

* Please consult us for information on processing not on the list.

Processing range (unit: mm)			
Product	Dimension Outside diameter	Total length	
		Rough grinding	Finish grinding
Centerless-ground product	$\phi 3$ or more - $\phi 12$ or less	- 330	Same as on the left
	More than $\phi 12$ - $\phi 16$ or less	- 200	Same as on the left
Cylindrically ground product	- $\phi 60$	- 580	- 330

Note: The total length of cylindrically ground products includes the center point.

Outside diameter precision (unit: mm)				
Outside diameter		Dimension tolerance		
More than	Or less	Rough grinding	Finish grinding (h7)	Finish grinding (h6)
—	3	+0.04 +0.02	0 -0.010	0 -0.006
3	6		0 -0.012	0 -0.008
6	10		0 -0.015	0 -0.009
10	18		0 -0.018	0 -0.011
18	30		0 -0.021	0 -0.013
30	50		0 -0.025	0 -0.016
50	80		0 -0.030	0 -0.019

Note: Use finish grinding (h7) unless other finishing dimensional tolerance is stated.

Length precision (unit: mm)			
Length		Tolerance class	
More than	Or less	Coarse	Medium
—	6	± 0.2	± 0.1
6	30	± 0.5	± 0.2
30	120	± 0.8	± 0.3
120	315	± 1.2	± 0.5
315	1,000	± 2.0	± 1.5

Note: Use "Coarse" unless otherwise stated.

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Surface roughness (unit: s (*1))	
Grinding class	Allowable value for surface roughness
Finish grinding	1.6 or less
Rough grinding	6.3 or less

*1: Surface roughness is interpreted as $s = R_{max}$ (JIS1970, 1982) = R_y (JIS1994) = R_z (JIS2001)

Centerless-ground product (unit: mm)									
Outside diameter		Cylindricity (finish grinding)						Roundness	
		Standard centerless grinding			Long centerless grinding				
		Or more	Less than	Measured length		Allowable value	Measured length		Rough grinding
Or more	Or less			More than	Or less				
3	4	30	80	0.002	80	330	0.003	0.002	0.001
4	6	35	90	0.002	90	330	0.003	0.002	0.001
6	8	35	100	0.002	100	330	0.003	0.002	0.001
8	10	35	110	0.002	110	330	0.003	0.002	0.001
10	13	45	120	0.002	120	330	0.003	0.002	0.001
13	16	60	160	0.003	160	200	0.003	0.002	0.001
16	21	60	160	0.003	160	200	0.003	0.002	0.001

Note 1) "Outer diameter tolerance width/3" is used as a guideline for cylindricity of rough grinding.

2) Minimum length of centerless grinding is performed according to the standard of surface C and center point processing equipment.

3) Use other methods to verify products that have undergone cylindrical grinding only.

Cylindrically ground product (unit: mm)									
Outside diameter		Cylindricity (finish grinding)						Roundness	
		Measured length		Allowable value	Measured length		Allowable value		
		Or more	Less than		Or more	Or less		More than	Or less
3	4	0	100	0.003	—	—	—	0.002	0.001
4	6	0	140	0.003	—	—	—	0.002	0.001
6	8	0	200	0.003	—	—	—	0.002	0.001
8	10	0	330	0.003	330	580	0.015	0.002	0.001
10	13	0	330	0.003	330	580	0.015	0.002	0.001
13	16	0	330	0.003	330	580	0.01	0.002	0.001
16	21	0	330	0.003	330	580	0.01	0.002	0.001

Note 1) Use "Tolerance width/3" as a guideline for cylindricity of rough grinding.

2) Minimum length of cylindrical grinding should reference a separate lathe dog width.

