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 ※.

FUSSOTHERMO-S100°C Hose

① Precautions regarding use of hoses

1. Usage:
- ⚠**Warning** The FUSSOTHERMO-S100°C Hose (hose and assembly) has been developed and manufactured for general industrial applications.
For applications that require safety to be considered, check the requirements and other conditions in advance.
Do not use Toyox products for implantation or injection into the human body, or for applications where parts of the product may remain inside the human body.
We do not guarantee adaptability or safety for these types of applications.

2. Operating pressure: Operating pressure may cause the hose to burst or the coupling to disconnect.
- ⚠**Warning** Use the hoses within their operating pressure.
- The hose may expand or contract due to changes in internal pressure, causing twisting or swelling. Be sure to allow enough room when piping the hose.
- When applying positive (negative) pressure, operate the valve opening and closing slowly to prevent impact pressure from being applied.

3. Fluid used: Depending on the fluid used, it may cause sudden deterioration of the hose, peeling, damage, or disconnection of the fittings, etc.
- ⚠**Warning** The FUSSOTHERMO-S100°C Hose has a special adhesive structure, so even though the inner layer is fluid-resistant, the fluid may penetrate the inner layer due to the conditions of use (pressure, temperature, etc.) and the fluid used (chemicals, solvents, etc.), and the intermediate layer and the outer skin may deteriorate, swell, or peel off. Be sure to check the availability under the actual conditions of use. (For chemical resistance data, check our website or contact our Customer Service Office)
- ⚠**Warning** The material of the outer layer is less chemical-resistant than fluorine resin. Do not immerse in chemicals or adhere chemicals to the outer layer or end surface.
- The FUSSOTHERMO-S100°C Hose uses fluorine resin as the innermost layer and is resistant to fuel oils such as gasoline and solvents such as toluene. However, it should not be used for fuel piping.
- Use in the temperature range of –5°C to 100°C. Do not use with hot water above 100°C.
When cleaning with steam, use a saturated vapor pressure of 0.2 MPa (130°C) or less for a short period of time.

4. Allowable bending: The service life of the hose may be shortened due to rupture of the hose.
- ⚠**Warning** Do not use the hose with less than the minimum bending radius, or with unreasonable bending or twisting.
- Do not use the hose with extreme bending or tension applied near the couplings.

② Precautions regarding assembly

1. Coupling: A rupture in the hose or disconnection of the coupling may cause fluid to spurt out or the hose to flail around, resulting in an accident.
- ⚠**Warning** Use coupling fittings and hose nipples that match the hose size.
- ⚠**Warning** If the tip or the threaded part of the hose nipple is sharp, the inner tube of the hose may be damaged, which may lead to liquid leakage or hose damage. Be sure to use a chamfered (0.3R or higher) nipple.
- ⚠**Warning** For hoses ø19 or larger, use two or more clamps and tighten evenly.
- ⚠**Warning** Never use commercially available assembly fittings to fasten Toyox hoses. Doing so may damage the inner tube and outer layer of the hose, leading to fluid leakage or hose damage.

2. Clamps: Hose breakage or disconnection from the hose nipple may result in an accident or injury such as a fluid leak or blowout.
- Never use wires or similar items in place of clamps.
- Tighten the clamp in the middle of the nipple threads, making sure that the outer layer of the hose will not be broken.
- When installing a clamp or coupling fitting, check the safety of the mounting part (to make sure there are no leaks or missing fittings).
- ⚠**Warning** Use two or more clamps and tighten evenly.
- When using hose clamps, the specifications will be different for each company, so please contact each clamp manufacturer before selecting the product to use.

