

---

---

## Bonded abrasive products — Limit deviations and run-out tolerances

*Produits abrasifs agglomérés — Écartes limites et tolérances de  
battement*

iTeh Standards  
(<https://standards.iteh.ai>)  
Document Preview

[ISO 13942:2019](https://standards.iteh.ai/catalog/standards/iso/f42acc1d-a141-43e6-bd85-72656157cc11/iso-13942-2019)

<https://standards.iteh.ai/catalog/standards/iso/f42acc1d-a141-43e6-bd85-72656157cc11/iso-13942-2019>



iTeh Standards  
(<https://standards.iteh.ai>)  
Document Preview

[ISO 13942:2019](https://standards.iteh.ai/catalog/standards/iso/f42acc1d-a141-43e6-bd85-72656157cc11/iso-13942-2019)

<https://standards.iteh.ai/catalog/standards/iso/f42acc1d-a141-43e6-bd85-72656157cc11/iso-13942-2019>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

	Page
Foreword .....	v
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Symbols and abbreviated terms</b> .....	<b>1</b>
<b>5 General</b> .....	<b>2</b>
<b>6 Straight grinding wheels, recessed, relieved and hubbed wheels</b> .....	<b>2</b>
6.1 Relevant shape types according to ISO 525 .....	2
6.2 Straight grinding wheels for general applications .....	7
6.2.1 Limit deviations $T_D$ of the outside diameter, axial run-out tolerance $T_{PL}$ and radial run-out tolerances $T_{RL}$ .....	7
6.2.2 Limit deviations $T_H$ of the hole diameter .....	7
6.2.3 Limit deviations $T_P$ of the recess diameter and assignment of radii $R$ .....	8
6.2.4 Limit deviations $T_T, T_U$ of grinding wheel thickness dimensions .....	8
6.2.5 Limit deviations $T_E$ of thickness at bore .....	9
6.3 Straight grinding wheels for other applications not specified in 6.2 .....	9
6.3.1 Examples of application .....	9
6.3.2 Limit deviations $T_D$ of the outside diameter, axial run-out tolerance $T_{PL}$ and radial run-out tolerance $T_{RL}$ .....	10
6.3.3 Limit deviations $T_H$ of the hole diameter .....	10
6.3.4 Limit deviations $T_P$ of the recess diameters and assignment of radii $R$ .....	10
6.3.5 Limit deviations $T_T$ of the grinding wheel thickness .....	10
6.3.6 Limit deviations $T_E$ of thickness at bore .....	11
6.4 Grinding wheels for high-pressure grinding .....	11
6.5 Straight grinding wheels used in sets .....	11
6.5.1 General .....	11
6.5.2 Limit deviations $T_D$ of the outside diameter .....	12
6.5.3 Limit deviations $T_T$ of the grinding wheel thickness .....	12
6.6 Cemented or clamped cylinder wheels and disc wheels .....	12
6.6.1 Relevant shape types according to ISO 525 .....	12
6.6.2 Limit deviations $T_D$ of the outside diameter, axial run-out tolerance $T_{PL}$ and radial run-out tolerance $T_{RL}$ .....	13
6.6.3 Limit deviations $T_H$ of the hole diameter .....	14
6.6.4 Limit deviations $T_W$ of the wall thickness .....	14
6.6.5 Limit deviations $T_D$ of the outside diameter of grinding wheel sets .....	14
6.6.6 Limit deviations $T_T$ of the grinding wheel thickness .....	14
<b>7 Dish and cup wheels</b> .....	<b>15</b>
7.1 Relevant shape types according to ISO 525 .....	15
7.2 Dish and cup wheels for general applications .....	16
7.3 Dish and cup wheels for tool and cutter grinding .....	16
<b>8 Grinding and cutting-off wheels</b> .....	<b>16</b>
8.1 Relevant shape types according to ISO 525 .....	16
8.2 Limit deviations $T_D$ of the outside diameter, axial run-out tolerance $T_{PL}$ , and the radial run-out tolerance $T_{RL}$ .....	18
8.3 Limit deviations $T_H$ of the hole diameter .....	18
8.4 Limit deviations $T_T$ and $T_U$ of the grinding wheel thickness .....	19
<b>9 Segments</b> .....	<b>19</b>
<b>10 Cones and plugs with threaded insert</b> .....	<b>21</b>
<b>11 Honing stones and superfinishing stones</b> .....	<b>24</b>
<b>12 Hand finishing sticks</b> .....	<b>24</b>

