

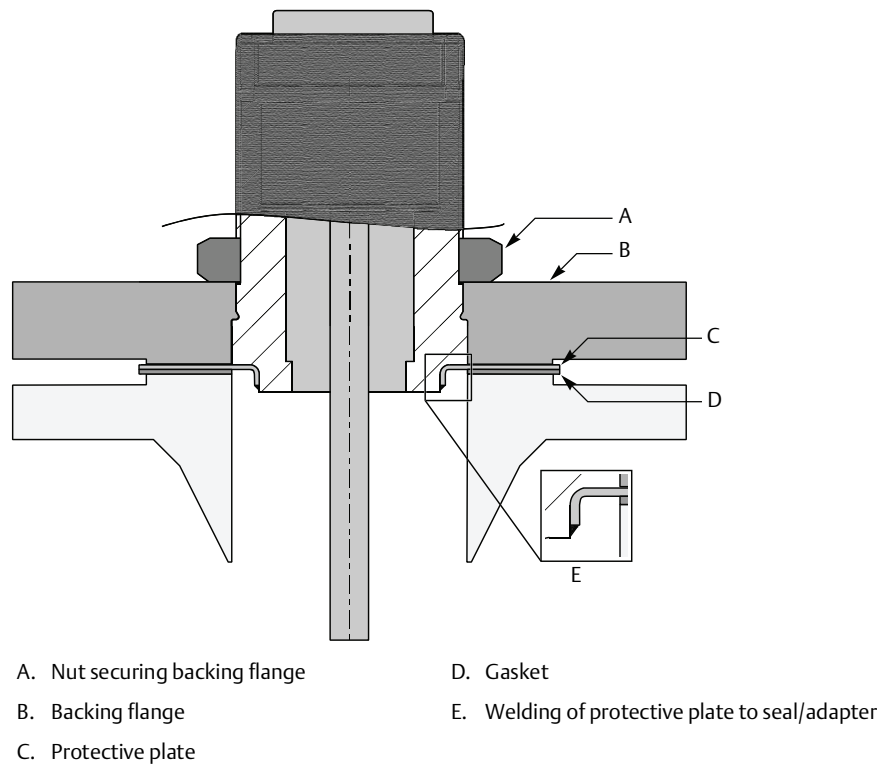
Flange with Protective Plate Design for Radar Transmitters

1.0 Introduction

The protective plate design is a technical solution for flanged process connections suitable in applications where the radar transmitter is exposed to harsh environments. The design meets customers' process requirements and is available for both guided wave radar (GWR) and non-contacting radar (NCR) transmitters⁽¹⁾. The radar transmitter parts exposed to the process environment (i.e. probe/antenna, protective flange plate, and process seal) are made of exotic materials. The flange is composed of two parts:

- Protective flange plate
- Backing flange

Figure 1-1. Plate Design with Raised Face Backing Flange



1. For non-contacting radars the protective plate design is only available for cone antennas. Purging connection is possible for non-contacting radars, however the gasket is required to have a minimum thickness of 0.125 in. (3.2 mm).

2.0 The protective plate design

For applications where the radar transmitter is exposed to harsh environments there is a requirement to protect the exposed transmitter parts (i.e. probe/antenna, flange and seal) with exotic materials and alloys. For standard flanged connections manufactured in exotic material the complete flange is made of exotic material. The requirement for the exotic material is the wetted part of the flange, facing the process. The flanged process connection with protective plate design was developed to reduce usage of exotic material and continue to meet process requirements.

2.1 Material of construction

The protective plate design is a flanged tank connection composed of a protective flange plate manufactured in the same exotic material as the probe/antenna, and a backing flange made of 316/316L/EN 1.4404. The protective flange prevents the backing flange from being exposed to the tank atmosphere as shown in [Figure 1-1 on page 1](#).

Available materials of construction for the wetted parts (i.e. protective plate, adapter, and probe/antenna) are Alloy C-276 (UNS N10276) and Alloy 400 (UNS N04400), for other material inquiries contact your local Emerson™ representative.

2.2 Flange specifications

The protective plate with thickness 0.06 in. (1.6 mm) is welded to the adapter for sealing of process environment. The plate surface finish R_a is 3.2-6.3 μm , following the standards (i.e. ASME B16.5, EN 1092-1, JIS B2220).

The backing flange can be specified with raised face or flat face according to the specified flange standard. The backing flange is secured to the protective plate and the adapter by a nut at the factory. The nut is tightened with a torque of 30 ft-lb (40 Nm).

A flat faced backing flange will have the overall design of a raised face flange, due to the addition of the protective plate covering only the raised face surface, see [Figure 1-1 on page 1](#).

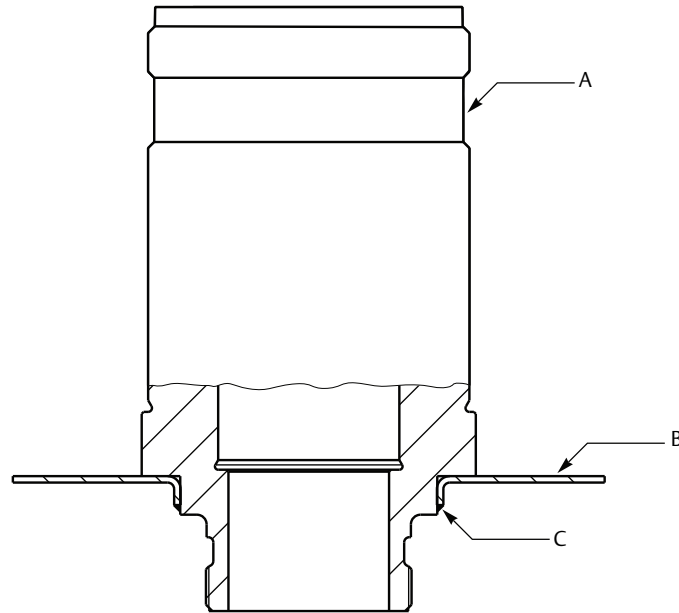
2.3 Flange ratings

Flange ratings available according to 316L SST backing flange ASME B16.5 Table 2-2.3, EN 1092-1 material group 13E0, and JIS B2220 material group 2.3. For further details (i.e. gasket requirements, process conditions, and construction material) refer to the product Product Data Sheet.

3.0 Welding

The protective plate is welded to the seal according to specified standard (EN/ISO 15613, ASME IX) with arc welding (i.e. GTAW, TIG, WIG, and 141 (142)). [Figure 1-2](#) illustrates the welding location on a non-contacting radar adapter. The welding location for a guided wave radar adapter is illustrated in [Figure 1-1 on page 1](#). For more information regarding the welding of the protective plate to the adapter, contact your local Emerson representative.

Figure 1-2. Welding of Protective Plate to Non-Contacting Radar Adapter



A. Adapter
B. Plate

C. Welding

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