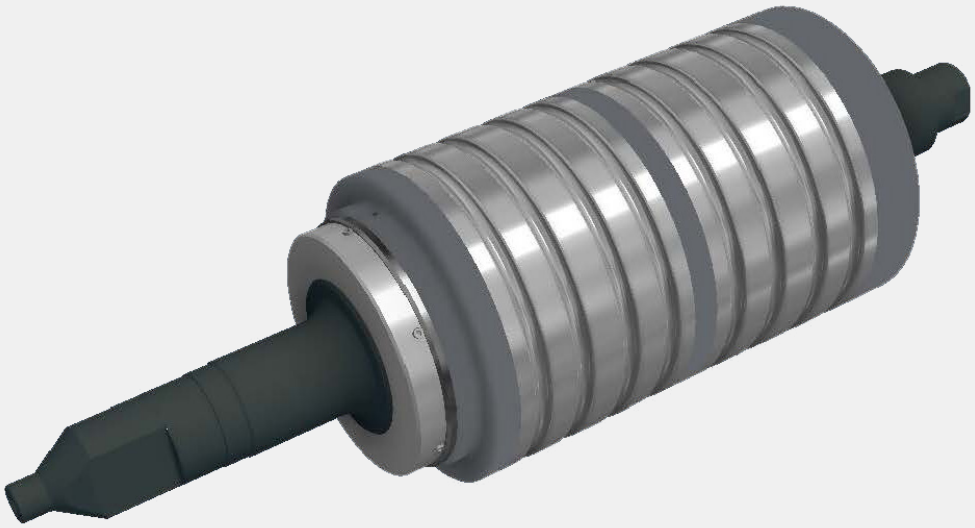
COMPOSITE ROLLS

Utilization of hard metals to improve rolling quality, reduce plant stops and increase productivity, recommended for intermediate and finishing area

DR-CR

>rolling mill roll series<



The utilization of hard metals instead of the conventionally used steels and cast iron in the intermediate and finishing area of rolling mills leads to a tangible reduction of wear process. Each rolling mill is unique and therefore each of them requires tailor-made solutions.

Main features:

> Considerable increase of rolling roll life

> Reduction of plant stoppages for roll substitution

> Multi-strand capability

> Product tolerances and surface finishing improvement

> Better cost/profit effectiveness

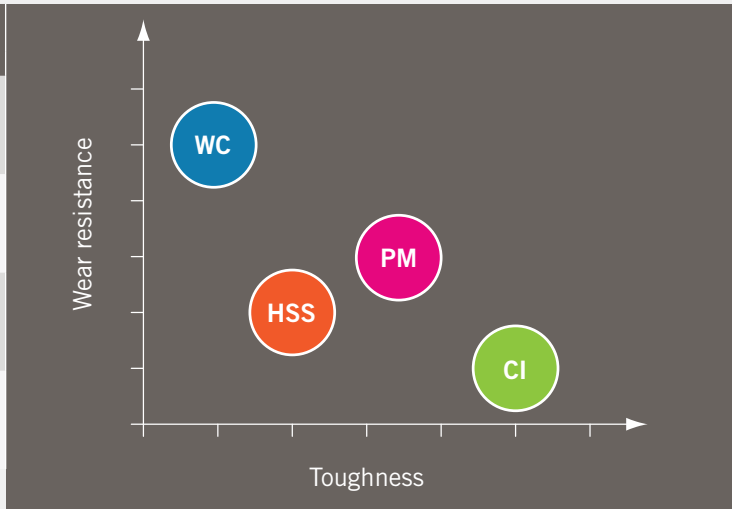
> Stable and performing blocking technology

> Easier roll assembly-disassembly

> Tailor made solution according to Client's need

COMBINED HYDRAULIC NUT LOCKING DEVICE FOR ROUND AND REBARS. PERFORMANCE ENHANCED BY 7-9 TIMES MORE THAN CAST IRON ROLLS

Material	Duration (ton)
CAST IRON (CI)	x 1
HIGH-SPEED STEEL (HSS)	x 2-5
POWDER METALLURGY (PM)	x 4-6
TUNGSTEN CARBIDE (WC)	x 7-9



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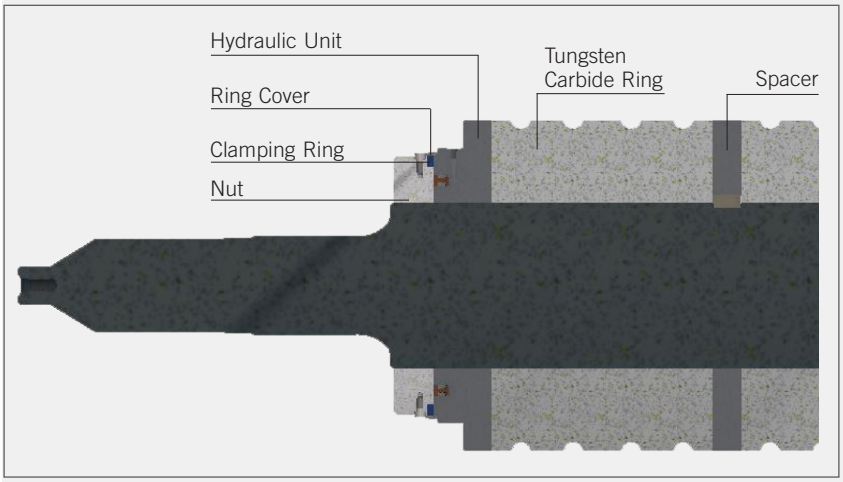
Composite roll with combined hydraulic nut locking device

Composite rolls are equipped with a mechanical clamping system. Under the action of pressurized oil, creating the right axial force, and hydraulic pressure, it is possible to assembly carbide rings and steel spacers held in place by a pressurized locking system.



