

# FABRICATING TOLERANCES

*Prepared by*

*Pipe Fabrication Institute Engineering Committee*



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## METRIC CONVERSIONS

The conversion of quantities between systems of units involves a determination of the number of significant digits to be retained. All conversions depend upon the intended precision of the original quantity and are rounded to the appropriate accuracy.

Pipe sizes together with applicable wall thickness are not shown with metric equivalents.

The SI (metric) values were included with the customary U.S. values in this Standard are the rounded equivalents of the U.S. values and are for reference only.

Metric units were derived utilizing the following conversion factor:

Conversion	Factor
inches to millimeter	25.4

### 1. Scope

- 1.1 This standard covers general pipe shop fabricating tolerances for prefabricated piping assemblies. This standard shall not apply to field erected pipe. This Standard does not address manufacturing tolerances such as straightness or ovality that are addressed by material specifications.

### 2. Linear Tolerances

- 2.1 The tolerances on linear dimensions (intermediate or overall) apply to the face to face, face to end, and end to end measurements of fabricated straight pipe and headers; center to end or center to face of nozzles or other attachments; or center to face of bends; as illustrated on Fig. 1. These tolerances are not cumulative.
- 2.2 Linear tolerances on "A" are  $\pm 1/8"$  (3.0 mm) for sizes 10" and under,  $\pm 3/16"$  (5.0 mm) for sizes 12" through 24" and  $\pm 1/4"$  (6.0 mm) for sizes over 24" through 36".
- 2.3 Linear tolerances on "A" for sizes over 36" are subject to tolerances of  $\pm 1/4"$  (6.0 mm), increasing by plus or minus  $1/16"$  (2.0 mm) for each 12" in diameter over 36".

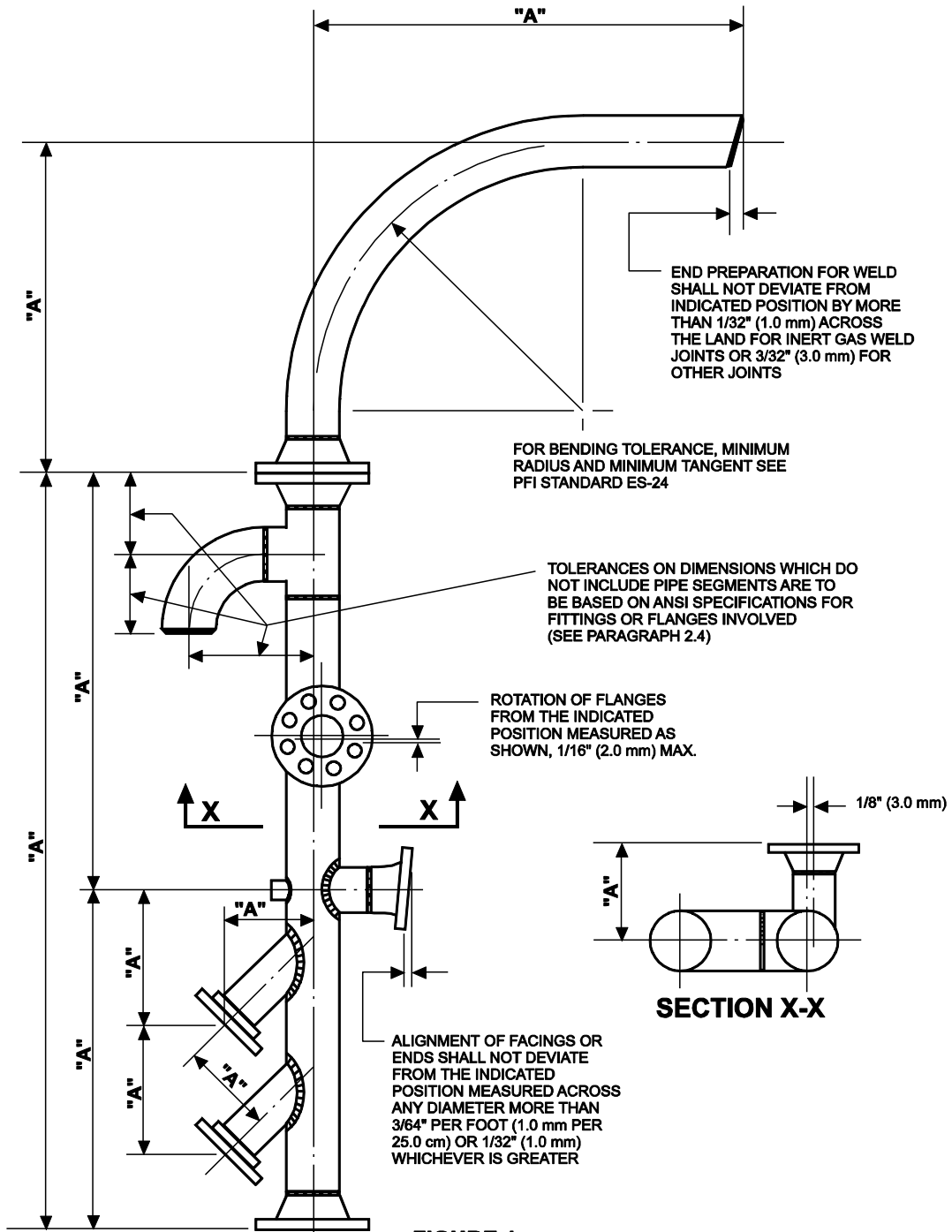
- 2.4 Due to the cumulative effects of tolerances on fittings or flanges, when joined without intervening pipe segments, deviations in excess of those specified in paragraphs 2.2 and 2.3 may occur, and are acceptable.

### 3. Angularity and Rotation Tolerances

- 3.1 Angularity tolerance across the face of flanges, weld end preparation and on rotation of flanges are as stated on Fig. 1.

### 4. Closer Tolerances

- 4.1 When closer tolerances than those given in paragraphs 2.2, 2.3, 2.4 or as addressed in ES 49 are necessary, they shall be subject to agreement between the Purchaser and Fabricator.



**FIGURE 1**  
**APPLICATION OF PIPE FABRICATION TOLERANCES**