

**1. General****1.1 Straightness**

The maximal admissible straightness amounts to max. 0.25 mm for rods without cooling holes and max. 0.35 mm for coolant channel rods. The straightness of round rods is to be taken from the following table:

Type of rod	Length [mm]	Straightness [mm]
Solid rods	<120	$\leq 0,15$
	120 - 249	$\leq 0,20$
	$\geq 250 - 420$	$\leq 0,25$
Rods with cooling holes	<120	$\leq 0,20$
	120 - 249	$\leq 0,30$
	$\geq 250 - 420$	$\leq 0,35$

Measurement method:

Two point support with dial gauge at half-length, difference between the smallest and the largest values after rotating rod by 360°. Distance of the support points from rod end  $\leq 5$  mm.

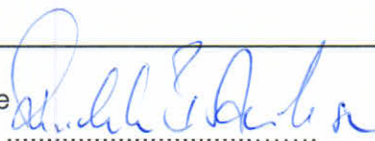
**1.2 Roundness**

The maximal admissible deviation from roundness amounts to 50 % of the particular diameter tolerance.

Measurement method:

Difference between the largest and the smallest values of the rotating rod – measured at different points.

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### 1.3 Conicity

The maximal admissible conicity amounts to 50 % of the particular diameter tolerance.

Measurement method:

Difference between the largest and the smallest values of the rotating rod – measured at different points.

### 1.4 Surface

The rods are free of cracks.

### 1.5 Angularity of End of Rod

The end of the rod has a maximal angularity of  $90^\circ \pm 3^\circ$  to axis of symmetry.

## 2. Round Rods without Coolant Channels

### 2.1 Tolerance of Diameter

Diameter [mm]	Tolerance [mm]
1,2 – 7,7	0 / +0,20
8,2 – 15,7	0 / +0,30
16,2 – 19,7	0 / +0,40
>19,7	0 / +0,50

### 2.2 Tolerance of Length

Length [mm]	Tolerance [mm]
- 100	0 / +1
- 200	0 / + 3
- 300	0 / + 5
- 415	0 / + 10

### **3. Round Rods with Coolant Channels**

3.1 Diameter and length tolerances for rods with coolant channels can be found in the catalogue.

#### **3.2 Centre Deviation**

##### **3.2.1 Central Channel**

The deviation of central channel amounts to 25 % of coolant channel tolerance along the total length of rod.

##### **3.2.2 Two and Three Cooling Channels (Parallel and Twisted):**

The deviation of centre amounts to 25 % of bolt circle tolerance along the total length of rod.

Measurement method 2 coolant channels:

The distance between the bolt circle and the centre of the rod in the x and y directions is determined.

Measurement method 3 coolant channels:

The distance between the centre of the rod and the centre of the bolt circle is determined.

The angular deviation (3 coolant holes) is  $\pm 4^\circ$ .

Measurement method:

The angular deviation with respect to the centre of the rod is determined.