Product Datasheet

Ultralane® 713A/B

URETHANE COATING, ADHESIVE & POTTING SYSTEM

Ultralane® 713A/B is an extremely versatile urethane adhesive, casting, and coating system. It is used as a conformal coating, an encapsulant, a staking compound, an adhesive, a casting compound for specialty rubber parts, and for many other applications.

The unique chemistry of this system allows for a range of mix ratio that vary the cured properties from a very soft elastomers (Shore 15A) up to a tough semi-flexible rubbers (Shore 60A), and the addition of amine based curatives like TIPA allows hard, stiff polymers with exceptional mechanical properties and Shore Hardnesses up to 80D to be produced.

In general, the cured polymers formed by this system have excellent mechanical and electrical properties and provide excellent moisture, chemical, and environmental resistance. In many of its mix ratio the fully cure Ultralane 713A/B achieves ASTM E 595 outgassing results that meet NASA and the ESA's low outgassing requirements.

This system is a composed of a low-free TDI pre-polymer and a polyol based hardener. It is designed to be an exact chemical match for another TDI pre-polymer system long used in aerospace, but has been produced using modern production technology that reduces the TDI monomer levels to less than 0.1% by weight. As a result this is not a dangerous good for shipping purposes, it has a much improve safety and regulatory profile and its long term sustainability in the face of increasing regulatory restrictions is vastly improved.

SUGGESTED APPLICATIONS:

- Coating, Encapsulation, & Staking of Electrical Devices
- Flexible to Tough and Semi-Rigid Adhesive Bonds
- Casting of Specialty Elastomeric and Plastic Parts

HANDLING PROPERTIES	VALUE	TEST METHOD
Ultralane 713A (resin)		
Visual Appearance	Clear yellow liquid	
Isocyanate Content (NCO % by wt.	10.4 – 10.8	
Specific Gravity at 25ºC	1.065 – 1.085 g/cm³	ASTM E-201
Viscosity, Part A, at 25ºC	200 – 300 poise	ASTM D-2393
Flash Point	>149°C	ASTM D-92
Ultralane 713B (hardener)		
Visual Appearance	Clear yellow Liquid	
Specific Gravity at 25ºC	0.957 – 0.961 g/cm³	ASTM E-201
Viscosity, Part B, at 25ºC	600 - 1000 cps	ASTM D-2393
Flash Point	>149°C	ASTM D-92

Product Datasheet

SP&S Specialty Polymers and Services

SOFT ELASTOMERS - SHORE 15A – 60A

Mix ratio by weight (713A :B)	**100A 73B**	**100A 80B**	**100A 90B**	**100A: 100B**	**100A 110B**	**100A 120B**	**100A 150B**	Test Method
Mix ratios by volume	100 :82	100 :90	100 :100	100 :112	100 :123	100 :135	100 :168	Calculated
Mixed Viscosity, cps	7000	6750	6400	6080	5800	5530	4880	ASTM D-2393
Pot Life, hours	3-4	5-6	5-6	6-7	6-7	7-8	7-8	
Cured Properties – cured 1 hour at 150ºC + 7 days at 25ºC								
Shore Hardness	60A	54A	50A	46A	44A	35A	15A	ASTM D-2240
Tensile Strength, psi	420							ASTM D-638
Tensile Elongation, %	100							ASTM D-638
Glass Transition Temperature (Tg)	-12°C							ASTM D-648
Taber abrasion (estimated)	70	65	45	45	40	70	150	ASTM D3489
Volume Resistivity, ohm-cm	3×10^{14}	1.4×10^{14}	1.0×10^{14}	7×10^{13}	$.7 \times 10^{13}$	7×10^{12}	2×10^{12}	ASTM D-257
Dielectric Constant at 1kHz, 25ºC	4.14							ASTM D-150
Dissipitation factor, at 1kHz, 25ºC	0.156							ASTM D-150

