

Notice to Suppliers



Update on the Effects of Replicating Media on Fluorescent Penetrant Inspection

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For the attention of Managing Director and Quality Manager

Scope/Applicability:

All Original Equipment Manufacture (OEM) suppliers & sub-contractors.
All Maintenance, Repair & Overhaul (MRO) suppliers and sub-contractors, with the exception of Civil Aerospace MRO (specific communication on this issue for Civil Aero MRO will be issued separately).

Dear Supply Partner,

Introduction:

A technical investigation by Rolls-Royce in 2019 discovered that the use of silicone-based replicating media (including but not limited to brands such as Microset, Flexbar Reprorubber, Repliset) on component surfaces can have a detrimental effect on the capability of subsequently performed Fluorescent Penetrant Inspection (FPI) to detect anomalies. The silicone-based compound leaves a visible residue which repels the penetrant. Whilst this may be removed from the main surface by subsequent cleaning operations, if a defect exists that is not readily open to the surface, e.g. a tight crack, the residue can remain in the defect, preventing the penetrant from gaining access in to the defect.

Therefore, the use of silicone-based replicating media prior to penetrant testing may result in surface breaking defects being missed. Cleaning operations such as vapour degreasing, aqueous and alkaline degreasing, steam cleaning, use of acetone, kerosene and etching solutions have all proven to be ineffective at removing the silicone-based residue from surface breaking tight defects. This issue is an industry-wide issue with other organisations identifying similar issues and was first communicated by Rolls-Royce in NTS480 in December 2019.

Action Required:

Since 2019 Rolls-Royce has continued to investigate this issue and can now be more targeted on the required actions for suppliers. Updates have been made to the following specifications (updates to equivalent MRO Technical publications will be communicated separately):

- RRP58003 Fluorescent Penetrant Inspection- Updated to invoke RRP58023.
- RRP58023 Assessment of Surface Features Using Rubber Replicating Media – Updates to required controls for replicast operations as below:

The main actions required to manage silicone replicast contamination remain unchanged. The requirements of RRP58023 are summarised as follows:

As a general policy, replicating media shall not be applied to a component prior to FPI. If it is necessary to apply replicating media prior to FPI one or more of the following controls shall be applied:

- a) Carry out a local FPI of the area to be replicated prior to replication.
- b) Use a cleaning process following replication that has been validated per RRP58023 (on real cracks) to restore FPI performance.
 - Recent trials have now shown that Digesil® - NC 701 and Digesil® Gel - RPM Technology (rpm-technology.com) is effective for removal of silicone based contamination from many types of replicating media, and cleaning techniques requiring no supplier-specific validation are now included in RRP58023.
- c) Fully remove the replicated surface prior to FPI.
 - Clarification has been added to RRP58023 that etch or Scotch Brite™ type abrasives are not sufficient to meet this requirement.
- d) RRP58023 now acknowledges that if the above actions are not practicable, that this shall be reported as a limitation to test for FPI in the normal way.

The specification now allows a graduated timeline for compliance based on the criticality of the replicated parts:

- Fleet product in service
 - No action required.
- Existing critical part production/maintenance methods updated by the end of March 2024 in line with the requirements of RRP58023.
 - Exceptions to this shall be agreed with the Rolls-Royce Technical Authority as defined within the RRP58023 specification.
- Existing non-critical part production/maintenance methods – no action required unless there is a specific concern.
- New production methods for all parts (and changes to existing methods which affect the replicast operations)
 - Implement the requirements of RRP58023 from end of March 2024.

Please cascade the content of this communication within your business and sub-tiers as appropriate. It applies to all areas using silicone-based replicating compounds, not just organisations that perform FPI. For any questions or further information required, please contact ndesupplyteam@rolls-royce.com

NTS Category:

Engineering/Technical

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