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BSI Standards Publication

Flanges and their joints – Design rules for gasketed circular flange connections

Part 2: Gasket parameters

bsi.

National foreword

This Published Document is the UK implementation of CEN/TR 1591-2:2020. It supersedes BS EN 1591-2:2008, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PSE/15, Flanges.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Flansche und ihre Verbindungen - Regeln für die Auslegung von Flanschverbindungen mit runden Flanschen und Dichtung - Teil 2: Dichtungskennwerte

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European foreword

This document (CEN/TR 1591-2:2020) has been prepared by Technical Committee CEN/TC 74 “Flanges and their joints”, the secretariat of which is held by DIN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1591-2:2008.

The major changes in comparison with EN 1591-2:2008 include:

- The introduction of the creep parameter $\boldsymbol{\Delta e_{Gc}}$;
- The introduction of the compressed gasket thickness measured during compression phase e_G;
- The removal of E_G and e_G results tables for the gasket codes K04, E02, G02, A02, G01, B01 and F01 showing measurement discrepancies.

EN 1591, *“Flanges and their joints — Design rules for gasketed flange connections”* consists of the following parts:

— *Part 1: Calculation method*

— *Part 2: Gasket parameters (CEN/TR)*

— *Part 3: Calculation method for metal to metal contact type flanged joint (CEN/TS)*

— *Part 4: Qualification of personnel competency in the assembly of the bolted connections of critical service pressurized systems Pressure Equipment Directive;*

— *Part 5: Calculation method for full face gasketed joints (CEN/TR).*

The data values given in this document were all determined by the test methods given in EN 13555. The data given was obtained during the PERL Project[1)] during which the test methods of EN 13555 were assessed for practicability and repeatability by the test laboratories at MPA and CETIM (see footnotes 2 and 3 of Table A.1). The materials selected for evaluation during that project were those suggested by the organisations taking part in the PERL project. The materials tested in that project, and therefore the data given in this document, are just a selection of the total range of commercial gasket offerings that are available from the various gasket manufacturers and distributors. The data presented in this document is intended to assist engineers using EN 1591-1 during their preliminary calculations. Other public sources of reliable data are given in Annex B. In all cases it is expected that engineers will obtain from the manufacturer of their choice the data for the gasket intended to be used in the application in hand. The website of the European Sealing Association, http://www.europeansealing.com/, contains links to their members throughout Europe.

The importance of using the data for the exact style, make and thickness of gasket intended to be used can be seen from the dispersion of the results between gasket makes within a style and thickness in this document.

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1) PERL, *Pressure Equipment, Reduction of Leak rate: Gasket parameters measurement, RTD Project in the Framework of the "Competitive & Sustainable Growth" Programme.*

1 Scope

This document details generic gasket parameters for use in EN 1591-1 during preliminary calculations during which the type of gasket to be used in an application is to be decided. Once the gasket type has been decided the parameters for gaskets of that type from the different potential commercial suppliers should be used in further calculations as within a gasket type there will be differences depending upon the supplier.

WARNING — For the final calculations using the method given in EN 1591-1 the reader is directed to obtain gasket parameters for the selected generic type of gasket from the intended gasket manufacturer. This is because the data for a generic gasket type will vary between manufacturers. This variation can be seen in the tables of data which are embodied in this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1591-1, *Flanges and their joints - Design rules for gasketed circular flange connections - Part 1: Calculation*

EN 13555, *Flanges and their joints - Gasket parameters and test procedures relevant to the design rules for gasketed circular flange connections*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1591-1 and EN 13555 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp/ui

— IEC Electropedia: available at http://www.electropedia.org/

4 Typical gasket parameters for various gasket styles

4.1 General

The data given in the following tables is only intended to be used in preliminary calculations using EN 1591-1. The data was obtained using the test methods given in EN 13555 during the testing of a selection of a few of the many styles and makes of commercial gasket that are on offer in Europe. For final calculations the user of EN 1591-1 should contact the gasket supplier of choice and obtain the data for the style and thickness of the gasket intended to be used.

EN 13555 permits the testing of gaskets sized for either DN40/PN40 or NPS 4 CLASS 300 flanges. All the data values given in this document were obtained from DN40/PN40 gaskets.

It should be noted that the rules of EN 13555 regarding $\boldsymbol{Q}_{\mathbf{Smax}}$ have been adhered to in that where no collapse was found during the $\boldsymbol{Q}_{\mathbf{Smax}}$ test then the value of $\boldsymbol{Q}_{\mathbf{Smax}}$ is taken to be that of the surface pressure, $\boldsymbol{Q}_{\mathbf{i}}$, used during the $\boldsymbol{P}_{\mathbf{QR}}$ test with the highest surface pressure tabulated.

The data in the following sets of tables is presented in three gasket parameter groupings, $\boldsymbol{Q}_{\mathbf{min[L]}}$ and $\boldsymbol{Q}_{\mathbf{Smin[L]}}$ in the 4.2 set of tables followed by $\boldsymbol{Q}_{\mathbf{Smax}}$ and $\boldsymbol{P}_{\mathbf{QR}}$ in the 4.3 set and then $\boldsymbol{E}_{\mathbf{G}}$ and $\boldsymbol{e}_{\boldsymbol{G}}$ in the 4.4 set to allow easy appreciation of how the parameter varies with gasket type. A brief explanation of the parameters in the grouping is given at the start of each set. For more information about the gasket parameters or test methods EN 13555 should be consulted.