



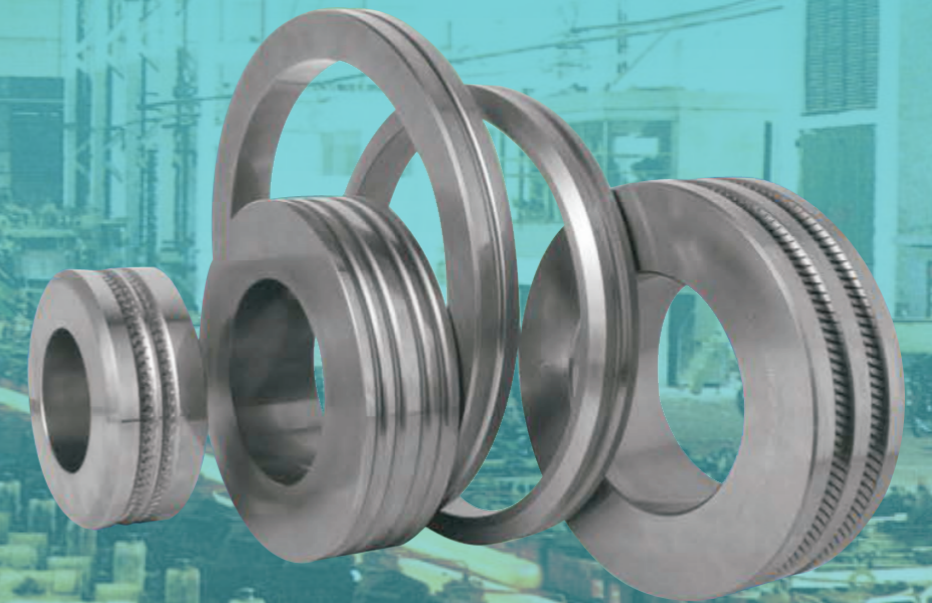
Kimberly Carbide

硬质合金辊环 CARBIDE ROLLS

为线材行业提供优质的模具产品

Provide a high quality mold products for the wire industry

诚信创新 共同发展



Zhuzhou Kimberly Carbide Company Limited
Add1:No.336 Lujiang Road,Tianyuan District,Zhuzhou,Hunan.China
Add2:No.158 Jinjing Road,Hetang District,Zhuzhou,Hunan,China
Tel/Fax:+86-731-28254576 Cell:+8613407330558
Email:johnny@kbcarbide.com /kbcarbide@163.com
Web site:www.kbcarbide.com



株洲金佰利硬质合金有限公司
ZHUSHOU KIMBELRY CARBIDE CO. LTD



硬质合金辊环特性

Characteristics of the carbide roll ring.

硬度高、耐磨性好: 常温下硬度可达到HRA78~89, 高温下的红硬性好, 600°C时超过高速钢, 1000°C时超过碳钢的常温硬度值。

High hardness and good wear resistance: Hardness at room temperature can reach HRA78 ~ 89, good red hardness under high temperature, 600 °C over high-speed steel, 1000 °C over the room temperature of carbon steel.

机械强度高: 抗压强度可高达6000MN/m², 900°C时抗弯强度仍可有1000MN/m²以上。

High mechanical strength: The compressive strength of up to 6000MN / m², 900°C, the bending strength can still above 1000MN/m².

弹性模数高: 常温下刚性较好, 无明显的塑性变形。其杨氏模量为钢的2-3倍。

High modulus of elasticity: Good rigidity at room temperature, no significant plastic deformation. Young's modulus is 2-3 times that of steel.

耐腐蚀性和抗氧化性好: 耐酸、耐碱, 600~800°C时不发生明显氧化。

Corrosion resistance and good oxidation resistance: acid, alkali, 600 ~ 800°C without significant oxidation.

线胀系数小: 在20~400°C的范围内为钢的0.35~0.65。

The linear expansion coefficient is small: in the range of 20 to 400°C for steel 0.35 to 0.65.

电导率: 与铁、铁合金相近

Conductivity: similar with iron and ferroalloy.

热传导率为钢的1/2,铜的1/3。

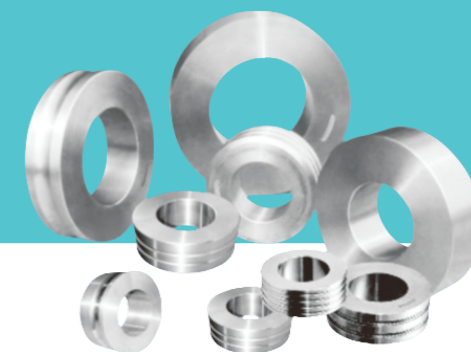
The thermal conductivity of steel 1/2, copper 1/3

密度高: 硬质合金辊环的密度远大于钢铁, 应用于轧钢领域的硬质合金辊环的粘结剂含量在6%~30%,密度大约在12.6~14.8 g/cm³之间。

High density: carbide roll ring density is much larger than the steel used in rolling the field of carbide roll ring binder content of 6 percent to 30 percent, the density is between 12.6 ~ 14.8 g/cm³.

