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**Geometrical product specifications  
(GPS) — Dimensional and geometrical  
tolerances for moulded parts —**

**Part 2:  
Rules**

*Spécification géométrique des produits (GPS) — Tolérances  
dimensionnelles et géométriques des pièces moulées —  
Partie 2: Règles d'utilisation*

ISO/TS 8062-2:2013

<https://standards.iteh.ai/catalog/standards/sist/9941ca72-8109-46ef-9d32-20efa9398b63/iso-ts-8062-2-2013>



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# Contents

	Page
<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>2</b>
<b>4 Symbols</b> .....	<b>3</b>
<b>5 Designation on drawings</b> .....	<b>5</b>
<b>6 Drawing type indicator</b> .....	<b>5</b>
6.1 Single and combined drawings.....	5
6.2 Final moulded part drawings.....	5
6.3 Intermediate machined moulded part drawings.....	6
6.4 Final machined moulded part drawings.....	6
6.5 Identifier for machining by the supplier.....	6
<b>7 Drawing indications</b> .....	<b>7</b>
7.1 Surface texture symbols.....	7
7.2 Part condition identifiers.....	7
7.3 Required machining allowance, RMA.....	11
<b>8 Indication of general tolerances</b> .....	<b>12</b>
8.1 General tolerances according to ISO 8062-3.....	12
8.2 General surface profile tolerance.....	12
<b>9 Types of specifications</b> .....	<b>12</b>
9.1 General.....	12
9.2 Specification of final moulded-part condition.....	12
9.3 Specification of intermediate machined moulded-part conditions.....	13
9.4 Specification of final machined moulded-part condition.....	14
<b>10 Tolerancing</b> .....	<b>15</b>
10.1 General.....	15
10.2 Tolerancing of final moulded parts.....	15
10.3 Tolerancing of intermediate machined moulded parts.....	15
10.4 Tolerancing of final machined moulded part.....	16
<b>Annex A (normative) Proportions and dimensions of graphical symbols</b> .....	<b>20</b>
<b>Annex B (informative) Accumulation method, relationship between moulded part and machined moulded part</b> .....	<b>22</b>
<b>Annex C (informative) Calculation of moulded part nominal dimensions of features to be machined</b> .....	<b>27</b>
<b>Annex D (informative) Examples for the multiple tolerancing method</b> .....	<b>29</b>
<b>Annex E (informative) Drawing examples</b> .....	<b>42</b>
<b>Annex F (informative) Task assignment</b> .....	<b>52</b>
<b>Annex G (informative) Relation to the GPS matrix model</b> .....	<b>55</b>
<b>Bibliography</b> .....	<b>57</b>

## 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. [www.iso.org/directives](http://www.iso.org/directives)

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. [www.iso.org/patents](http://www.iso.org/patents)

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

The committee responsible for this document is ISO/TC 213, *Dimensional and geometrical product specifications and verification*.

ISO 8062 consists of the following parts, under the general title *Geometrical product specifications (GPS) — Dimensional and geometrical tolerances for moulded parts*:

- *Part 1: Vocabulary* [ISO/TS 8062-2:2013](https://standards.iteh.ai/catalog/standards/sist/9941ca72-8109-46ef-9d32-20efa9398b63/iso-ts-8062-2-2013)
- *Part 2: Rules [Technical Specification]* <https://standards.iteh.ai/catalog/standards/sist/9941ca72-8109-46ef-9d32-20efa9398b63/iso-ts-8062-2-2013>
- *Part 3: General dimensional and geometrical tolerances and machining allowances for castings*

The following part is under preparation:

- *Part 4: General tolerances for castings (according to the GPS rules)*

This corrected version of ISO 8062:2013 incorporates a change in 7.2.2, Figure 8.

## Introduction

This part of ISO 8062 is to be regarded as a complementary process-specific tolerance geometrical production specification (GPS) standard (see ISO/TR 14638). It influences chain links 1, 2 and 3 of the chain of standards on mouldings.

