

Adhesives, Sealants & Coatings for the Aerospace Industry



Master Bond Inc. manufactures a comprehensive line of liquid, paste and film adhesives designed to provide unmatched performance for the aerospace industry. Products ensure reliability in the assembly of aircraft structures, components, interiors, and MRO applications. They are widely used for structural bonding, sealing and gap filling. Conformal coatings and potting/encapsulation compounds protect sensitive electronic parts against extreme conditions.

Advanced systems offer many outstanding performance properties. They can be formulated for toughness, high temperature resistance, cryogenic serviceability, thermal/electrical conductivity, and excellent bond strength to both similar and dissimilar substrates. Specific grades are halogen free, meet NASA low outgassing specifications, are UL 94V-0 rated for flame retardancy and pass horizontal/vertical burn tests per FAR 25.853(a).

Specific Master Bond grades meet NASA low outgassing requirements, ASTM E595, which is the industry standard test for measuring outgassing in adhesives and other materials. Developed by NASA to screen low outgassing materials for use in space, the test determines the volatile content of material samples placed in a heated vacuum chamber. Samples to be tested are first preconditioned at 50% relative humidity for 24 hours and then weighed. Following this, they go into the test chamber for another 24 hours with the temperature set at 125°C and the vacuum at a minimum of 5×10^{-5} torr. During the time in the test chamber, volatiles that outgas from the sample escape through a port in the test chamber and condense on a cooled (25°C) collector plate. The sample and condensate on the collector plate are then weighed to determine the total mass lost (TML) by the sample and the amount of collected volatile condensable materials (CVCM) on the collector plate. Materials pass or fail the test based on these TML and CVCM measurements. If the CVCM exceeds 0.1%, the material fails. The material will also fail if the TML exceeds 1%—though the TML may be offset by water vapor regained (WVR) by the sample in a subsequent measurement:

- If $CVCM \leq 0.10\%$ and $TML \leq 1.0\%$, the material passes
- If $CVCM \leq 0.10\%$ and $TML > 1.0\%$, the material can pass if $TML - WVR \leq 1.0\%$
- If $CVCM > 0.10\%$, the material fails
- If $TML - WVR > 1.0\%$, the material fails

We have what **you** need...



Typical Applications

Master Bond compounds are utilized in thousands of applications all over the world. From prototype to assembly line, our cutting edge polymer systems have kept pace with the rapidly changing needs of the aviation industry. Manufacturers of commercial, military, business aircraft, helicopters, satellites, missiles and unmanned air vehicles (UAV's) have successfully employed Master Bond to meet challenging requirements. We will help you find the most suitable material for your application and offer you assistance from the design stage through the manufacturing process. Applications include:

- **Flight control surface seals**
- **Optical fiber systems**
- **Bonding of metal and fiber reinforced composites**
- **EMI and RFI shielding**
- **Launch canister liners**
- **Braking systems**
- **Microelectronic applications**



Packaging Options

Specialty packaging is designed for applications ranging from design to high speed production. Master Bond's packaging adheres to the strictest quality standards to assure consistent reproducible results. Our packaging options include:

- **Standard packaging (jars and cans)**
- **FlexiPaks™**
- **Syringes and cartridges**
- **Gun applicators**
- **Premixed and frozen syringes**
- **Ultraviolet specialty packaging**

Products for the Aerospace Industry

Product	Bonding/ Sealing	Coating	Potting/ Encapsulation	Electrically Insulative	Electrically Conductive	Thermally Conductive	Page No.
ONE COMPONENT HEAT CURING EPOXIES							
EP13	✓			✓			5
EP15	✓			✓			5
EP17HT-LO	✓	✓	✓	✓			6
Supreme 3HTND-2DA	✓			✓		✓	6
Supreme 10ANHT-LO	✓			✓		✓	7
Supreme 10HTF-1	✓			✓			7
Supreme 10HT	✓			✓			8
Supreme 10HTS	✓				✓	✓	8
Supreme 12AOHT-LO	✓			✓		✓	9
Supreme 18TC	✓			✓		✓	9
EP36AO	✓	✓	✓	✓		✓	10
EP3SP5FL	✓			✓			11

TWO COMPONENT EPOXIES							
EP21HT-LO	✓	✓		✓			11
EP21TPND	✓			✓			26
EP31	✓	✓	✓	✓			11
EP41S-LO	✓	✓	✓	✓			11
EP77M-F	✓				✓	✓	11
EP21AOLV-2LO	✓	✓	✓	✓		✓	12
EP21FRNS-2			✓	✓			12
EP21TCHT-1	✓			✓		✓	13
EP37-3FLFAO	✓	✓	✓	✓		✓	13
EP90FR-V	✓	✓	✓	✓			14
EP90FR-H	✓	✓	✓	✓			15

Product	Bonding/ Sealing	Coating	Potting/ Encapsulation	Electrically Insulative	Electrically Conductive	Thermally Conductive	Page No.
TWO COMPONENT EPOXIES (continued)							
EP90FR-HFL	✓	✓	✓	✓			15
EP29LPSP	✓	✓	✓	✓			16
EP29LPSPAO	✓	✓	✓	✓		✓	16
EP21TDC-2LO	✓	✓	✓	✓		✓	17
EP21TDCHT-LO	✓	✓		✓			17
EP30-3LO	✓	✓	✓	✓			18
EP30AN-1	✓	✓	✓	✓		✓	18
EP30HT-LO	✓	✓	✓	✓			19
EP30LTE-LO	✓	✓	✓	✓		✓	19
EP42HT-2LO	✓	✓	✓	✓			20
EP42HT-2AO-1 Black	✓	✓	✓	✓		✓	20
EP42HT-2LTE	✓	✓	✓	✓			21
EP48TC	✓			✓		✓	21
EP62-1LO	✓	✓		✓			22
EP121CL-LO	✓	✓	✓	✓			22
Supreme 11AOHT-LO	✓			✓		✓	23
Supreme 42HT-2ND	✓	✓		✓			23

MasterSil® SILICONES							
MasterSil 151AN	✓	✓	✓	✓		✓	24
MasterSil 152	✓	✓	✓	✓			26
MasterSil 156			✓	✓		✓	24
MasterSil 705TC	✓	✓		✓		✓	24
MasterSil 705S	✓				✓	✓	24

Product	Bonding/ Sealing	Coating	Potting/ Encapsulation	Electrically Insulative	Electrically Conductive	Thermally Conductive	Page No.
MasterSil® SILICONES (continued)							
MasterSil 708FR	✓			✓			24
MasterSil 711	✓	✓		✓			24
MasterSil 920-LO		✓	✓	✓			25
MasterSil 921-LO	✓	✓	✓	✓			25
MasterSil 922-LO	✓	✓		✓			25
MasterSil 930	✓	✓		✓			25
MasterSil 972TC-LO	✓	✓	✓	✓		✓	25
MasterSil 973S-LO	✓				✓	✓	25
MasterSil 800	✓	✓		✓			26
SPECIALTY COMPOUNDS							
FL901S	✓				✓	✓	11
FLM36-LO	✓			✓		✓	10
Super Gel 9AO	✓	✓	✓	✓		✓	26
UV CURABLE							
UV15LV	✓	✓		✓			26
UV15X-2	✓	✓	✓	✓			26
UV10TKLO-2	✓	✓	✓	✓			27
UV22	✓	✓	✓	✓			27
UV24TKLO	✓	✓	✓	✓			28
UV25	✓	✓	✓	✓			28

The most common applications for each Master Bond compound is depicted in the chart above. This does not imply a recommendation of a specific compound for a particular application, nor does it restrict the use of said compound in any application not mentioned in the table. Every recommendation is made by our technical specialists on a case-by-case basis.