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硬质合金辊环简介

Carbide roll ring Profile

目前, 我公司可以批量生产直径 ≤ 380 mm, 高度 ≤ 130 mm的辊环, 现已具备年产量200吨的能力。完全能满足小型钢与棒、线材生产厂家对中轧、预精轧、精轧机组及减定径机组上各种规格硬质合金辊环的需求。

At present, the company can mass diameter ≤ 380 mm, thickness ≤ 130 mm roll ring, now have annual production capacity of 200 tons. Can meet the needs of small steel and rods, wire manufacturers in rolling, pre-finishing, finishing mill and the reduction in demand for all kinds of carbide roll ring sizing units.

硬质合金辊环新品

New carbide roll ring

1. 适用于轧制速度超过100米/秒和低温轧制技术的新牌号系列已投放市场。

New grades series and Low-temperature rolling technology that suit the rolling speed over 100 meters / sec has been put on the market.

2. 针对特殊用户的通用牌号辊环已批量交货并上机顺利使用。

Roll ring for a particular user's general trademark bulk delivery, and on the machine smoothly

3. KOCKS轧机上用的硬质合金辊环已投放市场。

The Carbide roll ring used for KOCKS mill has been on the market.

LH系列辊环材质说明和牌号使用推荐

Recommended applications of LH Series Grade for roll rings

LH系列辊环各牌号化学成分及物理力学性能

Physical and mechanical properties sheet of LH Series for roll rings

牌号 Grade	化学成分% Chemical Composition		密度 Density g/mm ³	洛氏硬度 Hardness HRA	抗弯强度 Transverserupture Strength N/mm ²	抗压强度 Compressive Strength N/mm ²	导热率 Thermal conductivity Cal/cm.sec.C	热膨胀系数 Coefficient of heat expansion 10 ⁻⁶ /K
	WC	Co						
LH20	90	10	14.3	≥ 86.0	≥ 2300	3500	0.20	6.0
LH25	87	13	14.1	≥ 85.5	≥ 2300	3500	0.20	6.0
LH30	85	15	13.9	≥ 84.5	≥ 2400	3300	0.20	6.1
LH40	82	18	13.6	≥ 84.0	≥ 2500	3200	0.19	6.4
LH45	80	20	13.4	≥ 83.0	≥ 2400	3100	0.18	6.5
LH50	74	26	12.9	≥ 81.0	≥ 2000	3000	0.17	7.0

LH系列辊环各牌号高温性能

Elevated temperature property of LH Series Grade

牌号 Grade	维氏硬度 Hardness (HV)			抗弯强度 Transverserupture Strength (N/mm ²)		
	20°C	300°C	600°C	20°C	300°C	600°C
LH20	1050	850	600	2300	2300	1900
LH25	1050	850	600	2300	2300	1900
LH30	1000	800	550	2400	2200	2000
LH40	950	750	500	2500	2300	2100
LH45	900	700	500	2400	2200	2000
LH50	700	600	400	2000	1900	1800



LH牌号使用推荐

Recommended applications of LH Series

牌号 Grade	使用推荐 Recommended Usage
LH20	<p>该牌号在现有辊环中含粘结剂最少，轧槽的耐磨性最好，导热率最高。具有较高的抗热裂性能。在轧制中可使产品保持最好形状和高的表面质量，但抗冲击韧性略差。适于装备精良工艺稳定的高速线材轧制精轧机组末架和倒数第二架，其修磨一次的轧制吨位远高于其他牌号辊环。可实现前几级机架同样的轧制量，减少换辊次数，实现高的生产效率。</p> <p>Minimum binder content, excellent wear resistance, best thermal coefficient. Best toughness and thermal crack resistance. Rolling, keep a product the best shape and high surface quality, but the impact toughness slightly worse. Used in the last stands of good high speed rolling mills for rolling common and hard steel bars. Can achieve the first few levels the rack the same amount of rolling to reduce the number of roll changing, high production efficiency.</p>
LH25	<p>该牌号在现有辊环中含粘结剂最少，轧槽的耐磨性最好，导热率最高。具有较高的抗热裂性能。在轧制中可使产品保持最好形状和高的表面质量，但抗冲击韧性略差。适于装备精良工艺稳定的高速线材轧制精轧机组末架和倒数第二架，其修磨一次的轧制吨位远高于其他牌号辊环。可实现前几级机架同样的轧制量，减少换辊次数，实现高的生产效率。</p> <p>Minimum binder content, excellent wear resistance, best thermal coefficient. Best toughness and thermal crack resistance. Rolling, keep a product the best shape and high surface quality, but the impact toughness slightly worse. Used in the last stands of good high speed rolling mills for rolling common and hard steel bars. Can achieve the first few levels the rack the same amount of rolling to reduce the number of roll changing, high production efficiency.</p>
LH30	<p>一种耐磨性和抗冲击韧性适中。通用性较强的牌号，在设备精度高，工艺操作稳定的轧制线，可用于精轧机组后部的大部分机架或全部机架。可减少辊环牌号过多而增加辊环的储备量，也便于辊环的管理。</p> <p>Moderate wear resistance and impact resistance. Good for general purposes. Versatility and strong grades in high precision equipment, process operation and stability of the rolling line can be used for the finishing mill most of the rear of the rack or full rack. Can reduce the roll grades to the excessive increase in the amount of the reserve roll, and also facilitate the management of the roll.</p>
LH40	<p>含粘结剂较高。合金具有较好的韧性和抗裂性能，又因合金生产原料和工艺特别，合金又具有较高的耐磨性。LH40合金通用性能最好，适用于较高水平精轧机的前面大部分机架和一般水平精轧机大部分后部机架。</p> <p>High binder content. Good toughness and thermal crack resistance, good wear resistance. Best for general purposes. Used in most stands of the finishing mills and in the rear stands of common mills.</p>
LH45	<p>该牌号含粘结剂较多。合金具有良好的韧性和抗裂纹能力，一般用于精轧机组第1-2架或预精轧，也适用于轧制速度低，设备精度较差，轧制工艺过程控制技术水平较低或不稳定的轧制线，用此牌号可尽量减少轧制中的碎裂。</p> <p>High binder content. Good toughness and thermal crack resistance. Used in the first and second stands of finishing rolling mills and in the stands of pre-finishing rolling mills. For every stand of rolling lines for low speed rolling, low precision and unstable operations.</p>
LH50	<p>含粘结剂最高。轧辊具有优良的韧性和抗裂纹能力，用于螺纹钢的轧制或预精轧机架。</p> <p>Maximum binder content. Good toughness and thermal crack resistance. Used in the stands of pre-finishing rolling mills for hot rolling ribbed steel bars.</p>

