Product Datasheet

Kondux™ DR 20-19A/B

2 PART ELECTRICALLY & THERMALLY CONDUCTIVE ADHESIVE

Kondux™ DR 20-19A/B is very economical, two-part epoxy system made with highly conductive silver fillers that conforms to MMM-A-1931 type I and II. It is an easy to use smooth paste that provides excellent electrical and thermal conductivity and has been used for military and space application for many decades. The system cures at room temperature or can be accelerate with heat. It forms strong impact resistant adhesive bonds with very good bond strength. The cured adhesive is heat resistance up to at least 100ºC and has very good resistance to moisture, solvents, and many chemicals. The Kondux™ DR 20-19 A/B system provides one hour application life and demonstrates excellent adhesion to most materials including metals, composites such as FR-4 and G-10, glass, and many rigid plastics.

BENEFITS & APPLICATIONS

- Multipurpose electrically & thermally conductive paste adhesive
- Conforms to MMM-A-1931 type I and type II
- Low cost make it ideal for consumables and other high volume/low value items
- Excellent for low temperature solder replacement

HANDLING PROPERTIES	VALUE	TEST METHOD
Kondux DR 20-19A (resin)		
Visual Appearance	Smooth flowing silver paste	Visual
Viscosity at 25	230,000 cps.	ASTM D-2393
Density, Part A	1.80 g/cm³	ASTM E-201
Flash Point	>160°C	ASTM D-92
Kondux DR 20-19B (hardener)		
Visual Appearance	Amber Liquid	Visual
Viscosity at 25	3,500 cps.	ASTM D-2393
Density,	1.07 g/cm³	ASTM E-201
Flash Point	>93°C	ASTM D-92
Mix Ratio (part by weight)	100A:6B	Calculated
Mix Ratio (part by volume)	100A:10B	Calculated
Viscosity, Mixed, at 25ºC	220,000 cps	ASTM D-2393
Thixotropic Index	2.4	ASTM D-2393
Solids Content (mixed system)	> 99.5%	ASTM D- D2369
Application life at 25ºC, 1 oz.	60 – 80 minutes.	ASTM D-2471
Time to handling strength at 25ºC	24 - 48 hours	

Cure Schedules: minimum cure time is 24 hours at room temperature (25ºC±5ºC) with a full cure occurring in 5 to 7 days. Alternately the adhesive may be heat cured for 2-3 hours at 95ºC. Heat curing may result in a small amount of increased shrinkage but may improve electrical & thermal conductivity and so be advantageous. If shrinkage is undesirable, but heat

curing is preferred, allow the adhesive to gel solidly at room temperature (about 2-3 hours) and then heat cure as this will reduce the shrinkage. If desired, after an initial room temperature cure, a post cure of 2 hours at 95ºC or 1 hour at 121ºC may be done at a later time to improve bond strength, as well as increase the heat and chemical resistance of the cured polymer.

PHYSICAL PROPERTIES (Tested at 25ºC unless otherwise noted)		**TEST METHOD**
Appearance	Silver - gray	Visual
Density	1.82	
Shore Hardness	89D	ASTM D-2240
Lap Shear Strength at -55ºC	>1200 psi	ASTM D-1002
Lap Shear Strength at 25ºC	>1200 psi	ASTM D-1002
Lap Shear Strength at 60ºC	>1200 psi	ASTM D-1002
Thermal Conductivity	>1.0 W/mK	ASTM D-2214
Volume Resistivity (ohm-cm) at 25ºC		ASTM D-150
cured 72 hours at 25ºC	≤0.003 ohm-cm	
cured 3 hours at 95ºC	≤0.002 ohm-cm	
Thermal Degradation Temperature:	> 300ºC	

PROCESSING AND APPLICATION INSTRUCTIONS

To use, first re-mixed the part A thoroughly as it may have settled or partially separated during shipment and storage. This is normal for epoxy resins filled with dense fillers such as silver and the resin must be thoroughly re-homogenized prior to use. When the part A is ready, weigh (or proportion by volume) mix Part A and Part B in the indicated ratio into a clean mixing container. Mixing containers should preferably be made of polypropylene, polyethylene, glass, or non-corroding metal. (Stainless steel, aluminum, etc.) Always use weighing equipment having accuracy that is ±1% or less of the smallest quantity that you will be weighing. Blend Part A & B thoroughly by using a spatula or stirring stick for at least 2-3 minutes using a kneading motion. Scrape the bottom and sides of the mixing container carefully and frequently to produce a uniform mixture. Vacuum de-gassing after mixing is desirable to achieve the best electrical and physical properties. Apply to clean, dry surfaces.

