

# **SILICONE HOSES AND HOSE ASSEMBLIES**

Original operating instructions



**TECNO PLAST**  
INDUSTRIE TECHNIK GMBH

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**It is extremely important and in the customer’s best interest to observe the information contained in these operating instructions. TECNO PLAST shall not be liable for any damage that arises as a result of the customer’s disregard for the information in these operating instructions.**

**1. Hose assembly pressure test**

Before commissioning, it is extremely important to test the suitability of the products for the specified operating pressure. To this end, all products undergo a test at one and a half times the operating pressure depending on the pressure limiting component (fittings and hose version), generally using water. This can also be found in the respective TECNO PLAST catalogs and product brochures.

This test should be carried out with a fully assembled hose assembly as the hose liner and fittings are both tested for leaks at the same time.

TECNO PLAST does not test bulk hoses. Instead, following self-assembly, the customer must conduct a pressure test on the complete hose assembly.

Customers who order a hose assembly with fittings supplied by the customer themselves or fittings that are not included in the TECNO PLAST delivery program may have to accept a hose that has not been pressure tested because some fittings cannot be connected to the pressure testing system.

The hose connection is marked as “untested” and delivered with a note indicating that a pressure test should be carried out.

**2. Installation of hose assemblies**

The length of the hose assemblies and how they are installed must always be in keeping with the length calculations and installation methods outlined in the product brochures and catalogs.

When connecting for use, the hose assembly fittings must always be connected to the appropriate counterparts using proper methods and proper tools, screwdrivers, clamps, nuts and bolts, etc. The connection must be tight enough to ensure that the joint does not leak, – but not so tight that it damages the sealing surface.

### 3. Safety information

TECNO PLAST products may not be used as implants in the human body, in the aviation and aerospace industry or in railway vehicles because the products were not designed for these purposes.

When in doubt, obtain approval from TECNO PLAST.

In addition, do not use SILICONE hoses in radioactive surroundings as radiation severely compromises the mechanical and electrical properties.

The usage restrictions listed here and in the corresponding product brochures and catalogs are to be understood solely as general guidelines. It is impossible to provide an exhaustive catalog as the possibilities for using our products are extremely diverse.

It is the duty of the user of our products to always carefully check both the suitability of the hose assemblies for the respective application and any associated safety aspects. This applies in particular to the chemical and electrostatic compatibility of the liquids or gases passing through the hose assemblies as well as to the type and probability of occurrence of an excessive mechanical load (e.g. internal or external abrasion, crushing, abnormal bending, etc.). Careful consideration must also be given to the anticipated risk to employees, the general population and the surroundings in the case of such damage – including the associated financial burden.

TECNO PLAST will only respond in writing to inquiries regarding the products and their use. Without such written information, TECNO PLAST cannot assume any responsibility for problems when using the products that occur due to application conditions not expressly listed in the respective catalogs and product brochures.

The purchaser of our products remains responsible for ensuring that the end user is in possession of all of the necessary product-specific information, catalogs and product brochures as well as safety information, even if the purchaser sells the product or passes it on to a third party in some other way.

**For proper use of the hose assemblies, observe the comprehensive information contained in the T002 (DGV 213-053) leaflet as well as applicable accident prevention regulations.**

**Attention: In accordance with the German Ordinance on Industrial Health and Safety, the hose assembly can be both a tool as well as a component of a system requiring monitoring. The operator must comply with the appropriate test requirements.**

### 4. Hazard and risk analysis

Conduct an appropriate hazard and risk analysis prior to commissioning the hose assembly. The following parameters, among others, must be taken into account:

- Operating pressure
- Operating temperature
- Resistance to the media to be transported
- Installation conditions
- Discharge capacity/conductivity of hose components

As these parameters may vary from case to case, TECNO PLAST cannot conduct a blanket analysis.

It is the responsibility of the operating company to provide the relevant parameters so that TECNO PLAST can carry out a customized hazard and risk analysis.

If this is not possible, the operating company bears all responsibility.

### 5. Steam sterilization

**Our silicone hoses can be sterilized using the usual methods, regardless of the guard, provided that the upper temperature limit is approx. 134°C/3.0 bar.**

Silicone hoses have been used in the food industry, pharmaceuticals, biotechnology and bottling and equipment technology for years and often in processes in which steam is used for sterilization.

The frequency with which the sterilization is performed must always be considered on a case-by-case basis. It depends on different factors including the design of the hose (guard), the type of construction and the operating conditions, e.g. residual medium and cleaning agent, and especially the duration and temperature of the sterilization. A lower sterilization temperature increases the service life of the silicone hose.

Only the user can determine the exact correlation between these two factors and thus the service life. There is no formula/rule of thumb for this. It is recommended that each user perform their own hazard and risk assessment for each application.

However, it is generally true that steam damages silicone and the polyester guard over time!

In other words, the material ages relatively quickly. In the end, this leads to hose failure (with shielded hoses this usually happens directly behind the connection due to the high heat transfer).

Silicone rubber is impervious to fluids and has a microporous molecular structure. It does not matter if it is a peroxide or platinum cured quality.

This makes the silicone permeable to gas and steam. The diffusing steam particles attach themselves and cause swelling. This then causes an explosive tearing out of these steam particles upon renewed application of steam.

This phenomenon continues with progressive steam application until, under certain circumstances, the inner tube is so damaged that it tears or loses its sterility!

Even though many cleaning methods are very similar, a decision as to how long this material can be used must always be made depending on the operating conditions and on the basis of the various interplays between all factors (duration, pressure, additives, frequency, etc.). This is usually based on operator experience and the necessary risk analysis.

Rule of thumb: The higher the temperature and thus pressure of the steam load or the longer the sterilization time, the shorter the service life of the hose.