The ISO/GPS Masterplan given in ISO/TR 14638 gives an overview of the ISO/GPS system of which this document is a part. The fundamental rules of ISO/GPS given in ISO 8015 apply to this document and the default decision rules given in ISO 14253-1 apply to specifications made in accordance with this document, unless otherwise indicated.

For more detailed information about the relation of this part of ISO 8062 to other standards and the GPS matrix model, see [Annex F](#).

This part of ISO 8062 takes into account experiences with the application of previous standards (e.g. ISO 8062:1994, ASME Y14-8M:1996, and ISO 1101).

The tolerancing methods in this part of ISO 8062 are not yet fully developed within the new approach of geometrical product specifications (GPS) according to ISO 17450. The requirements for castings (mainly due to the uncertainty in the calculation of the shrinking of the casting) remain incompatible with the GPS standards. Therefore, this Technical Specification has been issued in order to gather further experience in the tolerancing of castings.

It is intended that the next version of this document will include more realistic ways of calculating the nominal dimension  $d_G$  of the final moulded part by elaborating GPS-conformant ways of combining linear dimensions and tolerance zones.

This document is intended to cover all types of moulded parts. However, most of the examples refer to castings.

When the methods of this part of ISO 8062 are used in 3D models, provisions have to be made in order to distinguish between theoretically exact dimensions (TEDs) and linear and angular dimensions with plus/minus tolerances.

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# Geometrical product specifications (GPS) — Dimensional and geometrical tolerances for moulded parts —

## Part 2: Rules

### 1 Scope

This part of ISO 8062 gives the rules for geometrical dimensioning and tolerancing of final moulded parts and parts machined out of moulded parts. It also gives rules and conventions for the indications of these requirements in technical product documentation and specifies the proportions and dimensions of the graphical symbols to be used.

This part of ISO 8062 provides symbols which may be used to identify the relative completeness of the moulded features and parts. These graphical symbols should not be confused with the graphical symbols for surface texture according to ISO 1302, which are notably larger.

### 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.

ISO 129-1, *Technical drawings — Indication of dimensions and tolerances — Part 1: General principles*

ISO 1101, *Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

ISO 1302, *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation*

ISO 2692, *Geometrical product specifications (GPS) — Geometrical tolerancing — Maximum material requirement (MMR), least material requirement (LMR) and reciprocity requirement (RPR)*

ISO 5458, *Geometrical Product Specifications (GPS) — Geometrical tolerancing — Positional tolerancing*

ISO 5459, *Geometrical product specifications (GPS) — Geometrical tolerancing — Datums and datum systems*

ISO 7083, *Technical drawings — Symbols for geometrical tolerancing — Proportions and dimensions*

ISO 8015, *Geometrical product specifications (GPS) — Fundamentals — Concepts, principles and rules*

ISO 8062-1, *Geometrical product specifications (GPS) — Dimensional and geometrical tolerances for moulded parts — Part 1: Vocabulary*

ISO 8062-3:2007, *Geometrical product specifications (GPS) — Dimensional and geometrical tolerances for moulded parts — Part 3: General dimensional and geometrical tolerances and machining allowances for castings*

ISO 10135, *Geometrical product specifications (GPS) — Drawing indications for moulded parts in technical product documentation (TPD)*

ISO 10579, *Geometrical product specifications (GPS) — Dimensioning and tolerancing — Non-rigid parts*

ISO 13715, *Technical drawings — Edges of undefined shape — Vocabulary and indications*

ISO 14405-2, *Geometrical product specifications (GPS) — Dimensional tolerancing — Part 2: Dimensions other than linear sizes*

ISO 17450-1, *Geometrical product specifications (GPS) — General concepts — Part 1: Model for geometrical specification and verification*

ISO 81714-1, *Design of graphical symbols for use in the technical documentation of products — Part 1: Basic rules*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8062-1, ISO 1101, ISO 5459, ISO 17450-1 and the following apply.

