

Replaces:  
RN 1092:2012-03-07

## Punched discs

## Machining allowances and tolerances

Content	Page
1 Scope .....	2
2 References .....	2
3 Terms and definitions .....	3
4 Allowances and permissible deviations .....	3
4.1 Die-forged punched discs .....	3
4.2 Rough-turned punched discs .....	4
4.3 Punched discs with rough-turned contour .....	5
5 Delivery and transport conditions .....	5

### Changes

2023-07-05:

The following changed in comparison to RN 1092:2012-03-07:

- a) updated references
- b) scope extended for die-forged punched disks
- c) chapter 6: Lifting thread for punched discs with rough-turned contour with a weight  $\geq 6000$  kg
- d) editorially revised

Responsible division.: PK	Editor M. Förste	Approval: see doc. workflow	Technical reference: C. Eschert	Page: 1 / 5
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## 1 Scope

This factory standard applies to free form and die-forged punched discs, with and without pre-machining, with a diameter  $d_1 > 300$  mm. It includes specifications for machining allowances, dimensional tolerances, delivery and transport conditions.

Information about material properties, heat treatment, documentation and labelling is included in the standards mentioned in chapter 2.

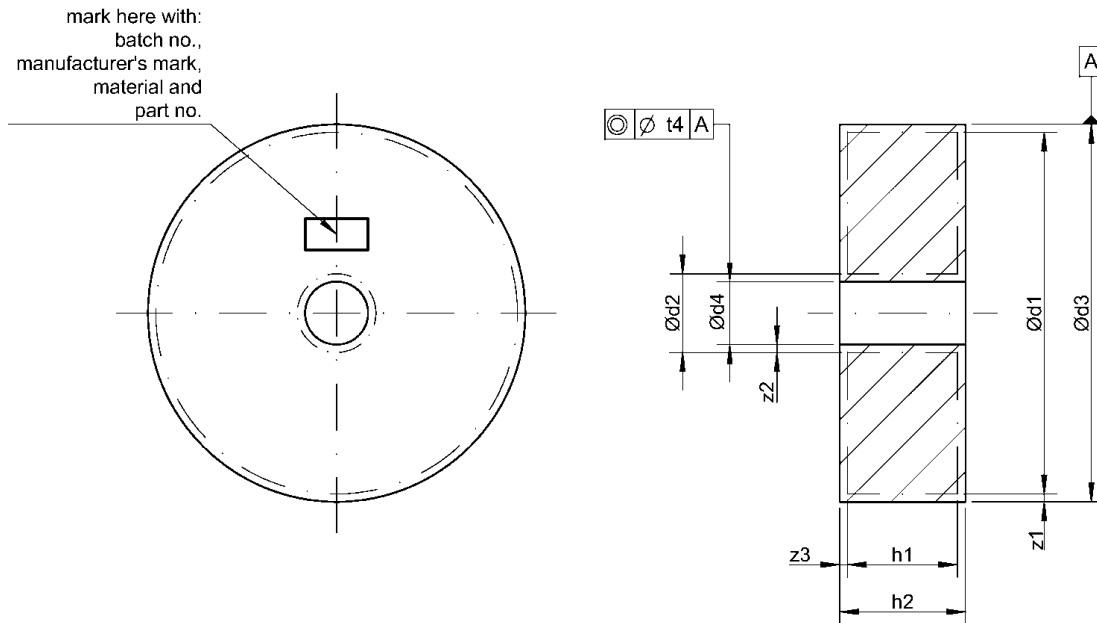
## 2 References

The following documents, cited in part or in whole, shall apply for the use of this standard. In the case of dated references, only the referenced edition applies; in the case of undated references, the latest edition of the referenced document (including all amendments) applies. The applicable version of the standards listed below shall apply to all contents not covered by this factory standard.

RN 810-3-1	Delivery conditions for case-hardening steel; Punched disks and rings of 18CrNiMo7-6 for rotors with peripheral speeds $< 50$ m/s
RN 810-3-2	Delivery conditions for case-hardening steel; Freeform punched disks of 18CrNiMo7-6 for rotors with peripheral speeds $> 50$ m/s
RN 830-3-1	Delivery conditions for nitriding steel; Punched disks and rings of 31CrMoV9 for rotors with peripheral speeds $< 50$ m/s
RN 840-3-1	Delivery conditions for quenched and tempered steel; Punched disks of 34CrNiMo6 for rotors with peripheral speeds $< 50$ m/s
RN 850-3-1	Delivery conditions for quenched and tempered steel; Punched disks and rings of 42CrMo4 for rotors with peripheral speeds $< 50$ m/s
RN 1936	Labelling; Raw material, parts and gearboxes

### 3 Terms and definitions

Following terms and definitions are mandatory for the use of this document.



**Figure 1 Dimensions and machining allowances on punched discs**

d1, d2, h1: dimensions of finished part (envelope dimensions) without machining allowances

d3, d4, h2: dimensions of finished part with machining allowances (dimensions of raw part)

z1, z2, z3: machining allowances related to a radius or side

t1, t2, t4: position tolerances

All dimensions and tolerances in mm

### 4 Allowances and permissible deviations

#### 4.1 Die-forged punched discs

Manufacturing: forging, no machining

Surface: raw, but free from adhering scale

ERP system: named "FM" (dimensions of finished part) and dimensions d1, d2, h1

(d1) > 1000: for this diameter range punched discs conforming to point 0 are to be preferred

Allowances: according to tables 1, 2 and 3  
 alternatively, vendor-specific lower allowances are accepted, if it is guaranteed that the required finished part can be manufactured without problems from the delivered punched disc. The punched disc is regarded as a defective part, if this is not possible.

