

# Notice to Suppliers



## Effect of Replicating Media on the Capability of Fluorescent Penetrant Inspection

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**Business Unit:** Civil Aerospace

**NTS Number:** 480  
**Issue:** 1  
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For the attention of the Managing Director and Quality Manager

**Dear Sir or Madam,**

**Scope/Applicability:**

All suppliers, sub-contractors, overhaul and component repair vendors approved by Rolls-Royce.

**Introduction:**

A technical investigation by Rolls-Royce has discovered that the use of replicating media on component surfaces can have a detrimental effect on the capability of subsequently performed Fluorescent Penetrant Inspection (FPI). The silicate-based compound leaves a visible residue which repels the Dye Penetrant. Whilst this may be removed 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 mouth of the defect preventing the penetrant from gaining access in to the defect. The concern exists that the use of silicate-based replicating media prior to standard FPI operations 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 silicate-based residue from surface breaking tight defects.

**Action Required:**

It has been recognised that silicate-based replicating compounds are widely used to measure the depth of component damage (nicks and scratches) and to measure geometrical features that are difficult to measure using conventional metrology equipment. As a general policy replicating compounds must not be applied to a component prior to standard FPI operations. If it is necessary to apply replicating compounds prior to standard FPI operations the following controls apply:

- (a) An FPI of the local area that requires application of the replicating compound must be performed prior to replicating compound application or
- (b) Replicating compound can be applied to a component prior to standard FPI operations if it has been validated that the replicating compound used and the subsequent cleaning operation(s) performed has no effect on surface defect detection by FPI. The validation must be done using a specimen(s) (not FPI plant performance panel) which contains a tight linear defect, e.g. crack. This validation must be documented and approved by the relevant Rolls-Royce Technical Authority or a Rolls-Royce approved supplier NDT Level 3.
- (c) Where subsequent operation(s) e.g. dressing or machining fully remove the surface(s) of the part that was covered with the replicating compound then it is acceptable to do the FPI after the replicating compound has been applied.

The content of this NTS will be captured within an updated revision of TSD594J OP224 and a new RRP58023, both of which proceduralise the use of replica compound to assess surface features. Please cascade the content of this communication within your business as appropriate. It applies to all organisations who use silicate-based replicating compounds, not just organisations that perform FPI. For any questions or further information required, please contact [ndesupplyteam@rolls-royce.com](mailto:ndesupplyteam@rolls-royce.com)

**NTS Category:**  
Engineering/Technical

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