CATALOG OF TUNGSTEN CARBIDE ROLLER

Anvils and Pressure Cylinders
Date of Preparation: 08/19/2011
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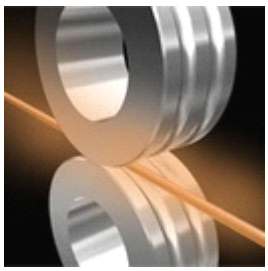
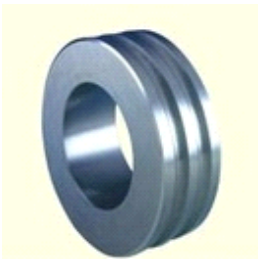
Reason for Issue: Updated Format

Chemical Name: Tungsten Carbide

Chemical Family: Refractory Metal (non-ferrous metal)

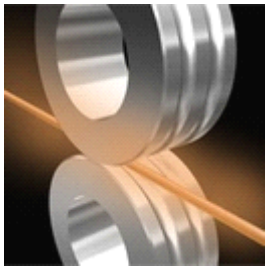
Chemical Formula: WC

Manufacturer: E-Biz Center of China Tungsten Industry Association

PRODUCTS CONTENTS

Tungsten carbide rolls ring data sheet



Tungsten carbide roll ring is a kind of tool material which consists of tungsten carbide and cobalt with high hardness and wear resistance. To take advantage of high wear resistance, long life and high efficiency of cemented carbide roll rings during the high speed rolling, attention should be paid as follows when purchasing and using cemented carbide roll ring.

Table of grades and properties of carbide rolls ring and related data

Grade	Chemical composition		Mechanical properties				Physical properties	
	Co+Ni %	WC %	Hardness HAR	T.R.S MPa	Compressive Strength MPa	Young's modulus of elasticity KN/mm^2	Density g/cm^3	Thermal conductivity
YGH20	10	90	>86.0	>2500	3500	560	14.2~14.5	0.2
YGH25	12	88	>84.0	>2300	3400	550	14.0~14.3	0.21
YGH30	15	85	>83.5	>2520	3300	540	13.8~14.2	0.2
YGH40	18	82	>83.0	>2570	3200	500	13.4~14.2	0.19
YGH45	20	80	>82.0	>2570	3100	480	13.3~13.9	0.18
YGH55	26	74	>81.0	>2570	3000	450	12.6~13.2	0.17
YGR20	10	90	>85.0	>2400	3400	550	14.2~14.8	0.2
YGR25	12.5	87.5	>83.0	>2270	3300	540	14.0~14.3	0.22
YGR30	15	85	>83.0	>2360	3200	530	13.8~14.3	0.2
YGR40	18	82	>82.0	>2400	3200	530	13.5~13.9	0.2
YGR45	20	80	>80.5	>2250	3000	480	13.4~13.9	0.18
YGR55	25	75	>79.0	>2400	2800	420	12.9~13.4	0.17
YGR60	30	70	>78.0	>2200	2600	300	12.6~13.1	0.16

Recommended applications of grades for tungsten carbide roll rings

Grade	Recommended applications
YGH20	Maximum hardness, excellent wears resistance in the series. Used in the last 1-2 stands of good high speed finishing mills for rolling common and hard steel bars.
YGH25	Higher wear resistance, moderate impact resistance in the series. Used in the last 1-3 stands of good high speed finishing mills for rolling common and hard steel bars.
YGH30	Moderate wear resistance and impact resistance, good for general purposes. Used in the last 1-4 stands or all stands of finishing mills.
YGH40	Best for general purposes, used in the front stands of good mills and in the rear stands of common mills.
YGH45	Used in the first and second stands of finishing mills and in the stands of pre-finishing rolling mills. For every stand of rolling lines for low speed rolling, low precision and unstable operation.
YGH55	Maximum binder content in YGH series, good toughness and thermal crack resistance. Used in the stands of pre-finishing rolling mills and for roll rings for hot rolling of ribbed steel.

YGH T series of roll rings

The new generation of YGH-T series of roll rings for high speed rolling of steel bars

As compared with conventional cemented carbide roll rings, the new generation of YGH-T series of rolls rings for high speed rolling of steel bars has a higher resistance to impact and thermal fatigue and a very high wear resistance as well.

The outstanding characteristics of YGH-T roll ring that are different from conventional cemented carbide roll rings in practical applications are as follows:

- They are suitable for high speed bar rolling machines with a speed of above 100m/s. and it is not easy for them to result in cracks, breakage, groove aging and chips.