#### 3.1 moulded feature

<of a moulded part> feature which has not been machined on a moulded part

#### 3.2 intermediate machined feature

<of a moulded part> feature of a moulded part which has undergone machining and which subsequently will be machined to its final condition

Note 1 to entry: An intermediate machined feature is typically a roughly machined *moulded feature* (3.1).

Note 2 to entry: An intermediate machined feature can be used as a datum for subsequent machining of the moulded part.

#### 3.3 final machined feature

<of a moulded part> feature of a moulded part which has been machined to its final condition

#### 3.4 final moulded part

moulded part after fettling (if any)

Note 1 to entry: A final moulded part only consists of features which are moulded and have not been finished except by fettling.

#### 3.5 intermediate machined moulded part

moulded part which has undergone some machining and which subsequently will be machined further

Note 1 to entry: An intermediate machined moulded part consists of at least one *moulded feature* (3.1) to be subsequently machined or at least one *intermediate machined feature* (3.2). In addition, it consists of moulded features not to be machined (if any) and *final machined features* (3.3) (if any).

Note 2 to entry: An intermediate machined moulded part can be produced from a final moulded part or from another intermediate machined moulded part.

#### 3.6 final machined moulded part

moulded part which has been machined to its final condition

Note 1 to entry: A final machined moulded part consists of *final machined features* (3.3) and can include *moulded features* (3.1) not to be machined. A final machined moulded part cannot include *intermediate machined moulded features*.

Note 2 to entry: A final machined moulded part can be produced from a *final moulded part* (3.4) or from an *intermediate machined moulded part* (3.5).

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**3.7****moulded-part condition**

manufacturing stage of a moulded part

Note 1 to entry: Listed in chronological order of manufacturing, a moulded part can be in a *final moulded-part* (3.4) condition, *intermediate machined moulded-part* (3.5) condition or *final machined moulded-part* (3.6) condition.

Note 2 to entry: Only one final moulded-part condition exists.

Note 3 to entry: Various intermediate machined moulded-part conditions can exist.

Note 4 to entry: Only one final machined moulded-part condition can exist.

Note 5 to entry: A moulded part does not need to exist in an intermediate machined moulded-part condition before the final machined moulded-part condition.

Note 6 to entry: Heat treatment or straightening (correction of unintended distortion) can be carried out in any moulded-part condition.

**3.8****single drawing**

<of a moulded part> drawing of a moulded part giving requirements for one moulded-part condition only

**3.9****combined drawing**

<of a moulded part> drawing of a moulded part giving requirements for more than one moulded-part condition

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**4 Symbols**










See [Table 1](#) for the letter symbols and [Table 2](#) for the graphical symbols used in this document.

<https://standards.iteh.ai/catalog/standards/sist/9941ca72-8109-46ef-9d32-20efa9398b63/iso-ts-8062-2-2013>

Table 1 — Letter symbols

Term, quantity	Letter symbol
Required machining allowance	$A_{RMA}$
Nominal dimension of the final moulded part	$d_C$
Nominal dimension of the final machined moulded part	$d_M$
Dimensional or size tolerance	$t_D$
Machining tolerance	$t_M$
Dimensional tolerance for the final machined moulded part	$t_{DMT}$
Form tolerance	$t_F$
Form tolerance for the final machined moulded part	$t_{FMT}$
Form tolerance for the final moulded part	$t_{FCT}$
Specific form tolerance of geometrical casting tolerance (GCT) for the final moulded part (casting)	
Casting form tolerance	
Dimensional tolerance for the final moulded part (casting)	$t_{DCT}$
Geometrical tolerance for the final moulded part (casting)	$t_{GCT}$
Cutting depth for machining	$c$
Parallelism tolerance for the final moulded part (casting)	$t_{PARC}$
Flatness tolerance for the final moulded part (casting)	$t_{FLAC}$
Casting tolerance	$t_C$
Positional tolerance	$t_{POS}$
Orientation contribution value	$c_{inclin}$
Length of datum	$l_d$
Length of toleranced feature	$l_t$
Surface profile tolerance	$t_{PROF}$
Maximum material virtual size	$S_{MMVS}$
Least material virtual size	$S_{LMVS}$
Theoretical exact dimension	TED