LH各机架辊环牌号推荐表

Table of grades recommended for use in different stands

轧机工作状态等级 Mill Classes				轧机工作状态优 Excellent working conditions	轧机工作状态良 Good working conditions	轧机工作状态差 Bad working conditions
预精轧机架 Stands of prefinish rolling mills	1	○	○	LH55	LH55	LH55
	2	○	○	LH55	LH55	LH55
	3	○	○	LH50	LH50	LH50
	4	○	○	LH50	LH50	LH50
精轧机架 Stands of finish rolling mills	1	○	○	LH45	LH50	LH50
	2	○	○	LH45	LH50	LH50
	3	○	○	LH40	LH45	LH50
	4	○	○	LH40	LH40	LH50
	5	○	○	LH30	LH40	LH45
	6	○	○	LH30	LH40	LH45
	7	○	○	LH30	LH40	LH45
	8	○	○	LH20	LH40	LH45
	9	○	○	LH20	LH20	LH40
	10	○	○	LH20	LH20	LH40
减定径机架 Stands for reducing diameters	1	○	○	LH40	LH45	LH45
	2	○	○	LH40	LH45	LH45
	3	○	○	LH20	LH40	LH40
	4	○	○	LH20	LH40	LH40

**LR系列辊环材质说明和牌号使用推荐**

Recommended applications of LH Series Grade for roll rings

LR系列辊环各牌号化学成分及物理力学性能

Physical and mechanical properties sheet of LH Series for roll rings

牌号 Grade	化学成分% Chemical Composition		密度 Density g/mm ³	洛氏硬度 Hardness HRA	抗弯强度 Transverse rupture Strength N/mm ²	抗压强度 Compressive Strength N/mm ²	导热率 Thermal conductivity Cal/cm.sec.C	热膨胀系数 Coefficient of heat expansion 10 ⁻⁶ /K
	WC	Co+Ni+cr						
LR20	89	11	14.3	≥ 86.0	≥ 2200	3400	0.2	6.0
LR25	87	13	14.1	≥ 84.0	≥ 2200	3400	0.2	6.0
LR30	85	15	13.9	≥ 83.0	≥ 2300	3200	0.2	6.1
LR40	82	18	13.6	≥ 82.0	≥ 2300	3200	0.2	6.2
LR45	80	20	13.5	≥ 81.0	≥ 2200	3000	0.14	6.4
LR55	75	25	13.0	≥ 80.0	≥ 2200	2800	0.17	6.8
LR60	70	30	12.8	≥ 79.0	≥ 2100	2700	0.15	7.0

LR系列辊环各牌号高温性能

Elevated temperature property of LH Series Grade

牌号 Grade	维氏硬度 (HV) Hardness			抗弯强度 (N/mm ²) Transverse rupture Strength		
	20℃	300℃	600℃	20℃	300℃	600℃
LR20	1000	750	600	2200	2100	2000
LR25	1000	750	600	2200	2100	2000
LR30	900	700	550	2300	2200	2000
LR40	750	650	530	2300	2100	2000
LR45	730	600	500	2250	2100	2000
LR55	700	550	450	2200	2000	1900
LR60	680	830	430	2100	1900	1800

该系列合金由于在粘结剂中加入镍和铬元素。使合金具有较高的抗热裂纹和抗腐蚀能力，从而能减少轧槽中微裂纹的深度的宽度，延长了轧槽的使用寿命，获得较高的轧制吨位和较优的轧材表面质量。在PH≤7.2的冷却水条件下，更显示出特殊的优越性。

The binder include the Nickel and Chromium. Tungsten carbide have higher thermal cracks and corrosion resistance , they are able to reduce the depth of micro- cracks of rolling slot width , to extend the life of the rolling groove , get rolling tonnage and optimum roll surface quality.