TOUGH ELASTOMERIC RUBBERS - SHORE 62A TO 88A

713A parts by wt	**100**	**100**	**100**	**100**	**100**	**100**	Test Method
713B parts by wt	**65.5**	**58**	**51**	**44**	**36.5**	**29**	
TIPA parts by wt	**1.5**	**3.0**	**4.5**	**6.0**	**7.5**	**9.0**	
Pot Life, hours	3.5	3.5	1.5 – 2	1.5 – 2	1	0.5	
Cured Properties – cured 1 hour at 150ºC + 7 days at 25ºC							
Shore Hardness	62A	64A	66A	70A	80A	88A	ASTM D-2240
Tensile Strengh, psi	470				>2000	>2500	ASTM D-638
Tensile Elongation, %	120				120	120	ASTM D-638
Taber abrasion (estimated)	85	65	45	45	40	70	ASTM D3489
Volume Resistivity, ohm-cm	3×10^{14}	3×10^{14}	$3 \times 1\ 0^{14}$	3×10^{14}	3×10^{14}	3×10^{14}	ASTM D-257
Dielectric Constant at 1kHz, 25ºC	4.0	3.92	3.78	3.65	3.6	3.55	ASTM D-150
Dissipitation factor, at 1kHz, 25ºC	0.156	0.124	0.094	0.072	0.056	0.051	ASTM D-150
*713B/TIPA preblend part numbers**	*713B-62A*	*713B-64A*	*713B-66A*	*713B-70A*	*713B-80A*	*713B-88A*	

*713B and TIPA can be purchased with the solid TIPA melted and pre-blended into the 713B at the ratio called out in each column using the part number indicated which includes the nominal cured hardeness of the cured polymer.

HARD SEMI-RIGID TO RIGID POLYMERS - SHORE 58D – 80D

713A parts by wt	**100**	**100**	**100**	**100**	Test Method
713B parts by wt	**21.5**	**14.7**	**7.3**	**15**	
TIPA parts by wt	**10.5**	**3.0**	**4.5**	**6.0**	
Pot Life, minutes	25 – 30	20 – 30	20 – 25	15 – 20	
Shore Hardness	58D	60D	70D	80D	ASTM D-2240
Tensile Strength, psi	3000	3200	3500	2500	ASTM D-638
Tensile Elongation, %	90%	60%	55%	20%	ASTM D-638
Taber abrasion (estimated)	85	65	45	45	ASTM D3489
Volume Resistivity, ohm-cm	3 x 10^{14}	3 x 0^{14}	3.0 x 0^{14}	3 x 10^{14}	ASTM D-257
Dielectric Constant at 1kHz, 25ºC	4.0	3.92	3.78	3.65	ASTM D-150
Dissipitation factor, at 1kHz, 25ºC	0.156	0.124	0.094	0.072	ASTM D-150
*713B/TIPA preblend part numbers**	*713B-58D*	*713B-60D*	*713B-70D*	*713B-80D*	

*713B and TIPA can be purchased with the solid TIPA melted and pre-blended into the 713B at the ratio called out in each column using the part number indicated which includes the nominal cured hardeness of the cured polymer.

CURE SCHEDULES :

Ultralane 713A/B does not require heat to fully cure, but it may take 1-3 days (depending on mix ratio to become fully set and for all surface tackiness to be go away only a room temperature cure. To reach a full cure at room temperature takes about 7 days at 25ºC.

If a faster cure is desired, one of the the following heat cures should be considered:
3 – 5 hours at 65ºC **or** 2 -3 hours at 93ºC **or** 90 minutes at 121ºC **or** 60 minutes at 150ºC

If using solvents to thin the Ultralane 713A/B for coating applications, allow enough time for the solvents to evaporate prior to heat curing or coating defects could occur. For stress senstive applications, consider allowing the 713 system to gel for 3 – 5 times the listed pot life for the mix ratio you are using before heat curing, as this may reduce shrinkage during curing and thus reduce stress on embedded components.

For best results, after heat curing, allow the parts to equilibrate at room temperature for at least 24 hours, before qualtiy control testing or subjecting them to severe conditions such as high humidity or strong chemical immersion. This will ensure the most consistent quality control results and the best performance.

PROCESSING AND APPLICATION INSTRUCTIONS :

To use, weigh Part A and Part B 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 using a spatula or stirring stick for at least 2 minutes using a kneading motion. Scrape the bottom and sides of the mixing container carefully and frequently to produce a uniform mixture. For Bubble-free parts, vacuum degas after mixing.

