

NASA WIRING FOR SPACE APPLICATIONS PROGRAM TEST RESULTS

Jim Ide
McDonnell Douglas Aerospace-East
St. Louis, Missouri

510-23

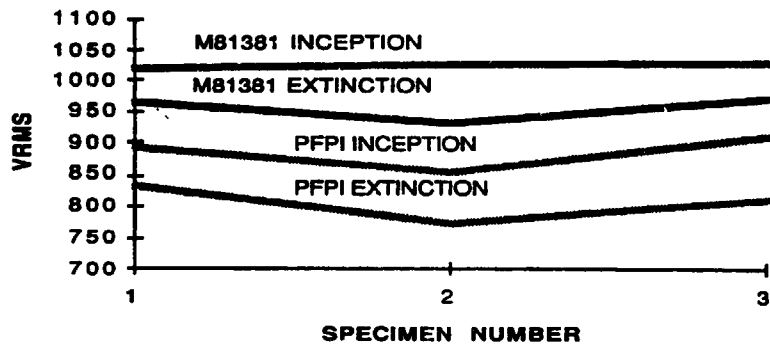
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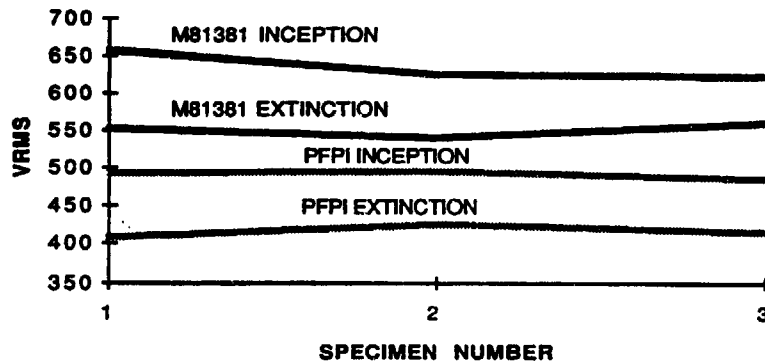
**FY '94 - '95 Testing Activities
McDonnell Aerospace/TRW**

- **Objective:** To begin examination of mechanical and electrical properties of PFPI insulation.
- **Tests:** AC Corona: 400 Hz, sea level & 60,000 ft.
Time/Current to Smoke
Wire Fusing Time
Abrasion Resistance: 25°C & 150°C
Dynamic Cut Through
Notch Propagation
Weight Loss (Outgassing)
- **Principal Investigator:** Jim Ide
McDonnell Douglas Aerospace - East
- **Note:** Immature manufacturing status of the PFPI material for wiring use resulted in degraded samples and must be considered when observing test results.