LR牌号使用推荐

Recommended applications of LH Series

牌号 Grade	使用推荐 Recommended of the usage
LR20	该系列中含 WC 量最高。导热性能较好，具有较高的耐磨性和耐腐蚀性，但韧性略差，用于装备良好的精轧机组最后 2—3 架次，可获得表面光滑的轧材和高的轧槽寿命。 High content of WC. Good thermal conductivity , high wear resistance and corrosion resistance , but the toughness slightly worse for the well-equipped finishing mill for the last 2-3 vehicles available surface smooth rolled and high- rolling groove life .
LR25	该系列中含 WC 量最高。导热性能较好，具有较高的耐磨性和耐腐蚀性，但韧性略差，用于装备良好的精轧机组最后 2—3 架次，可获得表面光滑的轧材和高的轧槽寿命。 High content of WC. Good thermal conductivity , high wear resistance and corrosion resistance , but the toughness slightly worse for the well-equipped finishing mill for the last 2-3 vehicles available surface smooth rolled and high- rolling groove life .
LR30	含粘结相适中。合金具有较好的韧性及抗热裂纹性、抗腐蚀性、耐磨性，通用性较好。可用于装备良好的精轧机中间和后部机架，使用该牌号可使产品表面质量提高，轧槽使用寿命延长。 Normal content of the binder. The alloy has good toughness and thermal crack resistance , corrosion resistance , abrasion resistance, good versatility . Used in the middle and rear stands of finishing mills, it available improve the surface smooth and improve the usage life.
LR40	该牌号粘结相较高。合金具有较好的韧性及抗热裂纹性、抗腐蚀性，同时具有较高的耐磨性，通用性能最好。适用于较高水平精轧机的大部分机架和一般水平精轧机的大部分后部机架。 High content of the binder. The alloy has good toughness and thermal crack resistance , corrosion resistance , abrasion resistance, good versatility . Used in the middle and rear stands of common finishing mills, it available improve the surface smooth and improve the usage life.
LR45	该牌号粘结相较高。合金具有较好的韧性及抗热裂纹能力。适用于精轧机组第 1—4 架，可明显减少轧制时轧槽中热裂纹的深度和宽度，减少轧辊碎裂的危险。 High content of the binder. The alloy has good toughness and thermal crack resistance , corrosion resistance. Used in the 1-4 stands of finishing mills. It could significantly reduce the depth and width of the rolling rolling tank of hot cracking , reducing the risk of fragmentation of the roll
LR50	该牌号粘结相最高。合金具有高的冲击韧性及抗热裂纹能力。适用于轧制中应力较大的螺纹钢轧制和预精轧，也可用于轧机精度较差轧机组第 1-2 架，可减少碎辊危险。 Highest binder content. Good impact resistance. Used for hot rolling ribbed steel bars and in the first and second stands of prefinishing rolling mills. Can reduce the risk of broke roller.
LR60	含粘结相量最高。轧辊具有优良的韧性和抗裂纹能力，用于螺纹钢的轧制或预精轧机架 Highest binder content. Good impact resistance and thermal crack resistance. Used in the stands of pre-finishing rolling mills for hot rolling ribbed steel bars.



LR各机架辊环牌号推荐表

Table of grades recommended for use in different stands

	轧机工作状态等级 Mill Classes			轧机工作状态优 Excellent working conditions	轧机工作状态良 Good working conditions	轧机工作状态差 Bad working conditions
	1	○	○			
预精轧机架 Stands of prefinish rolling mills	1	○	○	LR55	LR55	LR55
	2	○	○	LR55	LR55	LR55
	3	○	○	LR50	LR50	LR50
	4	○	○	LR50	LR50	LR50
精轧机架 Stands of finish rolling mills	1	○	○	LR45	LR50	LR50
	2	○	○	LR45	LR50	LR50
	3	○	○	LR40	LR45	LR50
	4	○	○	LR40	LR40	LR50
	5	○	○	LR30	LR40	LR45
	6	○	○	LR30	LR40	LR45
	7	○	○	LR30	LR40	LR45
	8	○	○	LR20	LR40	LR45
	9	○	○	LR20	LR20	LR40
	10	○	○	LR20	LR20	LR40
减定径机架 Stands for reducing diameters	1	○	○	LR40	LR45	LR45
	2	○	○	LR40	LR45	LR45
	3	○	○	LR20	LR40	LR40
	4	○	○	LR20	LR40	LR40

辊环型号规格表示方法

Carbide roll rings type and Size

辊环毛坯规格表示方法：辊环毛坯字母HR、外径、内径、高度等四个代号组成。

Roll rings' type and size: HR, OD, ID, H Type groove, expressed by five digitally number

示例 Example:

