

## INSTALLATION INSTRUCTIONS FOR SALCO HAZARSOLVE EDUCATION TUBES

Note: Tubes with flex ends are not to be used with spiders. Salco-Hazarsolve can provide education tubes that can fit in spiders, however this set of instructions does not apply to straight tubes used in conjunction with spiders.

### FLEX-END EDUCATION TUBE INSTALLATION INSTRUCTIONS FOR TANK CARS:

NOTE: Flex end tube part numbers ending in "103" have finished tube length of 111" to 120 ½". Flex end tube part numbers ending in "110" are 120" to 127 ½". Flex end tube part numbers ending in "116" are 127" to 133 ½".

1. Remove old tube.
2. Measure the distance from the top (face) of the railcar flange to which the tube is to be installed, to the **BOTTOM OF THE RAIL CAR. DO NOT MEASURE TO THE BOTTOM OF THE SUMP.** This will be DIM "A" as shown in Figure 2.
3. The overall length of the tube with flex end will be equal to DIM "A" minus 3 inches.
4. Measure from the bottom face of the dip tube flange (the side with the tube on it) to the end of the flex tube and mark the calculated measurement from step 3.
5. With a razor knife, carefully remove the excess flex tubing that extends over the mark you made. DO NOT cut the blue plastic tube.
6. Make sure flex tubing is slid completely on the smaller set of barbs of the blue pipe. If it has not already been done, slide the 8.5" long section of transparent shrink tubing (provided) over the flex tubing to engage the larger barbs and about 2 revolutions of the flex tubing. This will clamp the flex tubing to the pipe when the shrinking operation is performed. **SEE SHRINK CLAMP INSTRUCTIONS, BELOW.**
7. Screw 2" of the strainer end into the freshly cut flex tube. All flex ends require a strainer, as the tube will not work without it. Slide the 3.5" long section of transparent shrink tubing (provided) over the strainer and onto the flex end until the slots in the strainer end are fully exposed. This position will clamp the flex and the strainer together when the shrinking operation is performed. **SEE SHRINK CLAMP INSTRUCTIONS, BELOW.**
8. When a tube is installed into any rail car, there should be a minimum distance of 1" between the strainer end and the bottom of the car (**not the bottom of the sump**).

***The above instructions will give an installer a clearance of 1 ½" to 2" (depending upon gasket usage).***

### EDUCATION TUBE INSTALLATION INSTRUCTIONS FOR TRAILERS:

NOTE: If the trailer tube has a flex end, please follow the tank car instructions.

1. Remove old tube.
2. Measure the distance from the top (face) of the trailer flange to which the tube is to be installed, to the **BOTTOM OF THE CAR.** This will be DIM "A" as shown in Figure 2.
3. Measure the distance from bottom of the car to the **BOTTOM OF THE SUMP.** This will be DIM "C" as shown in Figure 2.
4. If installing education tube **WITHOUT** flex-end, trim the tube down so the finished length is equal do DIM "B" as shown in Figure 2 and install into trailer.

***The above instructions will give an installer a clearance of 1 ½" to 2" (depending upon gasket usage).***

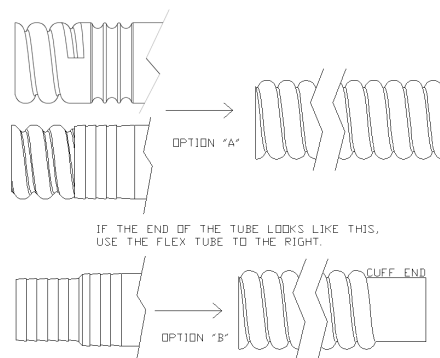
Shrink Clamp Instructions:

With a shrink clamp in its proper position, and using a hot air gun made for heat shrinking, apply the hot air to start the clamp shrinking. Only use a hot air gun, heat gun, made for application of heat shrink tubing. The minimum temperature of the heat gun should be 400°F. The maximum setting should be 1100°F. The temperature required will be dependent on the environmental conditions. **DO NOT** overheat the heat shrink tubing. If the tubing is scorched or starts turning brown, the clamp should be removed and a new piece of heat shrink tubing applied. The shrink clamp is best applied by holding the heat gun stationary and rotating the education tube. Starting in the middle of the clamp, work the heat around the full circumference of the shrink clamp. Once the middle of the clamp is tight and with the heat gun aimed towards the flex end, continue shrinking the clamp while rotating the tube and begin to follow the spiral grooves of the flex end. Be sure to heat the shrink clamp evenly while visually watching for the shrink to occur. Return to the middle of the shrink clamp and aim the heat gun towards the flanged end of the tube and begin to work the heat around the grooves of the tube. Let the whole assembly cool down before handling the tube. This cooling takes but a few minutes. After cooling, inspect your work to make sure that a good clamp has been made. The shrink clamp will pull down into the grooves in the strainer end and will pull down into the convolutions on the flex end. The shrink will not pull down all the way to the bottom of the convolutions on the flex-end tubing. It will be approximately half-way down in the convolutions and will be squeezing or clamping on their crowns or crests. Clamps should always be inspected before and after shrinking, and always before an education tube is placed in a rail car to be put in service. If doubts exist about the quality or integrity of a piece of shrink tubing as a finished clamp or as a post-shrink part, **DO NOT USE IT.**

Replacing a Flex End on an Education Tube:

**To remove shrink clamps:** Cut or nick a place on the edge of the shrink that is contacting the strainer or dip tube. Doing so will allow you to grasp the shrink with your fingers or a pair of pliers. Pull on the shrink at an angle and around the pipe in a circular spiraling motion. This action will easily tear the shrink and allow you to peel off the mating parts it is clamping. **DO NOT CUT ON THE SHRINK WHERE IT CONTACTS THE FLEX END.** Do NOT nick or scratch the flex tubing. Doing so will weaken the flex tubing which could jeopardize the integrity of the material.