<b>13 Spindle mounted points and wheels</b> .....	<b>24</b>
<b>Bibliography</b> .....	<b>27</b>

**iTeh Standards**  
**(<https://standards.itih.ai>)**  
**Document Preview**

[ISO 13942:2019](https://standards.itih.ai/catalog/standards/iso/f42acc1d-a141-43e6-bd85-72656157cc11/iso-13942-2019)

<https://standards.itih.ai/catalog/standards/iso/f42acc1d-a141-43e6-bd85-72656157cc11/iso-13942-2019>

## 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](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 (see [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.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 5, *Grinding wheels and abrasives*.

This second edition cancels and replaces the first edition (ISO 13942:2000), which has been technically revised. The main changes compared to the previous edition are as follows:

- Figures added for the following shape types: 2, 3, 4, 13, 16, 17, 17R, 18, 18B, 18P, 18R, 19, 19R, 20, 21, 22, 23, 24, 25, 26, 28, 29, 31A, 31B, 31C, 31D, 31E, 31F, 31G, 35, 36, 37, 39, 40, 52, 54 and 90; geometric tolerancing symbols for simple run-out ( $T_{PL}$  and  $T_{RL}$ ) and the related datum are indicated on the drawings where values for these exist in this document;
- drawings for types 5, 7, 27, 38, 39 and 41 amended to show the geometric tolerancing symbols;
- new symbols for elevation of depressed centre ( $M$ ), spindle diameter ( $S_d$ ), spindle length ( $L_2$ ) of mounted wheels and points, and internal radius of a segment ( $R_1$ ) added;
- in [Table 18](#), a new row for the outside diameter  $D > 1\,800$  mm added giving the corresponding limit deviations and run-out tolerances;
- in [Table 20](#), the limit deviations of grinding wheel thickness for wheels with  $T, U \leq 1,6$  mm changed;
- [Clause 5](#) added for general statements and requirements and [Clause 13](#) added for mounted wheels and mounted points;
- normative reference to ISO 603 changed to be informative.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).



# Bonded abrasive products — Limit deviations and run-out tolerances

## 1 Scope

This document specifies the essential limit deviations and run-out tolerances for bonded abrasive products.

## 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.

ISO 286-1, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 1: Basis of tolerances, deviations and fits*

ISO 286-2, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 2: Tables of standard tolerance classes and limit deviations for holes and shafts*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 286-1 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>

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

## 4 Symbols and abbreviated terms

For symbols of dimensions, limit deviation and tolerances see [Table 1](#).

**Table 1 — Symbols and designations**

Symbol of dimension	Designation	Symbol of limit deviation or tolerance
<i>A</i>	Smallest width of a trapezoidal segment	$T_A$
<i>B</i>	Width of a segment, stick or stone	$T_B$
<i>C</i>	Thickness of a segment, stick or stone	$T_C$
<i>D</i>	Outside diameter of abrasive products	$T_D$
<i>E</i>	Thickness at bore of cup, dish, recessed and relieved wheels	$T_E$
<i>F</i>	Depth of the 1st recess	—
<i>G</i>	Depth of the 2nd recess	—
<i>H</i>	Abrasive product bore diameter, thread diameter of wheels with threaded insert	$T_H$
$H_1$	Diameter of counterbore	$T_{H_1}$

Table 1 (continued)