- They can be used for rolling conventional steel bars, but also for high speed rolling of alloy steel bars.
- There is a high volume of steel rolled per groove and little regrinding of the groove is needed after the rolling is finished.
- They can be used for the rolling of conventional steel bars and alloy steel bars at a high speed and low temperatures.

Properties of grades for YGH-T series of rolls rings and related data

Grade	Chemical composition		Mechanical properties			Physical properties		
	Co+Ni %	WC %	Hardness HAR	T.R.S MPa	Density g/cm^3	Sandvik	Cerametal	Sintermet
YGH10T	6	90	88	2250	14.90	H6T	CE65	SM80
YGH20T	12	88	86	2750	14.30			SM64
YGH30T	15	85	85	2800	14.00	H15C	CE79	SM59
YGH40T	18	82	83	2700	13.70		CE103	SM65
YGH50T	22	78	82	2700	13.40	H25P	CE112	SM61
YGH60T	30	70	79	2500	12.70	C30P	CE260	SM62

Recommended applications of grades for YGH-T series of roll rings

Grade	Recommended applications
YGH10T	Maximum hardness, excellent wears resistance in the series. Used in the last 1-2 stands of good high speed finishing mills for rolling common and hard steel bars.
YGH20T	Higher wear resistance, moderate impact resistance in the series. Used in the last 1-3 stands of good high speed finishing mills for rolling common and hard steel bars.
YGH30T	Moderate wear resistance and impact resistance, good for general purposes. Used in the last 1-4 stands or all stands of finishing mills.
YGH40T	Best for general purposes, used in the front stands of good mills and in the rear stands of common mills.
YGH50T	Used in the first and second stands of finishing mills and in the stands of pre-finishing rolling mills. For every stand of rolling lines for low speed rolling, low precision and unstable operation.
YGH60T	Maximum binder content in YGH series, good toughness and thermal crack resistance. Used in the stands of pre-finishing rolling mills and for roll rings for hot rolling of ribbed steel.

Stands of finishing rolling mills

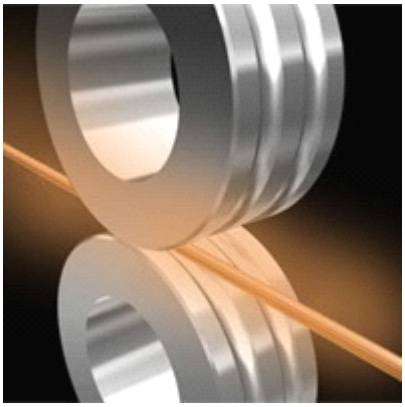


Table of grades recommended for use in different stands.

Grade series		YGH			YGR		
Mill classes		A	B	C	A	B	C
Stands of pre-finishing rolling mills	1 o o	YGH55	YGH55	YGH55	YGR60	YGR60	YGR60
	2 o o	YGH55	YGH55	YGH55	YGR60	YGR60	YGR60
	3 o o	YGH50	YGH55	YGH55	YGR55	YGR55	YGR60
	4 o o	YGH50	YGH55	YGH55	YGR50	YGR55	YGR55
Stands of finishing rolling mills	1 o o	YGH45	YGH50	YGH50	YGR40	YGR45	YGR45
	2 o o	YGH45	YGH50	YGH50	YGR40	YGR45	YGR45
	3 o o	YGH40	YGH45	YGH50	YGR40	YGR45	YGR45
	4 o o	YGH40	YGH45	YGH50	YGR40	YGR45	YGR45
	5 o o	YGH30	YGH40	YGH45	YGR30	YGR40	YGR45
	6 o o	YGH30	YGH40	YGH45	YGR30	YGR40	YGR45
	7 o o	YGH30	YGH40	YGH45	YGR30	YGR40	YGR40
	8 o o	YGH30	YGH40	YGH45	YGR30	YGR40	YGR40
	9 o o	YGH20	YGH25	YGH40	YGR20	YGR25	YGR40
	10 o o	YGH20	YGH25	YGH40	YGR20	YGR25	YGR40
Stands for reducing diameters	1 o o	YGH40	YGH45	YGH45	YGR40	YGR45	YGR45
	2 o o	YGH40	YGH45	YGH45	YGR40	YGR45	YGR45
	3 o o	YGH20	YGH30	YGH40	YGR20	YGR30	YGR40
	4 o o	YGH20	YGH30	YGH40	YGR20	YGR30	YGR40

The selection of the series of YGH-T tungsten carbide grade for roll rings used for different stands is listed in the Table.

