

Precautions to ensure safe usage

The precautions given below are intended to ensure safe and correct use of the products.
Note that certain restrictions apply to use of these products. Failure to observe these could result in injury or property damage.

 Warning	A potentially hazardous situation which could result in death or serious injury.
 Caution	A dangerous situation which could result in minor or medium injury and/or in which only property damage is foreseen.

 **Warning** TOYOX products have been developed and manufactured for general industrial applications.

For applications that require safety, confirm in advance.

Never use for implant or injection application or other applications where there is a possibility of the product partially remaining in the body.

ToyoX makes no guarantee of the adaptability or safeness related to such applications.

Please read the Handling Precautions carefully before use.

Note: See the terminology glosses on our website for words marked with a ※.

TOYOSILICONE THERMO Hose

① Notes for using the hoses

1. Can only be used with hot water.
2.  **Warning** Always use a hose within its recommended temperature and pressure range.
Do not use TOYOSILICONE THERMO Hose for high-temperature water above 100°C.
3. Hoses expand and contract according to internal pressure, so adequate space should be provided when setting up.
4. When pressurizing, slowly open / close any valves to avoid ※₁ impact pressure.
5. Do not use hoses at negative pressure.
6. Silicone rubber has high gas permeability.
Please note that when using gases, they may permeate the hose and leak from hose surface and cut surfaces.
7. Please note that compounding agents could be extracted / eluted from the hose depending on use conditions.
Please confirm the use conditions and the effects on your products before use.
8. Before using a TOYOX hose with an oil, powder, strong toxic chemical, concentrated acid, concentrated base or other potentially dangerous fluid, please consult with us to ensure safe use.
9. Never use silicone rubber hoses to convey nonpolar organic solvents (benzene, toluene, hexane, etc.), halogenated hydrocarbon (methylene chloride, trichloroethane, etc.), concentrated strong acid, strong alkali, mineral oil, steam for long periods of time, or animal or vegetable oil of 70°C or higher.
10. Do not use hoses for fuel oil.
11. When using steam, TOYOSILICONE THERMO Hose should be used at saturated steam pressure of 0.2 MPa (120°C) or less for a short usage period.
12. Use hoses at bend angles larger than their ※₃ minimum bending radius.
Angles smaller than the minimum bending radius may result in hose rupture or lower pressure resistance.
13. Powders and granular materials may cause wear.
Use a hose with as large a bending radius as possible.
14. Do not use a hose that is extremely bent near a coupling.
15. Do not bring the hose product near to or in direct contact with naked flame.
16. Do not run over hoses with a vehicle or other heavy objects.
17. Do not use collapsed hoses.
18. Do not let hard angled objects, such as pieces of iron, press hard or rub strongly against a hose.
19. When a load such as bends and stress is applied to the hose near a coupling, the barb nipple may cut the inner tube of the hose, possibly causing the hose to rupture.
20. Be careful not to damage the silicone rubber hose, as it is easier to cut compared to conventional soft PVC hose.
21.  **Warning** Do not pass an electric current through the hose. This is dangerous because it may rupture the hose or cause electric shock.
22.  **Warning** Do not allow anything other than the inner surface of the couplings or hose to come in contact with fluids, because the fluids may permeate the hose reinforcement layer or remain inside the couplings, and bacteria may propagate (attach to the parts) or the hose may deteriorate. Also, dust, hose fragments (reinforcement material) adhering to the outer surface may be mixed in.

② Notes for cutting the hoses

1. In order to retain pressure- and heat-resistant performance, the threads are specially braided for reinforcement.
(If improperly cut, the threads may unravel and fall out; handle with due care.)
2. When cutting a hose, use as new a cutting blade as possible and make sure that the edge face of the hose is cut perpendicularly.
If it is not perpendicular, the hose may leak or become disconnected.

③ Notes for assembly

1. We recommend using TOYOCONNECTOR, our dedicated coupling, for TOYOSILICONE THERMO Hose.
2. Use hose nipples suitable for the size of the hose. Do not use hose nipples with damaged or rusted surfaces.
3. Make sure the end of the barb fitting is as round as possible (0.3 R or more). Be careful with silicone rubber hoses, as they are easier to cut compared to conventional soft PVC hose.
4. When inserting the nipple barb into the hose, do not use oil on the hose or on the nipple barb, and do not treat the parts with fire.
If insertion is difficult, use lukewarm water to warm the hose and try inserting the fitting again.
5. Insert the nipple barb completely into the hose.
6. Do not use one-push couplings. Hose may rupture.
7. Fasten clamps centered on the nipple barbs, taking care not to cut the exterior surface of the hose. Use two or more clamps for a large diameter hose that is 19φ or larger.

8. Fasten clamps with the specified clamping torque.
9. Retighten the hose clamp as necessary. Hose softens at high temperatures.
10. Take care not to injure hands when using a Phillips or slotted screwdriver.
11. Avoid the following because it may damage the inner lining of a hose and cause it to rupture.
 - Tightly fasten hose with a wire instead of a clamp.
 - Hit hose with a hammer when attaching / detaching a clamp.
 - Use a coupling with a damaged or rusty nipple.
12. The compression strength indicated in this brochure is based on data which was obtained from pressure tests conducted by Toyox using the hoses alone by its own testing method.
 Therefore, the hose may be dislocated before the hose ruptures, or another problem may occur depending on the conditions of the connectors being set (the shapes of hose nipples, types of hose clamps, number of hose clamps, fastening torque and how they are crimped). Please select a safe, effective method for attaching couplings to the hoses based on the following data on withstanding pressure. For technological information on using couplings, please make inquiries through our Customer Advice Center.

④ Notes for inspections

1. Pre-work inspection: Before starting operation, check the hose for abnormalities, such as external damage, stiffening, softening and discoloration.
2. Regular inspection: During periods when the hose is in use, be sure to perform regular monthly inspections.

What to do if an abnormality is found

The life of hoses will be greatly affected by the physical properties, temperature, and flow rates of the fluid as well as by the frequency of pressurization and depressurization. If any of the following problems or similar signs are found in the pre-work or regular inspections, immediately cease use and replace the hose.

1. Abnormality near the coupling: localized stretching, bending, leakage or swelling
2. External damage: large scratches in the outer surface, cracking, or water infiltrating the reinforcement layer
3. Internal abnormalities: Bulging or ※5 separation of the inner surface, or wear that leads to exposure of the hose reinforcement material.
 Note: In the case of abnormalities on the interior or exterior surface, hose scrapings and fragments of hose reinforcing materials may mix into the fluid inside the hose.
4. Other abnormal changes (stiffening, ※6 swelling, cracking, bulging, adsorption of the fluid odor, taste, or smell, discoloration of the reinforcement layer, etc.)

⑤ Notes for storage

1. Do not store outdoors or in a place subject to direct sunlight. This may cause the quality of the hose surface to deteriorate, becoming sticky and/or susceptible to cracking.
 Store in a low-humidity, well-ventilated place. Store keeping the inside of the hose free from foreign matter and dust.
2. Do not store near rubber products. Even without direct contact, proximity may cause discoloration.

⑥ Notes for disposal

1. Do not incinerate the hose. The incineration may generate toxic gases or damage incinerators; therefore, the hose should be treated as industrial waste for disposal purposes.
2. The hose should be disposed of in accordance with the requirements of the local region.