Symbol of dimension	Designation	Symbol of limit deviation or tolerance
$J$	Smallest diameter of taper cup wheel, dish wheels, tapered and hubbed wheels, tapered cones and plugs	—
$K$	Internal diameter of recess of taper cup wheel and dish wheels	$T_K$
$L$	Length of segments, length of thread bore of wheels with threaded insert, sticks and stones	$T_L$
$L_2$	Length of the spindle in spindle mounted wheels and mounted points	—
$M$	Elevation of the depressed centre	—
$N$	Depth of the relief	—
$P$	Recessed diameter	—
$R$	Radius of recessed grinding wheels, segments, cones and plugs	$T_R$
$R_1$	Internal radius of a curved segment	—
$S_d$	Diameter of the spindle in spindle mounted wheels and mounted points	—
$T$	Overall thickness	$T_T$
$U$	Smallest thickness of tapered, hubbed and depressed centre wheels	$T_U$
$W$	Rim width of cups, cylinders and dishes	$T_W$
—	Axial run-out tolerance	$T_{PL}$
—	Radial run-out tolerance	$T_{RL}$

5 General

All dimensions and tolerances in this document are in millimetres.

The symbols for geometrical tolerances used in the figures are explained in ISO 1101 and ISO 5459.

Popular dimensions of products specified in this document are given in ISO 603-1 to ISO 603-18.

6 Straight grinding wheels, recessed, relieved and hubbed wheels

6.1 Relevant shape types according to ISO 525

Relevant shape types for straight grinding wheels for general applications according to ISO 525 are: Types 1, 3, 4, 5, 7, 20 to 26, 38 to 40. See Figures 1 to 15.

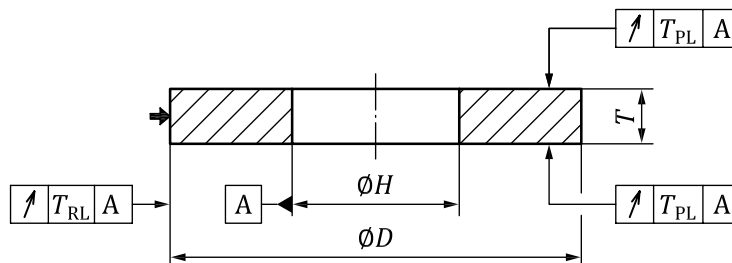


Figure 1 — Straight grinding wheel (Type 1)



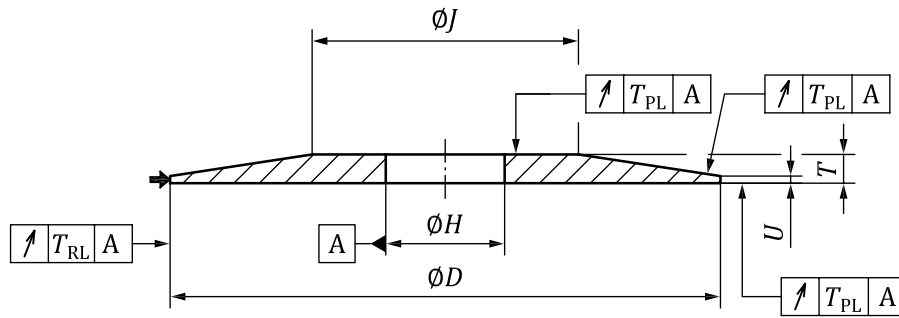


Figure 2 — Grinding wheel, tapered on one side (Type 3)

