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BSI Standards Publication

# Aluminium and aluminium alloys — Mechanical potential of Al-Si alloys for high pressure, low pressure and gravity die casting



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**National foreword**

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

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TECHNICAL REPORT

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English Version

# Aluminium and aluminium alloys - Mechanical potential of Al-Si alloys for high pressure, low pressure and gravity die casting

Aluminium et alliages d'aluminium - Potentiel mécanique des alliages Al-Si coulés sous pression et dans des moules permanents pour moulage par gravité et basse pression

Aluminium und Aluminiumlegierungen - Potential der mechanischen Eigenschaften von Al-Si-Legierungen für Druckguss, Niederdruckguss und Schwerkraftkokillenguss

This Technical Report was approved by CEN on 9 September 2014. It has been drawn up by the Technical Committee CEN/TC 132.

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## Foreword

This document (CEN/TR 16748:2014) has been prepared by Technical Committee CEN/TC 132 “Aluminium and aluminium alloys”, the secretariat of which is held by AFNOR.

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

## 1 Scope

This Technical Report presents the characteristics of reference dies and reference castings, to be used for evaluating the mechanical potential (in terms of Ultimate Tensile Strength, Yield Strength and Elongation) which can be expected by Al-Si based alloys, cast by high pressure, low pressure and gravity (permanent mould) processes. These properties are measured on separately cast test specimens produced with state-of-the-art knowledge on die design, process management and alloy treatments correctly applied to minimize defects and imperfections.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1559-1, *Founding - Technical conditions of delivery - Part 1: General*

EN 1559-4, *Founding - Technical conditions of delivery - Part 4: Additional requirements for aluminium alloy castings*

EN 1676, *Aluminium and aluminium alloys - Alloyed ingots for remelting - Specifications*

EN 1706, *Aluminium and aluminium alloys - Castings - Chemical composition and mechanical properties*

EN 12258-1:2012, *Aluminium and aluminium alloys - Terms and definitions - Part 1: General terms*

EN ISO 6892-1, *Metallic materials - Tensile testing - Part 1: Method of test at room temperature (ISO 6892-1)*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12258-1:2012 and the following apply.

**3.1**
**casting process**
process in which molten metal is introduced into a mould where it solidifies

[SOURCE: EN 12258-1:2012, 3.1.1]

**3.2**
**die casting process**
casting process in which molten metal is injected under substantial pressure, typically above 7 MPa, into a metal die and solidified under this pressure

Note 1 to entry: Die casting process is also referred to as “pressure die casting (process)” or “high pressure die casting (process)”.

[SOURCE: EN 12258-1:2012, 3.1.10]

**3.3**
**permanent mould casting process**
casting process in which molten metal is introduced by gravity or low pressure into a mould constructed of durable material, typically iron or steel

Note 1 to entry: A permanent mould casting process where the metal solidifies in a metal mould under low pressure (typically less than 1 bar above atmospheric pressure) is also referred to as a “low pressure die casting process”.

[SOURCE: EN 12258-1:2012, 3.1.9]