

Master Brewers Safety Toolbox Talk



Hose Fitting Attachment Methods

Overview

Hose fittings are often attached with the wrong type of attachment method. This "Toolbox Talk" will focus on fittings, attachment methods, and how to apply them to the appropriate hose and tube types.

According to the hose assembly guidelines published by NAHAD, the national hose industry association, "Improperly tightened or insufficient number of bands or clamps used per fitting may result in a potentially dangerous hose assembly. A tighter band or clamp keeps the fitting more secure, but excess tension or crimping can damage the hose or tube"

Fitting Attachment Method Types

- Worm Drive Clamp
- T-Bolt Clamp
- Center Punch Band Clamp
- Crimp Ferrule

Common Brewery Fittings

- Tri-Clamp
- DIN / SMS
- Spray Nozzle Swivel &
- Garden Hose (For Washdown)

Attachment Recommendations for Hose and Tube Types

- **Worm Drive Clamp:** Recommended for low psi, low temperature and non-volatile chemical transfer applications. For example: PVC tubing and silicone tubing. Most commonly found in home or small batch brewing set-ups.



- **T-Bolt Clamp:** Can be used in most hose and tube applications in the brewery. It is a good alternative attachment method if crimped ends or band clamps are not an option. Offers good retention on the barb of the fitting used. NOTE: Cold

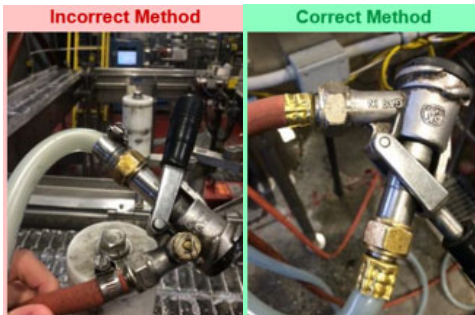


flow may require retightening of the bolt clamp.

- **Band Clamp:** Can also be used in most hose and tube applications in the brewery. It is the most common attachment method used in the field. Offers good retention on the barb of the fitting used.
- NOTE: Use adjustable size clamps as close to the size of the outer diameter of the hose and tubing as possible. The clamps are radiused to fit a range of sizes.



- **CAUTION: DO NOT** over tighten Worm Drive, T-Bolt or Pre-Formed band clamps as it can damage the tube and cover of the hose as well as the shank (barb) of the fitting. **DO NOT** use worm gear clamps for any highly pressurized hose/tubing applications (e.g. air, chemical, water, etc.)



- **Crimp Ferrule:** Can be used on a wide variety of brewery hoses. This method is the best option when done properly by a trained hose assembler as it provides a leak free connection that can operate at the highest system working pressure. **CAUTION:** Over crimping will damage the tube, cover, and the hose shank.



Proper Method of Attachment placement on Hose / Tube.

- Identify the hose/tube to be used for the application.
- Place fitting next to hose and mark the area where the fitting will end and where you will place the attachment method.



- Place the bands, clamps, or ferrules on the hose first. Insert the fitting into the hose.
- Manually applied band or clamps should be placed in the proper area to ensure a proper seal.

CAUTION: Do not place buckles next to each other. This will not allow for a proper seal of the inner tube against the hose barb and may create a leak path.

WRONG



CORRECT



- Crimp Ferrules can only be applied by a hydraulic crimper. The ferrule is attached, and the fitting inserted. The crimper is set to the correct crimp spec and attached. A metal feeler gauge can be used to verify there is a smooth transition from the fitting to tube of hose. This will ensure that there are no

gaps and the fitting isn't over-crimped, which could create areas that allow bacteria to build up.

CAUTION: When using manually applied attachments, there is a chance there will be a gap between the tube and fitting, which may cause bacteria to build up in your hose assembly. Proper CIP procedures are recommended to flush out any foreign particles.

Results of Improperly Attached Fittings



- Worm Drive Clamps are not recommended for wire reinforced hose. They do not provide proper retention from the fitting shank to hose inner tube.
- Over tightening of clamps or bands can also result in deformation of the fitting shank, creating gaps between the shank and tube. This can result in hose leaks and will create areas for bacteria to build up.



- Crimped on Industrial Ferrules

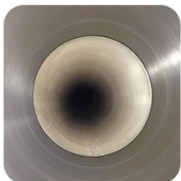


FIGURE 1

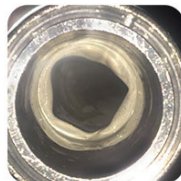


FIGURE 2

Proper Crimping of crimp ferrules allow for a smooth transition from fitting shank to hose tube.(Fig.1) No leaking or bacteria build up. Over crimping of crimp ferrules will result in tube failure and potential for bacteria to form (Fig.2)

NOTE: Crimp Ferrules require a crimp style shank. Standard shanks do not offer a proper retention to the inner tube of the hose.



Figure 1.
Standard Shank

Figure 2.
Crimp Style Shank

NOTE: Crimp shank fittings can also be used with Band and TBolt style retention methods.

CAUTION: Not to be used with Worm Drive Clamps

Tools for Attachment

- **Worm Drive Clamp:**

Flat head screwdriver or nut driver. Open, box or adjustable wrench.



- **T-Bolt Clamp:**

Open, box, or adjustable wrench.

Socket wrench.



- **Band Clamp**

Center punch tool.



Final Notes: If hose fittings and attachment methods are improperly used, this can lead to potential exposure to hazardous substances such as caustics and various other volatile chemicals, hot water and compressed air. Using the correct type and size of hose end fittings/connectors is crucial to ensure life of the hose and eliminates potential hazards and exposure to yourself and other employees.

If you have any questions regarding this Toolbox Talk, please see your supervisor / manager or a member of the Safety Committee.

FOR MORE INFORMATION ON BREWERY SAFETY, PLEASE VISIT THE MBAA BREWERY SAFETY WEBSITE AT:
<http://www.mbaa.com/brewresources/brewsaet>