There are two different versions of flex end tubing. See Figure 1 to determine which tube will work with which flex tubing. If option “A” is present, just screw in the flex tube onto the education tube and screw the strainer into the other end of the flex tube. The cuff (straight) end will need to be removed from the new flex end for correct fit up to the education tube. Follow the steps in SHRINK CLAMPING. If Option “B” is present, the cuff (straight) end must be press fit over the hose barbs on the education tube. The tube should be secured by a vice, or other means of clamping. Do not crush or scar the tube. Press the flex end onto the tube and screw the strainer on the flex tubing. Follow the steps in **SHRINK CLAMP INSTRUCTIONS**, above.



**Figure 1**

DIP TUBE STORAGE, INSPECTION, & MAINTENANCE INSTRUCTIONS:

To properly store education tubes, hang them vertically just as they are hung when installed in a vessel. Construct a rack with forks similar to a garden-tool implement rack, and include a latch or retaining device to prevent the tubes from dislodging and falling. Another type of storage rack is one that works much like a wine- or stemmed-glass holder. Education tubes should not be placed on the floor or stored horizontally where they are not well supported. The flex end will be in a bind or the tube will become bowed. The tube should lay or hang straight in a relaxed “in use” position.



**DO NOT** store plastic parts in sunlight. Best storage results from placing your rack in an out-of-the-way, low traffic area inside a climate-controlled building.

**ALL** tubes should be unwrapped upon arrival and inspected for damage to the flange, flange gasket faces, and the main rigid pipe. If the tube has a flex end, check for nicks, cuts, scratches, indentions in convolutions or corrugations, or any squashing or creasing that may have occurred during shipment. The shrink clamp that holds the flex end onto the rigid pipe should also be carefully checked for abrasions, cuts, nicks, tears, or peeled edges. Visually inspect the clamp to ensure that it sufficiently holds the flex end and the rigid pipe together. Next, grasp the flex end and hook the edge of the flange over a table or handrail then wiggle, tug and pull the tube to make certain the clamp is secure. This inspection is easy to perform and will allow you to accurately determine if a clamp is good or not. A wise rule of thumb is: ***When in doubt, replace the clamp with a new one.***

**NEVER** allow education tubes to be left installed in manways or flanges or attached to any equipment when those assemblies are taken off a vessel and laid down. This severely stresses the tube. Always remove the education tube and store it properly.

People who work with education pipes sometimes use an emergency or temporary dip pipe. **DO NOT USE IT.** This type of tube is usually cut off at an angle, and when installed through the Salco Hazarsolve tube, it is highly possible it will damage or destroy the flex end.

All tubes should be thoroughly inspected for any condition that might affect the use of the part. This includes close examination of the flange, the main rigid pipe, the shrink clamp, and the flex end (if so equipped). Any doubts or irregularities should be reported to Salco Products or to your company's supervisor over that area.

It is recommended that shrink clamps on tubes that have been in service then pulled out and racked for a period of time be replaced. Additionally, it is good practice to replace the flex end every four to five years. Many factors contribute to the proper functioning and longevity of Salco Hazarsolve's education tube, including good fluid loading and unloading practices; ensuring smooth travel time without hard stops or "humps"; knowledge of the commodities that come in contact with the complete tube; proper handling and storage of the tubes; and utilizing the expertise of experienced mechanics.

#### Scheduled Maintenance:

The tube should be inspected each time it is removed from the car or at every lining inspection. The shrink-wrap should be replaced if there are signs of wear of failure or at the time of each lining inspection.

#### **Hydrochloric Acid/Other:**

It is recommended that the flex end be replaced every 5 years and the dip tube every 10 years.

#### **Sodium Hypochlorite/Sodium Chlorite:**

It is recommended that the flex end be replaced every 5 years and the dip tube inspected after the first 5 years of service and every year after. Replacement may be necessary after 5 years of service.

**NOTE:** For inspection criteria, please see Salco document Education Tube Inspection Criteria\_MI. An education tube can be used after the listed recommended life span, at the equipment owner's discretion, if the part is inspected to the Education Tube Inspection Criteria.

#### COMMODITY EXPOSURE:

**ALL** education pipe materials must be thoroughly evaluated to ensure that the commodities these materials come in contact with will not damage them. **ALL** wetted parts must be reviewed for temperature and chemical compatibility before being placed in service. This, of course, holds true for any part.

***There are numerous factors that contribute to the success of a product. This instruction is but a guide that attempts to cover the essential variables involved with the use of Salco Hazarsolve's education tubes.***

**Figure 2**
