United Adhesives

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# Dielectric Potting Adhesives

United Adhesives Inc. provides various dielectric adhesives for electronic potting applications. They have following features:

- High dielectric strength for voltage insulation
- Soft rubber and flexible to couple thermal stress
- Some products provide high thermal conductivity
- Some products provide superior high voltage resistance

They are typically applied to pot or encapsulate parts and cavities, seal lids, covers, housings, connectors, or coat various electronic parts to provide dielectric insulation, vibration dampening, thermal stress coupling, etc.

| Name | SP4012 | SP4011 | SP4017 | OE1582 | ET1642 | EP1660 |
|---|---|---|---|---|---|---|
| Chemical Base | Silicone | Silicone | Silicone | Epoxy | Epoxy | Epoxy |
| Features / Advantages | Translucent fluid silicone. Readily flowable. Thermal cure to form firm rubbery dielectric gel. Non-corrosive. | One part version of SP4012. Readily flowable. Thermal cure to form firmrubbery dielectric gel. Non-corrosive. | One part dielectric firm gel. Non-sag (thixotropic). | Transparent epoxy potting or sealing for Opto-Electronic Applications. | High thermal conductivity. High bonding Strength. Low CTE. Easy flow | High voltage resistance. Low arching effect. Strong oil and chemical resistance. |
| Typical Application | Pot / encapsulate parts & cavities. Seal housings, lids. Coat electronic parts. Vibration dampening Thermal stress coupling | Pot / encapsulate parts & cavities. Seal housings, lids. Coat electronic parts. Vibration dampening Thermal stress coupling | Encapsulate parts & cavities. Seal housings, lids. Coat electronic parts. Vibration dampening Thermal stress coupling | Applying on LED Glob-Top, Optical Lens & IR Lens, Fiber optical, Lens, Prism, Endoscopes or Light Guides, etc. | Potting or sealing for high heat dissipations in electronics. | For high voltage insulation seal or encapsulation. High voltage component bonding or coating. |
| Rheology | Flowable, Dispensable | Flowable, Dispensable | Dispensable | Capillary flowable | Flowable | Flowable, Dispensable |
| Appearance / Color | Translucent | Translucent | Opaque | Transparent | Grey - A<br>Amber - B | Milky White or Grey |
| Part / Component | A/B = 1: 1 | One | One | A/B =2:1 | Two parts (1:1) | A/B =1:1 |
| Viscosity @25C (cps, after mixing) | 450 | 560 | 1,500 | 1,500 | 160,000 | 12,000 |
| Pot / Work life (hr) | 2 hrs | N/A | N/A | 60 min | 30 min | 45 min |
| Cure Rate | 125C 30 min | 125C 60 min | 125C 60 min | RmT 24hr<br>80C 60 min | 85C 120 min<br>125C 30 min | 125C 60 min |
| Storage | < 25C | < 5C | < 5C | < 25C | < 30C | < 25C |
| Shelf Life | 6 months @ 4C | 3 months @ < 5C | 3 months @ <5C | 12 month @ 24C | 6 month @ 5C | 6month @ 5C |
| Tg | -120C | -120C | -120C | 80 | 85 to 125 | 125 |
| CTE (ppm/C) ASTM D3386-94 | < 300 | < 300 | < 300 | 123 (above Tg)<br>58 (below Tg) | <100(> Tg)<br>< 30 (<Tg) | 120 (above Tg)<br>60 (below Tg) |
| Modulus or Hardness | Shore OO = 35 | Shore A = 20 | Shore A = 42 | Shore D = 77 | Shore D = 70 | 5.6 Gpa |
| Volume Resistivity (Ohm-cm) | > 10E14 | >10E14 | >10E14 | >10E12 | > 10E+12 | > 10E12 |
| Dielectric Strength (V/mil) | > 480 V/mil | > 480 V/mil | 400 V/mil | > 500 V/mil | 500 V/mil | > 800 |
| Adhesion (Al/Al Lap Shear) | N/A | N/A | N/A | > 1200 psi | > 1800 psi | > 1600 psi |
| Thermal Conductivity (W/mK) | N/A | N/A | N/A | N/A | 1.5 | N/A |