



ESD / Environmental Requirements for Electronic Assembly at Nexteer

Global Common

SD-1036

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Table of Contents

1.	Scope	3
2.	General Requirements.....	3
2.1	Room / Facilities.....	3
2.2	ESD Flooring / Wall.....	3
2.3	Environment.....	4
2.4	Documentation.....	4
2.5	Spare Parts	5
2.6	Project Management.....	5
2.7	Warranty	5

1. Scope

This specification details the requirements for the design, build, and installation of an electronic assembly area within a Nexteer Facility. The area (entire plant, permanent constructed room, or soft wall modular unit) must guarantee a safe production environment for both people and products. The characteristics of critical electronic components shall be included in the design. To provide a static safe environment, IEC-61340 standards (technical equivalent to ANSI/ESD S20.20 and other ESD Association Standards and Standard Test Methods) should be considered during design. All external specifications listed in this document are available to Nexteer employees at the HIS website via Compass and Business Systems Documentation.

2. General Requirements

2.1 Room / Facilities

- 2.1.1 The area/structure shall be (W) x (L) with an internal ceiling height of (H). Interior height shall be a minimum of 10'. Consider the ceiling height of the host building leaving room for roof access for service of utilities located above the grey room
- 2.1.2 Ceiling clearance height of facility containing the area/structure is (H) as provided by Nexteer.
- 2.1.3 Production in the area shall include but is not limited to soldering robots, motorized conveyor, robotic flux, grease and heat sink dispensing equipment. There will be employees assigned to production in the room.
- 2.1.4 All electrical considerations shall comply with the National Electrical Code (or local equivalent). Electrical power in the room shall be brought to a single source connection with Nexteer providing the connection to plant source.
- 2.1.5 Exterior facility power source available is (X)V @ (Y)A. The interior source required for machine power is (X)V @ (Y)A. With the exception of soft wall designs, wall receptacles of nominal regional voltage levels at an interval of 12 feet (4 meters) apart on exterior walls shall be provided.
- 2.1.6 Electrical outlets shall measure an impedance to ground (per ANSI/ESD S6.1) of < 1 ohm impedance on the equipment grounding conductor (green wire- third wire ground).
- 2.1.7 Lighting shall provide 75-100fc (807-1076lx) at production level and shall be of an energy efficient ballast system. LED is preferred.

2.2 ESD Flooring / Wall

- 2.2.1 The ESD floor system (including ESD mats) characteristics shall comply with IEC61340-5-1. Flooring material shall be as follows:
 - Preferred – Conductive tile (permanent/modular)
 - Optional – Epoxy ESD conductive paint
 - The floor electrical properties shall be < 1 x 10⁹ ohms (nominal 5 x 10⁵ to 1 x 10⁶ ohms)

- 2.2.2 There shall be a footwear tester that checks each person and their footwear for a pass condition prior to allowing entry into the EPA through a turnstile or magnetic locking door. This device should be set at ≤ 35 megohms. The **S20.20** and **IEC61340-5-1** standards require that personnel have a resistance to ground of < 35 megohms (3.5×10^7 ohms) when handling unprotected susceptible items. The device shall be tested per the manufacturers' recommendations.
- 2.2.3 For all purchased components related to ESD control including but not limited to flooring and foot grounder check stations, the supplier shall provide a testing matrix showing compliance to the related standard for each product. The supplier shall provide a second set of test data from testing of the product after install in the Nexteer facility to verify compliance.
- 2.2.4 If an enclosed structure is used the walls shall be of a painted block construction or a dissipative material (example: Acrylic, PVC, Polycarbonate, or Anodized aluminum).

2.3 Environment

- 2.3.1 The area/structure **shall** have a positive air pressure of 5-15 Pa with 5 Pa being the lower limit.
- 2.3.2 Air filtration shall remove any particle of ≥ 150 micron with an efficiency rating $\geq 90\%$ and room air change rate of 5x per/hour minimum. Air may be re-circulated or exhausted to the surrounding plant. Makeup air shall come from outside of host structure if plant air is deemed unacceptable by Nexteer for recirculation to area/structure atmosphere (example: containing oil or metal dust from machining operation).
- 2.3.3 The temperature shall be controlled 22 C (+5C/- 4C). A monitoring device shall be provided.
- 2.3.4 Humidity Control NOT required but acceptable if readily available. **If humidity control is used, a setting of 40% – 70% is required.**
- 2.3.5 Fire protection shall comply with all local and Nexteer requirements. Nexteer will provide fire extinguishers.

2.4 Documentation

- 2.4.1 The language on all documentation shall be as follows:
- Maintenance manuals and procedures - TBD
 - PC software - TBD
 - Drawings and parts list - TBD
 - Operator interface devices and warning labels – TBD
 - Others not listed - Consult the Nexteer Engineer

2.5 Spare Parts

2.5.1 The supplier shall provide a list of recommended spares for HVAC system:

2.5.2 The list should include:

- Manufacturer's name
- Quantity used
- Recommended quantity to stock and estimated price

2.6 Project Management

2.6.1 The supplier shall submit a detailed project-tracking schedule to the Nexteer Engineer.

2.6.2 This tracking schedule shall include dates for all review submissions and completion of critical tasks.

2.6.3 The schedule shall indicate the expected start and finish dates for each phase of the project (mechanical design, HVAC design, procurement, build, documentation, etc.). The schedule must also take into account the shutdown periods of the supplier, Nexteer.

2.6.4 The supplier shall submit a project status update to the Nexteer Engineer on the first of each month throughout the duration of the project. The status report shall include an update of the tracking schedule, explanation of schedule deviations, and plans to maintain the project timing.

2.6.5 The supplier shall hold review meetings with the Nexteer Engineer to review project schedule, issues list, and equipment designs. These meetings are mandatory from project kick-off through completion. Frequency determined by Nexteer Engineer.

2.6.6 An overall layout concept shall be submitted to the Nexteer Engineer for review and approval prior to the construction process. Design approvals made by the Nexteer Engineer do not remove responsibility from the supplier to provide a fully functional system that satisfies the TE-Spec requirements.

2.7 Warranty

2.7.1 The vendor's warranty for HVAC shall be 1 year minimum from the date of completion.

2.7.2 All malfunctioning components under warranty will be returned to the supplier for replacement or repair.

2.7.3 The quotation must detail the supplier's warranty part replacement plan.

RECORD OF REVISIONS

Revision No	Date	Section	Description
001	09JA13	ALL	Initial release.
002	03JN19	ALL	Reformatted to common specification template. No content changes.
003	01JN20	1, 2	General updates / clarifications. All changes highlighted.
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