

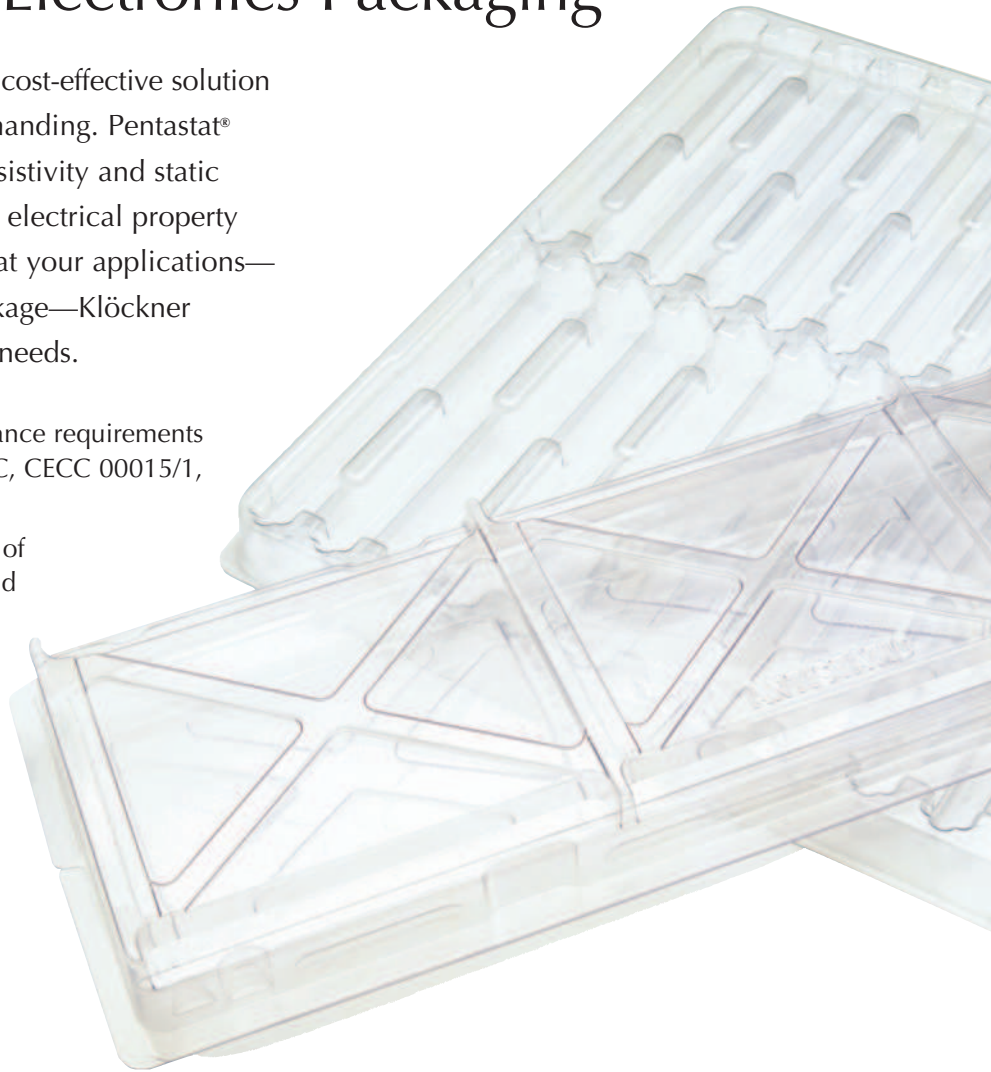
KLÖCKNER PENTAPLAST

PENTASTAT®

Anti-Static Film for Electronics Packaging

Klöckner Pentaplast's anti-static films are a cost-effective solution when your ESD requirements are less demanding. Pentastat® anti-static films meet or surpass surface resistivity and static decay standards for ESD packaging where electrical property certification is not required. No matter what your applications—clamshell, tray, or any thermoformed package—Klöckner Pentaplast has the right film to meet your needs.

- Meets or exceeds surface resistivity & resistance requirements of EOS/ESD S20.20, EIA-541, MIL-B-81705C, CECC 00015/1, and IEC 61340-5-1
- Meets or exceeds static decay requirements of EIA-541, MIL-B-81705C, CECC 00015/1, and IEC 61340-5-1
- Meets general conditions, according to SP Method 2472, for approval and registration of approved products with regard to ESD-protection qualities (*AS-EKPET/56 (KPET/56) only*)
- Excellent clarity, transparent
- Excellent anti-static properties
- Excellent deep-draw thermoforming properties
- Noncontaminating, nontoxic, reusable, flame resistant (*vinyl only*), and recyclable
- Bar code readable
- Design flexible (lightweight, stackable, puncture resistant, mechanically strong, and abrasion resistant)
- Cost savings over other packaging methods (reduced inventory items, lower labor costs for assembly, and lower freight costs)