**Table 1 Allowances for outside diameter d1 in mm**

diameter d1		allowance 2×z1	permissible deviation
over	up to		
300	630	40	± 10
630	1000	50	± 10
(1000)	(1500)	60	± 10

**Table 2 Allowances for inner diameter d2 in mm**

diameter d2		manufacture	allowance 2x2	permissible deviation	coaxiality t4
over	up to				
	110	supply without hole	-	-	-
110	120	drilling / hot punching	30	± 10	5
120	140	drilling / hot punching	40	± 10	10
140		drilling / hot punching	50	± 10	20

for forging reasons specific to forging: d4 > 80 required

**Table 3 Allowances for height h1 in mm**

diameter d1		height h1					permissible deviation
over	up to	> 100 ≤ 200	> 200 ≤ 300	> 300 ≤ 400	> 400 ≤ 500	> 500 ≤ 600	
		allowance 2x3					
300	630	20	25	30	30	40	± 5
630	1000	20	25	30	35	40	± 5
(1000)	(1500)	25	30	35	40	50	± 5

#### 4.2 Rough-turned punched discs

Manufacture: forging with subsequent machining

Surface: see material specification

ERP system: named "FM" (dimensions of finished part), dimensions d1, d2, h1 plus "rough-turned"

**Table 4 Allowances for outside diameter d1 in mm**

diameter d1		allow. 2x1	permiss. deviation	allow. 2x2	permiss. deviation	allow. 2x3	permiss. deviation	coaxiality t4
over	up to							
800	2000	6	± 1.2	10	± 0.5	14	± 0.5	3

### 4.3 Punched discs with rough-turned contour

Manufacture: forging with subsequent machining

ERP system: named "VM" (dimensions of rough-turned part), dimensions d3, d4, h2 plus "rough-turned contour"

Dimensions, allowances, tolerances, heat treatment and surface according to drawing.

The following position tolerances must be considered, if not indicated in the drawing:

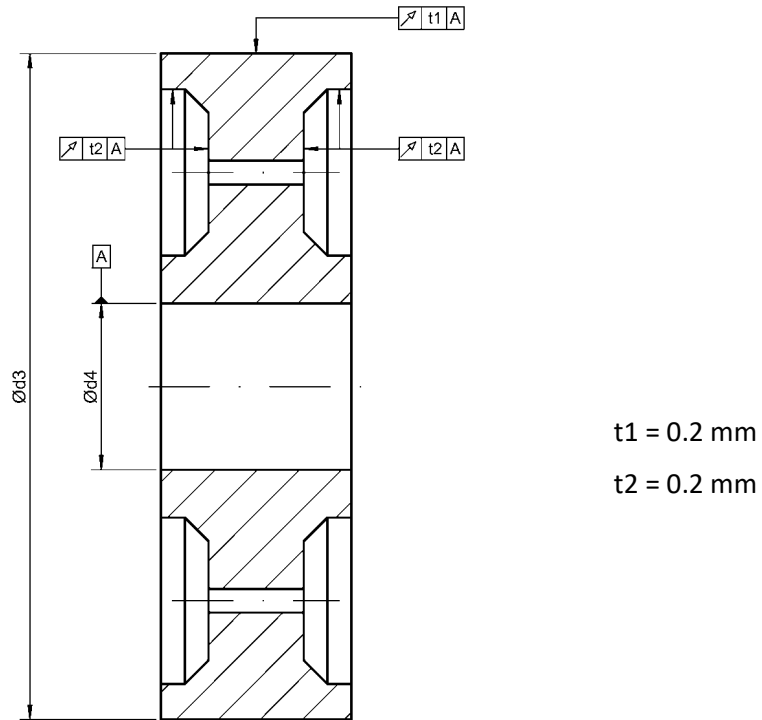


Figure 2 Tolerances on punched discs with rough-turned contour

## 5 Delivery and transport conditions

- Lifting thread for punched discs with a weight  $\geq 6000$  kg according to drawing.
- Shipping of punched discs on appropriate pallets with wooden blocks (minimum height of 50 mm) in between (see Figure 3).

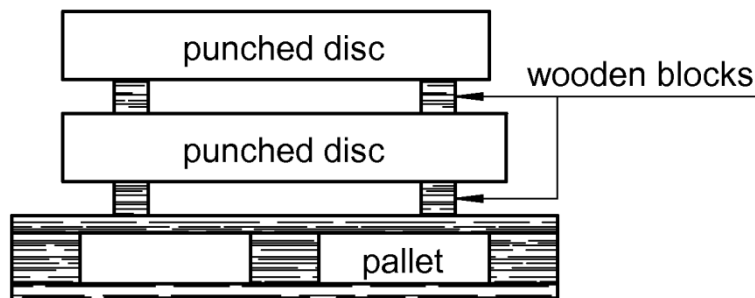


Figure 3 Delivery of punched discs

- Shipping of sample material on separate pallets. The marking of the punched discs has to be on the upper side for delivery.