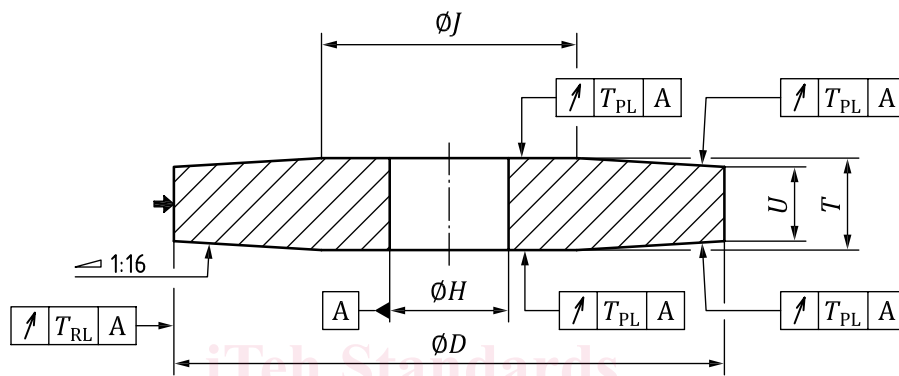


Figure 3 — Grinding wheel, tapered on both sides (Type 4)

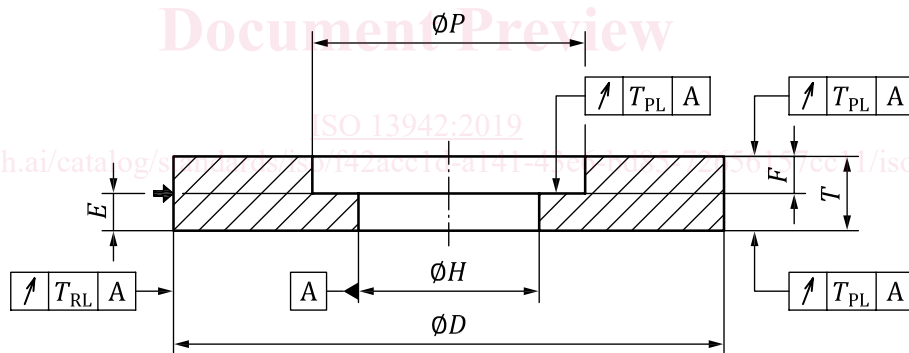


Figure 4 — Grinding wheel, recessed on one side (Type 5)

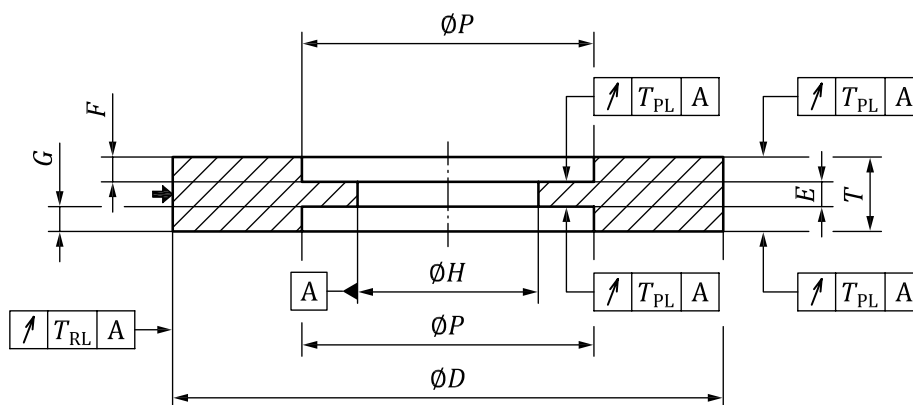


Figure 5 — Grinding wheel, recessed on both sides (Type 7)

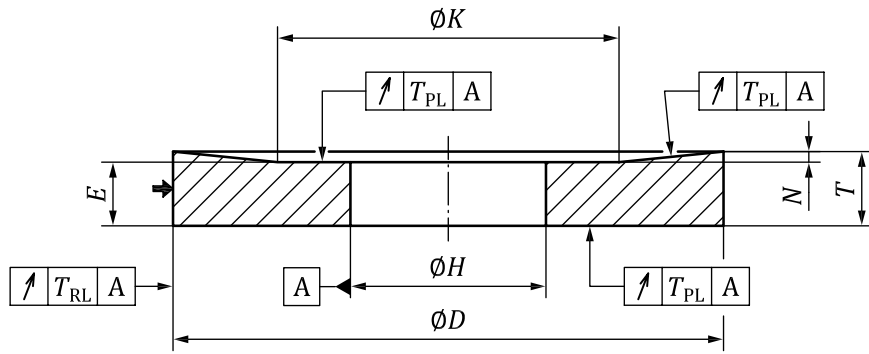


Figure 6 — Grinding wheel, relieved on one side (Type 20)

