HYPERION MATERIALS & TECHNOLOGIES

Smart Rolling Solutions

Cemented carbide composite roll solutions for intermediate and finishing stands

HYPERION
Materials & Technologies

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EXPERIENCE GAINED FROM MORE THAN 300,000 ROLLS

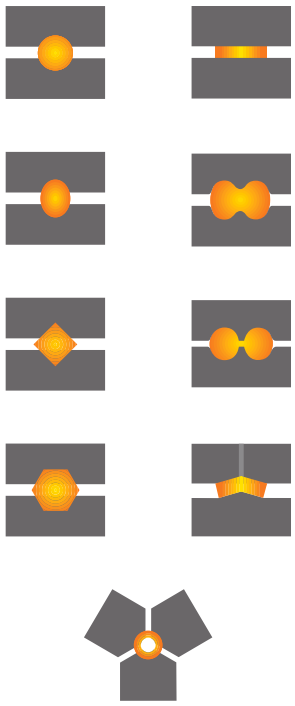
Hyperion's more than 50 years of experience in hot rolling applications, together with our wide range of rolls tailored to match market demands, give us the unique ability to partner with our customers in the development of effect solutions specific for their rolling mill needs.

DESIGNED TO CUSTOMER SPECIFICATIONS

With extensive knowledge in rolling technology, Hyperion plays a key role in improving profit margins in rolling mills worldwide. Every rolling mill is unique, which means that each one requires a tailor-made solution. Our field operation product specialists assist you in selecting the optimum composite roll application to meet your specifications.

Hyperion provides technical expertise about roll grades, machining data, handling of rolls, and evaluation of roll performance.

HYPERION OFFERS TAILOR-MADE SOLUTIONS
Cemented carbide block rolls
Combi rolls
Cast-in-Carbide (CIC®) solutions
CIC combi rolls
CIC integral
CIC tube rolls
CIC cantilever rolls



Demanding applications require the best in roll performance. Hyperion's cemented carbide composite rolls handle round, square, and hexagonal bars, flat strips, rebars, angles, and tubes with roll life up to 20 times that of ordinary cast iron rolls.

FROM A UNIQUE POWDER TO HIGH-PERFORMING CARBIDE ROLLS

CEMENTED CARBIDE

Cemented carbide is one of the most successful composite engineering materials ever produced. Cemented carbide's unique combination of strength, hardness, and toughness satisfies the most demanding applications.

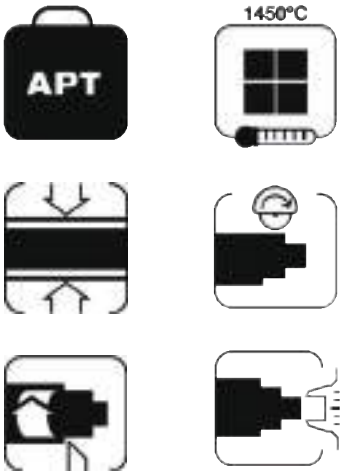
A key feature of cemented carbide is the potential to vary its composition so that the resulting physical and chemical properties ensure maximum resistance to wear, deformation, fracture, corrosion, and oxidation.

PRESSING, SHAPING, AND SINTERING

Cemented carbide manufacturing is highly specialized, involving many different metallurgical, chemical, and mechanical processes. The main stages from powder to finished roll blank are pressing, shaping, and sintering.

A pressing capacity of up to 2000 tons places Hyperion's powder pressing facilities in a class of their own. In the direct sintering process, the shaped blanks are heat-treated to a well-defined temperature, pressure, and time, depending on the particular carbide grade.

Hyperion's cemented carbide powder consists of spherical granules with highly uniform dimensions, ensuring optimal performance of the sintered carbide.



