SIWACO

ROLLS FOR THE FOOD INDUSTRY

SIWACO GMBH
A MEMBER OF
THE IRLE GROUP

We are specialised in wear resistant rolls and finished castings. Our technical expertise combined with the power of the IRLE GROUP offers cast rolls and products as well as reliable roll-services with an attractive price-performance ratio and short delivery times.

Essential parts of our business are wear resistant rolls and finished castings as well as an optimal treatment of rolls, considering the specific requirements of every application.

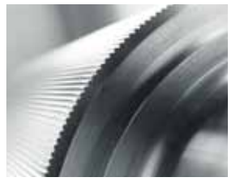
MORE THAN 300 YEARS OF FOUNDRY EXPERTISE, 200 YEARS OF ROLL CASTING

Our rolls are manufactured according to the utmost modern metallurgy and technical treatment standards and by experienced and qualified experts by WALZEN IRLE in Germany and by its subcompany IRLE KAY JAY ROLLS in India. In 2007 a joint-venture was established with the Indian Company Kay Jay Rolls Pvt. Ltd., Panchkula, India. Both parties agreed to build and operate an iron foundry near Chandigarh. For this „IRLE KAY JAY ROLLS Pvt. Ltd.“ has been founded to produce rolls for the food industry and stretch reducing rolls for the tube and wire industry.

ROLLS FOR THE FOOD INDUSTRY

The production of food using rolls for such processes as squeezing, milling, grating, breaking, refining or flaking put special demands on the type of rolls used.

The performance and quality of the rolls determine the quality of the products to be produced and the economic efficiency of the production. Rolls influence the process profitability due to their long lifetimes, reliability, wear- and service costs as well as cooling- or heating performances of thermal rolls.
We have decades of experience in manufacturing rolls of every type for the production of food. Our rolls have a worldwide reputation for their reliability and wear resistance.



CRACKER MILL ROLLS

Applications:
Cracking of oilseed (like soybeans, rapeseeds, canola, mustard seed), cracking of coffee beans, crushing of flour, processing in feedlots

Materials:
OCC®, OCE®, OCE® 600 Ultra, OCR®

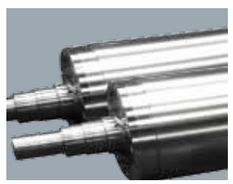
FLAKER MILL ROLLS

Applications:
Flaking of oilseed (like soybean, canola, rapeseed, sunflower), processing feedlots, breakfast cereal, corn flakes, rice flakes, guar gum, oatmeal and cotton seed
Materials:
OCC®, OCE®, ORT®, OCR®

SMOOTH ROLLS

Applications:
Crushing and extracting of flour

Materials:
OCC®, OCE®, OCE® 450 Ultra Matt



REFINER ROLLS

Applications:
Refining of chocolate, soap and dye

Materials:
OCC®

SIWACO ROLLS ARE PRODUCED FOR THE PROCESSING OF

- cereals,
- cotton seed
- cocoa beans,
- coffee beans,
- oilseeds such as
  - soybeans,
  - rape-oil seeds & canola,
  - sunflower seeds,
  - corn

APPLICATION FIELDS AND IMPLEMENTATIONS

We supply the food industry with all common roll types – from small cracking and smooth rolls beginning with a diameter of 200 mm up to big rolls for flakers with a diameter of 850 mm.

The roll layout, material and the shape of the roll surface – with crown, flat or fluted – are adjusted to the specific use and the processing technology.

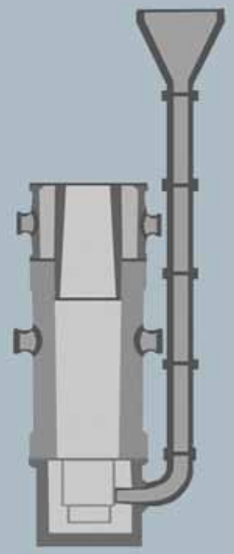
For the roll process in the production of food we offer different manufacturing processes and options including drilled systems for an optimal heating or cooling of rolls.

