Permissible mismatch is 0.5 mm.
At the transition, the maximum signal transmission and avoid arcing.
Main flange in order to maximize possible with the aperture in a flange must coincide as closely as possible the center of the aperture.

Functional Objective:
The original CAD model of the part.

Smart GDX77™ Decoding & Re-encoding
An Exercise in

Case Study - Microwave Flange

57
Case Study - Microwave Flange

The Original Tolerancing Scheme
Decoding the Original Tolerance Scheme

Case Study: Microwave Flange

1. Key to the Flange
   - Outer Diameter: 105.3 ± 0.05 mm
   - Inner Diameter: 75.1 ± 0.05 mm
   - Thickness: 8 ± 0.1 mm

2. Dimensions
   - 4x4.5 mm holes
   - 4x7.5 mm slots

3. Tolerances
   - ±0.15 mm for cylindrical dimensions
   - ±0.05 mm for flat surfaces

Decoding Commentary:

The original tolerance scheme is complex, with numerous dimensions and tolerances. The key to decoding it is understanding the standard tolerance symbols and their implications. The outer diameter has a tighter tolerance than the inner diameter, indicating a focus on maintaining shape and size consistency. The thickness tolerance is relatively loose, suggesting a less stringent requirement for this dimension.
Case Study - Microwave Flange
The Original Geometry Re-encoded - Alternative I

Case Study - Microwave Flange
Case Study - Microwave Flange

Re-encoding the Original Geometry One more Time

Now let's re-encode the drawing once more without changing the geometry, but further improving the proper encoding of function and also eliminating those pesky Radius tolerances. Since all ten bolt holes in fact act to eliminate roll and two more degrees of translational freedom, let's say that with GD&T!
The Original Coaxonomy: Alternate II

Case Study - Microwave Flange
Case Study - Microwave Flange

Reconfiguring the Geometry and Re-encoding the GD&T

Now re-encode the drawing based on the suggested improvements described on the preceding page.

Once complete, if you are using Surface Profile to control the aperture and the outer periphery of the flange, consider how to smooth their surfaces without tightening the tolerance on their "size", orientation and location, and add such controls.
Case Study - Microwave Flange

Encoding the Mating Flange

The mating part is identical to the original flange except that the bolt hole pattern is replaced by a pattern of M6 threaded bores. Please encode the features of the mating part to ensure a proper fit, keeping in mind the permissible mismatch of the surfaces of the aperture, namely 0.5 mm.

Drawing Note:
Datum Features B and C will receive shoulder bolts with a shoulder of Ø6.4±0.025.

Copyright by Multi Metrics, Inc., Menlo Park, CA 1999 and 2001 All Rights Reserved
The Main Flange Encoded

Case Study - Microwave Flange
Case Study - Microwave Flange

Now please check the drawings for both mating flanges to make sure the overlap between the surfaces of the mating apertures can never exceed the allowed 0.5 mm.

Imagine the Assembly process!

Remember to
EXAGGERATE!

Have you taken the DRF Overlap / Mobility factor into account?

If this factor could have an effect, please calculate its magnitude and re-encode the drawings for both flanges to account for it.
Case Study - Microwave Flange

Alternative IV with the DRF Mobility Factor Considered
The Original Frame Encoded
Case Study - Microwave Flange

The Mating Flange Encoded
with the DRF Mobility Factor Considered

Increasing the Surface Profile tolerance zone from 0.25 to 0.35 still ensures a worst case aperture overlap of 0.5.

Drawing Note:
Datum Features B and C will receive shoulder bolts with a shoulder of Ø6.4±0.025.