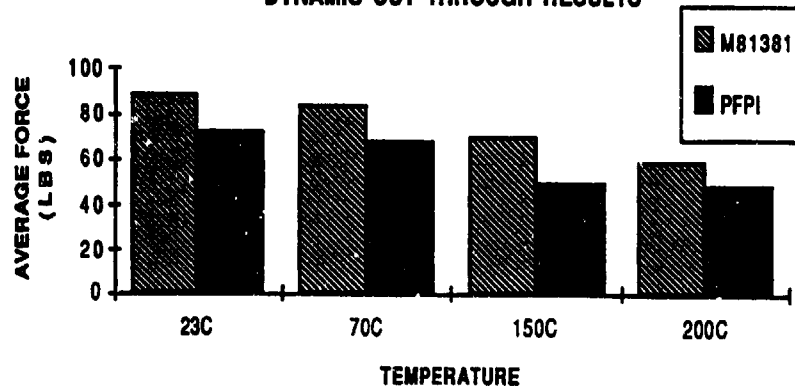
CORONA RESULTS AT SEA LEVEL



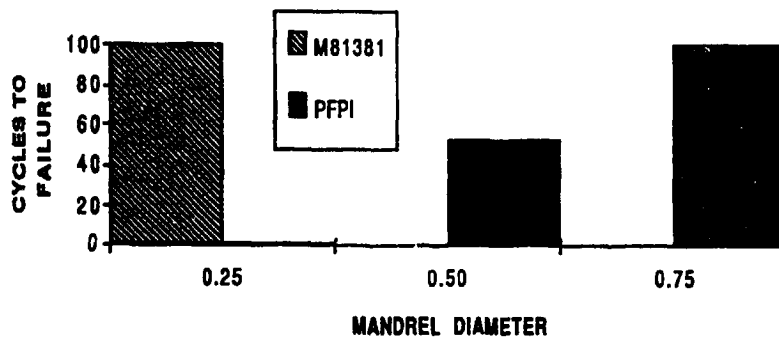
CORONA RESULTS AT ALTITUDE



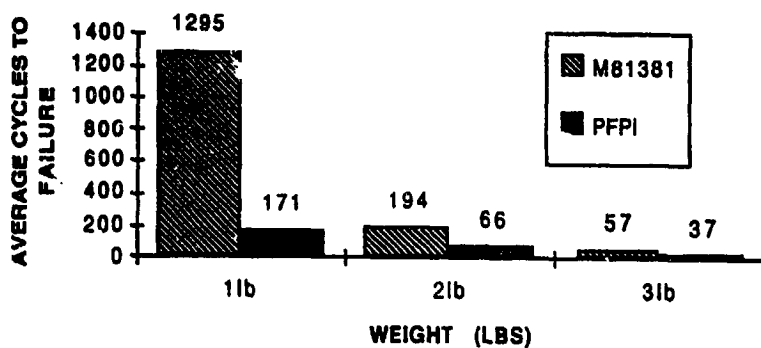
DYNAMIC CUT THROUGH RESULTS



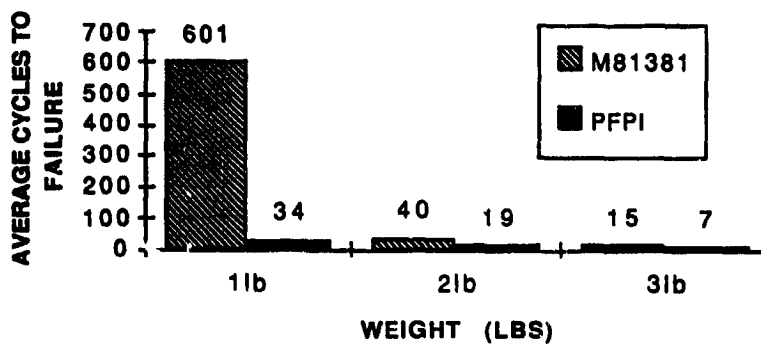
NOTCH PROPAGATION RESULTS



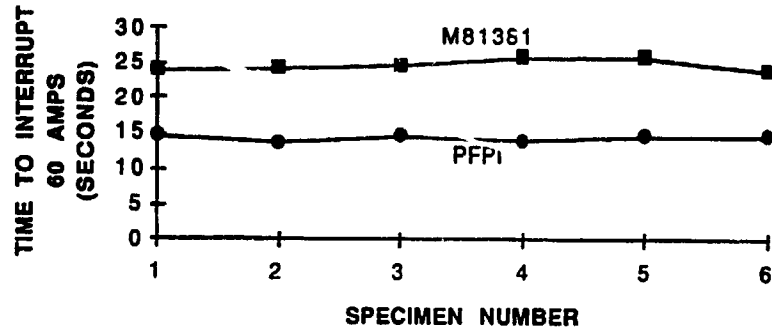
ABRASION RESULTS AT AMBIENT



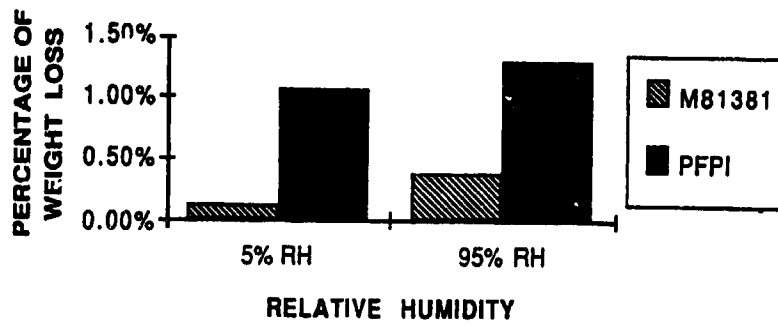
ABRASION RESULTS AT 150 DEGREES C

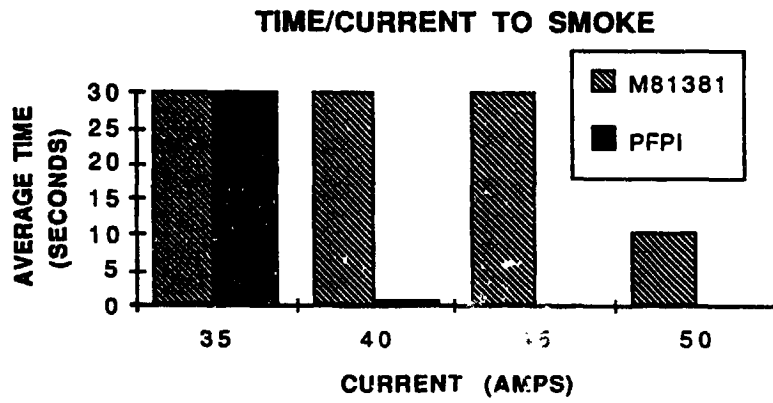


WIRE FUSING TIME



WEIGHT LOSS/OUTGASSING





Conclusions

- PFPI & MIL-W-81381/7 similar for AC Corona and Dynamic Cut Through

- All other tests, PFPI did not perform well

- PFPI manufacturing process needs to be upgraded

NASA WIRING FOR SPACE APPLICATIONS PROGRAM TEST RESULTS

Javaid Laghari and Jayant Suthar
State University of New York at Buffalo
Buffalo, New York

FY '94 - '95 Testing Activities University of Buffalo