The alternation of roll heating and cooling during its use results in a significant temperature gradient. Due to this fact, thermal tensions arise mainly on roll profiles, by creating a series of superficial chippings.

The typology of these chippings depends mostly on the chosen hard metal quality. Hard metal quality with high percentage of binder are characterized by a higher thermic expansion coefficient and by a low thermic conductivity.
In this particular typology of hard metals, chippings arise more easily, but normally they remain on the surface.

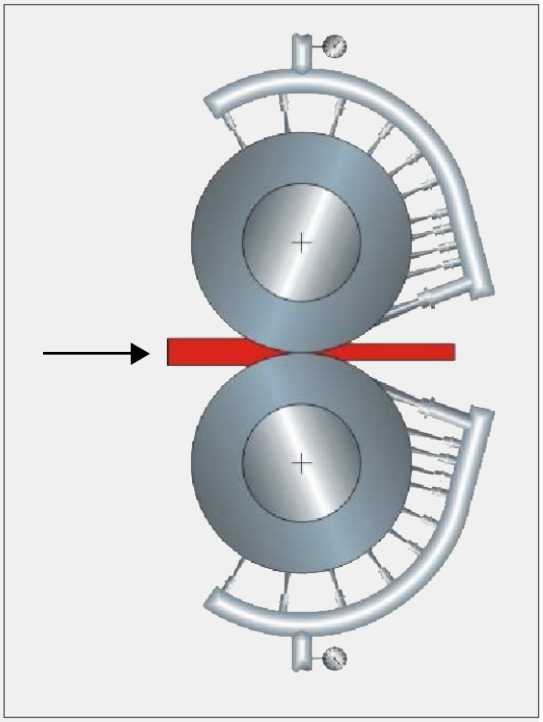
If rolling speed is low and contact time between roll and rolled product are longer, then chipping depth might increase up to 0,8mm.

Nevertheless, it is important that any chipping is completely removed during the process of roll regrinding.

Cooling system

The high processing temperature of the roll primarily occurs in the contact area between the roll and rolled product and involves a series of effects that shorten the useful life of the roll. Corrosion, wear, dimensional precision and spalling jeopardize production efficiency (and should therefore be avoided if possible).
In this case, the use of a sufficient amount of coolant is highly recommended.

Corrosion increases with rolling temperature, which means that the groove, if compared to the rest of the roll, presents a higher level of corrosion.
In fact, corrosion causes the binder to detach from the tungsten carbide structure. If surface corrosion is regular, wear is higher. Irregular corrosion, on the other hand, often leads to spalling caused by mechanical or thermal stresses. Special binders such as nickel-cobalt-chrome have a higher resistance to corrosion and can be used with pH values up to 5.5.



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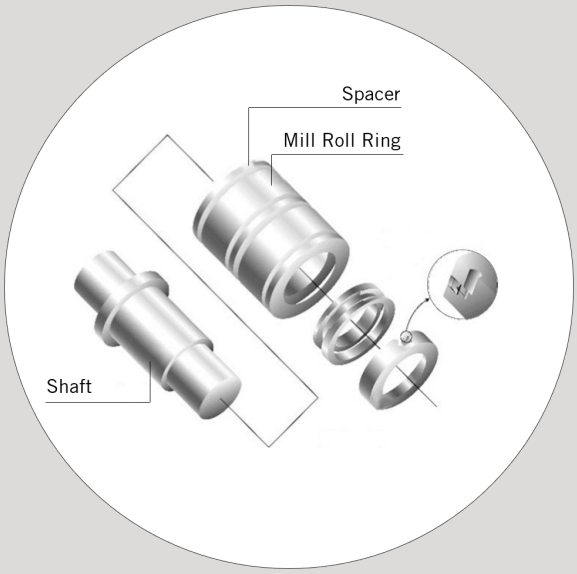
Powder Metallurgy Alloy



Produced by the powder metallurgy process has no segregation and obtains a very uniform and fine structure unlike the existing materials. The wear resistance can be improved by a large amount of various carbide forming elements can be added, and excellent heat treatment stability.
This type of material allows to maintain a large surface as in the case of cast iron rolls, i.e. a greater number of grooves than TC rolls.

> Minimum rolling speed is about 2,5m/s

> Uniformly dispersed fine vanadium carbide (VC) - High toughness and yield strength and excellent wear resistance

> Fine carbide - Easy remachining / repolishing (about 15% improvement) than casting HSS

> Manufactured by alloyed powder - Prevention of one-sided wear and roll marking

> Maintain wear resistance, toughness and hardness and minimize cracks up to 500 °C

> Similar heat treatment condition to casting HSS, but excellent in toughness and wear resistance (Improved wear resistance and lifetime by more than 30% compared to cast HSS)

Tungsten Carbide

Compared with other materials, it is much better in terms of heat-resistance, wear-resistance and strength. What's more, its hardness reduces a little under the condition of high temperature.

> Minimum rolling speed is about 1.5m/s

> Free from slippage even under high rolling torque and low rolling speed

> Regrinding depth on TC rings is 2 - 2,5mm

> Applicable to various rolling stands due to excellent and unique design, flexible and optimal design for every requirement

> Higher productivity with excellent surface finish of final products through precise dimension control during rolling

> Stable and reliable clamping technology

> Unique and flexible design for different requirements

> Minimum downtime for roll changes due to longer groove life-cycle of carbide rolls

> Easy to assembly and disassemble

> Reduced and minimizes mill downtime (for roll changes) - Maximum productivity

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