



57640 North Eleventh Street
Calumet, MI 49913
Ph. (906) 337-3018
Fax (906) 337-2930
rel@relinc.com
www.relinc.com

REL TAM Panel - Single (Part Number: 250-00104)



Certification

REL certifies that REL TAM Panels are Hexavalent Chromium free.

Compliances met by REL TAM Panel plating: RoHS, REACH, WEEE, ELV, and Proposition 65.

Pratt & Whitney Approved TAM 146040-1 (Mirror/Polished Finish).

REL, Inc. is an officially approved P&W Source Manufacturer. REL, Inc. certifies that the Fluorescent Penetrant Inspection REL TAM Panel meets the requirements as stated in **TAM 146040-1, ASTM E1417, MIL-STD-6866, TO 33B-1-1, NAVAIR 01-1A-16-1, TM 1-1500-335-23, Rolls-Royce, and GE Aviation Process Specification P3TF47**. The REL TAM Panel has been manufactured and tested in accordance with the REL, Inc. procedure RWI-1105.

REL TAM Panel and Documentation includes:

1. REL Tam Panel in Tool Control System
2. Panel Certificate of Conformance (Sealed) **this document*
3. Penetrant System Monitoring Panel Documentation
 - a. Serialized crack size certification document, including
 - b. 1:1 Picture

REL TAM Panel Cleaning Procedure:

1. **Ultrasonically** clean in 98% methanol for 15 minutes,
 - a. Alternate Cleaning Methods:
 - i. Ultrasonically clean in Acetone
 - ii. Ultrasonically clean in Isopropyl Alcohol
 - iii. Ultrasonically clean in Aqueous Alkaline Solutions***NOTE: Do NOT use Oxidizing Chemicals to Clean panel***
2. 15 minutes air dry,
3. Verify cleanliness:
 - a. Use a LED UV-A lamp Certified to ASTM E3022. (See illustrations on 'ASTM E3022 Certified Inspection Lamps'. REL, Inc. document included for lamps approved for this purpose.)
 - b. Inspect REL TAM Panel (5 places) at the intensity level of 3000 microwatts per centimeter squared to verify no residual fluorescent penetrant exists on the surface.

REL TAM Panel storage:

1. Store in dry packaging, or
2. Store in Acetone

REL TAM Panel Serial Number: 290714-133

Date of Certification: July 28, 2026

Certified by: REL X3
Inspector

REL TAM Panel Processing Procedure:

Type 1 (Fluorescent Dye), Method D (Post-Emulsifiable, Hydrophilic), Form a (Dry Powder), Level 4 (Ultra-high sensitivity)

1. Clean panel to specified "REL TAM Panel Cleaning Procedure"
2. Apply Fluorescent Penetrant by brush
 - a. Magnaflux Zyglo ZL-37 Level 4, Post-Emulsifiable, Fluorescent Penetrant
3. Penetrant Dwell: 20 minutes @ ambient temperature (50-90°F)
4. Penetrant Rinse: 1 minute maximum wash/rinse 90°F @ 20psi, 18" from part
5. Dip application Emulsifier/Remover:
 - a. Magnaflux Zyglo ZR-10E Hydrophilic Emulsifier (Maximum 20% solution)
6. Emulsifier Dwell: 1 minute maximum in 20% ZR-10E Emulsifier solution
7. Emulsifier Wash/Rinse: 1 minute maximum wash/rinse 90°F @ 20psi, 18" from part
8. Oven Dry: Dry for 5 minutes @ 60°C (140°F)
9. Apply Dry Developer:
 - a. Place panel in Developer Chamber
 - b. Magnaflux Zyglo ZP-4D Dry Powder Developer (formerly ZP-4B)
 - c. Agitate air in chamber to ensure complete coverage
10. Developer Dwell: 10 minutes
11. Remove excess Developer
 - a. Air spray @ 5psi
12. Inspect, Measure, & Document Panel
 - a. Pratt & Whitney TAM146040
 - b. ASTM E1417
13. Lab environmental conditions
 - a. Temperature 79 F
 - b. Humidity 46%

