

## High Chromium Duplex Cast Rolls

High Cr duplex rolls use the high alloy cast steel (or iron) with up to 6 - 22% Cr content as the shell's material, and use high strength nodular iron as the core material. According to the content of carbon, it can be divided into high Cr cast steel rolls and high Cr cast iron rolls. Influenced by the high Cr content, its carbide is  $M_7C_3$  which has higher hardness, better toughness and extremely good wear resistance than normal carbide. With the high alloy elements and special heat treatment, the matrix has the excellent comprehensive properties at high temperature.

According to the stand used and cooling water in the hot strip mills, high Cr cast steel or high Cr cast iron can be selected. These rolls can be used as the working rolls in the cold mills and tempering mills, and the rings can also be made of these material.

### 化学成分 Chemical composition(%)

代号 Symbol	C	Si	Mn	Cr	Ni	Mo
HCr-1	2.4-2.8	0.4-1.0	0.4-1.2	10-15	0.8-2.0	0.7-2.0
HCr-2	2.4-3.0	0.3-0.8	0.5-1.3	14-19	0.8-2.0	0.7-2.0
HCr-3	2.5-3.0	0.3-0.8	0.7-1.5	16-21	0.8-2.0	1.0-3.0
HCrS	0.6-1.4	0.4-1.0	0.2-1.0	6-15	0.2-1.0	1.0-3.0

### 物理性能 Physical Properties:

代号 Symbol	硬度 Hardness HS	抗拉强度 Tensile strength MPa	抗弯强度 Bending strength HS	冲击韧性 Impact Value $\times 10^4 \text{J/m}^2$	弹性模量 Elastic Modulus kMPa
HCr-1	60-70	500-800	700-1000	4-8	210-225
HCr-2	65-80	500-800	700-1000	4-8	210-225
HCr-3	78-92	600-900	900-1300	4-8	210-225
HCrS	65-85	700-1000			210-225
辊颈 Neck	35-50	>350	550	4-7	160-190

### 金相组织 Microstructure:

HCr-1 屈氏体 + 回火索氏体 + 贝氏体 + 碳化物  
troosite + temper sorbite + bainite + carbide

HCr-2 贝氏体 + 马氏体 + 碳化物  
bainite + martensite + carbide

HCr-3 回火马氏体 + 碳化物 + 少量二次碳化物  
temper martensite + carbide + a litter of secondary carbide

HCrS 回火索氏体或马氏体 + 碳化物  
temper sorbite or martensite + carbide

### 用途 Application:

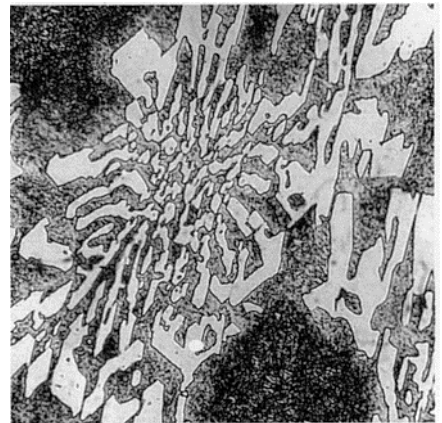
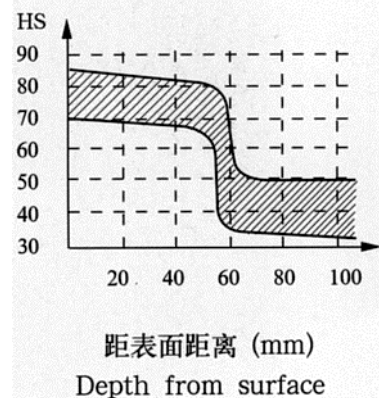
HCr-1	带钢热连轧机粗轧工作辊，宽中厚板轧机工作辊。 Work rolls for roughing stands of hot strip mills and wide plate mills.
HCr-2	带钢热连轧机精轧前段工作辊，棒线材轧机及无缝钢管矫直机用辊。 Work rolls for early finishing stands of hot strip mills and rolls for bar, rod mills and seamless tube straitening mills.
HCr-3	冷带轧机工作辊，平整工作辊。 Work rolls for cold strip mills and tempering mills.
HCrS	带钢热连轧机粗轧、精轧前段工作辊，带钢冷轧机工作辊，中板轧机工作辊。 Work rolls for roughing and early stands of hot strip mills, for cold strip mills and plate mills

### 承制范围 The capacity of making:

辊身直径(mm) Diameter of barrel	辊身长度(mm) Length of barrel	净重(t) Net weight
280-1350	400-3100	32(max.)

### 硬度分布曲线示例:

Example of typical hardness profile:



HCr-1、2、3 工作层 shell 500X



HCrS 工作层 shell 500X