Table 2 — Graphical symbols

Name of symbol	Graphical symbol	Clause	Reference document
Drawing identifier for final moulded part		<a href="#">6.2</a>	ISO/TS 8062-2
Drawing identifier for intermediate machined moulded part		<a href="#">6.3</a>	ISO/TS 8062-2
Drawing identifier for final machined moulded part		<a href="#">6.4</a>	ISO/TS 8062-2
Identifier for machining by the supplier <sup>a</sup>		<a href="#">6.5</a>	ISO/TS 8062-2
Part condition identifier for final moulded part		<a href="#">7.2</a>	ISO/TS 8062-2
Part condition identifier for intermediate machined moulded part		<a href="#">7.2</a>	ISO/TS 8062-2
Part condition identifier for final machined moulded part		<a href="#">7.2</a>	ISO/TS 8062-2
Surface texture — removal of material not permitted		7.1.2	ISO 1302
Surface texture — removal of material required		7.1.3	ISO 1302
<sup>a</sup> When there is a change in the allocation of the supplier, a change of the documentation may be necessary to reflect this.			

See [Annex A](#) for the proportions and dimensions of the graphical symbols referenced in this part of ISO 8062.

## 5 Designation on drawings

When drawing indications according to this part of ISO 8062 apply, the drawing shall be designated in or near the drawing title block:

ISO/TS 8062-2  
ISO/TS 8062-2

However, this reference is not required if general tolerances or required machining allowances according to other parts of ISO 8062 are referenced.

## 6 Drawing type indicator

### 6.1 Single and combined drawings

The requirements for the three types of moulded-part conditions (final moulded, intermediate and final machined) can be specified on a combined drawing or separately on single drawings as appropriate.

If use of the symbology in this document makes a combined drawing difficult to read, use single drawings instead.

Information, as to which part condition or conditions the stated specifications on the drawing apply, shall be indicated on the drawing in accordance with the following clauses; therefore the drawing shall indicate which part condition(s) the stated specification applies to.

On combined drawings, only the outline of the most advanced part condition for which the drawing is valid shall be illustrated. Requirements for the most advanced condition and for the preceding moulded-part condition in question shall be stated.

### 6.2 Final moulded part drawings

If the drawing specifies requirements on a final moulded part, the graphical symbol given in [Figure 1](#) shall be indicated in or near the drawing title block.



Figure 1 — Graphical symbol for a final moulded part drawing

### 6.3 Intermediate machined moulded part drawings

If the drawing specifies requirements on an intermediate machined moulded part, the graphical symbol given in Figure 2 shall be indicated in or near the drawing title block.



Figure 2 — Graphical symbol for an intermediate machined moulded part drawing

If more than one intermediate machined moulded-part condition exist on the drawing, they shall be numbered and indicated after the symbol (see Figure 3).



a)



b)



c)

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Figure 3 — Examples of numbered intermediate machined moulded parts

If stating general tolerances on a single drawing of an intermediate machined moulded part, e.g. by referencing ISO 8062-3 or by stating particular general tolerances, these general tolerances apply to the moulded features in the intermediate machined moulded-part condition only.

### 6.4 Final machined moulded part drawings

If the drawing states requirements on a final machined moulded part, the graphical symbol given in Figure 4 shall be indicated in or near the title block.