NIST Traceable Process Instrumentation:

1. UV-A & White Light Meter
2. Mini alarm timer/stopwatch
3. Water pressure gauge
4. Water temperature gauge
5. Refractometer
6. Thermocouple
7. Dryer controller
8. Air pressure gauge
9. Keyence IM-8010 Microscope
10. UV-A inspection lamps
11. All instruments used during panel processing procedure are NIST Traceable



Penetrant System Monitoring Panel Documentation

SN# 290714-133

Crack Position	A	B	C	D	E
Photo of Defect Magnification Factor: 1 : 3.5					
Measured Size (Inch)	0.024	0.054	0.084	0.137	0.198
Specification (Inch)	0.015 - 0.031	0.046 - 0.062	0.075 - 0.093	0.125 - 0.171	0.180 - 0.250
Measured Size (mm)	0.61	1.37	2.13	3.48	5.03
Specification (mm)	0.38 - 0.79	1.17 - 1.57	1.91 - 2.36	3.18 - 4.34	4.57 - 6.35

Crack Depth

.0025" ± .0001"

63 µm ± 2.5µm

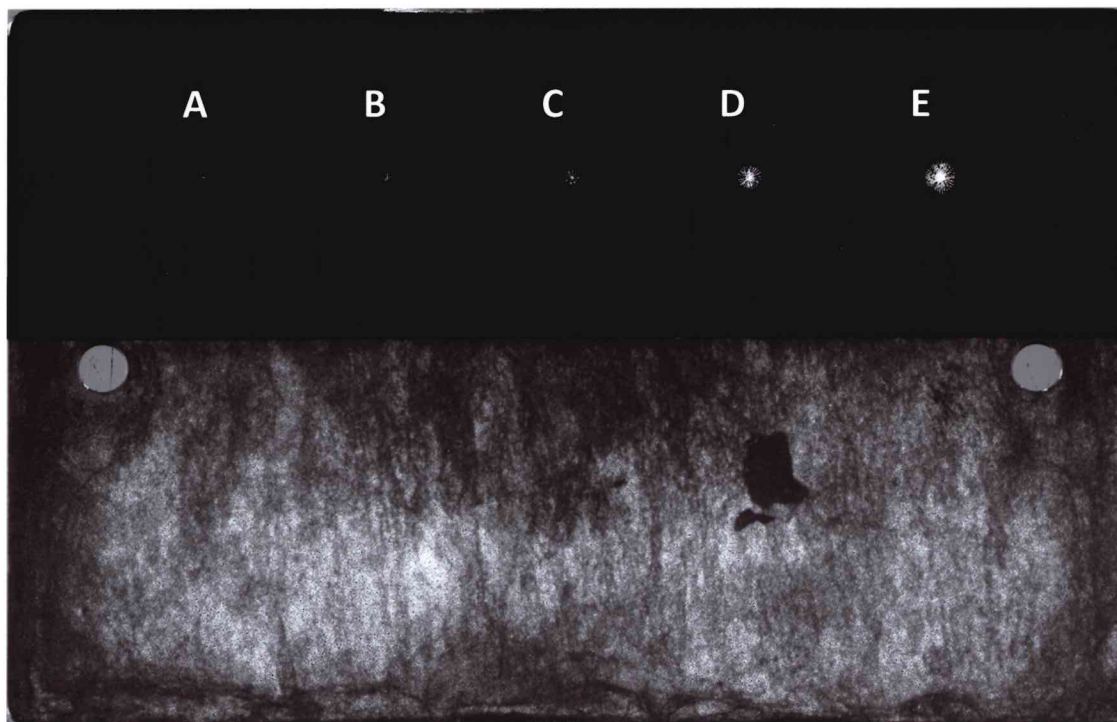
This panel has been tested to conform to all requirements of:
TAM146040-1

Measured with Keyence IM
8010
Calibration No. RM4133305C

Inspector: RAW

Date of Certification: 7/28/26

This panel does not contain
hexavalent chromium.



This photo is actual size. (1:1)