HYPERION CEMENTED CARBIDE GRADES

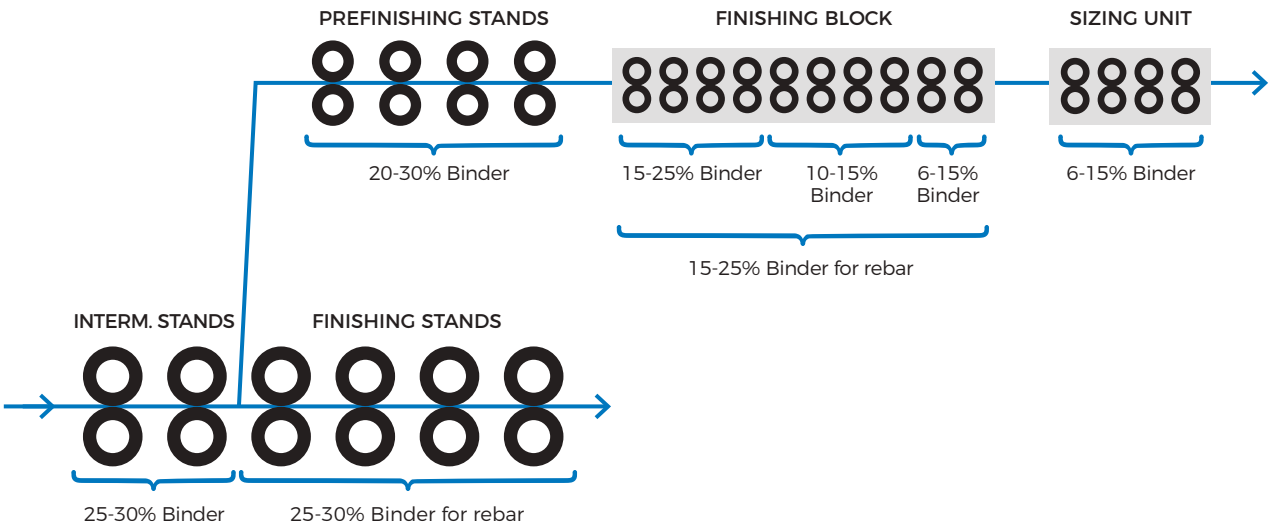
As the world's leading manufacturer of cemented carbide, Hyperion provides its customers our unique expertise in developing the correct combination of carbide and binding metal powder to optimize your roll application.

Cemented carbides are a range of composite materials, which consist of hard carbide particles bonded together by a metallic binder. The proportion of carbide is generally between 70 and 97% of the total weight of the composite, and its grain sizes average between 0.4 and 10 µm.

Tungsten carbide (WC), the hard phase, together with cobalt (Co), the binder phase, form the basic cemented carbide structure from which other types of cemented carbide have been developed.

Also, cemented carbides are produced that have the cobalt binder phase alloyed with, or completely replaced by, other metals such as chromium (Cr), nickel (Ni), molybdenum (Mo), or alloys of these elements.

Grades are applied according to performance requirements.



HYPERION COMPOSITE ROLL TECHNOLOGIES

Hyperion's composite roll technologies offer new opportunities for rolling mill managers to improve product quality, reduce downtime, and increase productivity

COMPOSITE ROLLS - A PROVEN INVESTMENT FOR ROLLING MILLS WORLDWIDE

The widespread success of composite rolls has been made possible through our close interactions with rolling mills worldwide, having supplied them with carbide rolls since 1965. Our experienced personnel and well-equipped laboratories ensure you get the grade and design you need and provide you with support for today's and tomorrow's applications.

BETTER PRODUCTION ECONOMY

Operating experience shows that composite rolls provide up to 20 times the rolled tonnage of conventional cast iron rolls. This translates into a considerable increase in mill output. Scrap is reduced, the production flow runs smoother, and product tolerances and surface finishes are improved.

All in all, Hyperion composite rolls are well-suited for better production economy in the rolling mill.

	CAST IRON ROLLS	CEMENTED CARBIDE ROLLS
Down time/year	450 hours	36 hours
Lost production/year	45,000 tons	3,600 tons
Extra production/year		> 40,000 tons
Increased revenue/year		15,000,000 USD

Calculated on a production of 100 tons/hour.

HYPERION CIC® COMBI ROLLS

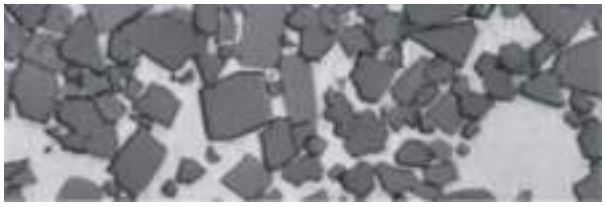
Hyperion's CIC combi rolls' unique designs are successfully in operation in more than 100 mills worldwide.

