

EN 1092-1 flanges rating with ASME/ASTM materials

Why does an EN flange made from ASME material, if calculated by rating, have lower performance than what is tabulated in Annex G?

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A question often asked by our software customers concerns the **rating verification of European EN 1092-1 flanges with ASME PMA materials**. With the same material group (indicated in Annex B) it happens that a flange with ASME material has a lower rating than the one pre-calculated by the standard and indicated in Annex G for the materials listed in Table 9. The confusion derives from the fact that some ASME materials are also listed by the standard in Annex D for information purposes. However, this does not mean that it is also possible to use the pre-calculated ratings of Annex G, but simply that the standards allow their use through the complete calculation procedure provided for in Annex F.

Unfortunately, this clarification is not clearly indicated in the European version of the standard, but in some versions implemented by individual European countries, for example in BS EN 1092-1:

National Annex NA (informative) to BS EN 1092-1:2007+A1:2013

NA.1 Introduction

In BS EN 1092-1:2007+A1:2013, the materials and material groups used in the manufacture of flanges are given in Table 9 and the Pressure/Temperature ratings of those materials and material groups are given in Annex G (normative).

Additional materials that are widely used in Europe but not listed, either as individual materials or as material groups, in Table 9, or in other EN standards, are given in Annex D (informative). The Pressure/Temperature ratings in Annex G only cover the materials and material groups listed in Table 9. As a result, EN 1092-1:2007+A1:2013 does not include any Pressure/Temperature information for the additional materials given in Table D.1.

For some groups of materials, Annex F provides the calculation of the allowables in table F.2.5-1 through yield strength at 1% ($R_{p1.0t}$), which however is not indicated in the ASME material specifications. The program therefore uses the 0.2% yield ($R_{p0.2t}$) more conservatively, which inevitably leads to a lower rating when compared with that of Annex G or Annex F itself if calculated with the European material equivalent.

Our advice is therefore to order the EN 1092-1 flanges with European materials and not to use, if possible, ASME PMA materials in case of calculation by rating only.