HR - 285 X 160 X 095

① ② ③ ④

- ① 表示辊环毛坯字母HR。
HR MEANS Roll Ring nibs.
- ② 表示辊环毛坯的外径尺寸，用3位数字表示，单位为mm，不足三位则前面加“0”填位。
Symbol of roll rings' OD, expressed by three digitally number, the unit is in mm, if the number is short of three digits, add "0" in the front to fill in it
- ③ 表示辊环毛坯的内径尺寸，用3位数字表示，单位为mm，不足三位则前面加“0”填位。
Symbol of roll rings' ID, expressed by two digitally number, the unit is in mm, if the number is short of two digits, add "0" in the front to fill in it
- ④ 表示辊环毛坯的高度尺寸，用3位数字表示，单位为mm，不足三位则前面加“0”填位。
Symbol of roll rings' H, expressed by three digitally number, the unit is in mm, if the number is short of three digits, add "0" in the front to fill in it

辊环精坯规格表示方法：辊环成品字母MHR、外径、内径、高度、槽型等五个代号组成。

Finished carbide roll rings: MHR, OD, ID, H, Type groove, expressed by five digitally number

示例 Sample:

MHR- 285 X 160 X 095- NA

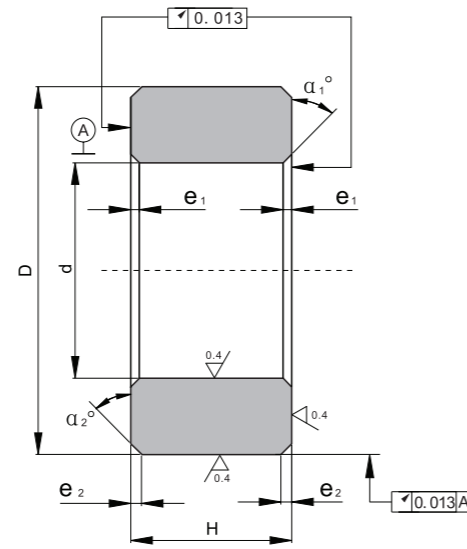
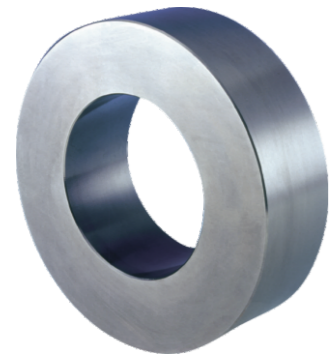
① ② ③ ④ ⑤

- ① 表示辊环精坯字母MHR。
MHR means finished carbide roll rings.
- ② 表示辊环精坯的外径尺寸，用3位数字表示，单位为mm，不足三位则前面加“0”填位。
Symbol of roll rings' OD, expressed by three digitally number, the unit is in mm, if the number is short of three digits, add "0" in the front to fill in it
- ③ 表示辊环精坯的内径尺寸，用3位数字表示，单位为mm，不足三位则前面加“0”填位。
Symbol of roll rings' ID, expressed by two digitally number, the unit is in mm, if the number is short of two digits, add "0" in the front to fill in it
- ④ 表示辊环精坯的高度尺寸，用3位数字表示，单位为mm，不足三位则前面加“0”填位。
Symbol of roll rings' H, expressed by three digitally number, the unit is in mm, if the number is short of three digits, add "0" in the front to fill in it
- ⑤ 表示辊环精坯的槽型，由2为字母组成。
Symbol of roll rings' groove, expressed by two digitally number,



平辊环精坯尺寸及精度

The precision of the finished carbide roll rings



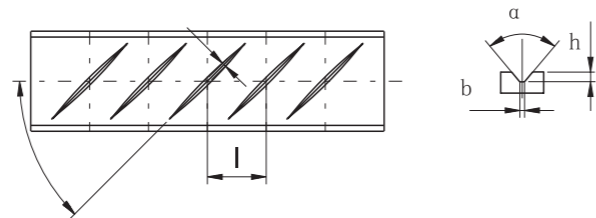
单位 : mm

外径范围 (D)	内径范围 (d)	高度范围 (H)
145—380	87—260	62—130

备注：我公司可以按照用户图纸加工 Note : We can machining according to customer's drawing

高线螺纹辊环精坯尺寸

Roll rings for high speed rolling of ribbed steel bars



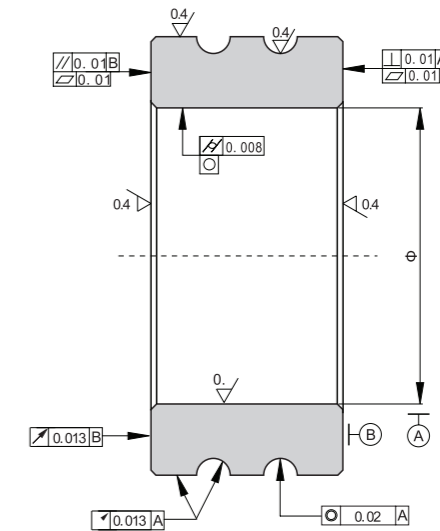
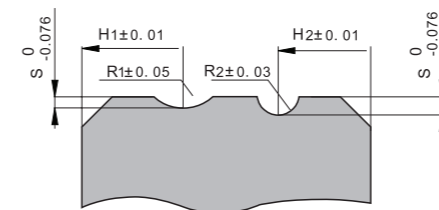
单位 : mm