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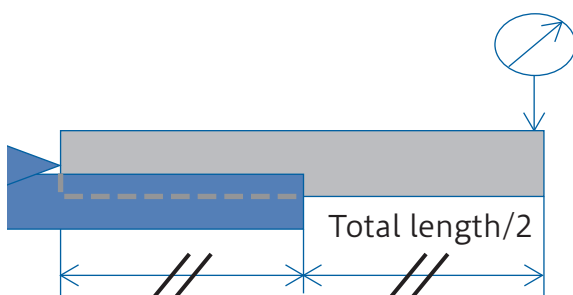
Radial runout Centerless-ground products (unit: mm)												
Outside diameter		Centerless-ground products Runout (finish grinding)										
		Standard centerless grinding				Long centerless grinding						
		Total length	Allowable value	Runout measurement method	Total length		Runout measurement method	Allowable value	Total length		Allowable value	Runout measurement method
Or less	Or less				More than	Or less						
Or more	Less than	Or less			More than	Or less			More than	Or less		
3	4	80	0.002	Location of measurement I	80	118	Location of measurement II	0.005	118	330	0.100	Location of measurement II
4	5	90	0.002	Location of measurement I	90	125	Location of measurement II	0.005	125	330	0.100	Location of measurement II
5	6	90	0.002	Location of measurement I	90	140	Location of measurement II	0.005	140	330	0.100	Location of measurement II
6	8	100	0.002	Location of measurement I	100	160	Location of measurement II	0.005	160	330	0.050	Location of measurement II
8	9	110	0.002	Location of measurement I	110	160	Location of measurement II	0.005	160	330	*0.050	Location of measurement II
9	10	110	0.002	Location of measurement I	110	165	Location of measurement II	0.005	165	330	*0.050	Location of measurement II
10	11	120	0.002	Location of measurement I	120	190	Location of measurement II	0.005	190	330	*0.050	Location of measurement II
11	12	120	0.002	Location of measurement I	120	205	Location of measurement II	0.005	205	330	*0.050	Location of measurement II
12	13	120	0.002	Location of measurement I	120	330	Location of measurement II	0.005	—	—	—	—
13	21	160	0.002	Location of measurement I	160	200	Location of measurement II	0.005	—	—	—	—

Note 1) The allowable value for runout for standard centerless roughly ground products is “0.005 mm”.

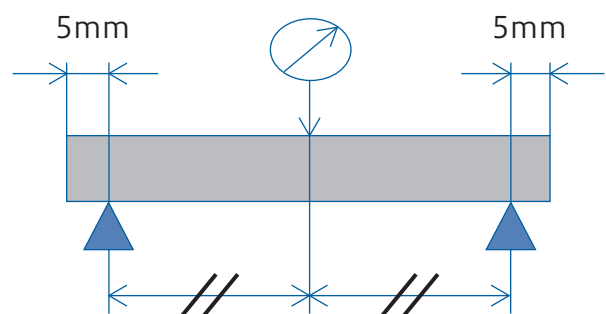
2) The tolerance for long centerless ground rods shall be “* 0.050” based on stock precision.

3) Long centerless ground rods are specially processed and three different sizes are in stock. Outer diameter of $\phi 16$, $\phi 20$, $\phi 25$, length 330 mm and an allowable runout value of 0.040 (location of measurement II)

Location of measurement I



Location of measurement II



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Cylindrically ground products (unit: mm)									
Outside diameter		Cylindrically ground products Runout (finish grinding)							
		Measured length	Allowable value	Measured length		Allowable value	Measured length		Allowable value
Or more	Less than	Or less		More than	Or less		More than	Or less	
4	6	100	0.002	100	140	0.003	—	—	—
6	8	120	0.002	120	200	0.005	—	—	—
8	10	160	0.002	160	250	0.005	250	580	0.02
10	12	200	0.002	200	300	0.006	300	580	0.02
12	16	260	0.002	260	300	0.006	300	580	0.02
16	20	330	0.002	330	580	0.015	—	—	—
20	25	330	0.002	330	580	0.015	—	—	—
25	31.5	330	0.002	330	580	0.01	—	—	—
31.5	60	330	0.002	330	580	0.01	—	—	—

Note 1) The runout of cylindrically ground products shall be the value measured using a dial gauge at the center of the ground portion with both centers supported.

2) The allowable value for runout of roughly ground products shall be “0.005 mm” for all above dimensions.