penetrants. Aqueous developers are applied prior to drying; dry powder and non-aqueous developers are applied after drying.

Warning! Parts should not remain in aqueous developers for any length of time, as the penetrant sensitivity could be impaired.

## **RECOMMENDED DEVELOPERS**

The following developers are recommended for use.

- ZP-4B Dry Powder Developer
- ZP-9F Non-Aqueous Developer
- SKD-S2 Non-Aqueous Developer
- ZP-5B Water Suspensible Developer
- ZP-14A Water Soluble Developer

## **SPECIFICATION COMPLIANCE**

AMS-2644, ASTM E 1417, ASTM E 165, MIL-STD-271, MIL-STD 2132, ASME B & PV Code, Sec V, AECL, Boeing PS-21202, Pratt and Whitney.

**PACKAGING**

ZL-2C 5 Gal. Pail and 55 Gal. Drums.

ZL-27A 5 Gal. Pail, 20 and 55 Gal. Drums, Aerosols

ZL-37 5 Gal. Pail, 20 and 55 Gal. Drums, Aerosols

**COVERAGE**

(1) Gal. (ZL-2C, ZL-27A, ZL-37) covers approximately 1,000 square feet.

(1) 16 fl. oz. aerosol can (ZL-27A, ZL-37) covers approximately 65 square feet.