



Penetrant Professor Approved

# Product Data Sheet

## FP-93A(M)

### Fluorescent Penetrant

1  
112015



Met-L-Chek Company manufactures a complete line of penetrants used in the fluorescent (**Type 1**) and visible (**Type 2**) dye penetrant inspection process. All Met-L-Chek Company penetrants are qualified to **AMS-2644** and are sold under the **Met-L-Chek®** and **Pen-Chek®** trademarks. Met-L-Chek Company products are manufactured under license in The Netherlands by NDT Europa.

**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.

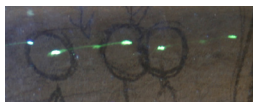
**FP-93A(M)** is listed on the Qualified Products List for **AMS-2644**. It meets the requirements of **AMS-2647**, **ASME Boiler and Pressure Vessel Code Section V**, **ASTM E-165**, and **ASTM E-1417**, for penetrant inspection materials. It is low in sulfur and halogens and is safe for use on all 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  $\mu\text{w}/\text{cm}^2$  @ 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  $\mu\text{w}/\text{cm}^2$  @ 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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## Product Data Sheet

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11/2015

### FP-93A(M)

## Fluorescent Penetrant

### 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

The warranty shelf life of the product is 5 years  
from date of batch approval.

### Specifications

<b>AMS-2644E</b>	<b>AMS-2647</b>
<b>ASME B &amp; PV code Sec. V</b>	
<b>ASTM E-165</b>	<b>ASTM E-1417</b>
<b>ISO-3452</b>	
<b>P &amp; W FPM PMC # 4352-AA SPOP-62</b>	
<b>R-R Omat# 650B</b>	<b>R-R RPS-702</b>

### Product Availability

1 gallon (3.7L) metal can  
5 gallon (18.9L) metal pail  
55 gallon (208L) metal 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>



### GHS Information



#### **Warning**

#### **GHS Hazard Statements:**

**H315:** Causes skin irritation.  
**H319:** Causes serious eye irritation.

#### **GHS Precautionary statements:**

**P102:** Keep out of reach of children.  
**P261:** Avoid breathing dust/fumes/gas/mist/vapors/spray.  
**P280:** Wear protective glove/clothing/eye protection/face protection.  
**P284:** In case of inadequate ventilation wear respiratory protection.



#### **GHS response statements:**

**IF INHALED:** Remove person to fresh air and keep comfortable for breathing, get medical advice/attention if you feel unwell.  
**IF ON SKIN:** Wash with plenty of water. If skin irritation occurs, get medical advice/attention.  
**IF IN EYES:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easily to do. Continue rinsing, get medical attention.  
**IF SWALLOWED:** Immediately call a poison center/doctor/physician. Do Not induce vomiting.  
**IF ON CLOTHING:** Take off contaminated clothing and wash it before reuse.

#### **Transport:**

DOT- not regulated.  
IATA- not regulated.  
IMDG- not regulated.

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