Grade	Stands of pre-finishing rolling mills				Stands of finishing rolling mills									
	15	16	17	18	19	20	21	22	23	24	25	26	27	28
	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
YGR60T	O	O	O	O										
YGH50T					O	O	O	O	O					
YGH40T								O	O	O	O	O	O	
YGH30T										O	O	O	O	O
YGH20T												O	O	O
YGH10T														O

Finished carbide roll rings

Dimensions and precision of the finished carbide roll rings

1, Outside diameter: 145mm-380mm

2, Inside diameter: 87mm-260mm

3, Height: 62-130

We can supply them according to the drawings provided by customers.

Tolerances allowable for the O.D., I.D. and height of roll rings

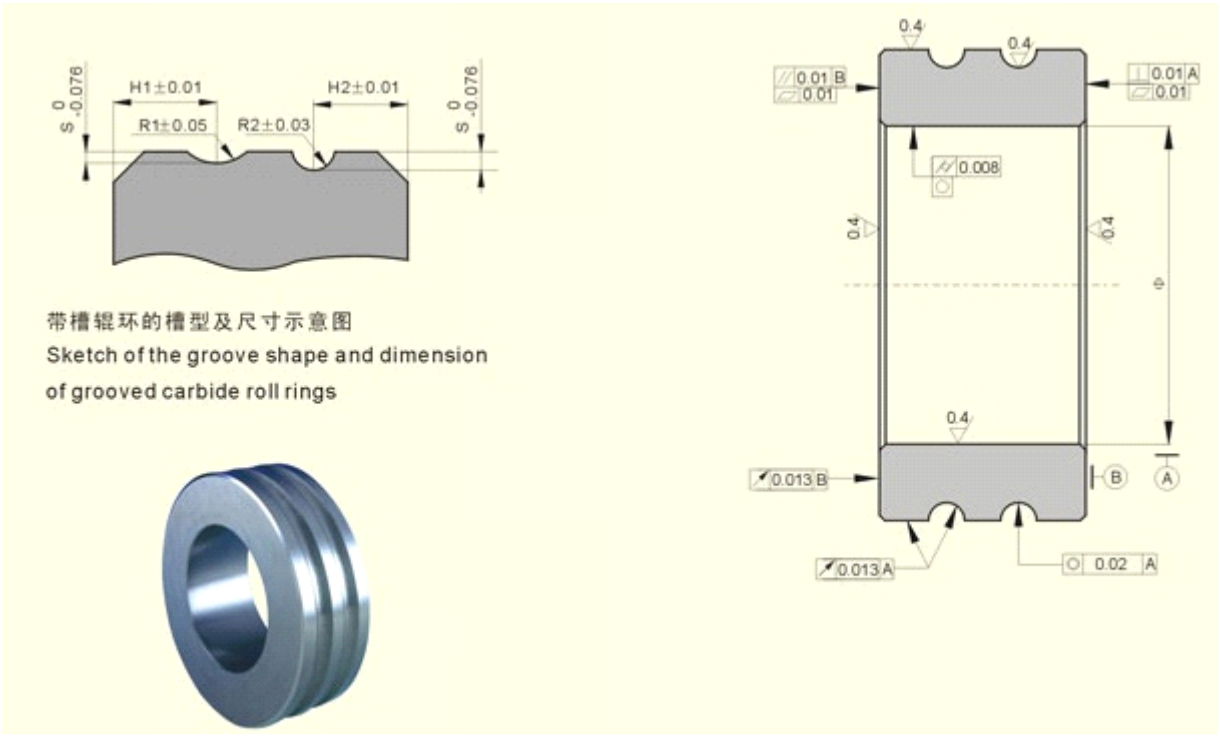
Precision Class	Tolerances of OD (mm)	Tolerances of ID (mm)	Tolerances of height (mm)
Class 1	0.02	IT5	0.03
Class 2	0.05	IT6	0.10
Class 3	0.10	IT7	0.20
Class 4	0.15	IT8	0.50

The allowable deviation of carbide roll rings

- Radial runout of groove < 0.01mm
- Radial runout of periphery < 0.02mm
- End face runout < 0.02mm
- End face planeness < 0.01mm
- End face of parallelism < 0.01mm
- Inner hole cylindercity < 0.01mm