EP13

Structural adhesive for high temperature applications



Key Features

Rigid curing EP13 has superior dimensional stability, bonds well to a wide variety of substrates and is machinable.

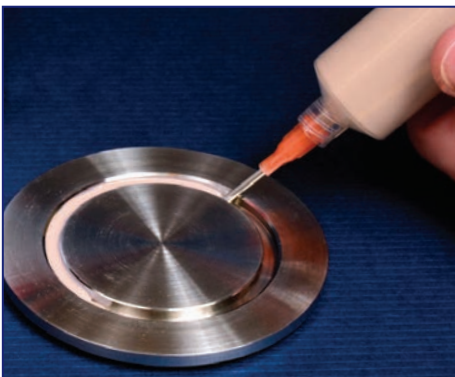
- ✓ Structural adhesive with high tensile, lap shear and compressive strength properties
- ✓ Outstanding heat resistance
- ✓ Superb electrical insulation
- ✓ Excellent chemical resistance

Typical Properties

Service temperature range	-60°F to +500°F [-51°C to +260°C]
Lap shear strength, aluminum to aluminum, 75°F	3,500 psi
Coefficient of thermal expansion, 75°F	30-35 x 10 ⁻⁶ in/in/°C
Hardness, 75°F	>80 Shore D
Viscosity, 75°F	Smooth, self leveling consistency

EP15

Specialized epoxy for testing adhesion or cohesive strength of flame sprayed coatings



Key Features

With a tensile strength exceeding 12,000 psi, EP15 is a one part epoxy that has high bond strength to ceramic substrates and forms rigid, dimensionally stable bonds.

- ✓ "Go-to" material for use in ASTM C633 testing applications
- ✓ Exceptionally high tensile strength
- ✓ Excellent dimensional stability
- ✓ Non-drip version available

Typical Properties

Tensile strength, 75°F	>12,000 psi
Lap shear strength, aluminum to aluminum, 75°F	>3,000 psi
Volume resistivity, 75°F	>10 ¹⁴ ohm-cm
Hardness, 75°F	>80 Shore D
Viscosity, 75°F	40,000-65,000 cps

EP17HT-LO

Adhesive offers chemical and heat resistance up to 650°F



Key Features

This single component, thermally stable system has a glass transition temperature of 225°C. EP17HT-LO resists a variety of chemicals such as acids, bases, salts, fuels, oils and many solvents, even at elevated temperatures.

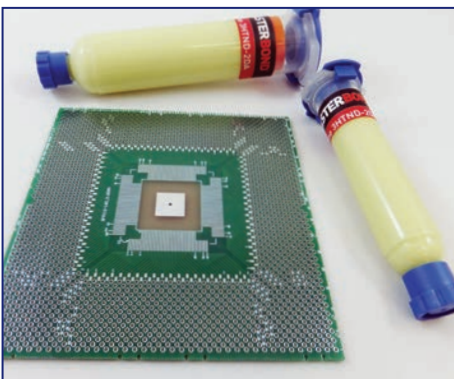
- ✓ Extremely high glass transition temperature
- ✓ Meets NASA low outgassing specifications
- ✓ Excellent compressive/tensile strength properties
- ✓ Low exotherm upon curing

Typical Properties

Service temperature range	-80°F to +650°F [-62°C to +343°C]
Glass transition temperature (T_g)	225°C
Hardness, 75°F	>80 Shore D
Lap shear strength, aluminum to aluminum, 75°F	3,200 psi
Viscosity, 75°F	15,000-25,000 cps

Supreme 3HTND-2DA

Toughened, electrically insulative epoxy for die attach applications



Key Features

Supreme 3HTND-2DA dispenses smoothly without tailing. This fast setting compound will cure in 5-10 minutes at 150°C. It can be automatically applied and requires only refrigeration for storage

- ✓ Thermally conductive
- ✓ NASA low outgassing
- ✓ Formidable high shear strength
- ✓ Withstands rigorous thermal cycling and shock

Typical Properties

Service temperature range	-100°F to +400°F [-73°C to +204°C]
Glass transition temperature (T_g) (TMA)	100-105°C
Thermal conductivity, 75°F	9-10 BTU•in/ft ² •hr•°F [1.30-1.44 W/(m•K)]
Volume resistivity, 75°F	>10 ¹⁴ ohm-cm
Viscosity, 75°F	>300,000 cps (thixotropic)

Supreme 10ANHT-LO

Thermally conductive, electrically isolating epoxy



Key Features

Offering high strength properties, Supreme 10ANHT-LO is a single component heat curing system serviceable over a wide temperature range.

- ✓ Outstanding thermal conductivity
- ✓ Toughened system with superb shear/peel strength
- ✓ Meets NASA low outgassing specifications
- ✓ Excellent electrical insulation

Typical Properties

Service temperature range	4K to +400°F [4K to +204°C]
Thermal conductivity, 75°F	22-25 BTU•in/ft ² •hr•°F [3.17-3.61 W/(m•K)]
Volume resistivity, 75°F	>10 ¹⁴ ohm-cm
Lap shear strength, aluminum to aluminum, 75°F	>2,500 psi
Viscosity, 75°F	Smooth paste

Supreme 10HTF-1

Toughened epoxy adhesive/sealant



Key Features

Supreme 10HTF-1 combines rapid curing and high bond strength. It is able to withstand vibration, impact, shock and thermal cycling.

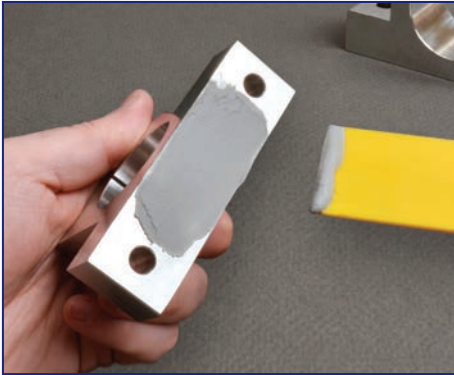
- ✓ Superb electrical insulation
- ✓ Bonds well to similar and dissimilar substrates
- ✓ Dimensionally stable
- ✓ Excellent physical strength properties

Typical Properties

Service temperature range	4K to +400°F [4K to +204°C]
Lap shear strength, aluminum to aluminum, 75°F	>3,200 psi
Hardness, 75°F	>70 Shore D
Tensile modulus, 75°F	350,000-400,000 psi
Viscosity, 75°F	>500,000 cps (thixotropic)

Supreme 10HT

Toughened epoxy features excellent physical strength



Key Features

Supreme 10HT is a one part epoxy formulated to cure in 60-75 minutes at 250°F. It features processing advantages including no mixing prior to use, an “unlimited” working life at room temperature and no viscosity change over time.

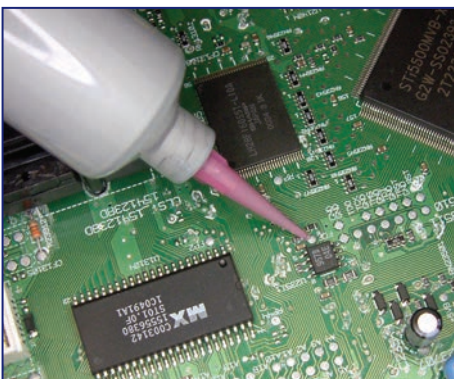
- ✓ Exceptionally high peel and lap shear strength
- ✓ Meets NASA low outgassing specifications
- ✓ Resists mechanical vibration and impact
- ✓ Withstands thermal cycling

Typical Properties

Service temperature range	4K to +400°F [4K to +204°C]
Hardness, 75°F	>70 Shore D
Lap shear strength, aluminum to aluminum, 75°F	>3,600 psi
T-peel strength, 75°F	25-30 pli
Viscosity, 75°F	>500,000 cps

Supreme 10HTS

Silver conductive, toughened epoxy system



Key Features

Supreme 10HTS features a combination of performance properties including high shear and peel strength, superb electrical conductivity and easy processing.

