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Sandvik offer consists of tailor-made:

- Cemented carbide block rolls
- Dynalock® 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. Sandvik 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.

EXPERIENCE GAINED
FROM MORE THAN 300,000 ROLLS

50 years of unique experience in hot rolling applications, together with the wide range of rolls tailored to match market demands, has made Sandvik a successful partner in the rolling mill sector.

DESIGNED TO CUSTOMER SPECIFICATION

With strong know-how in rolling technology, Sandvik Hyperion plays a key role in improving profit margins in rolling mills worldwide by supporting customers in partnership. Every rolling mill is unique, which means that each one requires a tailor-made solution. Our field operating product specialists assist you in selecting the optimum composite roll application to match your specifications. We support you with valuable advice on roll grades, machining data, handling of rolls and evaluation of roll performance.
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 manufacture is a highly specialized area, 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 our 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.

Sandvik’s Cemented Carbide powder consists of spherical granules with highly uniform dimensions, ensuring optimal performance of the sintered carbide.
CEMENTED CARBIDE GRADES

As the world’s leading manufacturer of cemented carbide, Sandvik has unique know-how in applying the right carbide and binding metal powder constituents for any particular roll application.

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

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

Also, cemented carbides are produced which 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.
COMPOSITE ROLL TECHNOLOGIES

Sandvik’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 make sure 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, product tolerances and surface finish are improved. All in all, Sandvik composite rolls are well suited for better production economy in the rolling mill.

<table>
<thead>
<tr>
<th></th>
<th>Cast iron rolls</th>
<th>Cemented carbide rolls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Down time/year</td>
<td>450 hours</td>
<td>36 hours</td>
</tr>
<tr>
<td>Lost production/year</td>
<td>45,000 tons</td>
<td>3,600 tons</td>
</tr>
<tr>
<td>Extra production amount</td>
<td>&gt;40,000 tons</td>
<td></td>
</tr>
<tr>
<td>Increased revenue</td>
<td></td>
<td>15,000,000 USD</td>
</tr>
</tbody>
</table>

Calculated on a production of 100 tons per hour
CIC® COMBI ROLLS

Sandvik’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 the carbide takes care of the rolling, while torque transmission is handled by the ductile cast iron.

In order to improve productivity, CIC combi rolls offer two distinct advantages:

• Pass life up to 20 times of conventional cast iron rolls, which heavily influence downtime costs.
• Easy to mount, with a safe procedure.
LONG EXPERIENCE IN PRODUCING ROLLS

More than 300,000 cemented carbide rolls have been produced by Sandvik 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 Sandvik 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 a complete CIC combi rolls from Sandvik, or only replaceable 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.
CAST IN CARBIDE
A COMBINATION HARD TO BEAT

The strongest design available for the early and intermediate stands in your mill. Best suitable for:

• Highest rolling torque & force
• Low rolling speeds, even below 1 m/sec.

State-of-the-art rolling technology is represented by the CIC Integral combi rolls. The cast iron arbor and the cemented carbide rings are cast and machined as one solid piece. No keys, no keyways, no locking nuts. This permits higher torque transmission than the conventional CIC combi rolls. Also, since there are no locking devices that take up space, more pass forms are available for productive rolling.
DYNALOCK®
COMBI ROLLS-THE EVER LASTING LOCK

THE DYNAMIC SOLUTION SUITABLE FOR ALL ROLL MATERIALS

When designing and manufacturing combi rolls, a major concern is to create safe, reliable locking of the roll rings, ensuring that the rings will never slip. A missed rolling due to slippage is to be avoided at all times.

Existing combi rolls based on solid roll rings have a static lock, i.e. a set locking load is applied at assembly. During usage roll deflection creates local deformation between the different roll parts, which together with other deteriorations, like corrosion, will cause the locking load to decrease and eventually the roll rings will slip.

Sandvik has developed locking systems with a dynamic function. Our roll rings are locked as good at scrap diameter as when the rolls are new. Dynalock is a development platform from which different rolling applications can get the best possible, tailored solutions.

From your normal combi roll stand to the toughest you can imagine, used in all different roll materials - let Dynalock combi rolls give you the best possible productivity.
CIC® ROLLS FOR OTHER APPLICATIONS

CIC TUBE ROLLS
Sandvik’s CIC tube rolls can give a pass life up to 40 times that of conventional cast iron rolls. CIC tube rolls will provide excellent surface finish, tolerances and geometry of the rolled tube.

CIC CANTILEVER ROLLS
Sandvik’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, require less machining of roll parts. CIC rolls guarantee the absence of carbide ring slippage.
OUR VALUE PROPOSITION

Together with a high quality product we have our product specialists working close to the customer giving on site support and answers on technical questions. Our specialists:

• Advice on grade choice.
• Make cost per ton calculations to improve roll economy.
• Give our recommendation on roll cooling for 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.