

Instruction Manual of TOYOSILICONE STEAM Hose

Be sure to read this manual before use the hose.

To make the best and safe use of the hose, read carefully and observe the cautions described in this manual. Or, you may suffer injuries or damages to properties.

Cautions for safe use of TOYOSILICONE STEAM Hose

Note : In this manual, the parts written in bold and headed by  represent warning, and other parts headed by  represent cautions.

 Warning	Indicates the hazardous state which may cause death or heavy injury.
 Caution	Indicates the hazardous state which may cause light or moderate injury or damages to properties.

Cautions for using the hose

Applications ... ① **TOYOSILICONE STEAM Hose (Hose & Hose Assemblies) have been developed and manufactured for general industrial applications. For applications that require attention to safety, please confirm in advance by the user. 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.**

② **This hose is for steam and high-temperature water use. Do not use hoses for food or chemical cleaning applications.**

Working pressure ... May cause burst of the hose or removal or fitting if not observed.

③ **Use the hose within the range of the working pressure.**

④ The hose may be extended or and shrunk by the internal pressure, so arrange its layout with a margin.

⑤ When applying pressure to the hose, open or close the valve slowly to avoid applying impact pressure.

Fluid used ... May cause sudden degradation of the hose or damage to the hose, removal of the fitting, etc.

⑥ **Never use with the hose nonpolar organic solvents (benzene, toluene, hexane, etc.), hydrocarbon halogenide (methylene chloride, trichloroethane, etc.), high-concentrate strong acid or alkali, mineral oil, or vegetable or animal oil of 70 degrees centigrade or higher.**

⑦ Use the hose in a range of temperature, -30 to 140 degrees centigrade.

⑧ **For steam conditions, a saturated steam pressure of 0.3 MPa (140°C) or less and intermittent use (maximum continuous use: 8 hours/day) with one side of the hose open is required.**

Avoid use as fixed piping (both ends connected) for any reason. It will result in a shorter service life.

⑨ Silicone rubber has high gas permeability and easily adsorbs fluids. When using gases, they may permeate the hose and leak from hose surfaces and ends. As well, note that fluids with odors, tastes, or colors may transfer these attributes to the hose.

Bending tolerance ... Surpassing the bending tolerance may cause burst of the hose, etc., shortening the life of the hose.

⑩ Don't use the hose bent more sharply than the minimum bend radius, or in a condition bent forcibly or sharply or twisted.

⑪ Don't use the hose bent excessively near the fitting.

Cautions for assembling

Fitting ... We recommend to use "TOYOCONNECTOR," our special joint made for TOYOSILICONE Hoses .When installing the hose, please read the handling guide attached to the product first and install the hose properly. Please be aware of the following items when using anything other than special joints. The burst of the hose, removal of fitting, etc., may result in burst out of the fluid, jumping around of the hose, etc., causing an accident involving injuries.

① **Use a coupling, hose nipple, etc., compatible with the hose size.**

② **The tip of the hose nipple and the edges of the bamboo-shoot section may damage the inner tube of the hose, causing leak and burst of the hose. Be sure to use a hose nipple which has chamfered corners (more than 0.3R).**

③ **When connecting the nipple with the hose, don't apply lubricant to the hose or nipple, warm them with fire, or pound the hose.**

Hose Clamp ... May cause broken hose or removal of nipple, and resulted leak or burst out of fluid, etc., may lead to an accident involving injuries.

④ Never use a steel wire, etc., as a substitute of the band.

⑤ Tighten the band covering the center of the bamboo-shoot section of the nipple, and take care so that the outer layer of the hose may not be cut.

⑥ After attaching the band or coupling fitting, check that the connection is safe (no leak or removal of the fitting).

⑦ **Multiple fixtures involving two or more bands should be used on hoses of size 19 mm and larger. All bands must be tightened uniformly.**

⑧ The specifications of the hose bands vary from their manufacturer to manufacturer. Choose one after inquiring its manufacturer of details.

Cautions for inspection

① Every-day's check up ... ● Before using the hose, check for any abnormalities found in the appearance of the hose (flaw on the exterior, dusts on the surface, wastes, etc.).