- ✓ Exceptionally low volume resistivity
- ✓ Meets NASA low outgassing specifications
- ✓ Very good dimensional stability
- ✓ High thermal conductivity

Typical Properties

Service temperature range	4K to +400°F [4K to +204°C]
Hardness, 75°F	>75 Shore D
Volume resistivity, 75°F	<0.006 ohm-cm
Thermal conductivity, 75°F	>11 BTU•in/ft ² •hr•°F [1.59 W/(m•K)]
Viscosity, 75°F	>500,000 cps

Supreme 12AOHT-LO

High temperature resistant, thermally conductive, electrically insulative epoxy



Key Features

Supreme 12AOHT-LO fully meets ASTM E595 for low outgassing and offers formidable bond strength. This toughened compound withstands shock, impact and thermal cycling.

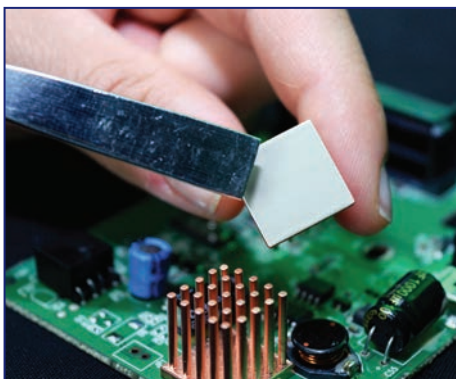
- ✓ Cryogenically serviceable
- ✓ Smooth, thixotropic paste
- ✓ Dimensional stability
- ✓ Thermal stability up to 500°F

Typical Properties

Service temperature range	4K to +500°F [4K to +260°C]
Thermal conductivity, 75°F	9-10 BTU•in/ft ² •hr•°F [1.30-1.44 W/(m•K)]
Volume resistivity, 75°F	>10 ¹⁴ ohm-cm
Lap shear strength, aluminum to aluminum, 75°F	>3,500 psi
Viscosity, 75°F	Smooth, thixotropic paste

Supreme 18TC

Specially formulated epoxy adhesive featuring low thermal resistance



Key Features

Supreme 18TC has high thermal conductivity and can be applied in bond lines as thin as 10-15 microns. This product is an excellent electrical insulator.

- ✓ Meets NASA low outgassing specifications
- ✓ Superior thermal cycling capabilities
- ✓ Smooth paste consistency
- ✓ "Unlimited" working life

Typical Properties

Service temperature range	4K to +400°F [4K to +204°C]
Thermal conductivity, 75°F	22-25 BTU•in/ft ² •hr•°F [3.3 W/(m•K)]
Volume resistivity, 75°F	>10 ¹⁴ ohm-cm
Lap shear strength, aluminum to aluminum, 75°F	22,000-24,000 psi
Viscosity, 75°F	Smooth paste

EP36AO

Flexibilized epoxy features thermal shock resistance



Key Features

EP36AO is a uniquely versatile, single component epoxy system that exhibits high thermal stability while maintaining outstanding physical strength.

- ✓ Toughened, B-stage epoxy system
- ✓ Excellent electrical insulation with high thermal conductivity
- ✓ Available in 30 gram cookies
- ✓ Ideal for potting and encapsulation

Typical Properties

Service temperature range	-100°F to +500°F [-73°C to +260°C]
Thermal conductivity, 75°F	9-10 BTU•in/ft ² •hr•°F [1.30-1.44 W/(m•K)]
Hardness, cured	80 Shore D @ 75°F, 28 Shore D @ 212°F, 24 Shore D @ 300°F
Dielectric strength, 75°F	440 volts/mil
Viscosity, 180-200°F	80,000-120,000 cps

FLM36-LO

B-staged film/preform for high performance bonding and sealing



Key Features

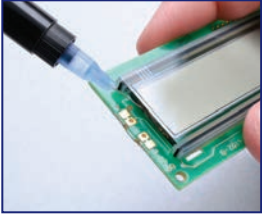
FLM36-LO is a film/preform adhesive featuring high strength properties, heat resistance, first class thermal conductivity and superior thermal cycling resistance.

- ✓ Tough and flexible
- ✓ Easily cut and provides uniform bond line thickness
- ✓ Excellent electrical insulation and high thermal conductivity
- ✓ Meets NASA low outgassing specifications

Typical Properties

Service temperature range	-100°F to +500°F [-73°C to +260°C]
Hardness	27 Shore D @ 212°F, 22 Shore D @ 350°F
Thermal conductivity, 75°F	9-10 BTU•in/ft ² •hr•°F [1.30-1.44 W/(m•K)]
Lap shear strength, aluminum to aluminum, 75°F	>4,000 psi
Elongation, 75°F	>50%

EP3SP5FL



Ultra fast curing EP3SP5FL is recommended for high volume assembly applications. It is more readily repairable than most epoxies.

- ✓ Cures in 1-2 minutes at 300°F
- ✓ Excellent electrical insulation
- ✓ Good flow properties
- ✓ Low shrinkage

EP21HT-LO



EP21HT-LO offers superior bond strength to similar and dissimilar substrates along with good heat resistance properties.

- ✓ Excellent physical strength
- ✓ Meets NASA low outgassing specifications
- ✓ Convenient one to one mix ratio
- ✓ Good flow properties

EP31



Two component epoxy adhesive, sealant and coating with exceptional peel and shear strength properties.

- ✓ Low viscosity
- ✓ Impressive optical clarity
- ✓ Volume resistivity of $>10^{15}$ ohm-cm
- ✓ Low shrinkage

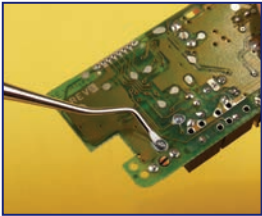
EP41S-LO



Fast, room temperature curing, chemical resistant epoxy system. Forms high strength bonds upon cure.

- ✓ NASA low outgassing approved
- ✓ Withstands exposure to oils, fuels, acids, bases and many solvents
- ✓ Superior electrical insulation properties
- ✓ 100% solid - does not contain any solvents or diluents

EP77M-F



High strength EP77M-F is a two component, silver filled epoxy with a set up time of 5-10 minutes at room temperature.

- ✓ Exceptionally low volume resistivity
- ✓ Convenient one to one mix ratio
- ✓ Fast fixture time at room temperature
- ✓ High thermal conductivity

FL901-S



High performance silver filled epoxy adhesive film/preform, FL901S features outstanding electrical conductivity and superior mechanical strength.

- ✓ Exceptionally low volume resistivity
- ✓ Easy processing with minimum squeeze out
- ✓ Uniform bond line thickness
- ✓ High thermal conductivity

EP21AOLV-2LO

Thermally conductive, electrically insulating epoxy



Key Features

Featuring low exotherm, EP21AOLV-2LO is a two part, room temperature curing epoxy used for potting, bonding, sealing and coating applications.

