

Knowledge Domain: Plumbing
Unit: Seal
Skill: Creating a Gasket

Tools and Parts Required:

- 1) Pencil
- 2) Component requiring new gasket
- 3) Gasket paper
- 4) Utility knife

Introduction

A gasket is a seal to prevent air or fluid leakage. Gaskets can be many shapes, but gaskets are usually round. Gaskets seal an opening between two surfaces that are similar in shape. A gasket is placed between two matching machine parts or around pipe joints.

When dismantling a piece of equipment, a gasket can stick to both sides of the part being removed and will tear as the parts are separated. The damaged gasket should be replaced.

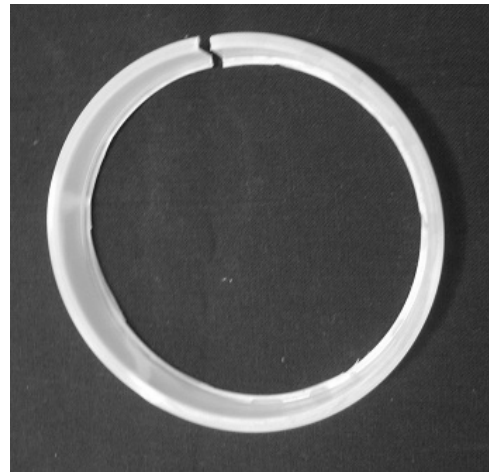
Gaskets can be made out of gasket paper, rubber, metal, fiberglass, or plastic. Preferred gasket materials can bend and create a tight fit when placed between the two surfaces.

Example

Below is an example of a new gasket and a failed gasket.



New gasket



Failed gasket

Identification and Diagnosis

Some gaskets are exposed to high pressures and high temperatures. The high pressures and high temperatures cause the gasket to fail.

A failed gasket can cause gas to leak where the gasket is located. A failed gasket can cause liquid to leak where the gasket is located. A liquid leak can form small drops or a large pool of liquid.

To confirm diagnosis of a failed gasket, remove the gasket for observation. A failed gasket can appear weakened, lack flexibility, have a deformed shape, have a hole, have small cracks, or have a broken ring.

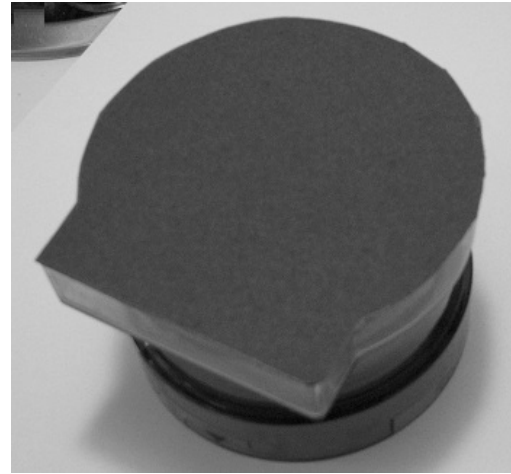
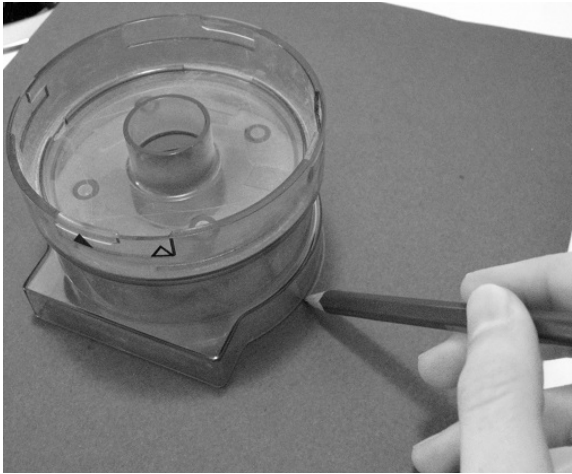
Procedure

1. Identify the component that requires a new gasket. Remove the old gasket.
2. Determine the correct material for the replacement gasket. The replacement gasket material should have similar material properties to the old gasket. You must know the temperature and state (gas or liquid) of the material inside the tubes. Refer to the chart below:

	Gasket Material:	Liquid Gasket:	Rubber:	Plastic:	Paper:
Source/ Examples:	Neoprene, nitrile, silicone, cork, teflon, viton, EPDM Rubber, carbon fiber	"Liquid Gasket", Permatex "Form-a-Gasket"	Used car or bicycle tire	Several layers of plastic bags	Thick paper or cardboard
Low temperature gas (<100°C)	X	X	X	X	X
Low temperature liquid (<100°C)	X	X	X	X	
High temperature gas or liquid (>100°C)	X	X	X		

3. If you are using a commercial gasket material or liquid gasket, follow the directions on the bottle or packaging. If you are using other materials, following the directions below.
4. Place the component that needs a new gasket on the selected material. The sealing surface of the component should be touching the paper.

5. Use a pencil to draw a pattern. Trace the outside edge of the component and any bolt holes onto the selected material. Use a cutting tool and cutout the pattern. Confirm the fit of the replacement gasket on the component.



6. Place the replacement gasket on the sealing surface of the component. Use a pencil to trace the inside diameter and any bolt holes onto the replacement gasket. Cut out the inside diameter
7. Confirm the replacement gasket matches the sealing surface of the component.
8. Install the replacement gasket. You may lightly lubricate both sides of the gasket.

Exercise

Your instructor will give you a component that requires a new gasket. The component can come from a piece of medical equipment, piping, or from an old car.

Select the correct material for the new gasket. Trace the sealing surface of the component and cut a new gasket from the selected material. Your instructor must verify your work before you continue.

Preventative Maintenance and Calibration

Gaskets fail due to exposure to high pressures and high temperatures over time. To prevent early gasket failure, ensure the medical device is not generating excess high temperatures or pressures.

Do not overtighten the connecting bolts between gasketed materials. Over-tightening damages the gasket.

Inspect the gasket frequently and record the observation. The side of the gasket should be a uniform color all the way around the seal. If the gasket is discolored in one area, it may indicate a gasket failure.

Always calibrate every medical device before returning it to use.