



Penetrant Professor Approved

## Product Data Sheet

# FP-93A(M)

## Fluorescent Penetrant



Met-L-Chek manufactures a complete line of penetrants used in the fluorescent (Type 1) and visible (Type 2) dye penetrant inspection process. All Met-L-Chek penetrants are qualified to AMS-2644 and are sold under the Met-L-Chek® and Pen-Chek® trademarks.

FP-93A(M) is approved to AMS-2644 as a fluorescent (Type 1); Methods “B”, “C”, and “D”; sensitivity level 2 post emulsifiable inspection penetrant. It is approved with Method “B” emulsifier E-57 and Method “D” emulsifier E-58D. For Method “C” applications it is used with E-59, E-59A, R-503, and R-504. FP-93A(M) is applied by immersion, spray, or wipe on. FP-93A(M) meets requirements for medium sensitivity aerospace applications.

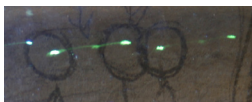
FP-93A(M) is listed on the Qualified Products List for AMS-2644. It meets the requirements of AMS-2647, ASME Boiler and Pressure Vessel Code Section V, ASTM E-165, and ASTM E-1417, for penetrant inspection materials. It is low in sulfur and halogens and is safe for use on all metal surfaces.

### Guide to METHOD “B” (lipophilic) processing per ASTM E-1417

1. Part must be clean, dry and at a temperature of 4.4°-52°C (40°-125°F) before penetrant is applied.
2. Apply FP-93A(M) using spray, immersion, or wipe on.
3. Wait a minimum of 10 minutes; 20 minutes if temperature is 4.4°-10°C (40-50°F).
4. Immerse part in and out of E-57 emulsifier, or flow on emulsifier; drain time < 3 minutes.
5. Wash part; water temperature 10°-38°C (50°-100 °F). Water pressure < 275kPa (< 40 psi); if a hydro-air nozzle used limit pressure to < 172kPa (<25 psi). Distance >30cm (>12 inches). Wash time- only long enough to remove surface fluorescence under UV-A .
- 6\*. Dry part; temperature not to exceed 71°C (160°F), time - only long enough to dry surface.
7. Apply dry powder developer, form “a” (D-72A), by dusting, or non aqueous developer, form “d”(D-70), by spraying.
- 7A\*. If water based developers forms “b “(D-76B) or “c”(D-78B) are used they are applied by immersion or spray, prior to step 6 drying.
8. Wait a minimum of 10 minutes before inspection. Maximum time is 1 hour for form “d ” (non aqueous), maximum 2 hours for forms “b & c” (aqueous), and maximum 4 hours for form “a” (dry powder). If times are exceeded, clean part and reprocess.
9. Use UV-A illumination of >1000 μw/cm<sup>2</sup> @ 15inches (38.1 cm) in a darkened area of <21 lux visible light (<2 foot candles).

### Guide to METHOD “D” (hydrophilic) processing per ASTM E-1417

1. Part must be clean, dry and at a temperature of 4.4°-52°C (40°-125°F) before penetrant is applied.
2. Apply FP-93A(M) penetrant using spray, immersion, or wipe on
3. Wait a minimum of 10 minutes; 20 minutes if temperature is 4.4°-10°C (40-50°F).
4. Pre-rinse part with water. Water temperature 10°-38°C (50°-100 °F). Water pressure < 275kPa (< 40 psi);only long enough to remove bulk of surface penetrant. This step may be skipped when emulsifier is applied by spray.
5. Immerse part in gently agitated E-58D emulsifier diluted to 17-20%. for 30 seconds to 2 minutes depending upon part roughness For spray applications emulsifier concentration should be 1-5% and spray contact for less than 2 minutes.
6. Wash part; water temperature 10°-38°C (50°-100 °F). Water pressure < 275kPa (< 40 psi); if a hydro-air nozzle used limit pressure to < 172kPa (<25 psi). Distance >30cm (>12 inches). Wash time- only long enough to remove surface fluorescence under UV-A .
- 7\*. Dry part; temperature not to exceed 71°C (160°F), time - only long enough to dry surface.
8. Apply dry powder developer, form “a” (D-72A), by dusting, or non aqueous developer, form “d”(D-70), by spraying.
- 8A\*. If water based developers forms “b” (D-76B) or “c”(D-78B) are used they are applied by immersion or spray, prior to step 6 drying.
9. Wait a minimum of 10 minutes before inspection. Maximum time is 1 hour for form “d ” (non aqueous), maximum 2 hours for forms “b & c” (aqueous), and maximum 4 hours for form “a” (dry powder). If times are exceeded, clean part and reprocess.
10. Use UV-A illumination of >1000 μw/cm<sup>2</sup> @ 15inches (38.1 cm) in a darkened area of <21 lux visible light (<2 foot candles).



Fluorescent Penetrant Indications  
Type 1 (FP-93A(M), Method B (E-57),  
Level 2, form “a” (D-72A).



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### Typical Physical Properties

Form: yellow green liquid  
 Density: 915 g/L  
 Flash Point: > 93°C (> 200°F)  
 Viscosity 5.9 mm<sup>2</sup>/s  
 Fluorescent Brightness:(AMS-2644 requirement > 80 %) 84.6 %  
 Corrosion of aluminum: none  
 Corrosion of carbon steel: none  
 Corrosion of magnesium: none  
 Corrosion of stainless steel: none  
 Corrosion of titanium: none  
 Chloride content: < 100 ppm (0.01%)  
 Fluoride content: < 50 ppm (0.005%)  
 Sodium content: < 100 ppm (0.01%)  
 Sulfur content: < 100 ppm (0.01%)  
 Mercury: none  
 VOC's: 0 g/L  
 Ozone layer depleting substances: none  
 PCB's: none

### NSN #

<b>ISO-3452</b>	
<b>AMS-2644</b>	<b>AMS-2647</b>
<b>ASTM E-165</b>	<b>ASTM E-1417</b>
<b>R-R RPS-702</b>	<b>R-R OMAT #650B</b>
<b>BAC 5423</b>	<b>HONEYWELL EMS 52309</b>
<b>P&amp;W PMC # 4352</b>	
<b>ASME B &amp; PV code Sec. V</b>	

### Product Availability

6 x 1 pint (0.4L) can with dauber  
 1 gallon (3.7L) plastic bottle  
 5 gallon (18.9L) plastic jug with our spout  
 55 gallon (208L) plastic drum

### NSN #

<b>1 gallon</b>	<b>6850-01-268-8616</b>
<b>5 gallon</b>	<b>6850-01-268-6694</b>
<b>5 gallon</b>	<b>6850-01-269-4151</b>
<b>5 gallon</b>	<b>6850-01-268-6703</b>
<b>55 gallon</b>	<b>6850-00-782-2732</b>
<b>55 gallon</b>	<b>6850-01-265-2741</b>
<b>55 gallon</b>	<b>6850-01-268-6704</b>



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