

# TECH SHEET

## PEM® REF/ TECHNICAL CLEANLINESS



### **SUBJECT: AUTOMOTIVE STANDARDS FOR TECHNICAL CLEANLINESS**

#### **What is it?**

Ultra-fine cleaning to comply with the highest levels of cleanliness requirements in the automotive industry.

Components are now becoming smaller and more compact, this harbours the risk of tiny microscopic particles interfering or damaging electrical assemblies, these particles are produced in the manufacturing process.

Ultra-fine cleaning reduces the risk of electrical short circuit in the assembly.

#### **Requirement:**

The demand for quality control of components and cleanliness testing have risen steadily in recent years—so much so that clean manufacturing is now one of the main issues in the automotive industry. Both functionality and the lifetime of products are linked directly to the extent of particulate contamination.

#### **VDA 19**

The following standards pertaining to technical cleanliness were introduced in 2005

- VDA 19 Part 1 - Inspection of Technical Cleanliness (Particulate contamination of functionally relevant automotive components)
- VDA 19 Part 2 - Technical Cleanliness in Assembly (Environment, Logistics, Personnel & Assembly Equipment)

#### **VDA 19 Part 1 - Inspection of Technical Cleanliness**

- This standard states the requirements for applying and documenting methods for determining particulate contamination on components (cleanliness inspection). This inspection is based on a particle extraction method where the maximum amount of particulate is removed from the components, typically using a liquid, to extract the particles for inspection.
- The standard also states the method for documenting cleanliness specifications for components.

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### PennEngineering Compliance:

- PennEngineering are fully compliant with VDA19 Part 1 and with currently quoted applications (typically no particles > 400µm after additional cleaning operation that must be agreed/stipulated).
- New applications need to be reviewed by PennEngineering on a case by case basis when technical cleanliness requirements are stated, Please send us your requirements for review.

### VDA 19 Part 2 - Technical Cleanliness in Assembly

#### Scope:

- This standard is concerned with the planning of processes in assembly areas where cleanliness is a factor
- This standard assumes that components to be used in the assembly are already meeting the required cleanliness specification when tested as per VDA 19 Part 1.
- This standard is a guide to help locate and eliminate particle sources in assembly processes where the required degree of cleanliness cannot be attained in the assembly system despite the use of clean components which meet VDA19.1 requirements (for example, particles created from component installation, from engaging threads between components, from particles detaching from coatings)
- The standard guides assembly manufacturers on principles to prevent or remove particles at the point of generation in assembly processes (assembly workstation)

### PennEngineering Compliance:

#### PennEngineering compliance is as follows:

- Inspection of cleanliness as per VDA 19 Part 1 **at the point of fastener packaging.**
- The following potential risks need to be mitigated by the assembler who is using PennEngineering product subject to technical cleanliness requirements.
- Potential particle creation during the installation of the fastener.
- Potential particle creation from the coating of the fasteners due to feeding, abrasion, etc.
- Potential particle creation from threading processes (mating component thread engagement).
- Particle creation risks in assembly processes are stated in VDA19 Part 2 and guidelines for prevention/removal of these particles during assembly are also stated.
- Please contact us to discuss your individual requirements.

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### PennEngineering Product Solutions:

One of our solutions for microscopic particles is our blind nut and standoff range pictured below.

- Protects internal components from intrusion of screws, and will contain any particles so long as the mating screw is not removed after final assembly.



Other solution would be to use our stud range, most commonly seen in busbar assemblies. The forming manufacturing process reduces the risk of contamination.