Statements to the contrary should be treated with caution because they usually mean that the service life has not been taken into account, making such statements extremely relative.

### 6. TECNO PLAST Storage instructions / storage times as well as operating times for silicone hose and hose assemblies of type A6092, A6093, AE6093, AES6093 and TP RED

When storing our products, observe the ISO 2230 and DIN EN ISO 8331 standards.

In particular, we refer to:

1. Inventory change according to the “first in first out” principle
2. Storage temperature between -40 °C and +50 °C
3. Dry storage and humidity between 10% and 85%
4. Protection from direct sunlight and UV exposure
5. Avoid ozone formation
6. Avoid the harmful effects of certain products and their vapors – e.g. disinfectants, solvents, etc.
7. Avoid the negative influences of electric and magnetic fields

#### 6.1. Storage procedures

Storage must be in closed rooms – storing the products outside is prohibited.

Store platinum catalyzed hoses and hose assemblies without braid (e.g. series A6092, A6093 and other Shore hardnesses for these types) in sealed, non-perforated PE bags.

Always store silicone products away from other products in closed, adequately ventilated rooms and on a dry surface on shelves or in storage boxes/drums. Silicone absorbs odors from its surroundings and under certain circumstances may

transfer those odors to the product in contact with the silicone hose. The same is true for substances without odor.

In addition, observe the following during storage:

1. Ensure that bending radii are no lower than the minimum permitted bending radii
2. Products on the bottom should not be deformed by the weight of the products on top of them
3. Hose fittings should not depress or damage the hoses

Hanging hoses on hooks is not recommended. Hose assemblies may be stored hanging. If a hose assembly is hung by the fitting, ensure that the insertion is not damaged by the weight of the hose assembly.

Protect the hoses from rodents.

#### 6.2. Storage periods

The following storage periods apply to hoses when adhering to the aforementioned storage conditions:

Peroxide-linked goods (TP red) in the perforated bag: 5 years

Platinum-catalyzed material (A6092, A6093, AE6093, AES6063 and other silicone hoses with shore hardnesses A 50 ± 5 to 70 ± 5 in reference quality A6093) 10 years in non-perforated bags, whereby changes in color cannot be ruled out.

#### 6.3. Guidelines for operating times

Reliable statements about the expected service life of silicone products of the types referred to here can only be given by TECNO PLAST, if at all, if they have precise knowledge of all relevant information about the specific use. This includes, for example:

- Pressure (avoid pulsating pressures)
- Installation conditions
- Medium
- Mechanical influences
- Cleaning methods and frequency
- Temperature (both of the medium and the ambient temperature)

Repeated sterilization in autoclaves and with the SIP/CIP process may cause adverse effects resulting in a shorter useful life of the products.

Please note that our silicone products are not suitable for continuous use in steam.

It is the customer's responsibility to assess the risks associated with hose failure, including the anticipated consequences, and to take suitable measures to protect their employees and the public, if necessary.

Outages can be avoided through proper handling and appropriate installation conditions. In this respect, we refer to the operating instructions, conditions of use and hose configurations with installation tips in our catalogs, which the customer must observe. This information can also be found online at [www.tecnoplast.de](http://www.tecnoplast.de).

Braid reinforced silicone hose assemblies manufactured by TECNO PLAST always undergo a leak test and a visual in-

spection prior to delivery. Relevant certificates in accordance with DIN EN 10204 - 3.1 will be issued on request.

For safety reasons, we recommend carrying out at least one inspection in accordance with T002 (DGUV 213-053), including an additional endoscopic inspection of the core hose, by a qualified person or under the supervision of a qualified person within six months. Inspect the silicon cover for damage or brittleness as well.

## 7. TECNO PLAST Storage instructions for Advanta-Pure silicone products in the series APST, APSH/ APSW, AdvantaFlex, molded silicone

### 7.1. APST, APSH hoses, AdvantaFlex, and molded silicone components

1. They may only be stored in enclosed spaces.
2. Keep the storage room dry and protect the goods from the effects of the weather and UV light. The interior lighting should only emit minimal amounts of UV and ozone.
3. Keep the storage area free of odors and vapors that may be produced by materials like solvents, gases and other materials.
4. The atmosphere should have an average temperature of approx.
5. 21°C and humidity of 50% or less. Between 15°C and 25°C for molded silicone components.
6. The goods are delivered in single or double heat-sealed PE bags because they are clean room products. There is a risk of contamination when these PE bags are opened. Pack any leftover amounts back into appropriately sealed PE bags.
7. Stack the hoses in layers in closed plastic containers or, if allowed, in boxes, in order to protect the product from light and contamination. The containers should not be placed directly on the floor and should be closed while in storage.
8. Be careful with the lower layers, they should not be crushed under the weight of the items on top.
9. Prevent the products from kinking.

If these recommendations are followed, the products will last 10 years from the time of manufacture. This is a non-binding guideline with optimal storage conditions. This is not associated with any acceptance of guarantee and/or extension of the warranty period. It is the customer's responsibility to check the products for damage incurred during storage prior to commissioning.

### 7.2. APSW hoses (also applies to APSM and APSW PC hoses)

1. The storage location must comply with the requirements laid out in points 1 to 3 (left column).
2. Each length of hose is delivered with a protective Mylar sleeve in which the product should also be stored.
3. In addition, each length of hose is sealed with plastic caps at both ends to prevent contamination. For this reason, please always store the goods with caps on the ends.
4. Please store the goods in appropriate containers – if the bending radius allows this.
5. If this is not possible due to the bending radius, store the lengths of hose straight on clean shelves or racks (not on the floor) and cover the individual lengths of hose with a film to protect them from light, UV rays and contamination.



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