Figure 4 — Graphical symbol for final machined moulded part drawing

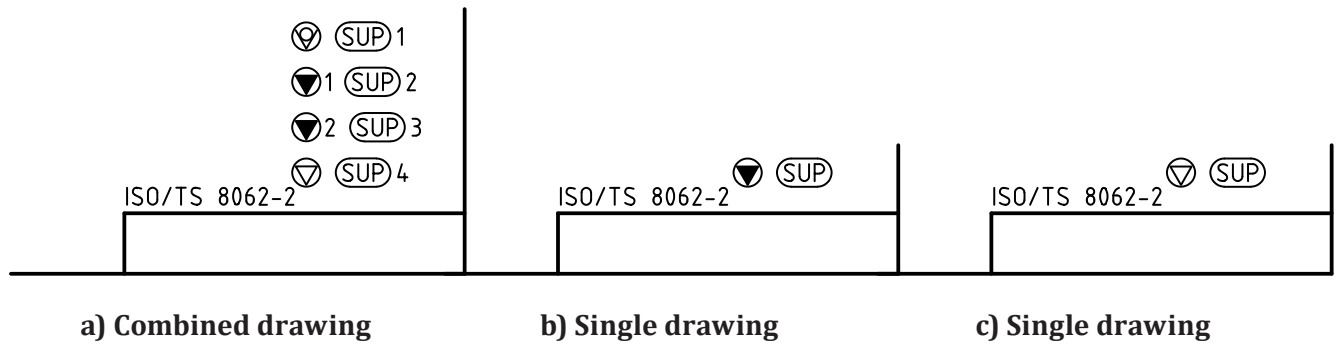
If stating general tolerances according to ISO 8062, e.g. by referencing ISO 8062-3 for castings, on a drawing of a final machined moulded part, these general tolerances apply to the moulded surfaces in the final machined moulded-part condition only.

### 6.5 Identifier for machining by the supplier

If there is, for some special reason, a need to identify which part condition specifications a supplier is expected to meet, this can be indicated by the symbol as shown in Figure 5 after the drawing type indicator (see Figure 6).



Figure 5 — Symbol for machining by the supplier



**Figure 6 — Example of SUP indication used together with the drawing type indicator near the drawing title block**

In any case, the contract shall clearly state which part condition and which specification the supplier is expected to meet, irrespective of other part conditions and specifications appearing on the drawing.

## 7 Drawing indications

### 7.1 Surface texture symbols

On combined drawings, each surface shall be indicated with only one surface texture symbol according to the condition of the surface in question on the most advanced part condition stated on the drawing.

### 7.2 Part condition identifiers

[ISO/TS 8062-2:2013](https://standards.iteh.ai/catalog/standards/sist/9941ca72-8109-46ef-9d32-20efa9398b63/iso-ts-8062-2-2013)

#### 7.2.1 General

<https://standards.iteh.ai/catalog/standards/sist/9941ca72-8109-46ef-9d32-20efa9398b63/iso-ts-8062-2-2013>

Three part condition identifiers are used for identifying which part condition a specification applies to (see [Figure 7](#)).



**Figure 7 — Part condition identifiers**

The part condition identifier may be omitted on single drawings.

The use of part condition identifiers is necessary on combined drawing to state requirements to different part conditions (final moulded, intermediate machined moulded, final machined moulded), see [Figure E.7](#). More than one intermediate machined moulded-part condition may be specified. This being the case, the intermediate machined moulded-part condition is enumerated in consecutive sequence according to the manufacturing processes.

When a specification is given without a part condition identifier, this specification applies to all part conditions stated on the drawing.

