Product Datasheet

Liquidweld® 213-3A/B

MULTIPURPOSE EPOXY ADHESIVE

Liquidweld® 213-3A/B is long work-life, 2-part epoxy adhesive system that is excellent for bonding and sealing applications. The cured adhesive is translucent, light amber in color and is excellent for applications requiring tough, flexible to semi-flexible, bonds. The cured adhesive has excellent impact and vibration resistance. Liquidweld® 213-3A/B provides excellent adhesion to materials including ceramics, concrete, wood, fiberglass, metal, and many rigid plastics. The cured adhesive also exhibits excellent moisture, chemical and environmental resistance and is electrically insulating.

Liquidweld® 213-3A/B has a convenient mix ratio, which can be varied to adjust the performance of the cured adhesive. Higher concentrations of the part B (2A:3B mix ratio) will provide increased flexibility and elongation, but with a reduction in maximum bond strength and chemical resistance. Low concentrations of the part B (70A:30B mix ratio) will produce a harder, stiffer, more chemical & heat resistant bond, but will also reduce impact and vibration resistance.

BENEFITS & SUGGESTED APPLICATIONS:

- Many assembly applications including bonds tool shafts to heads, potting connectors, and many others
- Variable mix ratio allows the user to customize adhesive properties.
- Long work-life
- Bonds most materials including ceramics, composites, concrete, glass, wood, metals, rigid plastics, stone, porcelain, etc.

HANDLING PROPERTIES	VALUE	TEST METHOD
Liquidweld® 213-3 part A		
Visual Appearance	Clear to light yellow liquid	
Density	1.15 g/cm³	ASTM E-201
Viscosity, Part B, at 25ºC	2,200 cps	ASTM D-2393
Flash Point	>93°C	ASTM D-92
Liquidweld® 213-3 Part B		
Visual Appearance	Light yellow to amber liquid	
Density	0.95 g/cm³	ASTM E-201
Viscosity, Part A, at 25ºC	15,000 cps	ASTM D-2393
Flash Point	>100°C	ASTM D-92
Mixed Properties		
Mixed Viscosity – 1A:1B by weight	8,000 cps	
Mixed Viscosity – 2A:3B (100:150) by weight	9,000 cps	
Mixed Viscosity – 70A:30B by weight	4,200 cps	

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Mix Ratio:	from 100A:42B (70A:30B) up to 100A:150B (2A:3B) parts by weight The most common ratios are 1A:1B by weight or 1:1 by volume.
Shelf-life	at least 12 months at room temperature (~25ºC)
Pot life (100 grams) at 25ºC	65 – 95 minutes
Minimum Cure Schedules:	24 - 48 hours at 25ºC **or** 6-8 hours at 40ºC **or** 3 hours at 65ºC. Please note at room temperature full strength may take 3- 7 days to develop.

PROPERTIES	**1A:1B by weight mix ratio**	TEST METHOD
Appearance	Clear light amber	Visual
Hardness, Shore D at 25ºC	80D	ASTM D-2240
Tensile Lap Shear (AL:AL)		ASTM D-1002
at -55ºC (-67ºF)	1800 psi	
at 25ºC (77ºF)	2800 psi	
at 94ºC (200ºF)	800 psi	
Flexural Strength	8,400 psi	
Flexural Modulus	380,000 psi	
Compressive Strength	9,800 psi	ASTM D-695
Compressive Modulus	335,00 psi	ASTM D-695
Linear Cure Shrinkage	0.005” per inch	ASTM D 2566
Moisture absorption (24 hour at 25ºC - % weight gain)	0.20%	ASTM D-570
Thermal Conductivity	0.18 W/mK	ASTM D-2214
Thermal Rating	-55ºC to 105ºC	EIC 216

NOTE: Values shown are based on laboratory testing or typical production results using 1A:1B part by weight ratio. Data for other mix ratios is available by request. Not for specification purposes.

PROCESSING AND APPLICATION INSTRUCTIONS :

When ready to use, measure out Part A and Part B in the desired mix ratio as accurately as possible into a clean mixing container. Always use weighing equipment having accuracy in proportion to the amounts being weighted. Blend by using a spatula or stirring stick for 1-2 minutes using a kneading motion. Scrape the bottom and sides of the mixing container carefully and frequently to ensure a uniform mixture. When the mixture is uniform apply to clean dry surfaces.

Liquidweld® 213-3A/B can be applied using stiff (short bristle) brush, a roller, knife, or spatula. For large volume it may also be handled with meter-mix dispensing equipment.

For best bond strength, roughen the surfaces to be bonded using sandpaper, a wire brush, sand-blasting or similar means. Be sure to clean and degrease the surfaces after roughening to remove any contaminants and loose material that could weaken the bond-line. Hold the bonded

parts tightly in place for at least 16 – 24 hours to ensure sufficient bond strength has developed before handling. For best results allow for a full cure prior to handling.

PACKAGING AVAILABLE: This product is available in a wide range of package sizes including pint kits, quart kits, gallon kits, etc. It can also be supplied pre-mixed and frozen in syringes that have at least a 6 month shelf-life at -40ºC.

STORAGE GUIDELINES:
Store the Liquidweld® 213-3A/B in a clean, cool, dry environment in their tightly closed original containers. Protect from extended exposure to temperatures below 15ºC (59ºF) to prevent crystallization. If crystallization occurs, heat the entire container for at least 4 hours at 50ºC to 60ºC with the lid slightly loosened, but in place until the crystals have melted and the material is fully re-liquefied.

Also protect from exposure to extended moisture or high humidity by tightly re-sealing the containers after use. If the recommended storage conditions are observed the two products will have a minimum shelf-life of 12 months from the date of shipment. Please note, that pre-mixed and frozen products will have a different shelf-life which will be at least 6 months from date of shipment when stored at -40ºC

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.

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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