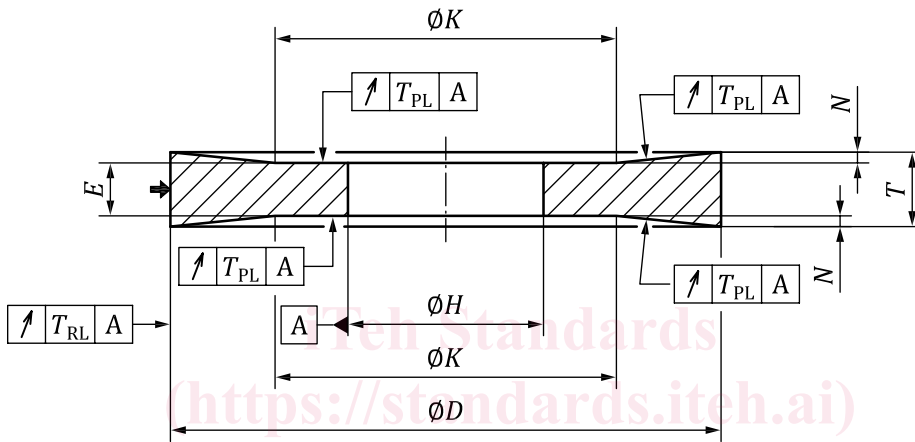


Figure 7 — Grinding wheel, relieved on both sides (Type 21)

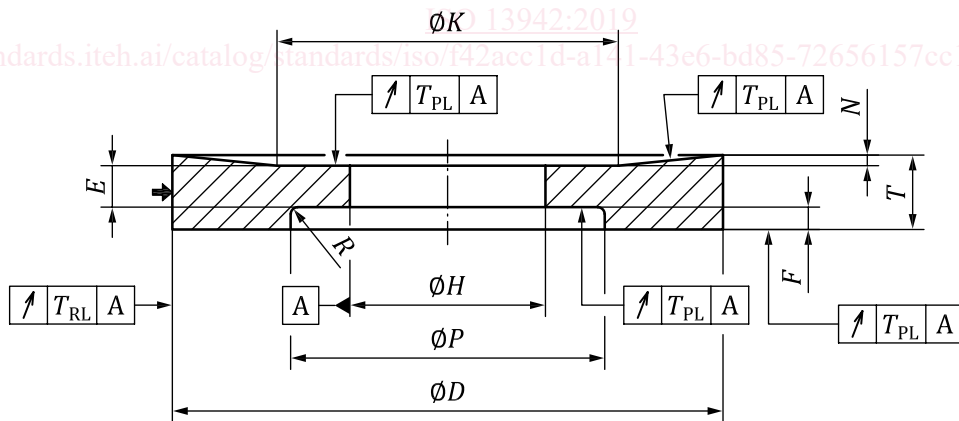


Figure 8 — Grinding wheel, relieved on one side, recessed on the other side (Type 22)