② Regular inspection ... ● Be sure to inspect the hose once a month on a regular basis as long as you use it.
● If any cut is found on the surface, etc., of the hose, replace it with a new one. Or, the tearing may develop from the cut as the hose is used, leading to its burst.
● **When using steam, be sure to perform regular inspections and replacements based on the "Conditions and service life (replacement) guidelines."**

- ③ The life of the hose can vary substantially depending on factors such as the physical properties of the fluid, the temperature and flow rate, and frequency of compression and decompression. If any of the following abnormalities is found at the every-day's check up or the regular inspection, stop using the hose immediately, and repair it or replace it with a new one:
1. Problem with a hose around fitting ... Localized stretch, curvature, leakage or expansion, or less deep insertion into nipple
 2. Damage ... Large scratch, crack, or an undated reinforcement layer.
 3. Internal damage ... internal swelling, peeling, or friction damage (such as when hose reinforcing materials are exposed) (Note) If the interior damage occurs, foreign objects peeled off the hose or fragments of the reinforcing material may mix with the fluid.
 4. Other abnormal changes (stiffening, swelling, cracking, bulging, adsorption of the fluid odor, taste, or smell, discoloration of the reinforcement layer, etc.)

Cautions for maintenance and control

※ These cautions concern the possible problems affecting on safe use of the hose for a long time.

Storage of the hose after use

① After using the hose, remove any residual objects inside the hose.

② Store the hose at a place which is not exposed to direct sunshine and is well ventilated.

③ Avoid storing the hose in a condition bent excessively, twisted, or bent sharply. In particular, avoid hanging it on a nail on a wall to store it.

Storage of the hose as inventory

④ Store the hose in a container at a place which is not exposed to direct sunshine, has low moisture and is well ventilated.

If the hose is not stored in a box, encourages build-up of electric charge, attracting dirt and dust to the hose surface. This can cause the hose to become dirty and unhygienic.

⑤ Do not store the hose out of its box and near rubber products. Even if it is not touching, the rubber can cause discoloration.

Cautions for disposal

① To dispose of the hose, follow the regulations on segregation of wastes in your district.

Other cautions

① **Don't touch the surface of the hose with bare hand immediately after cleaning the hose, or accidents such as burn may be caused.**

② If heated over 100 degrees centigrade with hot water, steam, or a furnace, the hose may become nebulous. But this does not mean degradation; the hose will restore the original conditions if heating is stopped and some time elapses.

③ Because " hose materials are hard to be removed when bacteria and mold stick, please be careful " .

④ The hose is shipped unsterilized.

⑤ 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.)

⑥ 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 squarely perpendicular, the hose may leak or become disconnected.

⑦ Be careful not to damage the silicone rubber hose, as it is easier to cut compared to conventional rubber hoses.

⑧ **When used inside tanks for water heaters, etc., if the hose comes into direct contact with liquid and is used for steam, it may deteriorate and hose fragments could contaminate the liquid. Insert the hose into a pipe, etc. so it will not come into direct contact with the liquid.**

Specifications

Code	I.D. × O.D. mm	Steam (~140°C)	High-temperature water (~140°C)	Length m	Min. bending radius mm
		Working Pressure (MPa)	Working Pressure (MPa)		
TSISTM- 9	9.5 × 16	0~0.3	0~1.0	20	100
TSISTM-12	12.7 × 19.5		0~0.5	10	130
TSISTM-15	15.9 × 24		0~0.5	10	150
TSISTM-19	19 × 28		0~0.5	10	180
TSISTM-25	25.4 × 35.5		0~0.5	10	220

□ The range of working temperature is -30 to 140 degrees centigrade.

Steam (140°C, 0.3 MPa) usage service life (replacement) guidelines

Conditions	Service life (replacement) guidelines *Reference values
When used for 1 hour per day	800 operating days (36 months)
When used for 2 hours per day	400 operating days (18 months)
When used for 4 hours per day	200 operating days (9 months)
When used for 8 hours per day	100 operating days (4.5 months)

* This table does not show guaranteed values. * Replace hoses according to the above guidelines.

□ Maximum continuous use is limited to 8 hours/day.

Steam pressure/temperature comparison table

Steam pressure (MPa)	0.020	0.039	0.059	0.078	0.098	0.118	0.137	0.157	0.177	0.196	0.216	0.235	0.255	0.275
Temperature (°C)	104.2	108.7	112.7	116.3	119.6	122.6	125.4	128.0	130.5	132.8	135.0	137.1	139.1	140.0