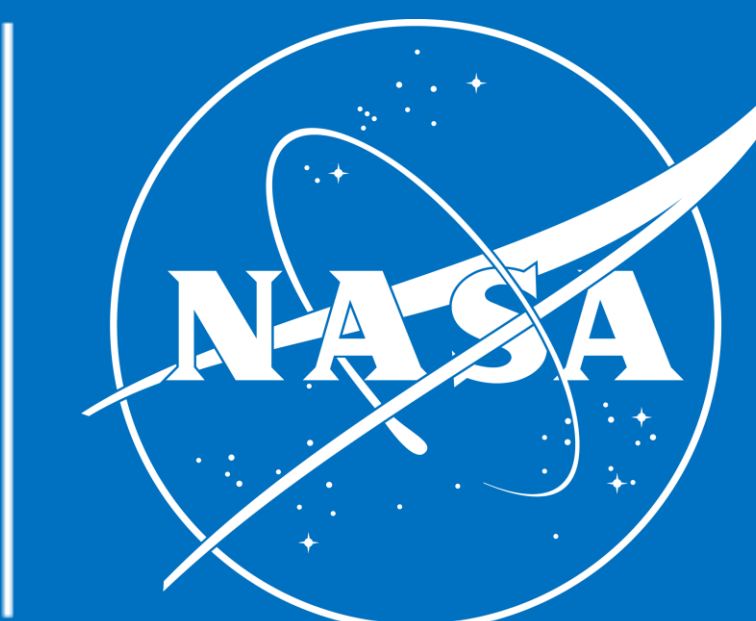


# Cleanroom Site Activation For Flight Hardware Assembly

National Aeronautics and  
Space Administration



Paul M. Schrader – EM22 Chemistry & Contamination Control

## Assembling Flight Hardware at MSFC

Requires **Specialized Areas** To Control The Cleanliness Of The Hardware  
And Minimize Hazards That Can Be Associated With The Assembly Process.

Area	MSFC Standards	Required Training	Site Assessments	Equipment
Cleanrooms	MSFC-STD-246 Standard Design & Operational Criteria for Controlled Environmental Areas	SMA-HQ-WBT-308 Cleanroom Protocol And Contamination Control	<ul style="list-style-type: none"> <li>Room Classification Based On Required Hardware Cleanliness</li> <li>Weekly Certifications through EM22</li> <li>Continuous Monitoring</li> <li>Lighting</li> <li>Air Filters</li> <li>Air Shower</li> <li>Access Controls</li> </ul>	<ul style="list-style-type: none"> <li>Shoe Brushes</li> <li>Sticky Mats</li> <li>Cleanroom Garments</li> <li>Bench</li> <li>Full Length Mirror</li> <li>Rack to Hang Re-Usable Garments</li> <li>Disposal Container For Used Items</li> <li>Hamper For Re-Usable Garments</li> </ul>
FOD Areas	MSFC-STD-3598 Standard for Foreign Object Damage/ Foreign Object Debris (FOD) Prevention	SHE 415 Foreign Object Debris Awareness SHE 416 Foreign Object Debris Prevention SHE 417 Foreign Object Debris Monitor Training	<ul style="list-style-type: none"> <li>Site Assessment Performed*</li> <li>Corrective Actions Completed Prior To Bringing Hardware Into Cleanroom</li> <li>Access Controls</li> </ul>	<ul style="list-style-type: none"> <li>Access To FOD Database</li> <li>FOD Areas Segregated</li> <li>Signs And Area Agreements Posted</li> <li>Tool Controls Implemented</li> <li>FOD Supplies Available</li> </ul>
ESD Areas	MSFC-RQMT-2918 Requirements for Electrostatic Discharge (ESD) Control	SHE 413 Certification Training For Electrostatic Discharge (ESD) Control	<ul style="list-style-type: none"> <li>Verification Audit By SMA</li> <li>Access Controls</li> </ul>	<ul style="list-style-type: none"> <li>ESD Equipment In-Place And Tested</li> <li>Ionizers Calibrated</li> <li>Signs Posted</li> <li>SMA ESD Certification Posted</li> </ul>

**\* Schedule A Site Assessment With EM22**

**As Soon As You Know**

You Are Going To Receive Or  
Assemble Flight Hardware.

**Corrective Actions for Facilities Can Be  
Expensive And Take Months To Complete!**

The EM22 Contamination Control Team Works With You  
To Establish Cleanroom, FOD, And ESD Areas

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