- **Objective:** Investigate the electrical breakdown properties of the candidate wire insulation constructions.
- **Tests:** Dielectric Strength: 23°C, 200°C
Time To Breakdown: 400 Hz, 200°C
ASTM D-149
- **Principal Investigators:** Javaid Laghari and Jayant Suthar
State University of New York at Buffalo

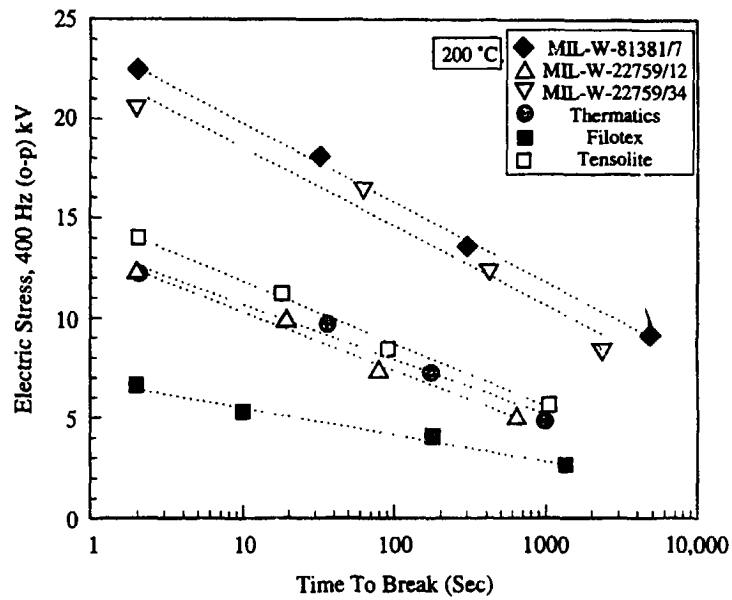
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Dielectric Strength of Wiring Insulations

Insulation System	23°C kV _(o-p)	200°C kV _(o-p)
MIL-W-81381/7	25.7	22.5
MIL-W-22759/12	14.2	12.3
MIL-W-22759/34	28.9	20.7
Thermatics	14.3	12.2
Filotex	10.2	6.7
Tensolite	14.2	14.0

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Time-To-Breakdown Characteristics of Wiring Constructions at 200°C and Various Electrical Stresses



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Final Conclusions

- In process of completing final in-house testing.
- Final results will be printed in program final report which is to be completed.