ZL-440

Level 2 Water-Based, Water-Washable Fluorescent Penetrant

ZL-440 is a water-based, water-washable fluorescent penetrant used for finding indications in castings, forgings, extrusions and other materials with rough surfaces commonly found in automotive part applications. ZL-440 is an ideal solution when waste water produced during the inspection process is a concern for the operation. ZL-440 is water based and contains no petroleum distillates which may allow its rinse water to be disposed of directly into the sewage system depending on local regulations.

The penetrant features great rinse characteristics, and depending on the application and specification may be used without a developer.

ZL-440 is designed with environmental health and safety in mind while meeting industry performance standard approvals, including EN ISO 3452-2 and AMS 2644, and can be used in similar applications as other conventional Level 2 water-washable fluorescent penetrants

BENEFITS

Reduce environmental footprint and waste-water pollutants

- Reduce water treatment costs and discharge waste process water directly into the sewage system (depending on local regulations) due to minimal water-based contaminants.
- Meet or exceed local discharge regulations with low Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) levels.
- Support a healthy environment with water-based penetrants that have minimal occupational health and safety impacts.

Reliably speed up inspection and wash processes

- Identify bright indications with superior sensitivity and low fluorescent background interference.
- Increase throughput and reduce costs by eliminating the developer step of inspection processes depending on procedures and requirements.
- Rapid rinse and post inspection washing of parts thanks to excellent washability properties, due to trade secret chemistry.

FEATURES

- Level 2, medium sensitivity
- Hydrocarbon-free
- Biodegradable
- Excellent water wash removability
- Developer may not be required

SPECIFICATION COMPLIANCE

- ASME BPVC
- ASTM E165 / E165M-18
- ASTM E1417 / E1417M
- ISO 3452-2
- MIL-STD-2132
- NAVSEA T9074-AS-GIB-010/271
- QPL SAE AMS 2644

APPLICATIONS

Defect location: open to surface

Industry types: automotive, general industrial

Ideal applications:

- Castings
- Forgings
- Extrusions
- Rough surfaces
- Ferrous and non-ferrous

Material types:

- Aluminum
- Steel
- Nickel
- Titanium
- Plastic
- May cause staining on magnesium at dwell times longer than 4 hours.

Additional notes:

- When converting from oil based penetrant it is recommended using a gravity feed if transferring product from a penetrant line
- Automated rinsing may require water pressure adjustments or re-positioning of angles

USE RECOMMENDATIONS

Dry developer	ZP-4D
Solvent-based developers	SKD-S2, ZP-9F
UV lamps	EV6000, EV6500, ST700
Usage Temperature	40 to 125°F / 5 to 52°C
Storage Temperature	50 to 86°F / 10 to 30°C

PROPERTIES

NDT Method	Fluorescent Penetrant
Type	1
Method	A (W)
Sensitivity Level	2, medium
Required Equipment	UV light source
Flash Point	> 200°F / 100°C
Density	1.000 g/cc / 8.33 lb/gal (1.000 g/ml)
Viscosity (at 100°F / 38°C)	14.4 cst (14.4 mm^2/s)
Water Content	45.2% – 55.2%
Biochemical Oxygen Demand (BOD) (SM 5210 B-2001)	380,000 mg/L
Chemical Oxygen Demand (COD) (SM 5220D-1997)	985,000 mg/l
NPE-Free	Yes
Brix Range (at 20 °C)	43.5 - 37.0
Refractive Index Range (at 20 °C)	1.4062 - 1.3939

WATER CONTENT & BATH MAINTENANCE

Refer to ASTM E1417 Section 7.8.2.3 for guidance on managing water content of A(w) penetrants. Due to the nature of water-based penetrant formulations, water loss may occur over time depending on environmental conditions. We recommend taking an initial refractometer reading to set a baseline, and then sample and measure the water content of your penetrant tank over time as needed based on specifications using the same refractometer process. If your penetrant tank sample is out of the recommended water content range, we recommend adding additional fresh penetrant to the tank to bring the water content back within the range. If the water content is below the recommended range, deionized water can also be added to increase water content; however be sure to mix the tank contents sufficiently after water addition to ensure full incorporation.

We recommend using a refractometer or similar measurement tool to measure the water content. Other common methods can also be used, such as Karl Fischer analysis. Note that the provided Brix and refractive index measurements for each product were measured using a refractometer under Magnaflux lab conditions, and customer readings may vary due to differences in refractometers and environmental conditions impacts on measurements.

PART NUMBERS & PACKAGING

Packaging	Country of Origin	Part Number
55 gal / 208 L drum	United States	01-3440-45
275 gal / 1,040 L tote		01-3440-67
25 L drum	United Kingdom	056C229
200 L drum		056C230
1,000 L tote		056C231

HEALTH AND SAFETY

Review all relevant health and safety information before using this product. For complete health and safety information, refer to the product Safety Data Sheet, which is available at **www.magnaflux.com**.