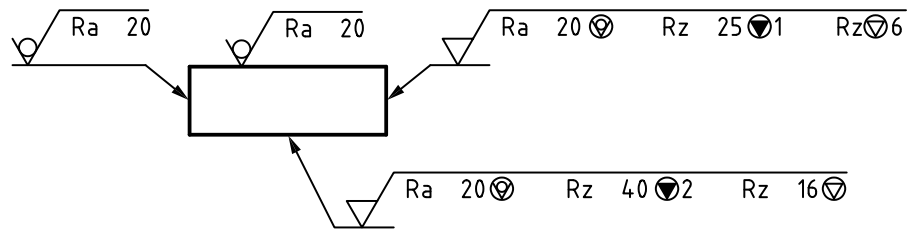
On combined drawings, requirements on features that remain as moulded in the most advanced part condition according to the drawing may also be given. If not otherwise specified, this type of specification applies to all part conditions according to the drawing, see [Figure 8](#).

When a specification is given with an intermediate part condition, this specification applies for all subsequent part conditions if not otherwise specified.

7.2.2 Surface texture

On combined drawings, surface texture requirements shall be indicated for each part condition using the symbols as shown in Figure 8.

Drawing indication:



Meaning

condition

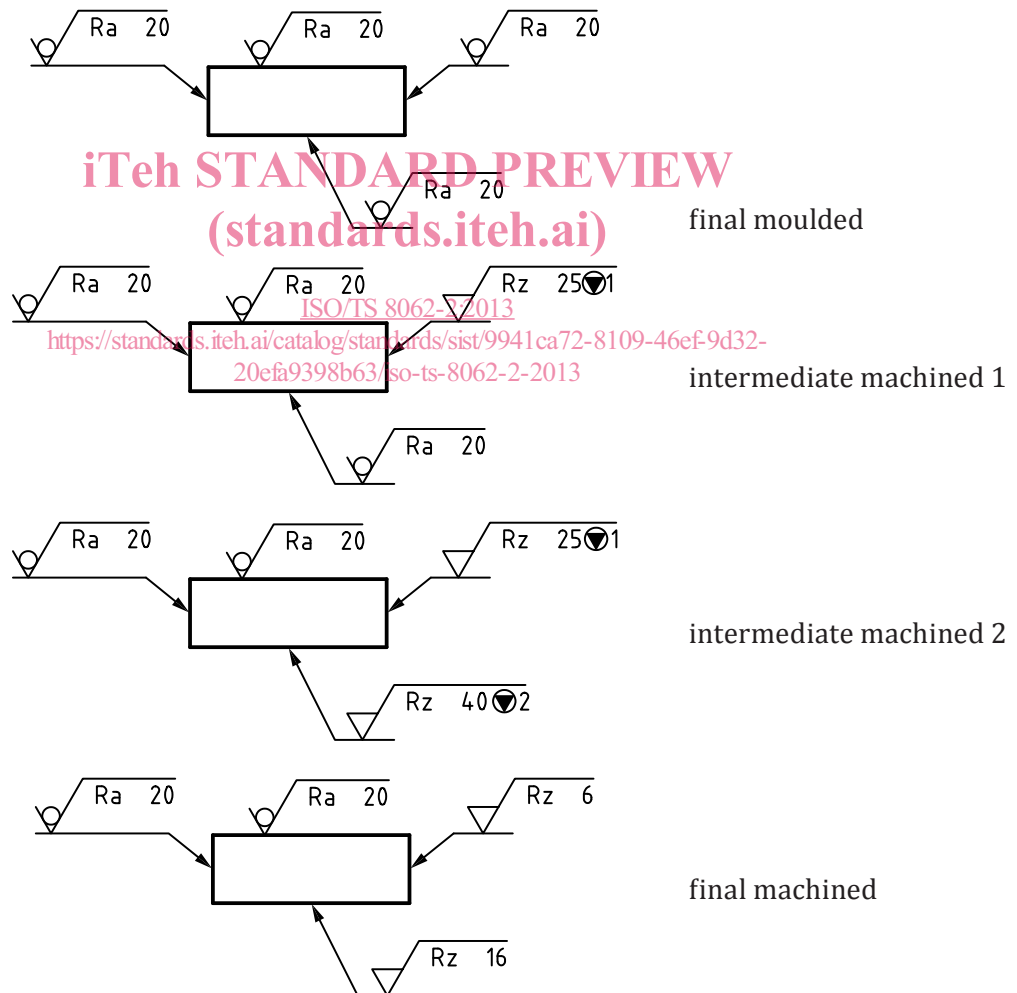


Figure 8 — Example of a surface texture indication on a combined drawing and its interpretation

### 7.2.3 Linear dimensions

The part condition to which the linear dimension applies shall be indicated by a part condition identifier as shown in [Figure 9](#), if necessary.