If using TIPA, this component will have to be melted to liquefy it prior to use. This is often easiest to do by adding it to the desired quantity of the 713B and heating the mixture to at least 55ºC and preferably 65ºC or warmer. Stir to blend the 713B and the TIPA and continue heating and stirring until all of the TIPA is melted and the mixture is untiform. Then allow to cool to room temperature until ready to use. Ensure good ventilation is used and an appropriate respirator when handling warm TIPA as irritating amine vapors may be given off. Read the SDS for the TIPA before handling.

ANCILLARY MATERIALS:

Catalysts:

- T-12 – standard tin catalyst available at 100% concentration or in various dilutin in solvents or in a plasticizer such as DIDP or DINCH.
- S-Kat 14 – mix metal mercury alternative catalyst – helps to maintain a good work-life while giving rapid curing through. More selective catalyst than tin - favors the urethane reaction heavily over the isocyanate – water reaction. Also available at 100% concentration or in solvent or plasticizer dilutions.

Primers

- Primax S – general purpose primer for metal, glass, ceramics, etc.
- Primax SF – film forming primer with good adhesion to most surfaces, helps to prevent inhibiting and other incompatibility issues between surfaces.
- Primax M – improves adhesion to metals
- Primax P – improves adhesion to many hard-to bond plastics and rubbers

Release Agents

- Camie 100 – heavy duty 6% silicone release agent available in aerosol can
- Camie 610 – Economical silicone release agent available in aerosol can
- Camie A1000 – PTFE dry release agent available in aerosol can
- QZ 13 – wipe-on or brush-on solvent borne silicone for high temp. applications
- EZ-Part 76 – water borne wipe-on or brush-on silicone for hig temp. applications.

Colorants

- Reactint Liquid Dye – we carry the Reactint Liquid dyes which chemically react into the cured urethane polymer to produce beautiful permanent colors. These colorants ensure there is no effect on outgassing and provide exceptional resistance to extraction. In small quanties and thin section the polymer may remain transparent, but in higher concentration,

darker colors (like black), or thicker sections opactity will develop. They are stable when added to the 783B component with or without TIPA.
- Epoxicolor color pastes – these color pastes are available in a range of colors and are compatible and provide strong opaque colors that are very heat resistant. They are stable in the 783B, but should not be added to mixture containing TIPA as they may react.

PACKAGING AVAILABLE:

This product is available in pints, quarts, gallons, 5-gallon pails, and many other package sizes by requests. It is also available in pre-mixed and frozen syringes and some mix ratios can be supplied in dual syringe cartridiges.

This product can also be be supplied pre-mixed with thickerns such as fumed silica or fillers such as silica or aluminum oxide, plasticizers, colorants, catalysts, thinners, and many other modifiers to meet your companies specific needs. If this would be of interest please contact us and we'd be very happy to assist you.

STORAGE GUIDELINES:

Store these materials in a clean, cool and dry environment in their tightly closed original containers. Protect from extended exposure to temperatures below 18ºC (64.4ºF). Crystallization may occur if the material is exposed to cold for extend periods. If this occurs, heat the entire container for 4 hours at 50ºC to re-liquefy the material. Allow to cool to ambient temperature prior to using. Also protect the Ultralne 713A/B from exposure to moisture or high humidity. Tightly re-seal containers after use. If the recommended storage conditions are observed these products will have a minimum shelf-life of 12 months for the 713A and 24 months for the 713B from the date of shipment.

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:

Ultralane 713A

WARNING! Harmful if inhaled. Causes skin and eye irritation. Causes allergic skin and respiratory reaction. Avoid contact with eyes, skin, and clothing. Avoid breathing vapor or mist. Avoid prolonged or repeated contact with skin. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

Ultralane 720B

WARNING! In accord with good industrial practice, handle with due care. Could cause eye, skin, and respiratory irritation. Prolonged or repeated skin contact or inhalation of vapors may cause allergic skin or respiratory reactions. 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.

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 supercedes 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

Specialty Polymers & Services, Inc. (SP&S)
27822 Fremont Court **Tel: 661-294-1790**
Valencia, CA 91355 **Fax : 661-294-0640**
www.spolymers.com **info@spolymers.com**