外径范围 (D)	内径范围 (d)	高度范围 (H)
145—380	87—260	62—130

备注：我公司可以按照用户图纸加工 Note : We can machining according to customer's drawing

槽辊环精坯尺寸

Table of specifications of finished rolls



单位 : mm

外径范围 (D)	内径范围 (d)	高度范围 (H)
145—380	87—260	62—130

备注：我公司可以按照用户图纸加工 Note : We can machining according to customer's drawing

精坯辊环技术条件

Table of specifications of finished rolls

精坯的外径、内径、高度尺寸及允许偏差

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

单位 : mm

类别/TYPE	外径 OD ≤ 200 mm		外径 OD > 200mm	
	较高级 Better Grade	普通级 Normal Grade	较高级 Better Grade	普通级 Normal Grade
外径极限偏差 Tolerance of OD	± 0.020	± 0.050	± 0.030	± 0.050
内径极限偏差 Tolerance of ID	+0.020 0	+0.035 0	+0.025 0	+0.050 0
高度极限偏差 Tolerance of H	± 0.025	± 0.100	± 0.050	± 0.100



热轧棒材、螺纹钢用硬质合金复合辊环

Composite cemented carbide roll rings for hot rolling rod and ribbed steel bars

精磨辊环的形位公差

Tolerance of finished carbide roll rings

单位：mm

类别 TYPE	外径 OD≤200 mm		外径 OD > 200mm	
	较高级 Better Grade	普通级 Normal Grade	较高级 Better Grade	普通级 Normal Grade
槽的径向跳动 Radial runout of groove	0.013	0.025	0.020	0.030
外圆径向跳动 Radial runout of periphery	0.013	0.025	0.020	0.030
端面跳动 End face runout	0.010	0.020	0.015	0.025
两端面平行度 Two end face parallelism	0.010	0.025	0.015	0.030
内孔圆柱度 Inner hole cylindricity	0.008	0.020	0.010	0.025

辊环粗糙度

Roughness of carbide rolls

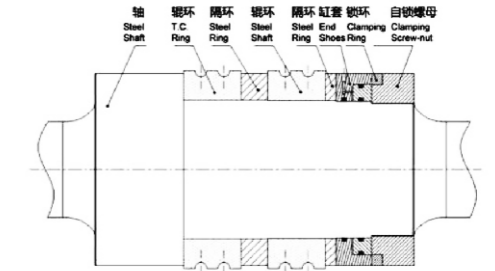
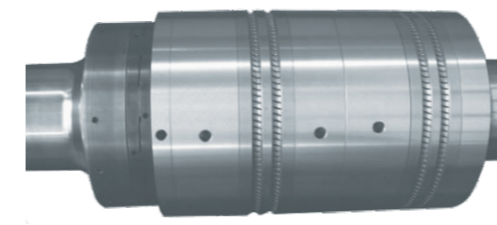
单位：μm

类别 TYPE	端面 End Face	内孔 Inner Hole	外圆 Periphery	轧槽凹面 concave face of groove	倒角 Chamfer
表面粗糙度 Ra	≤0.4	≤0.4	≤0.8	≤0.8	≤3.2

制品超声波探伤检验技术要求

Technical requirements of ultrasonic testing

分层、裂纹 Delamination, crack	探头移动时伤波不迅速消失并有一定长度。 Probe moves flaw echo can't quickly disappeared and with a certain length.
孔洞、脏化 Holes, dirty technology	探头移动时伤波迅速消失。 Probe moves flaw echo quickly disappeared .
脱碳、渗碳 Decarburization, carburization	探头移动时伤波有草状回波。 The probe moves hurt the wave of grass-like echo



在螺纹钢、棒材轨机的成品前机架上，采用硬质合金复合轧辊可以大幅度减少换槽、换辊次数，减轻劳动强度，提高劳动生产率，提高轧材表面量和成材率，从而获得显著的经济效益。

Installed on the finished products stands and stands afore of rods and twist steel rolling machines can substantially reduce the times of groove changes and roll changes, reduce labor intensity, increase productivity, improve surface quality and yield of rolled material, thus achieving outstanding economic benefits.

采用热轧棒材、螺纹钢专用硬质合金牌号

采用液压螺母锁紧装置，通过注入100–200Mpa的高压油，液压螺母产生500–1500KN的轴向预紧力，将硬质合金辊环紧固在母轴上。该装置实用、可靠，在适当的预应力保护下，确保硬质合金复合轧辊发挥更高的轧制性能。

为棒线减径机提供直径300–400、厚度30–150各种规格的硬质合金辊环。

提供热轧螺纹钢、棒材用的各种规格的硬质合金复合轧辊。

提供硬质合金复合轧辊的设计、槽型加工、刻肋等技术服务。

提供硬质合金复合轧辊加工所需各类配套刀具。

Special cemented carbide grades

Special cemented carbide grades are used for hot rolling rods and ribbed steel bars With hydraulic nuts locking devices and in-feed of oil with a pressure of 100–200Mpa, the hydraulic nuts create an axial preloaded force of 500–1500KN and fasten the cemented carbide roll rings to the mother shafts. The devices are practical in use and reliable and they can insure higher performances of composite cemented carbide roll rings under the protection of a proper preloaded force.

Various cemented carbide roll rings are available with diameters of Φ300–400mm and thicknesses of 30–159mm for rod reducing and sizing machines.