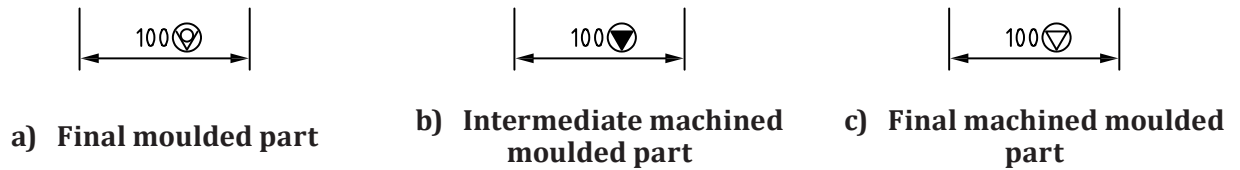


Figure 9 — Examples of nominal dimensions

### 7.2.4 Linear dimensions and individually indicated dimensional tolerances

The part condition to which the linear dimension with its tolerance applies shall be indicated by a part condition identifier as shown in [Figure 10](#), if necessary.

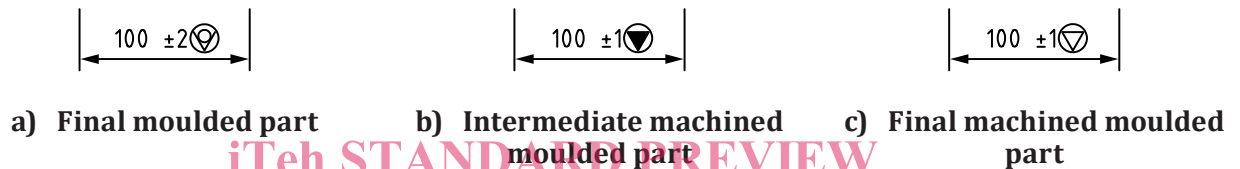


Figure 10 — Examples of nominal dimensions with individual tolerances

[ISO/TS 8062-2:2013](https://standards.iteh.ai/catalog/standards/sist/9941ca72-8109-46ef-9d32-7516798b63/iso-ts-8062-2-2013)

[https://standards.iteh.ai/catalog/standards/sist/9941ca72-8109-46ef-9d32-](https://standards.iteh.ai/catalog/standards/sist/9941ca72-8109-46ef-9d32-7516798b63/iso-ts-8062-2-2013)

### 7.2.5 Theoretically exact dimensions

The part condition to which the theoretically exact dimension applies shall be indicated by a part condition identifier as shown in [Figure 11](#), if necessary.

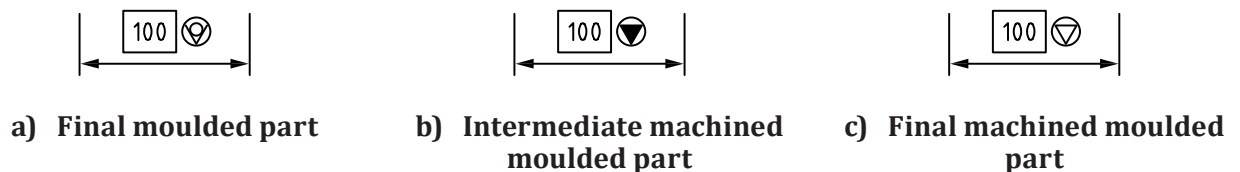


Figure 11 — Examples of theoretically exact dimensions