

November, 2023

APM Unoflex 502

Description	
APM number:	
System:	1-component MS hybrid adhesive / sealing compound
Colour:	colourless, transparent or black
Viscosity:	viscous
Solid bodies:	100% / solvent-free
Skin formation:	10 minutes
Temp. range:	- 40 °C to +90 °C

Application / specifications	
Curing:	24 h at 23 °C/ 50% RH
Device sealing and display bonding	
Sealing of plastic lights	
RoHS compatible	
compliant with REACH	
ISO 10993 (Medical):	10993-5, -12 and -1 compliant

Unoflex 502 is a highly flexible MS polymer adhesive and sealant with permanently elastic properties. The sealant is solvent-free and extremely weather-resistant. Typically Unoflex 502 is used for bonding displays in devices or for sealing covers. An adhesive cavity of 0.1 – 2.0 mm is typical. The adhesive cavity is selected depending on the size of the parts to be sealed, the application temperature range and the difference in thermal expansion stress. Unoflex 502 is frequently used to seal plastic parts or glass displays in optical or electronic devices or plastic lighting fixtures. The sealant produces excellent results for sealing a wide variety of materials, such as plastics, glass and metals.

Properties of fluid adhesive	
Chemical base:	MS hybrid polymer
Colour:	colourless transparent
Consistency (25°C):	liquid
Processing time:	max. 10 minutes
Density (25°C):	1.04 g/cm ³
Shrinkage:	< 5%
Processing temperature:	+5°C to +40°C

Surface pretreatment / cleaning

The surfaces to be bonded must be dry and free from dust, oil, separating agents and other impurities. The selected type of surface treatment depends on the requirements profile (cleanliness, mechanical strength, ageing resistance). Mechanical pretreatment such as grinding or sand-blasting results in improved

adhesion, especially on metallic and in many cases non-metallic surfaces. It is best to clean glass surfaces using the aqueous ultrasound cleaning method at raised temperature. Clean metallic surfaces with aqueous cleaners or clean solvents.

For these materials and in particular plastics, surface pretreatment using oxygen plasma has proven successful. Plasma treatment dries the surface and improves wettability. This achieves good adhesion of the adhesive. With plastics, the surface is also chemically modified. With poor adhesive plastics this produces an adhesive surface.

Primers are no replacement for surface pretreatment. Adhesion and ageing resistance can also be significantly improved by using primers.

Applying the adhesive

Unoflex 502 is a single-component, moisture-curing adhesive and is therefore very easy to process.

The ideal processing temperature is between 20°C and 28°C. Viscosity falls at high temperature. If necessary Unoflex 502 can be processed between +5°C and +40°C. The skin building time is dependent on temperature and relative air humidity during the application. The adhesive can be easily applied from the cartridge using a dosing device.

Curing: 24 h at 23 °C/ 50% RH 3.5 mm

Properties of cured adhesive

Colour:	colourless transparent
Completely cured after 24 h:> 2 mm at 20°C/50% air humidity	
after 48 h:> 3 mm at 20°C/50% air humidity	
Thermal stability:	-40°C / +90°C
Shore A (25°C):	45-55
Density (25°C):	1.0 – 1.1 g/cm ³
Modulus of elasticity:	> 1.8 N/mm ²
Tensile strength:	> 3.0 N/mm ²
Elongation at rupture:	> 150 %
Thermal conductivity:	0.2 W/mK
Chem. resistance:	water, aliphatic hydrocarbons

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 esters. Comply with the official safety regulations when handling combustible solvents. Cured adhesive can only be removed mechanically.

Ageing resistance of adhesive bonds

The typical application temperature range of Unoflex 502 is from -40°C to +90°C. Adhesive bonds are very age resistant within this temperature range. The product can even withstand temperatures of up to 110°C for short periods. The cured plastic has an exceptional temperature stability, humidity ageing resistance and solvent resistance.

Compliance

Unoflex 502 and all its constituents comply with the requirements of the RoHS Directive and REACH regulations. Always comply with the safety data sheet when handling the adhesive.

Safety instructions

Avoid contact with skin and eyes. 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. Liquid adhesive irritates on contact with the eyes and may lead to permanent eye damage. Before use, please observe the instructions in the safety data sheet.

Storage

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The adhesive has the best shelf life at temperatures between 5 °C and 20 °C. The adhesive shelf life in 300 cm³ cartridges is at least 12 months under these conditions. The shelf life in 30 cm³ / 55 cm³ cartridges shortens to min. 6 months due to its sensitivity to humidity. Lower temperatures cause a temporary higher viscosity.

Disposal

The liquid adhesive must be disposed of as hazardous waste in the same way as synthetic resin or paint components. Cured adhesive is disposed of as hazardous waste in the same way as thermosetting plastics depending on local legal requirements or as domestic waste.

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.