
**Petroleum and natural gas
industries — Formulae and
calculations for the properties of
casing, tubing, drill pipe and line pipe
used as casing or tubing**

*Industries du pétrole et du gaz naturel — Formules et calculs relatifs
aux propriétés des tubes de cuvelage, des tubes de production, des
tiges de forage et des tubes de conduites utilisés comme tubes de
cuvelage et tubes de production*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 5, *Casing, tubing and drill pipe*.

This second edition cancels and replaces the first edition (ISO/TR 10400:2007), which has been technically revised.

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Introduction

Performance design of tubulars for the petroleum and natural gas industries, whether it is formulated by deterministic or probabilistic calculations, compares anticipated loads to which the tubular can be subjected to the anticipated resistance of the tubular to each load. Either or both of the load and resistance can be modified by a design factor.

Both deterministic and probabilistic approaches to performance properties are addressed in this document. The deterministic approach uses specific geometric and material property values to calculate a single performance property value. The probabilistic method treats the same variables as random and thus arrives at a statistical distribution of a performance property. A performance distribution in combination with a defined lower percentile determines the final design formula.

Both the well design process itself and the definition of anticipated loads are currently outside the scope of standardization for the petroleum and natural gas industries. Neither of these aspects is addressed in this document. Rather, it serves to identify useful formulae for obtaining the resistance of a tubular to specified loads, independent of their origin. It provides limit state formulae (see annexes) which are useful for determining the resistance of an individual sample whose geometric and material properties are given, and design formulae which are useful for well design based on conservative geometric and material parameters.

Whenever possible, decisions on specific constants to use in a design formula are left to the discretion of the reader.

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