



April 1, 202215 March 2019

ESD/LPD Trade/187

Mr. Doron Lewit - CEO LPD Trade

RE: Measurement Results of antistatic Hand Tools

Reference:

- 1) LPD Trade/FBK Catalog of Antistatic tools
- 2) ESD TR53-01-06: Compliance Verification of ESD protective Equipment and Materials, ESD Association (USA)
- 3) ASTM D-257-78: electrical resistance measurement methods of insulating materials
- 4) CENELEC/TR 50404-2003: Electrostatics - Code of practice for the avoidance of hazards due to static electricity
- 5) IEC 60079-32-2/Ed1: Explosive atmospheres – Part 32-2: Electrostatics hazards – Tests

1. Background

Tested Material

Several black polypropylene hand tools were received for lab characterization. The tools are manufacturer by FBK. ID appearing in the table of measurement results are the tools' catalog number provided by LPD Trade.

According to CENELEC/TR 50404-2003 ESD standard (Ref 4) acceptable antistatic tools would have resistivity (measured from tool handle to its end making a contact with HAZMATs) less than $1.0 \times 10^8 \Omega$, as is presented in the following table:

Sub clause	Type of installation	Maximum resistance to earth, ohms
10.3.4	Items fabricated from non-conductive or dissipative materials	10^6 to 10^8

2. Measurement Details

- Measurement methods are per Ref.2, Ref. 3, and Ref 5, tests 4.3 (surface resistivity) and test 4.5 (leakage resistance).
- Measurement voltage: 10-100V
- Instrument: Resistance Meter, Prostate, Model PRS-812; Upper measurement range $10^{14} \Omega$
- Calibration due date: 28 September. 2019
- Tool electrical resistivity was measured from end to end (handle to tool's end making a contact with ESD sensitive material/component)

3. Measurement Results

All measurements were conducted at 24°C and RH 42%

No.	Cat. #	Tool Description	end-to-end Resistivity kΩ	Pass/ Fail
1	C24147	Broom (just brush)	170	Pass
2	C29904	Broom Handles	280	Pass
3	C10713	Brush with metallic handle	11	Pass
4	C57156	Tube Cleaner	20	Pass
5	C80305	Dust Pan Black	13	Pass
6	CY15106	Dust Pan Yellow	78MΩ	Pass
7	C28500/C28503	Squeegees	16	Pass
8	C27131	Tube Cleaner Brush	91	Pass
9	C52126	Hand held Brush	270	Pass
10	C29856	Telescopic Handles	1.1MΩ	Pass
11	C27134	Tank Brush	14	Pass
12	C15109	Spatula	13	Pass

K=1000; M=10⁶; G=10⁹



4. Product Depiction







5. Conclusions

All tested hand tools were found to have very good static dissipative characteristics. They are good quality tools and need only GMP approval for pharmaceutical materials. For other processing industries such as food, hi-tech, chemicals, and petro-chemicals these hand tools are the **best tools approved by our lab, so far, for ESD control.**

Best Regards,

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