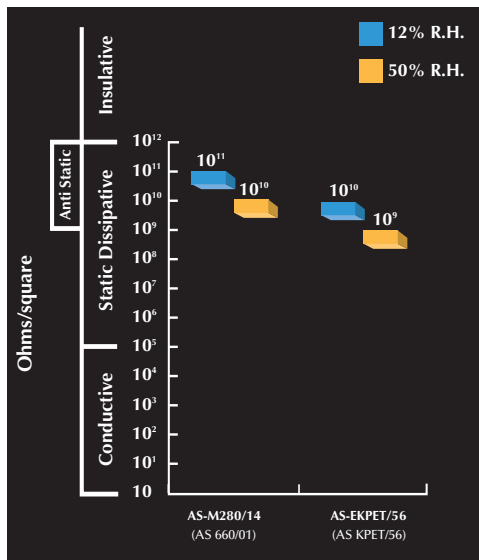


Pentastat® Typical Physical Properties

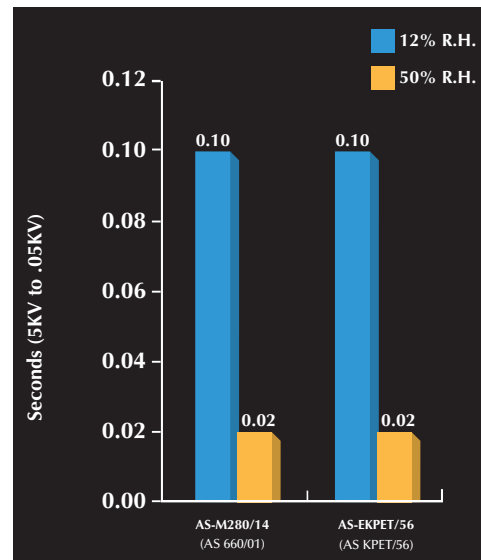
*Current nomenclature appears in bold.
Former nomenclature appears in parentheses
for your reference.

| | Test Method (Standard) | Units | *AS-M280/14 (AS 660/01) <i>Vinyl</i> | AS-EKPET/56 (AS KPET/56) <i>APET</i> |
|--|--------------------------------------|---------------------|--|--|
| Thickness | | | 7.5 to 35 mils | 7.5 to 60 mils |
| Specific Gravity | ASTM D-1505 | — | 1.32 | 1.33 |
| Yield (20 mils) | ASTM D-1505 | in ² /lb | 1050 | 1040 |
| Tensile Strength (Yield) | ASTM D-882 | lb/in ² | 6650 | 7800 |
| Elongation (Break) | ASTM D-882 | % | 180 | — |
| Cold Break Temperature | ASTM D-1790 | °F | -4 | 14 |
| Heat Deflection Temperature (264 psi) | ASTM D-648 | °F | 162 | 149 |
| Surface Resistivity | EOS/ESD S11.11 & S20.20 & ASTM D-257 | Ω/□ | | |
| 12% RH | (EIA-541; MIL-B-81705C; | | 10 ¹¹ | 10 ¹⁰ |
| 50% RH | CECC 00015/1; IEC 61340-5-1) | | 10 ¹⁰ | 10 ⁹ |
| Surface Resistance | EOS/ESD S11.11& S20.20 | Ω | | |
| 12% RH | (EIA-541; MIL-B-81705C; | | 10 ¹⁰ | 10 ⁹ |
| 50% RH | CECC 00015/1; IEC 61340-5-1) | | 10 ⁹ | 10 ⁸ |
| Static Decay ± (5KV to .05KV) | FTM 101C-4046 | sec. | | |
| 12% RH | (EIA-541; MIL-B-81705C; | | 0.10 | 0.10 |
| 50% RH | CECC 00015/1; IEC 61340-5-1) | | 0.02 | 0.02 |

| | Test Method (Standard) | Units | 190 to 890 microns | 190 to 1525 microns |
|---|--------------------------------------|--------------------|--------------------|---------------------|
| Thickness | | | 190 to 890 microns | 190 to 1525 microns |
| Specific Gravity | DIN 53479 | — | 1.32 | 1.33 |
| Yield (500 microns) | DIN 53479 | m ² /kg | 1.52 | 1.51 |
| Tensile Strength (Yield) | ASTM D-882 | N/mm ² | 46 | 54 |
| Elongation (Break) | DIN 53455 | % | 180 | — |
| Cold Break Temperature | ASTM D-1790 | °C | -20 | -10 |
| Heat Deflection Temperature (1.8 N/mm²) | ASTM D-648 | °C | 72 | 65 |
| Surface Resistivity | EOS/ESD S11.11 & S20.20 & ASTM D-257 | Ω/□ | | |
| 12% RH | (EIA-541; MIL-B-81705C; | | 10 ¹¹ | 10 ¹⁰ |
| 50% RH | CECC 00015/1; IEC 61340-5-1) | | 10 ¹⁰ | 10 ⁹ |
| Surface Resistance | EOS/ESD S11.11& S20.20 | Ω | | |
| 12% RH | (EIA-541; MIL-B-81705C; | | 10 ¹⁰ | 10 ⁹ |
| 50% RH | CECC 00015/1; IEC 61340-5-1) | | 10 ⁹ | 10 ⁸ |
| Static Decay ± (5KV to .05KV) | FTM 101C-4046 | s | | |
| 12% RH | (EIA-541; MIL-B-81705C; | | 0.10 | 0.10 |
| 50% RH | CECC 00015/1; IEC 61340-5-1) | | 0.02 | 0.02 |



Surface Resistivity



Static Decay

The information contained herein is true and accurate to the best of our knowledge; however, it is presented without any guarantees either expressed or implied and without the assumption of any liability as a result of the information herein. A matrix of typical physical properties is available upon request. (3/02)