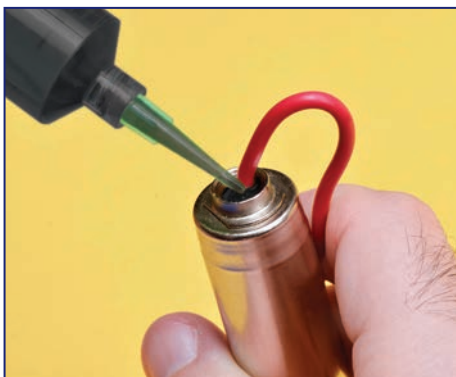
- ✓ Meets NASA low outgassing specifications
- ✓ Outstanding electrical insulation and heat dissipation properties
- ✓ Long working life at room temperature
- ✓ Suitable for large potting/casting applications

Typical Properties

Service temperature range	-60°F to +250°F [-51°C to +121°C]
Compressive strength, 75°F	>18,000 psi
Thermal conductivity, 75°F	9-10 •in/ft ² •hr•°F [1.30-1.44 W/(m•K)]
Coefficient of thermal expansion, 75°F	22-25 x 10 ⁻⁶ in/in/°C
Viscosity, 75°F	Part A: 1,500-3,000 cps, Part B: 55,000-125,000 cps

EP21FRNS-2

Flowable, flame retardant epoxy system features non-halogen filler



Key Features

EP21FRNS-2 has excellent electrical insulation properties and features durability, toughness and a high strength profile.

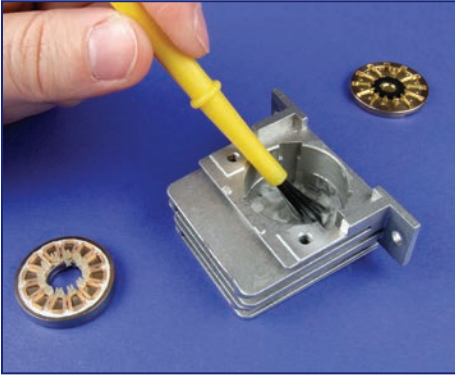
- ✓ Meets UL 94V-0 flame retardant specifications
- ✓ Used for potting, encapsulation and casting type applications
- ✓ Superior dimensional stability
- ✓ Low smoke generation

Typical Properties

Service temperature range	-60°F to +194°F [-51°C to +90°C]
Hardness, 75°F	>75 Shore D
Dielectric constant, 75°F, 60 Hz	4.5
Working life after mixing, 75°F; 100 gram batch	90-150 minutes
Viscosity, 75°F	Part A: 40,000-70,000 cps, Part B: 30,000-45,000 cps

EP21TCHT-1

Epoxy for cryogenic and high temperature applications



Key Features

High strength EP21TCHT-1 is a thermally conductive, heat resistant epoxy compound formulated to cure at ambient temperatures.

- ✓ Cryogenically serviceable, high T_g material
- ✓ Meets NASA low outgassing specifications
- ✓ Excellent electrical insulation with superior heat dissipation properties
- ✓ Extremely low CTE

Typical Properties

Service temperature range	4K to +400°F [4K to +204°C]
Thermal conductivity, 75°F	10 BTU•in/ft ² •hr•°F [1.44 W/(m•K)]
Coefficient of thermal expansion, 75°F	18-21 x 10 ⁻⁶ in/in/°C
Tensile modulus, 75°F	>500,000 psi
Viscosity, 75°F	Part A: Thixotropic paste, Part B: 40,000-90,000 cps

EP37-3FLFAO

Flexible, thermally conductive epoxy



Key Features

EP37-3FLFAO is widely used for bonding, sealing, coating and encapsulation applications. It has good flowability, strong, flexible bonds and withstands vibration, impact and shock

- ✓ Meets NASA low outgassing specifications
- ✓ Excellent electrical insulation with high thermal conductivity
- ✓ Superior thermal cycling resistance
- ✓ Convenient one to one mix ratio

Typical Properties

Service temperature range	4K to +250°F [4K to +121°C]
Thermal conductivity, 75°F	9-10 BTU•in/ft ² •hr•°F [1.30-1.44 W/(m•K)]
Hardness, 75°F	35-45 Shore D
Dielectric strength, 75°F	450 volts/mil
Viscosity, 75°F	Part A: 6,000-11,000 cps, Part B: 7,000-12,000 cps

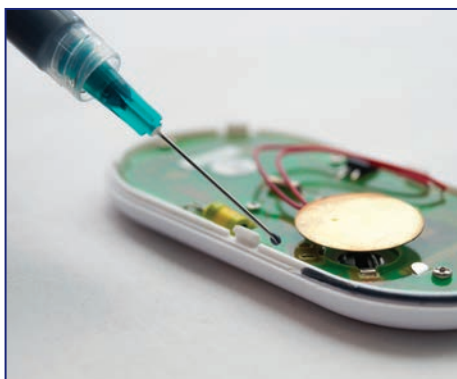
Master Bond has formulated 3 unique products successfully passing both the vertical and horizontal burn tests as listed under the FAR 25.853 (a). This test is typically used for determining material compatibility for cabin and cargo compartment components inside aircrafts. According to the test, the sample is put in contact with a flame for a specified time frame and angle. The burn rate, burn length and time are then measured. These parameters need to meet corresponding vertical and horizontal burn test specifications. The vertical test requirements are a bit more demanding compared to the horizontal test. However, the horizontal burn test is also very stringent and adequate in many applications.



Learn more about the FAR certification process

EP90FR-V

Epoxy passes vertical burn test based on FAR 25.853 (a)



Key Features

Two part system featuring superior electrical insulation making it ideal for electronic potting and sealing applications.

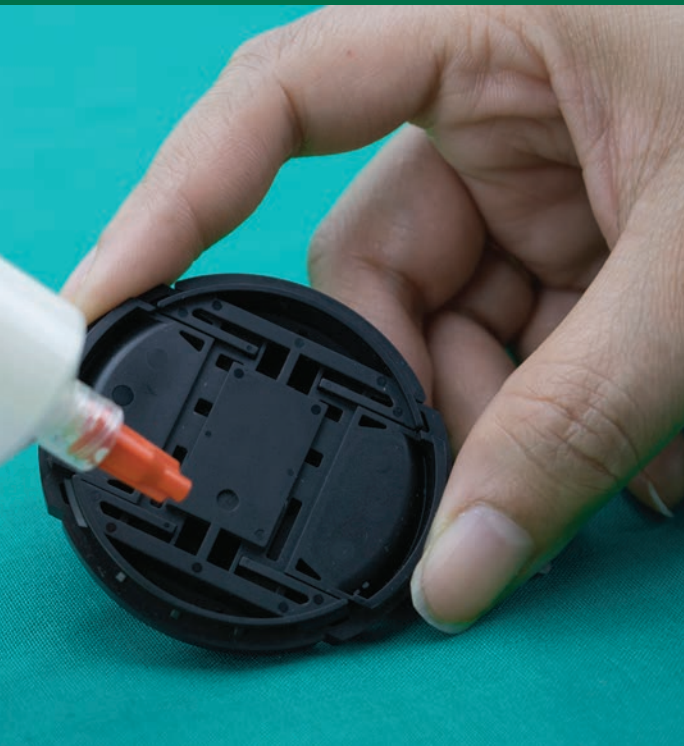
- ✓ Convenient processing; 1:1 mix ratio
- ✓ Superior mechanical strength
- ✓ Moderate viscosity with long working life
- ✓ Low shrinkage upon curing

Common Applications

EP90FR-V is often selected for many aircraft applications including interior panels, galley structures, door frame linings, stowage compartments, floor structures and door structures.

Typical Properties

Service temperature range	-60°F to +250°F [-51°C to +121°C]
Lap shear strength, aluminum to aluminum, 75°F	>1,400 psi
Mixed viscosity, 75°F	20,000-40,000 cps
Hardness, 75°F	>75 Shore D
Volume resistivity, 75°F	>10 ¹⁴ ohm-cm



EP90FR-H & EP90FR-HFL

Epoxies pass horizontal burn test based on FAR 25.853 (a)

- Easy to use compounds
- Good flow characteristics
- Excellent dielectric properties
- High bond strength

EP90FR-H and EP90FR-HFL are flame resistant, non-halogenated epoxies that feature convenient handling. Moderate viscosity, EP90FR-H offers an impressive physical strength profile. As a toughened system, EP90FR-HFL features excellent resistance to rigorous thermal cycling. This low viscosity, flexible epoxy delivers a long working life at room temperature.

