

October, 2017

APM Epicol 83S

Description	
APM number:	202392
System:	2K – silver-filled epoxy adhesive
Colour:	silver grey
Viscosity:	viscous / thixotropic
Density:	3.8 g/cm ³
Mixture ratio:	2:1
Pot life:	3 days

Specifications	
Temp. range:	- 55 °C to +230 °C
Temp. range short:	- 55 °C to +325 °C
Solid bodies:	100% / solvent-free
EC No. 1907/2006:	compliant with REACH
Directive 2011/65/EC:	RoHS compatible

APM Epicol 83S is a universally applicable, silver-filled, electrically conductive epoxy adhesive. Electrical and thermal conductivity is produced by particles containing silver. Epicol 83S is used where silver is necessary due to its outstanding electrical and thermal conductivity. The liquid adhesive does not dry out in the air and is therefore suitable for screen or pad printing and for application with a stamp. But the adhesive can also be easily dispensed from the cartridge using dosing needles with a diameter of > 0.25 mm. The adhesive can be stored unmixed at room temperature or premixed in the deep freeze. The adhesive easily bonds a wide variety of metals and is therefore suitable for many applications.

Properties of fluid adhesive	
System:	Silver filled epoxy
Viscosity mix:	10 – 20 Pa.s / thixotropic
Resin viscosity:	10 – 30 Pa.s
Hardener viscosity:	10 – 25 Pa.s
Pot life at 25°C:	3 days
Particle size:	< 30 um
Dispensability	Needle, inner diameter greater than 0.25 mm

The selected type of surface treatment depends on the requirements profile (cleanliness, mechanical strength, ageing resistance). It is best to clean the surfaces using the aqueous ultrasound cleaning method at raised temperature. Metal surfaces can also be cleaned using clean solvents. Pretreating surfaces with reducing plasma has proven to be an excellent method to obtain better electrical contacting. Plasma treatment dries the surface and improves wettability. This achieves good adhesion of the adhesive. Do not use primers since they can affect electrical contacting and thermal conductivity.

Surface pretreatment / cleaning

The surfaces to be bonded must be dry and free from dust, oil, separating agents and other impurities.

Applying the adhesive

The ideal processing temperature is between 20°C and 28°C. Viscosity falls at higher temperature and pot life shortens. The adhesive is applied from the cartridge using a dosing device. It can also be transferred with a stamp. Thin adhesive bonds normally have the best properties. Join the parts together and prevent them from slipping during curing by attaching clamps or fixing devices.

Curing the adhesive

Heating cabinet	80 °C	2 hours
Heating cabinet	90 °C	60 minutes
Heating cabinet	120 °C	15 minutes
Heating cabinet	150 °C	5 minutes

After the adhesive is cured, the parts can be further processed. However, the bond only achieves optimum strength and resistance after a few days. Excellent electrical and thermal conductivity can be achieved by curing at high temperature and/or by subjecting the bond to subsequent ageing treatment at the highest temperature permitted for the component.

Properties of cured adhesive

Colour:	silver grey
Shore D (25°C):	80 – 85
Density:	3.8 g/cm ³
Volume resistance:	< 0.0005 Ω.cm
Thermal expansion stress:	48 x 10 ⁻⁶ / K under T _g 174 x 10 ⁻⁶ / K over T _g
Softening temperature T _g :	50 to 70 °C
Temperature range:	-55°C to + 230°C
Decomposition temperature:	300 °C

Cleaning the adhesive

Residue from non-cured adhesive on the substrates and processing equipment can be removed or cleaned using a solvent such as isopropanol or acetone. Organic solvents may lead to component destruction or stress cracking in plastics. For this reason, avoid use of aggressive solvents such as acetone, ketones and esthers. Comply with the official safety regulations when handling combustible solvents. Cured adhesive can only be removed mechanically. The adhesive becomes softer at temperatures over 75 °C.

Compliance

Epicol 83S and all its constituents comply with the requirements of RoHS and REACH guidelines. Always comply with the safety data sheet when handling the adhesive.

Safety instructions

Avoid contact with skin and eyes. When applying the adhesive, always wear gloves and safety goggles. If adhesive comes into contact with the skin, do not use solvents to remove. Instead wash the affected area (hands) with warm water and soap and then dry. Before use, please observe the instructions in the safety data sheet.

Storage

The shelf life of unmixed Epicol 83S in a refrigerator (4-5°C) is min. 6 months. Before mixing the individual components must be brought up to room temperature and stirred well.

Disposal

Cured adhesive contains pure silver which can be recycled and is therefore valuable.

The specifications in this data sheet are based on meticulous tests and our previous experience in everyday practice. They are non-binding instructions, in the same way as our application advisories are also non-binding, whether verbal, in writing or by trials since we cannot accept any liability due to the wide variety of possible influences during processing and application. APM Technica AG disclaims all other explicit or implicit warranties, conditions and terms, be they of real or legal nature, including those which refer to usual market quality, their suitability for a particular use, satisfactory quality or observance of third-party trademarks. APM Technica excludes all liability to the extent permitted by law – whether arising from contract, quasi contract or tort (including negligence) – for direct, indirect and consequential damages, punitive damages awarded by court, loss of business of all kinds, loss of information or data or any other financial losses which may result from the sale, installation, maintenance, use, performance, failure or interruption of operation of the product or in connection therewith, even if we were informed of the possibility of occurrence of such damages. Data and other specifications concerning the nature and suitability of our products are non-binding general conditions and specifically represent no guarantee of certain characteristics. We advise you to perform your own adequate tests to determine the suitability of our products for your specific application. The user is himself responsible for defining the suitability of production methods mentioned in the technical data sheet for his purposes and for taking precautionary measures which are suitable to protect assets and persons from any danger which may occur during the handling and usage of these products. In all other cases our General Terms and Conditions of Business shall apply.