



Slide 1



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## ***Comparison of ASTM E595 and CSS-Q-70-02A Data***

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Beijing, China, May 2007

No notes

Slide 2



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## ***Agenda***



- Materials tested
- Test conditions
- Data analysis

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***Participating Laboratories with Data Analyzed Herein***



- NASA WSTF
- NASA GSFC
- JAXA
- ESA
- NASA and JAXA used ASTM E595, while ESA used ECSS-Q-70-02A

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***Materials Evaluated***



- High density polyethylene beads
- RNF-100-3/64 Black Shrink Tubing, Raychem
- CV-2500 Clear Silicone Adhesive, Nusil Technology
- CV-2942 Gray Silicone Adhesive, Nusil Technology
- FLGCP0311-24-5D Insulated wire, green Tyco
- Eccobond 45LV/15LV Epoxy, Emerson & Cuming
- EA9313 A/B Semkit Epoxy, Loctite Dexter-Hysol

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### ***Test Conditions***



- 125 °C sample temperature
- 25 °C collector temperature
- Other conditions were specific for each method

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### ***Data Analysis***



- Differences between the two methods were evaluated in light of the criteria for materials selection for aerospace:
  - TML less than 1 percent
  - VCM less than 0.1 percent
- The limited number of tests conducted did not allow evaluation of methods differences for precision and relative accuracy

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**Data Analysis (continued)**



- Of the total 7 materials tested, in four instances all the labs provided consistent results considering the spacecraft materials qualification criteria:
  - All labs passed RNF Heat Shrink tubing, CV-2500 and CV-2942 Silicones
  - All labs failed EA9313 Semkit epoxy

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**Data Analysis (continued)**



- All labs were consistent on the TML criteria
- WSTF, GSFC, and JAXA – failed the HD PE beads and the Eccobond 45LV. ESA passed both (on the VCM criteria)
- WSTF, GSFC, and JAXA passed the Tyco insulated wire, while ESA passed it (on the VCM criteria)

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### **Data Analysis (continued)**

Differences between the methods were relatively large in the two situations where the VCMs were larger for the ASTM E595 tests. The average VCM% for HD PE and Eccobond is:



WSTF	GSFC	JAXA	ESA
0.14	0.15	0.136	0.052
0.415	0.36	0.344	0.0815

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### **Data Analysis (continued)**

Differences between the methods were smaller for the situation where the VCM was smaller for the ASTM E595 tests. The average VCM% for the Tyco-insulated wire is:

WSTF	GSFC	JAXA	ESA
0.075	0.075	0.058	0.12

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No notes