CAST IN CARBIDE

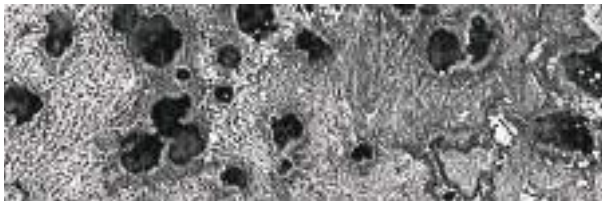
Containing an optimized combination of cemented carbide and ductile iron, CIC combi rolls merge excellent pass form wear resistance with high strength and toughness in the roll body. The composite design of CIC combi rolls means that carbide performs the rolling, while torque transmission is handled by the ductile cast iron.

CIC combi rolls improve productivity because of two distinct advantages:

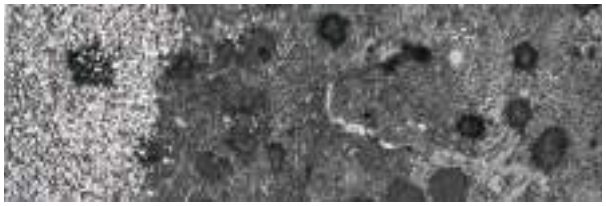
- Pass life up to 20 times that of conventional cast iron rolls, which heavily influences downtime costs
- Easy to mount, with a safe procedure.



Microstructure of cemented carbide



Microstructure of nodular cast iron



Microstructure of the metallurgical bond

HYPERION CIC® COMBI ROLLS

LONG EXPERIENCE IN PRODUCING ROLLS

More than 300,000 cemented carbide rolls have been produced by Hyperion since 1965. The CIC concept takes this roll material a step further, as demonstrated in hot rolling mills all over the world.

The properties of Hyperion composite rolls have been thoroughly tested in the CIC combi rolls concept, consisting of just four elements: the CIC ring, the arbor, the drive keys, and the locking nut. For reliable torque transmission, keyways are machined into the CIC ring's iron body. You can order complete CIC combi rolls from Hyperion or only replacement CIC rings, if you prefer to manufacture the arbor, key, and locking nut yourself.

SPEED, ROLL WEAR, AND AVAILABILITY

Rolling speed, minimized rolls wear, and overall availability are the key factors in improving mill output. CIC combi rolls handle these requirements extremely well, thanks to the unique combination of high-performance carbide and a selected ductile iron for the roll body.

HYPERION CIC® INTEGRAL STATE-OF-THE-ART ROLL TECHNOLOGY

CIC INTEGRAL ROLLS - A COMBINATION HARD TO BEAT

Hyperion's CIC integral rolls provide the strongest design available for the early and intermediate stands in your mill. They are best suited for:

- Highest rolling torque and force
- Low rolling speeds, even below 1 m/sec.

The cast iron arbor and cemented carbide rings are cast and machined as one solid piece, with no keys, no keyways, and no locking nuts. This permits torque transmission higher than that of conventional CIC combi rolls. Also, because there are no locking devices that take up space, more pass forms are available for productive rolling.

HYPERION CIC® ROLLS FOR OTHER APPLICATIONS

CIC TUBE ROLLS

Hyperion's CIC tube rolls can give a pass life up to 40 times that of conventional cast iron rolls. CIC tube rolls provide excellent surface finishes, tolerances, and geometries of the rolled tube.

CIC CANTILEVER ROLLS

Hyperion's CIC cantilever rolls are often used in the intermediate and finishing sections of rod mills. Compared to the alternative, a carbide ring on a separate steel body, CIC rolls are easier to mount and require less machining of roll parts. CIC rolls guarantee the absence of carbide ring slippage.

HYPERION GLOBAL PRESENCE

OUR VALUE PROPOSITION

Along with our high quality products, Hyperion offers product specialists who work closely with our customers to provide on-site support and answers to technical questions.

Our specialists:

- Recommend material grades
- Calculate cost savings
- Recommend roll cooling options for the best possible roll performance.

We also offer start-up assistance at your production site, support on roll machining, and tailor-made technical training for officers, engineers, and operators at the Rolls Technology Center, located at our production unit in Stockholm, Sweden.

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