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## Requirements relating to Electronics Design, Sourcing and Supply Chain Control:

For the attention of the Managing Director

Dear Sir or Madam,

### Scope

- All global suppliers providing parts containing electronic components intended for use in or with Rolls-Royce products, for new or aftermarket use.
- Please note this document is issued as a revision to NTS 181 and NTS 174 and as such supersedes / replaces the content of the former instructions.

### Introduction

As a result of preparations by the electronics industry to move away from tin-lead solder, a number of threats to product reliability need to be managed. The primary threats are concerned with poor solder joint reliability due to incompatible materials and the potential for short-circuits associated with the phenomenon of 'tin whiskers'. European Union Restriction of Hazardous Substances (RoHS) legislation became active during 2006 and similar legislation is in development in other regions and countries.

This legislation is having a growing impact in causing changes to material content and termination finishes used in electronic components. Such changes have been made in many cases without any change in part number. Additionally, there are indications that a significant proportion of components sourced on the open market are counterfeit – including incorrect component finishes, reuse of parts from used electronic assemblies, incorrect packaging, or incorrect/missing semiconductor dies.

Suppliers of electronic parts and assemblies are reminded of their existing liabilities for product design control and quality, including supply chain assurance. Design change, non-conformance and source changes require appropriate approval in accordance with the respective SABRe processes.

### Requirements

The following constraints are required for parts manufactured, repaired or overhauled for Rolls-Royce products to minimise immediate risks associated with the above threats:

1. Tin/lead solder shall continue to be used within Rolls-Royce products or systems until any changes are approved by Rolls-Royce.
2. The supplier shall agree a Lead Free Control Plan with Rolls-Royce in accordance with GEIA-STD-0005-1 and GEIA-STD-0005-2, risk control level 2B.
3. The Lead-Free Control Plan shall specifically include detail regarding:
  - a. Component families using pure tin (>95%) termination finishes
  - b. Design mitigations for such components preventing tin whiskers, such as physical barriers, separation, the nature of the finishes, and conformal coating (including type and control of thickness)
  - c. The verification basis supporting the combination of design mitigations
  - d. Supply chain assurance controls to prevent the use of counterfeit components or undeclared changes termination finishes.
  - e. For control and protection units - inspection requirements of returned assemblies to ensure the continuing effectiveness of tin whisker design mitigations – a requirement
4. The supplier shall only use assured routes from the original manufacturer for electronic components to prevent use of counterfeit components and undeclared changes. Aftermarket sources of electronic components shall only be used with the specific agreement with Rolls-Royce of the testing requirements to ensure component validity/quality.
5. The supplier shall ensure the above requirements are flowed down to sub-tiers such as Printed Circuit Board assemblers and component distributors where applicable.
6. The supplier shall provide a positive written response to the applicable operational buyer in acceptance of the above requirements.

Suppliers are reminded that all changes to component materials, including those of catalogue or standard components are design changes requiring specific approval from Rolls-Royce. Suppliers are responsible for sub-tier supply chain control.

*Rolls-Royce reserves the right to verify the effective implementation of the above measures. If you have any questions or concerns regarding these measures, please contact Steve George, Head of Supplier Engineering, Control Systems ([steve.george@rolls-royce.com](mailto:steve.george@rolls-royce.com))*

**Yours faithfully  
For Rolls-Royce plc**



**Steve George  
Chief of Commodity Engineering  
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**Authorised by:  
Lawrence Jenkins**



**Lawrence Jenkins  
Supplier Development  
Operations Director**