Common Applications

Passing the FAR 25.853 (a) horizontal burn test enables these specialized epoxies to be used in a variety of aircraft applications involving acrylic windows, seat belts, structural window panes, lighted instrument assemblies and baggage equipment.

Typical Properties

	EP90FR-H	EP90FR-HFL
Service temperature range	-60°F to +250°F [-51°C to +121°C]	-60°F to +250°F [-51°C to +121°C]
Mixed viscosity, 75°F	20,000-50,000 cps	3,000-10,000 cps
Hardness, 75°F	>80 Shore D	25-45 Shore D
Tensile lap shear strength, aluminum to aluminum, 75°F	>1,500 psi	>1,100 psi
Tensile strength, 75°F	5,000-6,000 psi	3,000-4,000 psi
Tensile modulus, 75°F	300,000-350,000 psi	150,000-200,000 psi
Elongation, 75°F	5-10%	30-40%
Coefficient of thermal expansion, 75°F	35-40 x 10 ⁻⁶ in/in/°C	70-75 x 10 ⁻⁶ in/in/°C
Working life after mixing, 75°F; 100 gram batch	1-2 hours	3-4 hours

Cryogenically Serviceable Epoxy Compounds

EP29LPSP & EP29LPSPAO

- Cure at moderately elevated temperatures
- Long pot life at room temperature; low exotherm
- High physical strength properties
- Excellent chemical resistance
- Superb dimensional stability
- Very low shrinkage



EP29LPSP

NASA low outgassing approved, EP29LPSP is specially formulated for cryogenic applications. EP29LPSP offers a low mixed viscosity, long working life, high bond strength and excellent optical clarity.

EP29LPSPAO

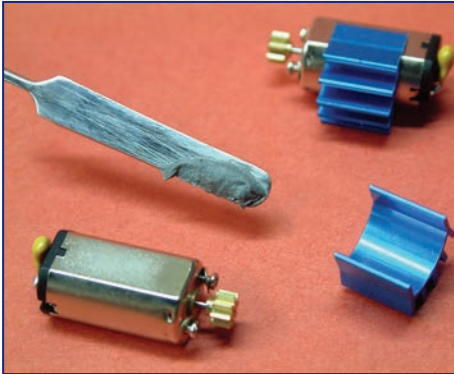
EP29LPSPAO is a thermally conductive, electrically insulative epoxy system for bonding, sealing, coating and encapsulation applications. The product has excellent resistance to cryogenic cycling and shocks (room temperature down to liquid helium temperatures in a 5-10 minute period).

Typical Properties

	EP29LPSP	EP29LPSPAO
Service temperature range	4K to +275°F [4K to +135°C]	4K to +275°F [4K to +135°C]
Hardness, 75°F	>65 Shore D	>75 Shore D
Working life after mixing at 75°F; 100 gram batch	>4-5 hours	5-7 hours
Thermal conductivity, 75°F	—	9-10 BTU•in/ft ² •hr•°F [1.30 to 1.44 W/(m•K)]
Coefficient of thermal expansion, 75°F	45-55 x 10 ⁻⁶ in/in/°C	22-27 x 10 ⁻⁶ in/in/°C
Tensile modulus, 75°F	>400,000 psi	>450,000 psi
Viscosity, 75°F	Part A: 10,000-16,000 cps Part B: 10-70 cps	Part A: 55,000-70,000 cps Part B: 2,500-18,000 cps

EP21TDC-2LO

Highly flexibilized epoxy compound featuring thermal conductivity



Key Features

EP21TDC-2LO is a two part system widely used as an adhesive, sealant and encapsulant that offers remarkable resistance to chemicals, thermal cycling and mechanical shock.

- ✓ Superb toughness with high elongation
- ✓ Meets NASA low outgassing specifications
- ✓ Excellent electrical insulation with high thermal conductivity
- ✓ Superior thermal cycling resistance

Typical Properties

Service temperature range	4K to +250°F [4K to +121°C]
Thermal conductivity, 75°F	9-10 BTU•in/ft ² •hr•°F [1.30-1.44 W/(m•K)]
Hardness, 75°F	30-40 Shore D
Elongation, 75°F	>25%
Viscosity, 75°F	Part A: 35,000-85,000 cps, Part B: 300,000-800,000 cps

EP21TDCHT-LO

Toughened adhesive for bonding and sealing



Key Features

EP21TDCHT-LO is a two component, one to one mix ratio epoxy that offers superior resistance to vibration, mechanical shock and severe thermal cycling.

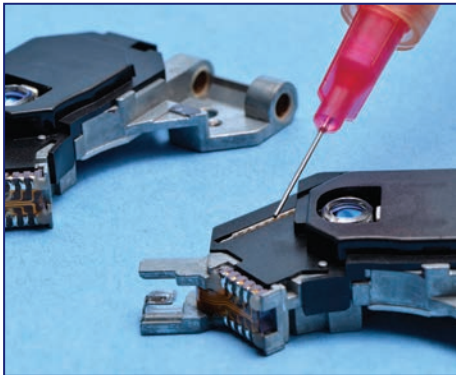
- ✓ High peel and shear strength
- ✓ Convenient one to one mix ratio
- ✓ Meets NASA low outgassing specifications
- ✓ Good dimensional stability

Typical Properties

Service temperature range	-100°F to +350°F [-73°C to +177°C]
Lap shear strength, aluminum to aluminum, 75°F	>2,700 psi
T-peel strength, 75°F	25 pli
Hardness, 75°F	>60 Shore D
Viscosity, 75°F	Part A: 60,000-110,000 cps, Part B: 70,000-140,000 cps

EP30-3LO

Highly versatile, optically clear epoxy system



Key Features

Master Bond EP30-3LO is widely used for bonding, sealing, coating and casting. It features a combination of optical clarity, high glass transition temperature and excellent chemical resistance.

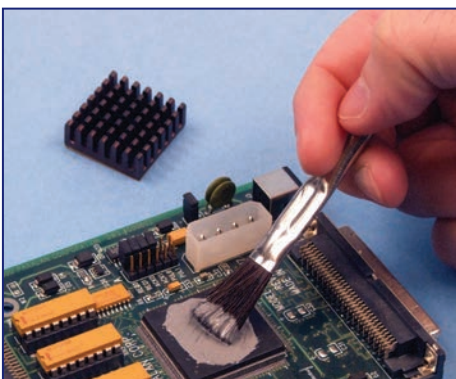
- ✓ Outstanding thermal stability; very high T_g
- ✓ Superior optical clarity
- ✓ Meets NASA low outgassing specifications
- ✓ Very long working life at room temperature

Typical Properties

Service temperature range	-80°F to +450°F [-62°C to +232°C]
Glass transition temperature (T_g)	>175°C
Tensile strength, 75°F	>11,000 psi
Hardness, 75°F	>75 Shore D
Viscosity, 75°F	Part A: 10,000-14,000 cps, Part B: 100-150 cps

EP30AN-1

Electrically insulative system offers high thermal conductivity



Key Features

EP30AN-1 is formulated for high performance potting, sealing, coating and bonding. It has superb dimensional stability and physical strength properties.