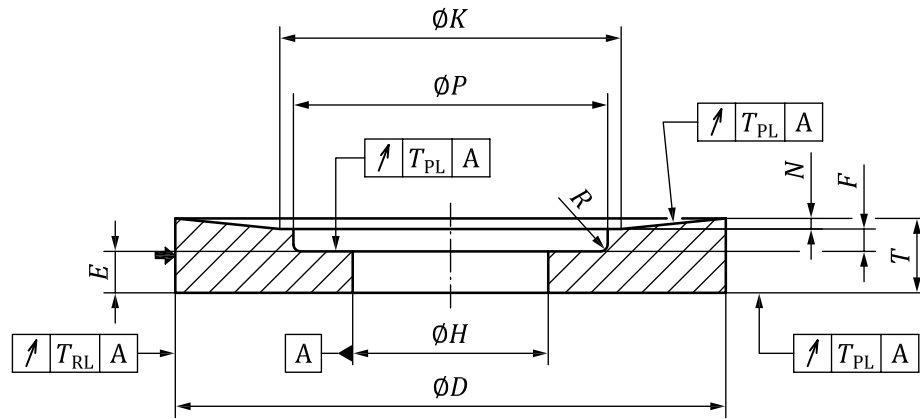


Figure 9 — Grinding wheel, relieved and recessed on one side (Type 23)

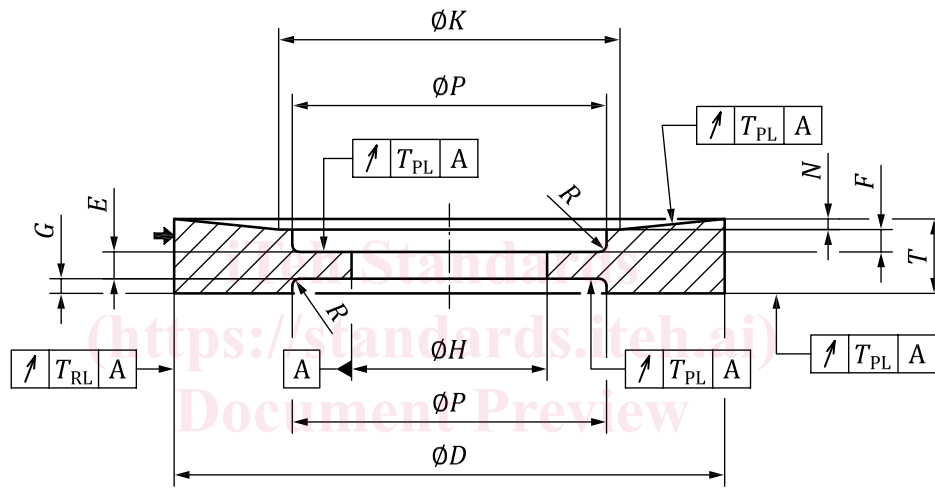


Figure 10 — Grinding wheel, relieved and recessed on one side, recessed on the other side (Type 24)

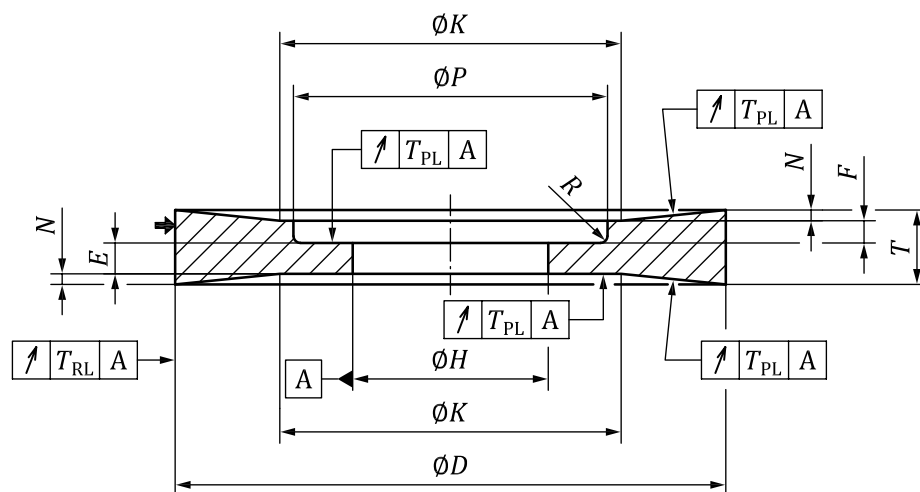


Figure 11 — Grinding wheel, relieved and recessed on one side, relieved on the other side (Type 25)