PACKAGING AVAILABLE

This product is available in a wide range of 2 part kits sizes including 1oz, 3oz, and 8oz. In addition, pre-mixed and frozen syringes are available in a wide variety of sizes (1ml, 3ml, 5ml, 10ml, 20ml and 30ml) in both manual and air operated syringe types.

Please call use with any special packaging requests, or for information on custom kitting.

STORAGE GUIDELINES

Store these components in a clean, cool and dry environment in their tightly closed original containers. Protect from extended exposure to temperatures below 15ºC (59ºF). Crystallization may occur if the material is exposed to cold for extend periods. If this occurs, heat the entire container for 4 hours at 60ºC to re-liquefy the material. Allow to cool to ambient temperature prior to using. Also protect from exposure to moisture or high humidity. Tightly re-seal

containers after use. If the recommended storage conditions are observed the products will have a minimum standard shelf-life of 12 months from the date of shipment. Please note that some specifications like the MMM-A-1931 may have shelf-lives from Date of manufacture.

HANDLING PRECAUTIONS

Mandatory and recommended industrial hygiene procedures should be followed whenever these products are being handled and processed. For additional information please consult the corresponding material safety data sheets.

PERSONAL HYGIENE

Kondux™ DR 20-19A WARNING! Causes skin irritation. Causes serious eye irritation. May cause allergic skin reaction. Very toxic to aquatic life with long lasting effects. Harmful if inhaled or swallowed. Avoid contact with eyes, skin, or clothing. Wear eye protection and impervious gloves when handling. Wash thoroughly after handling. Avoid breathing vapor or mist. Keep containers closed when not in use. Use only with adequate ventilation. Do not take internally.

Kondux™ DR 20-19B DANGER! Causes severe skin burns and eye damage. Causes serious eye damage. May cause allergy or asthma symptoms breathing difficulties if inhaled. May cause an allergic skin reaction. Suspected of causing cancer. Suspected of damaging fertility. May cause damage to organs (central nervous system (CNS)). Causes damage to organs through prolonged or repeated exposure: (skin, respiratory tract, kidneys, lungs, liver).

FIRST AID

In case of contact: **Skin** – Immediately wash skin thoroughly with mild soap and water. Remove contaminated clothing and wash before reuse. Destroy contaminated shoes and other articles made of leather. **Eyes** – Immediately flush eyes with plenty of water for 15 minutes and get prompt medical attention. **Inhalation** - Remove person to fresh air. Administer oxygen or artificial respiration if necessary. Call a physician. **Ingestion** - Do not induce vomiting. Dilute with plenty of water and contact physician immediately. Never give anything by mouth to an unconscious person.

DISCLAIMER

IMPORTANT: The following supersedes Buyer's documents. **SELLER / MANUFACTURER MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE**. No statements herein are to be construed as inducements to infringe any relevant patent. Under no circumstances shall Seller / Manufacturer be liable for incidental, consequential or indirect damages for alleged negligence, breach of warranty, strict liability, tort or contract arising in connection with the product(s). Buyer's sole remedy and Seller's sole liability for any claims shall be Buyer's purchase price. Data and results presented are based on controlled or laboratory work and must be confirmed by Buyer by testing for its intended conditions of use. The product(s) has not been tested for, and is therefore not recommended for, uses for which prolonged contact with mucous membranes, abraded skin, or blood is intended; or for uses for which implantation within the human body is intended.

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*Please note that this product was original developed by Delta Plastic Company (also known as Epoxy Resin Innovators, Inc.), that product line was acquired by SP&S in December 2019. Some of the data may be based on historical information provided by Delta Plastics Company and may not have been independently re-verified by SP&S.