- ✓ Outstanding thermal conductivity
- ✓ Very good flow properties
- ✓ Meets NASA low outgassing specifications
- ✓ Low thermal expansion coefficient

Typical Properties

Service temperature range	-60°F to +250°F [-51°C to +121°C]
Thermal conductivity, 75°F	25 BTU•in/ft ² •hr•°F [3.61 W/(m•K)]
Coefficient of thermal expansion, 75°F	20-25 x 10 ⁻⁶ in/in/°C
Compressive strength, 75°F	>18,000 psi
Viscosity, 75°F	Part A: 10,000-18,000 cps, Part B: 300-400 cps

EP30HT-LO

Optically clear epoxy features exceptional physical strength



Key Features

EP30HT-LO cures rigid and offers excellent dimensional stability. This two component system combines outstanding bond strength with excellent optical clarity.

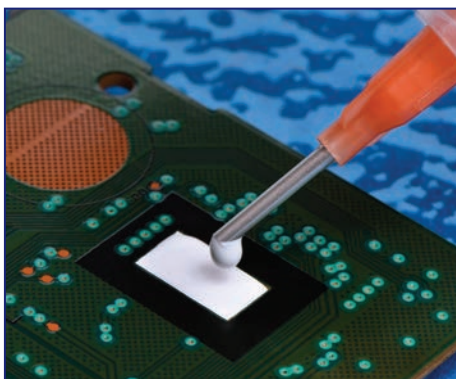
- ✓ Meets NASA low outgassing specifications
- ✓ Superior temperature resistance properties
- ✓ Good flow properties
- ✓ Excellent light transmission

Typical Properties

Service temperature range	-60°F to +400°F [-51°C to +204°C]
Lap shear strength, aluminum to aluminum, 75°F	>3,000 psi
Hardness, 75°F	>75 Shore D
Refractive index, 75°F	1.54
Viscosity, 75°F	Part A: 55,000-110,000 cps, Part B: 250-500 cps

EP30LTE-LO

Epoxy features exceptionally low coefficient of thermal expansion



Key Features

EP30LTE-LO is a room temperature curing epoxy used for bonding, sealing, coating and encapsulation. It offers very low shrinkage upon cure and is serviceable at cryogenic temperatures.

- ✓ Excellent electrical insulation and high thermal conductivity
- ✓ Good flow properties; low viscosity
- ✓ Meets NASA low outgassing specifications
- ✓ Outstanding dimensional stability

Typical Properties

Service temperature range	4K to +250°F [4K to +121°C]
Thermal conductivity, 75°F	8-10 BTU•in/ft ² •hr•°F [1.15-1.44 W/(m•K)]
Coefficient of thermal expansion, 75°F	15-18 x 10 ⁻⁶ in/in/°C
Volume resistivity, 75°F	>10 ¹⁵ ohm-cm
Viscosity, 75°F	Part A: 35,000-70,000 cps, Part B: 290-500 cps

EP42HT-2LO

Epoxy features heat, steam and chemical resistance



Key Features

EP42HT-2LO can withstand exposure to many inorganic and organic acids, alkalis, organic solvents and aromatic hydrocarbons. It is a superior electrical insulator and castable to thicknesses exceeding 2-3 inches.

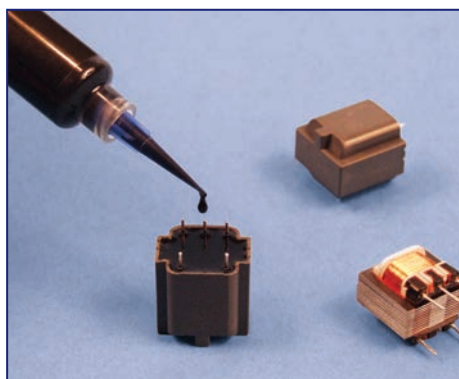
- ✓ Outstanding temperature resistance properties
- ✓ Meets NASA low outgassing specifications
- ✓ Features low viscosity
- ✓ Excellent dimensional stability

Typical Properties

Service temperature range	-60°F to +450°F [-51°C to +232°C]
Lap shear strength, aluminum to aluminum, 75°F	>2,000 psi
Hardness, 75°F	>75 Shore D
Refractive index, 75°F	1.62
Viscosity, 75°F	Part A: 55,000-110,000 cps, Part B: 30-70 cps

EP42HT-2AO-1 Black

Thermally stable, NASA low outgassing approved compound



Key Features

EP42HT-2AO-1 Black features outstanding temperature and chemical resistance and is widely used in a variety of potting and encapsulation applications where thermal conductivity is needed.

- ✓ Very wide service temperature range
- ✓ Good flow properties
- ✓ Castable to thicknesses exceeding 2-3 inches
- ✓ Excellent electrical insulation with high thermal conductivity

Typical Properties

Service temperature range	4K to +400°F [4K to +204°C]
Thermal conductivity, 75°F	9-10 BTU•in/ft ² •hr•°F [1.30-1.44 W/(m•K)]
Coefficient of thermal expansion, 75°F	25-30 in/in x 10 ⁻⁶ /°C
Tensile modulus, 75°F	>500,000 psi
Viscosity, 75°F	Part A: 50,000-120,000 cps, Part B: 200-1,000 cps

EP42HT-2LTE

Epoxy adhesive, sealant and coating offers ultra low coefficient of thermal expansion



Key Features

Room temperature curing system features superb electrical insulation. It bonds well to a wide variety of substrates and features low linear/volumetric shrinkage.

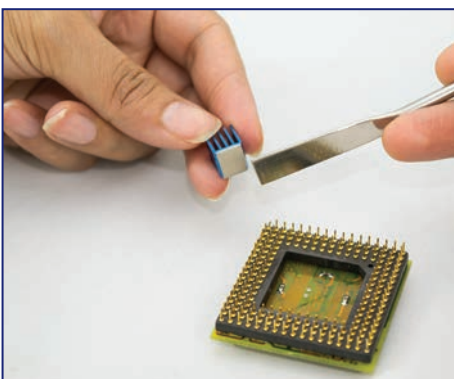
- ✓ Outstanding dimensional stability
- ✓ Allows precise alignment with minimal fixturing
- ✓ Utilizes a specialty negative CTE filler
- ✓ Good electrical insulation properties

Typical Properties

Service temperature range	-60°F to +300°F [-51°C to +149°C]
Coefficient of thermal expansion, 75°F	9-10 in/in x 10 ⁻⁶ /°C
Hardness, 75°F	>85 Shore D
Volume resistivity, 75°F	>10 ¹⁴ ohm-cm
Viscosity, 75°F	Part A: Paste, Part B: 2,000-6,000 cps

EP48TC

Two part epoxy adhesive has exceptionally low thermal resistance



Key Features

Electrically insulative/thermally conductive EP48TC can be applied in bond lines as thin as 10-15 microns. It has a very low coefficient of thermal expansion and low shrinkage.

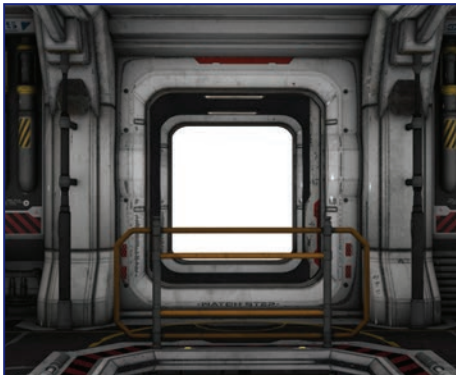
- ✓ Exceptional heat transfer characteristics
- ✓ Excellent electrical insulation profile
- ✓ Long open time
- ✓ Outstanding strength retention

Typical Properties

Service temperature range	-100°F to +300°F [-73°C to +149°C]
Thermal conductivity, 75°F	20-25 BTU•in/ft ² •hr•°F [2.88-3.60 W/(m•K)]
Coefficient of thermal expansion, 75°F	13-15 in/in x 10 ⁻⁶ /°C
Volume resistivity, 75°F	>10 ¹⁴ ohm-cm
Viscosity, 75°F	Part A: Paste, Part B: 150,000-200,000 cps

EP62-1LO

Chemically resistant epoxy system features very long pot life



Key Features

EP62-1LO cures rapidly at moderately elevated temperatures, and once cured, exhibits remarkably high thermal stability. It features outstanding chemical resistance and electrical insulation.