Roughness of carbide rolls

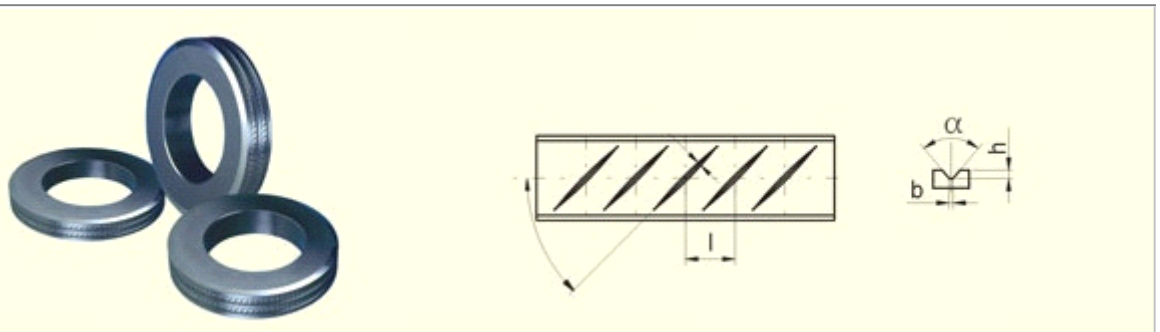
- Inner hole roughness 0.4um
- External roughness 0.4um
- End face roughness 0.4um



带槽辊环的槽型及尺寸示意图
Sketch of the groove shape and dimension of grooved carbide roll rings

Roll rings for ribbed steel bars

Roll rings for high speed rolling ribbed steel bars.



Specification	h (mm)	b (mm)	l (mm)	α
Φ 6	0.7	0.35	4.0	70°, 80°
Φ 6.5	0.7	0.35	4.0	

Φ 8	0.9	0.40	5.5	
Φ 10	1.15	0.45	7.0	
Φ 12	1.35	0.45	8.0	
Φ 14	1.55	0.54	9.0	
Φ 16	1.75	0.65	10.0	

Cold rolling ribbed steel bars

Cold rolling ribbed steel bars

Our company is a Kay enterprise engaged in manufacturing all kinds of rolls for cold rolling. All rolls feature:

1.Improved mechanical properties;

2.Good surface finish and corrosion-resistance;

3.Longer tool life and possible to 600-ton steel bars, suitable repeated use.

The main performances of the three dimensional carbide rolls for cold rolling ribbed steel bars.

Grade	Chemical composition		Mechanical properties			Physical properties
	Co+Ni %	WC %	Hardness HAR	T.R.S MPa	Density g/cm^3	
YGH30	15	85	>83.5	>2520	13.8~14.2	Cold rolling of ribbed steel bars
YG15	15	85	>86.5	>2220	13.9~14.2	

The three dimensional carbide roll rings for cold rolling ribbed steel bars.

Specification	External diameter (D±0.02)	Internal diameter (d±0.02)	High (H±0.02)	Specification	External diameter (D±0.02)	Internal diameter (d±0.02)	High (H±0.02)
GS123082015	123	82	15	GS150095015	150	95	15
GS125082015	125	82	15	GS150095020	150	95	20
GS128082015	128	82	15	GS150096015	150	96	15
GS130082015	130	82	15	GS150096020	150	96	20
GS130082016	130	82	16	GS180125015	180	125	15
GS138080018	138	80	18	GS180125020	180	125	20
GS138090018	138	90	18	GS205150015	205	150	15
GS145095015	145	95	15	GS205150020	205	150	20
GS145095020	145	95	20	GS220140025	220	140	25
GS147095015	147	95	15				

Note:

1, The specifications in the table are recommended for use. We can also produce roll rings according to the drawings provided by customers.

2, The grooves of the roll rings can be designed and manufactured according to GB13788-2000 standard and they can also be designed based on customers' requirements and marked in a special way.

3, We can supply compatible tool steel systems to customers for assisting them with modifying their mills and rolling process.

Application requirements of 3-dimensional cemented carbide roll rings

1, Any striking on and collision with roll rings is strictly prohibited.

2, When installing the whole assembly of roll rings, the clearance of the bearings in relation to the casings should be on the tighter side.

3, The precision of rotation of the whole assembly (circular runout and end runout) should be kept within +0.05mm.

4, The fitting in of the whole assembly and the roll rings shall be a transitional fitting in and fastened.

5, The roll rings should not be cooled by water or oil water emulsion.

6, The joints of the pipes in the internal cooling system should not be leaky and it is advisable that any internal cooling is not to be applied.