

**Knowledge domain: Plumbing**  
**Unit: Connections**  
**Skill: Clamps**

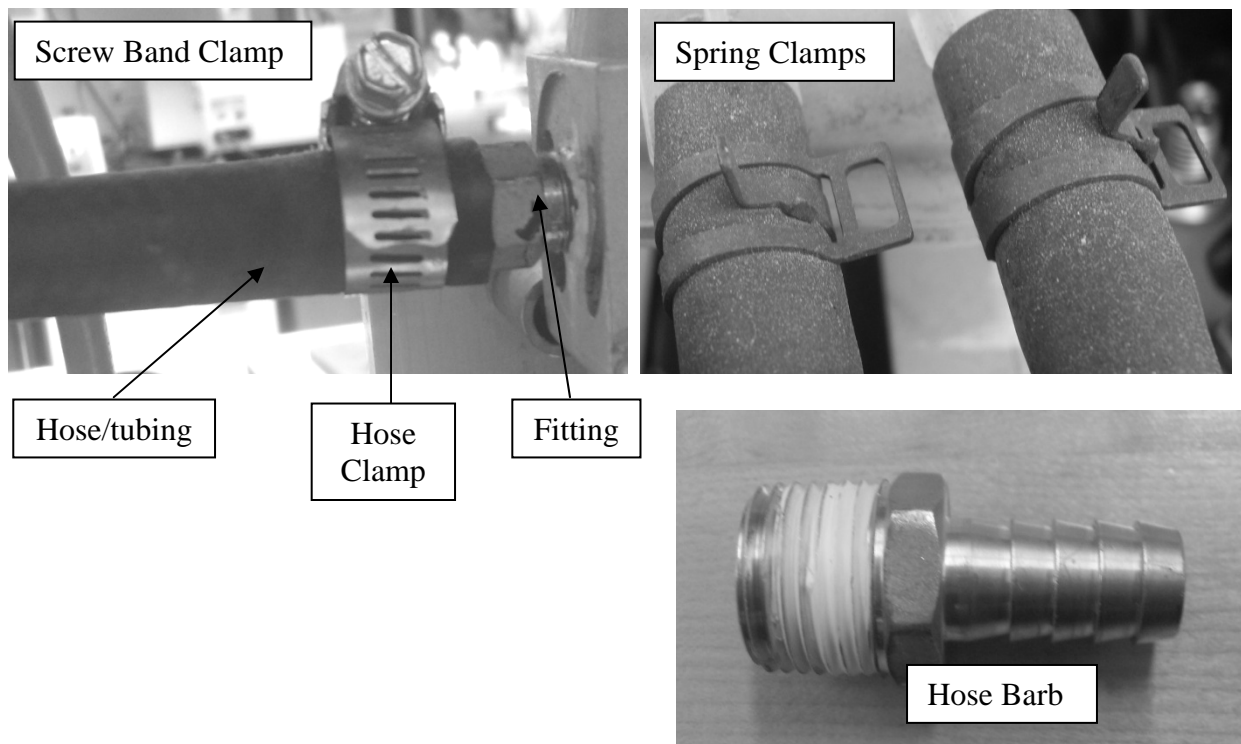
**Tools and Parts Required:**

- |                     |                          |
|---------------------|--------------------------|
| 1) Screw band clamp | 6) Hose pieces           |
| 2) Spring clamp     | 7) Screwdriver, flathead |
| 3) Ear clamp        | 8) Pliers                |
| 4) Wire clamp       | 9) Ear clamp tool        |
| 5) Hose barb        |                          |

**Introduction**

Hose clamps seal hoses or tubing onto a fitting. Hose clamps prevent fluid from leaking. The hose clamp is tightened around the hose and the fitting. Common types of hose clamps are the Screw Band (Worm Gear), Spring, Wire, and Ear Clamps. Hose barbs are one type of fitting.

**Example**

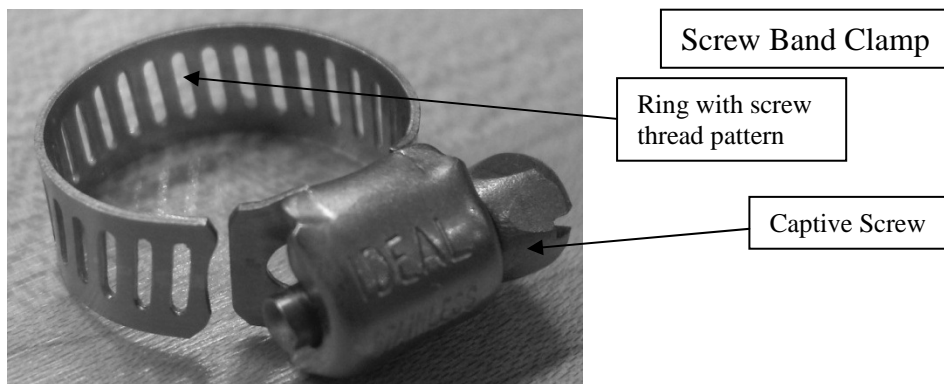


## Identification and Diagnosis

Use a hose clamp when connecting hoses or tubing that will withstand moderate pressure. Automotive and household hoses are under moderate pressure. Do not use hose clamps for high pressures. For high pressure applications, other designs are used.