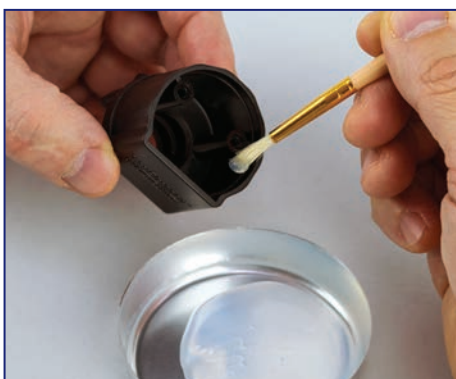
- ✓ Very high glass transition temperature
- ✓ Meets NASA low outgassing specifications
- ✓ Exceptionally long working life at room temperature
- ✓ Superior bond strength properties

Typical Properties

Service temperature range	-60°F to +450°F [-51°C to +232°C]
Glass transition temperature (T_g)	>170°C
Hardness, 75°F	>80 Shore D
Tensile modulus, 75°F	500,000-550,000 psi
Mixed viscosity, 75°F	4,000-8,000 cps

EP121CL-LO

Optically clear, potting/encapsulation, coating and sealing compound



Key Features

EP121CL-LO features an extremely long open time at room temperature and cures at elevated temperatures. This product has outstanding electrical insulation and thermal stability.

- ✓ Outstanding optical clarity
- ✓ Excellent physical strength profile
- ✓ Very good temperature resistance profile
- ✓ Meets NASA low outgassing specifications

Typical Properties

Service temperature range	-80°F to +500°F [-62°C to +260°C]
Refractive index, 75°F	1.56
Hardness, 75°F	>80 Shore D
Tensile strength, 75°F	>12,000 psi
Viscosity, 75°F	Part A: 10,000-14,000 cps, Part B: 150-300 cps

Supreme 11AOHT-LO

Toughened epoxy compound resists high temperatures



Key Features

Supreme 11AOHT-LO features exceptional thermal conductivity and electrical insulation properties for high performance bonding and sealing applications.

- ✓ Toughened system with superb physical strength
- ✓ Meets NASA low outgassing specifications
- ✓ Withstands rigorous thermal cycling
- ✓ Convenient one to one mix ratio

Typical Properties

Service temperature range	-100°F to +400°F [-73°C to +204°C]
Thermal conductivity, 75°F	9-10 BTU•in/ft ² •hr•°F [1.30-1.44 W/(m•K)]
Coefficient of thermal expansion, 75°F	35-40 in/in x 10 ⁻⁶ /°C
Lap shear strength, aluminum to aluminum, 75°F	>3,200 psi
Viscosity, 75°F	Part A: 200,000-300,000 cps, Part B: Thixotropic paste

Supreme 42HT-2ND

Epoxy paste with outstanding chemical and temperature resistance



Key Features

Tough system offers superior thermal cycling capabilities. Supreme 42HT-2ND is easy to apply, has a long working life and low exotherm upon cure.

- ✓ Resists many acids, bases, solvents, fuels and oils
- ✓ Excellent physical strength
- ✓ Reliable electrical insulator
- ✓ Passes ASTM E595 testing

Typical Properties

Service temperature range	-80°F to +425°F [-62°C to +218°C]
Glass transition temperature (T _g)	130-135°C
Hardness, 75°F	70-80 Shore D
Volume resistivity, 75°F	>10 ¹⁴ ohm-cm
Viscosity, 75°F	Part A: Paste, Part B: Paste

MasterSil 151AN



MasterSil 151AN is a two part, thermally conductive compound that combines high temperature resistance and flexibility.

- ✓ Excellent electrical insulation with outstanding thermal conductivity
- ✓ Very good flow properties
- ✓ Suitable for potting, encapsulation and casting applications; low exotherm
- ✓ Superb thermal shock resistance

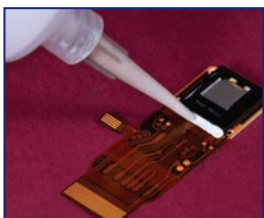
MasterSil 156



Featuring superb electrical insulation, MasterSil 156 is a two component, moderate viscosity silicone system for high performance potting, encapsulation and sealing.

- ✓ Meets UL 94V-0 flame retardant specifications
- ✓ Excellent electrical insulation with high thermal conductivity
- ✓ Convenient one to one mix ratio
- ✓ High degree of flexibility

MasterSil 705TC



MasterSil 705TC is a thermally conductive, electrically isolating silicone. It is well suited for applications that require flexibility and high temperature resistance.

- ✓ One part, non-corrosive, moisture curing system
- ✓ Excellent electrical insulation with high thermal conductivity
- ✓ High degree of flexibility
- ✓ Superb thermal shock resistance

MasterSil 705S



MasterSil 705S is a single component, silver filled silicone that offers excellent temperature resistance.

- ✓ Exceptionally low volume resistivity
- ✓ High degree of flexibility
- ✓ One part, moisture curing system
- ✓ Superb thermal shock resistance

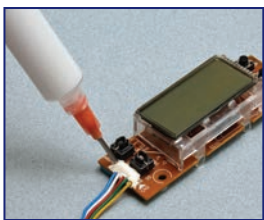
MasterSil 708FR



Featuring a rapid, non-corrosive cure, MasterSil 708FR is often selected for bonding and sealing applications that require flame retardancy.

- ✓ Meets UL 94V-1 and UL 94V-0 flame retardant specifications
- ✓ Excellent electrical insulation
- ✓ One part moisture curing system featuring fast set-up
- ✓ High degree of flexibility

MasterSil 711



One component MasterSil 711 is a moisture curing silicone compound for bonding, sealing and coating that offers impressive shock and impact resistance.

- ✓ Superior temperature resistance
- ✓ Tack free time of 2-5 minutes at 75°F at more than 50% humidity
- ✓ Extremely low dielectric constant
- ✓ Very high elongation

MasterSil 920-LO



Single component, moderate viscosity, non-corrosive, low stress silicone sealant, coating and encapsulant.

- ✓ Meets NASA low outgassing specifications
- ✓ Superb optical clarity
- ✓ Resists -175°F to +500°F
- ✓ Shore A hardness 25-35

MasterSil 921-LO



High performance, one part silicone for bonding, sealing, coating and potting that passes NASA low outgassing testing.

- ✓ Flowable consistency
- ✓ Elongation 150-250%
- ✓ Neutral curing, non-corrosive system
- ✓ Withstands rigorous thermal cycling

MasterSil 922-LO



Specially blended one component, non-corrosive RTV silicone system for bonding, sealing and coating applications.

- ✓ Paste consistency
- ✓ Shore A hardness 40-50
- ✓ Elongation 250-350%
- ✓ Tack free time at 75°F 30-40 minutes

MasterSil 930



Acetoxy type fluorosilicone bonding, sealing and coating compound with enhanced chemical resistance properties.

- ✓ One part system
- ✓ Serviceable up to +400°F
- ✓ Good physical strength profile
- ✓ Paste consistency

MasterSil 972TC-LO



Two component, thermally conductive/electrically insulative silicone adhesive, sealant and potting compound that meets NASA low outgassing specifications.

