



## MEC432 Technical Project

### Project: Corrugated Gasket Machine

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### Objective

Design a machine to manufacture flat gaskets by cutting rings from stainless steel sheet and corrugating both sides.

### Abstract

A.R. Thomson Group is a Canadian company that distributes and custom manufactures specialty fluid containment equipment for the petrochemical industry. Their head office is located in Surrey, British Columbia and they have many branch plants including one in Edmonton. The Edmonton plant would like to have a machine designed to satisfy a product specification required by Chevron. The single machine would cut flat gaskets from 20 gauge 316 stainless steel then roll a corrugated profile into both sides. Gaskets would range in size from 8-inch O.D. to 120-inch O.D. See the attached addendum for additional manufacturing information.

### Company Contact Information

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### Intellectual Property Ownership

The solution developed by the NAIT student team(s), and the documentation supporting it, will be the intellectual property of A.R. Thomson Group.

### Deliverables to Industry Sponsor

Final design report, working drawing set, cost estimate, engineering calculations, and any supporting data (i.e. specification sheets, test data, etc.).

# Addendum – Chevron Corrugated Gasket Specification

## 4.1 Material (Metal)

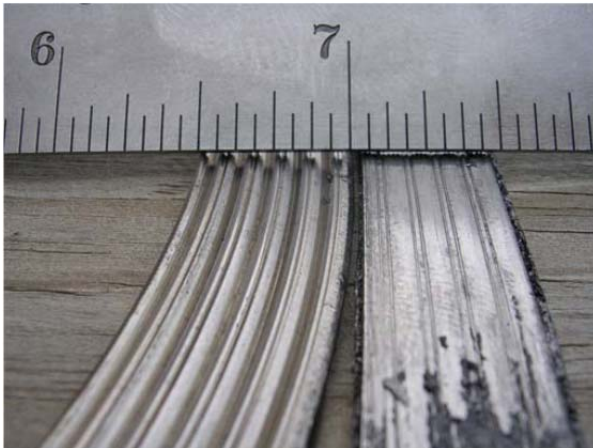
1. Gasket metal ring core shall be 1/32 inch (0.711 mm) thick (22 BWG) +/- 0.002 inch (0.051 mm) 304L or 316L SS or other specified metal alloy.
2. Austenitic stainless steels shall be furnished in the annealed condition.

## 4.2 Dimensions (ideal size range 8" ID minimum, 120" ID maximum)

1. ID and OD tolerances are  $\pm 1/32$  inch (0.794 mm).
2. Rings shall be a radial width of 1/2 inch (12.7 mm) or wider.

## 4.3 Corrugation Height and Pitch

1. Total corrugation height (tip to tip) of 0.045 inch (1.143 mm) is considered optimum if using 22 BWG plate.
  - a. Minimum acceptable corrugated height shall be 0.040 inches (1.016 mm).
  - b. Maximum acceptable corrugated height shall be 0.050 inch (1.27 mm).
2. Minimum pitch of corrugations shall be 1/8 inch (3.175 mm), except standard pipe flange gaskets NPS 1-1/2 inches and smaller, which shall be 3/32 inch (2.381 mm) pitch.
3. In the pictures shown below the gasket core on the left is acceptable while the core on the right is not acceptable.



## 5.3 Ring Flatness

1. Gasket rings shall lay completely flat before applying graphite, without any radial bending of the ring that would cause the ID or OD of the ring to lift up off a flat surface.
2. Minor “waving” around the circumference or across pass partition ribs shall be acceptable, as long as the waving does not rise more than 1/4 inch (6.35 mm) above a flat surface.