Hose clamps are also used wherever a tightening band would be useful. Below are common types of hose clamps:

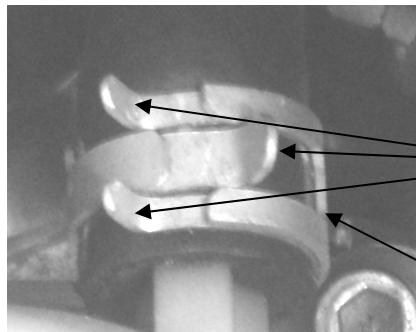
*Screw band clamps* consist of a metal ring with a screw thread pattern. A captive screw is attached to one end. A screwdriver is used to tighten the clamp around the hose. Use screw band clamps for hoses with a diameter of 1/2 inch (1.27cm) or wider.



*Spring Clamps* consist of a ring with protruding ends. Use spring clamps to clamp a hose located in a confined or awkward place. Spring clamps do not require tightening tools.

Spring clamps are used on dryer vents. Spring clamps are used on cooling hoses which range from 1-8 cm in diameter. Spring clamps are not used for high pressures. Spring clamps are good for systems that experience low pressures and vibration.

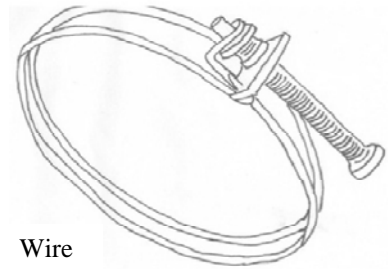
A piece of spring steel wire bent into a loop can serve as a spring clamp. These wire spring clamps are only used on vacuum hoses. These wire spring clamps are opened and closed by hand. These wire spring clamps place a slight pressure on the hose. They prevent the hose from sliding off the hose barb.



Spring Clamp

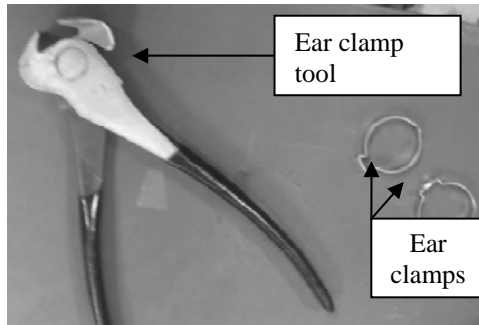
Protrusions

Band



Wire  
Clamp

A *Wire Clamp* consists of a wire ring. A captive nut is attached to one end. A captive screw is attached to the other end. When the screw is tightened, the overlapping ends of the wire are pushed apart, tightening the wire loop around the hose.



Ear clamp  
tool

Ear  
clamps

An *Ear Clamp* consists of a ring with one or more “ears.” The “ears” become permanently deformed when the clamp is secured. The “ears” are almost completely closed when installed.

Use ear clamps for small hose widths. Use ear clamps to provide a concentrated compression on the hose.

## Procedure

*Screw Band Clamp:* Use the screwdriver to open the screw band clamp. Slide the screw band clamp onto the end of the hose. Fit the end of the hose on the hose barb. Slide the screw band clamp over the portion of the hose on the hose barb. Insert the flat end of the screw band clamp underneath the screw on the screw end. Tighten the screw with a screwdriver.



Tighten band  
clamp screw  
when the hose is  
over the hose  
barb.

**Wire Clamp:** Loosen the screw completely. Slide the clamp onto the hose. Fit the hose on the hose barb. Slide the clamp onto the portion of the hose over the hose barb. Tighten the screw with a screwdriver.

**Spring Clamp:** Use pliers to press the tabs toward each other. This increases the diameter of the clamp. Slide the clamp onto the hose beyond where the hose barb will reach. Fit the hose onto the hose barb. Use pliers to press the tabs toward each other again. Slide the clamp onto the portion of the hose over the hose barb. Release the tabs. The clamp will now compress the hose onto the hose barb.



Pinch the protrusions of the spring clamp toward each other to open

**Ear Clamp:** Place the clamp over the end of the hose. Fit the hose on the hose barb. Slide the clamp onto the portion of the hose over the hose barb. Use pliers to close the “ears” by pinching them shut. The clamp will permanently deform. Closing the “ears” causes the band to tighten around the hose.



Squeeze the ear of the ear clamp using a pliers or ear clamp tool. The clamp will permanently deform.

## Exercise

Explain the differences types of clamps to your instructor.

Practice assembling the hose, hose barb and different clamps. Your instructor must verify your work before you continue.

## Preventative Maintenance and Calibration

Always calibrate every medical device before returning it to use.