Various composite cemented carbide roll rings for hog rolling ribbed steel bars and rods.

Service is to be rendered for the design, grooving machining and rib machining of composite cemented carbide roll rings.

Various compatible tools can be provided for machining composite cemented carbide roll rings.

**硬质合金复合辊环使用注意事项**

The use instruction of Carbide Composite Rolls for hot rolling Thread Steel

硬质合金轧辊属脆性材料。装配时严禁用铁锤敲打。和其他重器敲击，吊装时严禁出现硬质合金轧辊碰撞硬质合金轧辊。容易引起崩块加剧，水质PH值大于7.2时，不仅对硬质合金辊环腐蚀减少，提升寿命。而且对轧机的腐蚀减少，起了保护作用。

Cemented carbide roll is fragile & brittle product. Striking with hammer and hitting with other heavy objects are prohibited. When assembling, roll rings should not hit with one and another. When water PH>7.2, The corrosion of cemented carbide will be reduced and its service life will be prolonged as well. Moreover, it also protect the mill from being corroded The cooling water is very important to the effectiveness and service life of cemented carbide roll. The pressure of cooling water should be kept above 3-5 bar. Water injection should be radial direction which is at an angle of 15-30 degree against the direction of ring, the cooling water shall not b scatterid, nor sprayed It must be injected straightly into the groove. The cooling water must be precipitated and purified, , the volume of solid particle in water should be kept less than 30rng/L. The flow rate of cooling water should not be lower than 24 cubic meter (2) lhour.

冷却水对硬质合金轧辊使用效果及寿命至关重要，冷却水压力要求保证在3-5巴以上,喷水方向为径向。与轧辊放置方向成(15-30)度角，水不能散射或成雾状,应在主进水弯管上焊接小大嘴，使冷却水直接射入轧槽。冷却水需进行沉淀和净化处理，使固体粒子的含量小于30mg/L.冷却水的流量应大于等于24立方米/时。

轧槽在使用过程中出现微裂纹是很难避免的。属正常现象，但当轧槽中裂纹深度达至0.3mm左右时,就应及时换槽或修磨，这是为了减少和避免轧槽中微裂纹继续扩展引起碎辊。必须轧辊重修磨时。务必将微裂纹彻底修磨干净。否则未磨尽的裂纹将给下一次轧制带来碎辊和"掉肉"的危险。

修磨完成后的轧槽需进行钝化处理。以消除轧槽与横肋交接处的刃口并使其带有R0.05-0.1mm的圆滑过渡。以提高轧槽的使用寿命，提高单槽过钢量。

Crack of groove is inevitable during the rolling, it is a normal phenomenon. But when the crack depth in groove reaches around 0.3mm, it should be replaced with new groove or grinding. This is to reduce the risk of broken roll caused by the expansion of micro-cracks in groove. When regrind the roll, the micro-cracks must be thoroughly eliminated, otherwise, remnant crack will bring risks of broken roll in the next round of rolling After grinding, the groove should undergo inactivation treatment to eliminate the blade in the junction of groove and the transverse rib, and make it have the R0.05 - 0.1mm smooth transition, this will help enhance the service life of groove and improve capacity of each groove

硬质合金辊环的使用要求

Operational requirements of cemented carbide roll rings

硬质合金辊环是由碳化钨和粘结金属组成的高硬度、高耐磨性的工具材料，要使硬质合金辊环在高速线材轧制中充分发挥其高耐磨、长寿命、高效率的优点，在采购和使用硬质合金辊环时，需注意处理好以下事项：

Cemented 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 rings:15Cemented carbide roll rings

牌号选择 Grades selection

全面了解各牌号硬质合金的性能是正确选择各机架所用硬质合金辊环的牌号的依据，实现各机架牌号的匹配的需要。

An overall understanding of the properties of cemented carbide grades is a basis for correctly selecting the grades for roll rings used in the stands of rolling mills and an optimal combination of grades is required for the various stands of rolling mills.

辊环安装 Roll rings installation

辊环的镶套和上机组装严格按设计工艺要求的精度进行，辊环与机架辊轴及锥套之间要求合适的配合，不能过紧或过松；过紧时使辊环处于大的张力状态，稍大的轧制力波动将使辊环碎裂；过松使轧制中的辊环与轴、锥套造成相对滑动，刮坏锥套、辊轴而引起碎裂。上机前需检查辊环是否合乎要求，并且辊环及锥套、轴的装配面需仔细擦洗干净，上机时严禁用铁锤或其他硬物敲打辊环，运输、安装过程严禁辊环的相互碰撞，以防损坏辊环。