③ Test precautions

*** These precautions are important to ensure that you can use the hose safely for a long time.**

1. Inspection before starting work:
   - ⚠**Warning** Before using the hose, check for any abnormalities in the appearance of the hose (external scratches, dust on the surface, dirt, etc.) or on the inner surface (swelling, peeling, etc.).
   - ⚠**Warning** When using the hose for food applications, it is recommended that the inside of the hose be cleaned before and after use.
     * Example of cleaning treatment: Clean at 100°C for 30 minutes.
2. Regular inspections:
   - During the usage period of the hose, be sure to perform regular inspections once a month.
   - If you find cuts or abnormalities on the hose surface or inner tube, replace the hose with a new one. During use, tear progression and peeling may occur from scratches, which may lead to damage or rupture of the hose.
3. The service life of the hose is greatly affected by the physical properties of the fluid, temperature, flow rate, and frequency of pressuriza tion and decompression. If you observe any of the following abnormalities or signs during the pre-work inspection or regular inspection, immediately discontinue use and replace the hose with a new one.
   1. Abnormalities near couplings: Local elongation, bending, leakage, swelling, or insertion into the nipple has become shallow.
   2. Presence of external scratches: Scratches or cracks on the exterior surface, and submergence to the reinforcement layer
   3. Inner surface abnormalities: Inner surface swelling, peeling, or wear (hose reinforcement material exposure)
      (Note) If the inner surface is abnormal, there is a risk of contamination of the fluid with flakes from the hose or fragments of the reinforcement material.
   4. Other cases with significant changes (hardening, swelling, cracking, discoloration of the reinforcement layer, etc.)

④ Precautions regarding maintenance and management

*** These precautions are important to ensure that you can use the hose safely for a long time.**

Storing the hose after use

1. After using the hose, remove any residue from it.
2. Store the hose in a well-ventilated place away from direct sunlight.
3. In particular, do not store the hose on a nail on the wall or similar to prevent extreme bending or twisting.

Storage as inventory

4. Store the hose in a box in a low humidity, well-ventilated place, out of direct sunlight. If you store the hose out of the box, it can easily become electrically charged, and dust and debris will be attached to the surface of the hose, making it easy to become dirty and unsanitary.
5. Do not store the hose in the vicinity of rubber products when it is out of the box. It may become discolored even if the rubber products do not touch the hose directly.

⑤ Disposal precautions

1. ⚠**Warning** Never incinerate the hose as combustion will generate harmful gases.
2. To dispose of the hose, please follow local regulations for separate disposal.

⑥ Other precautions

1. ⚠**Warning** Do not touch the hose surface immediately after cleaning with hot water. Doing so may result in an accident such as a burn.
2. Note that it is difficult to remove bacteria or mold from hose materials other than the inner layer if they become attached.
3. There is no sterilization or disinfection treatment.
4. In order to maintain pressure and heat resistance, thread reinforcement with special braiding is used.
   (Note that if you cut the thread accidentally, it may fray and be lost)
5. When cutting the hose, use a new cutter blade as much as possible to cut the hose so that the end face is vertical.
   If the cut is not vertical, leakage or disconnection may occur.
6. Handle with caution as there is a risk of injury from the end surface of the reinforcement material and of making holes in the hose.
7. Do not crush the hose with excessive external pressure.
8. ⚠**Warning** Do not allow fluid (food, etc.) to contact any part other than the inner surface of the hose and coupling. Doing so may cause the fluid to penetrate the hose reinforcement layer, remain in the coupling, encourage bacteria (adhesion), and cause hose deterioration.
   In addition, contamination of dust or hose fragments (reinforcement material) on the outer surface may occur.

FUSSOTHERMO-S100°C Hose Standard

Model	Inner diameter × Outer diameter	Operating pressure	Standard length	Operating temperature range	Minimum bending radius
	mm	MPa	m	°C	mm
FSTH100C-12	12.7 × 19.5	–0.1 to 0.5	10	–5 to 100	80
FSTH100C-15	15.9 × 24.0	–0.1 to 0.5	10		105
FSTH100C-19	19.5 × 28.5	–0.1 to 0.5	10		140
FSTH100C-25	25.4 × 35.5	–0.1 to 0.5	10		190