- ✓ Long working life after mixing
- ✓ Cures in thick sections or in wide cross sections
- ✓ Serviceable from -120°F to +400°F
- ✓ Low shrinkage

MasterSil 973S-LO



Two component, silver filled silicone features excellent electrical/thermal conductivity, flexibility and vacuum compatibility.

- ✓ Paste consistency
- ✓ Cures well in deep and wide sections
- ✓ NASA low outgassing approved
- ✓ Volume resistivity is 0.004 ohm-cm at 75°F

MasterSil 800



MasterSil 800 offers a short tack free time and outstanding temperature resistance along with a high degree of flexibility.

- ✓ Non-corrosive cures
- ✓ Outstanding heat resistance
- ✓ One part, moisture curing system
- ✓ Extremely fast set-up time

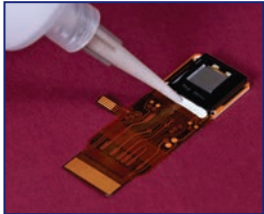
MasterSil 152



Two part, condensation curing silicone for sealing, potting and encapsulation offers high optical clarity and superb electrical insulation properties.

- ✓ Low viscosity
- ✓ Elongation at 75°F 150-180%
- ✓ Refractive index at 75°F 1.45
- ✓ Low exotherm

Super Gel 9AO



A urethane modified filled epoxy that cures readily at room temperature to form a soft gel like system.

- ✓ Excellent flexibility/low stress
- ✓ Superior heat dissipation properties
- ✓ High degree of dimensional stability
- ✓ Easy retrievability post cure

EP21TPND



Room temperature curing epoxy polysulfide system has superior resistance to fuels, oils and hydraulic fluids.

- ✓ Non-drip viscosity
- ✓ Tough, flexible bonds
- ✓ Withstands vibration, impact and thermal cycling
- ✓ One to one mix ratio by weight or volume

UV15LV



Epoxy based UV15LV is an optically clear, one part, high strength, UV curable system that is especially noteworthy for its ultra low viscosity.

- ✓ Good dimensional stability
- ✓ Low shrinkage
- ✓ Outstanding optical clarity
- ✓ Excellent temperature resistance properties

UV15X-2

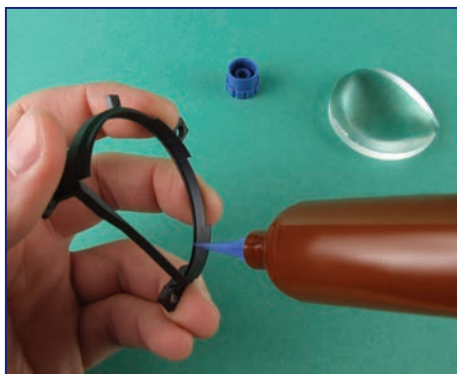


UV15X-2 offers a combination of superior physical strength properties, very low shrinkage upon curing and superior non-yellowing characteristics.

- ✓ Superb optical clarity
- ✓ Good flow properties
- ✓ Superior electrical insulation properties
- ✓ Very good abrasion resistance

UV10TKLO-2

NASA low outgassing approved, high viscosity system



Key Features

One part, UV10TKLO-2 features superior physical strength properties and good dimensional stability over a wide temperature range.

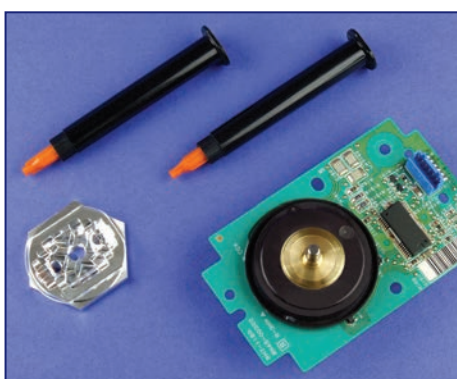
- ✓ Meets NASA low outgassing specifications
- ✓ Very good temperature resistance profile
- ✓ Excellent optical clarity
- ✓ Chemically resistant

Typical Properties

Service temperature range	-60°F to +300°F [-51°C to +149°C]
Tensile strength, 75°F	>6,000 psi
Hardness, 75°F	80-85 Shore D
Dielectric constant, 75°F, 60 Hz	3.6
Viscosity, 75°F	225,000-275,000 cps

UV22

Nanosilica filled UV curable epoxy meets NASA low outgassing requirements



Key Features

UV22 has outstanding physical strength, dimensional stability, chemical inertness and withstands elevated temperatures.

- ✓ Low shrinkage
- ✓ Optically clear compound
- ✓ Excellent dimensional stability
- ✓ Good abrasion resistance

Typical Properties

Service temperature range	-80°F to +350°F [-62°C to +177°C]
Tensile strength, 75°F	>7,000 psi
Hardness, 75°F	>75 Shore D
Refractive index, 75°F	1.52
Viscosity, 75°F	1,000-1,800 cps

UV24TKLO

NASA low outgassing approved, UV curing adhesive, sealant and encapsulant



Key Features

UV24TKLO cures rapidly upon UV light exposure up to $\frac{1}{16}$ of an inch. It can be easily “layered” to higher levels and features outstanding chemical resistance properties.

- ✓ Moderate viscosity
- ✓ Excellent optical clarity and light transmission
- ✓ High physical strength
- ✓ Superb dimensional stability

Typical Properties

Service temperature range	-60°F to +400°F [-51°C to +204°C]
Hardness, 75°F	80-85 Shore D
Tensile strength, 75°F	>8,000 psi
Volume resistivity, 75°F	10 ¹⁴ ohm-cm
Viscosity, 75°F	30,000-45,000 cps

UV25

Moderate viscosity system features extremely high T_g



Key Features

UV25 features a very high glass transition temperature along with superb chemical resistance. This adhesive, sealant, coating and encapsulation compound is also a reliable electrical insulator.

- ✓ Outstanding temperature resistance properties
- ✓ Excellent optical clarity
- ✓ Very good physical strength properties
- ✓ Electrically insulative
- ✓ Fast curing

Typical Properties

Service temperature range	-60°F to +500°F [-51°C to +260°C]
Glass transition temperature (T _g)	186°C
Hardness, 75°F	>80 Shore D
Refractive index, 75°F	1.55
Viscosity, 75°F	7,000-11,000 cps

White Paper

LIBRARY

Master Bond's research and development team has published a wide variety of white papers regarding the most pertinent topics within the adhesive industry. Our white papers help engineers understand important criteria considerations in adhesive selection.

Below are some of the white papers we offer:

Epoxy Compounds Get Even Tougher

With adhesive products, high performance and rigidity are often thought to go hand in hand. And it is true that the very best strength, thermal, chemical and electrical properties tend to be found in rigid compounds, especially epoxies. Yet there is a growing class of adhesives, sealants and coatings that add ductility to the long list of desirable epoxy properties. Examine the use of these toughened epoxies.

Epoxies for Space Applications

Adhesives in space applications are subject to high vacuum and extreme temperatures making adhesive selection a critical design consideration. Learn how low out-gassing epoxies satisfy these stringent conditions ensuring reliable space applications.

Epoxies and Glass Transition Temperature

Gain a better understanding about glass transition temperature (T_g) and why it is one of many factors to consider for bonding, sealing, coating and encapsulation applications. Explore how temperature impacts the performance of polymers, why glass transition temperature is significant and how it is measured. T_g can be extremely useful for determining the reliability of epoxies as it pertains to temperature.

Thermally Conductive Epoxies Optimize Electronic Assemblies

The use and selection process of thermally conductive epoxies can make or break your application. Too much heat can lead to component malfunction or premature component failure, while the inability to stay below specified temperature limits may result in irreversible damage and permanent performance shifts. Learn about the most important considerations for the selection of epoxies for efficient thermal management.

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