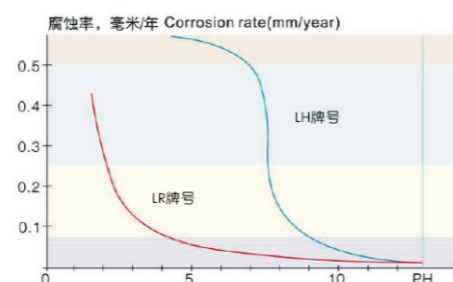
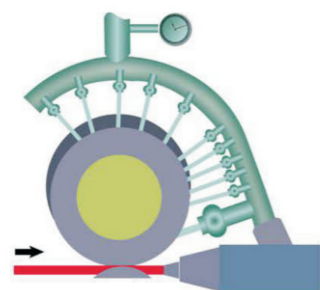
Sleeve mounting and assembly of roll rings should be strictly performed according to the precision required by the design process. Proper fitting is needed for the roll rings, roll mandrel for stands and conical sleeves, which cannot be over tight or loose. When it is too tight, the roll rings are in a tensile state and more fluctuation of rolling force will make the roll rings break. When it is too loose, it causes the roll rings, roll mandrel and conical sleeve to slide relatively during rolling, which scratches conical sleeves and roll mandrel resulting in cracks. Before running the mill make a check if the roll ring meets the needs and roll ring, the assembling faces of the conical sleeve and the roll mandrel need to be cleaned. It is forbidden to knock at the roll rings with a hammer or other hard materials when running the mill. It is forbidden for the roll rings to impact each other during the transportation and installation to prevent roll rings from damage.



冷却及冷却水质 Cooling and cooling water quality

冷却是为了减少辊环轧制时的热腐蚀、热疲劳及热应力对辊环的作用，防止辊环破裂，延缓裂纹的扩散，延长轧槽寿命，对硬质合金辊环效果的发挥非常重要，冷却的参考规范如下：冷却水的温度低于25℃，冷却水的压力（5-6）巴、水量（24-30）m³/小时架，喷水应为径向，与辊环的旋转方向成（15-30）度的角，水柱宽度为轧槽的2倍，应直接喷入轧槽，水不能散射或呈雾状。

Cooling is intended to reduce the influence on roll rings of thermal corrosion, fatigue and stress during rolling. It can prevent the roll rings from cracking and slow down the diffusion of cracks, prolonging the life time of grooves. It plays an important role in optimizing the performances of roll rings. The reference data for cooling are as follows: The temperature of cooling water is below 25° C, pressure of cooling water is 5-6 bar with a water volume of 24-30m³/hr/stand. The water is jetted in a radial direction and the angle between the water jet and the rotating direction of roll rings is 15-30 degrees. The width of the water column is 2 times that of the groove and the water should be jetted directly into the grooves and the water should not be scattering or misty.



水质要求 Water quality requirement:

LH系列需用于PH≥7.2的中性或弱碱性水质
For YGH series PH≥7.2 medium or weak alkali water
LR系列可用PH≥7.2 或PH≤7.2的微酸性水质
For YGR series PH≥7.2 or PH≤7.2 weak acid water
水中固体粒子含量 < 15毫克/升
The content of solid particles in the water < 15mg/L

轧槽的修磨 Regrinding of grooves

轧槽轧制到一定时间时会出现微裂纹，当微裂纹延长加深至0.2mm时应下机修磨。修磨时需彻底磨去微裂纹，否则未磨尽的微裂纹将会使下次轧制时微裂纹更快扩大，使辊环碎裂。正常轧制的修磨量建议控制如下：

Microcracks will occur after the rolling of the groove for some time and when the microcracks extend to 0.2mm the roll ring has to be reground. Microcracks must be reground thoroughly when regrounding, otherwise the unground microcracks will make

the microcracks extend more rapidly during the next rolling and probably make the roll ring crack. The recommended amount of regrounding after normal rolling is as follows:

- 精轧机（9-10）架辊环（0.4-0.6）mm
Roll rings for stands 9-10 of finishing rolling mill (0.4-0.6)mm
- 精轧机（1-8）架辊环（0.7-1.2）mm
Roll rings for stands 1-8 of finishing rolling mill (0.7-1.2)mm
- 预精轧机辊环（1.2-2.0）mm
Roll rings for stands of pre-finishing rolling mill (1.2-2.0)mm

硬质合金辊环的轧制量

Reasonable rolled quantity

轧制时轧槽出现微裂纹是不可避免的，达到一定深度（一般控制在0.2mm）时需修磨。过量轧制，导致微裂纹深度较快扩大，碎辊的危险增大，应该防止。建议正常轧制量选择范围如下：

During rolling microcracks in grooves can not be avoided, and they need to be reground when they are at a certain depth (normally controlled at 0.2mm). Excess rolling causes the depth of microcracks to extend rapidly and dangers of crushed rolls increase, which should be prevented. The volume of material to be rolled normally after each regrinding is as follows:

- 预精轧机架：（3500-4500）吨
Stands of pre-finishing rolling mill: (3500-4500) tons
- 精轧1-2架：（1800-3000）吨
1-2 Stands of finishing rolling mill: (1800-3000) tons
- 精轧3-4架：（1800-3000）吨
3-4 Stands of finishing rolling mill: (1800-3000) tons
- 精轧5-6架：（1500-2500）吨
5-6 Stands of finishing rolling mill: (1500-2500) tons
- 精轧7-8架：（1500-2500）吨
7-8 Stands of finishing rolling mill: (1500-2500) tons
- 精轧9-10架：（600-1800）吨
9-10 Stands of finishing rolling mill: (600-1800) tons
- 减定径机架：（600-1800）吨
Stands for reducing diameters: (600-1800) tons