CONSTRUCTION

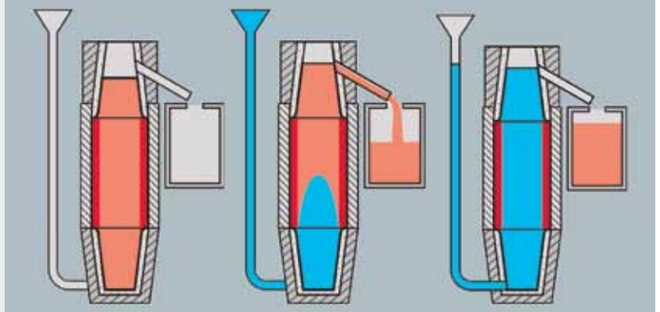
Our customers especially appreciate the following values of our products: excellent long lifetimes, good thermal performance, high-quality smooth running behaviour due to dynamic balancing and improved Total Cost of Ownership (TCO).

SHRUNK-IN JOURNALS

FLANGED ON JOURNALS



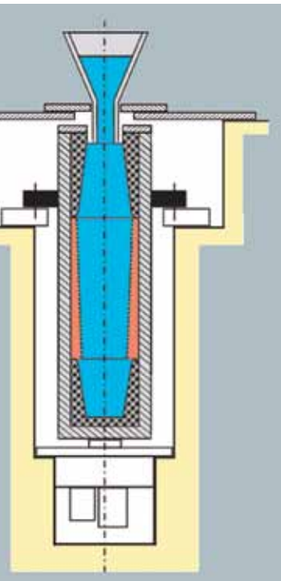
STATIC SINGLE POURED CASTING PROCESS



STATIC COMPOUND CASTING PROCESS

MANUFACTURING PROCESSES

The foundry supplies all casting forms, either as chill moulds or sand moulds for the pieces to be cast.

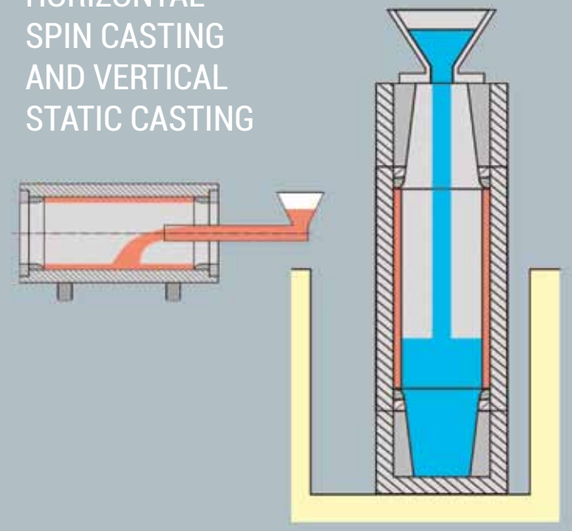


VERTICAL SPIN CASTING MACHINE

In order to meet your demands we offer an individual stock- and delivery service as well as a consulting service on site with regard to all processing questions.
As a roll supplier for all renowned mechanical engineering and constructions we offer you the necessary know-how for the production of high-quality rolls.

DRILLED HEATED / COOLED ROLL TYPES

HORIZONTAL SPIN CASTING AND VERTICAL STATIC CASTING



MELTING FACILITIES:

- 8 electrical melting furnaces (induction), from 3 to 30 tons each

CASTING FACILITIES:

- static single poured and compound casts - single pieces up to a maximum cast weight of 130 tons, over a diameter of over 1,700 mm and 13 m length
- horizontal/vertical centrifugal cast machines for single poured and compound cast pieces up to a barrel length of 6 meters
- vertical spin casting machine for rolls up to 11,5 m length and 75 tons finish weight

HEAT TREATING FACILITIES:

- 17 gas-fired heat treatment furnaces

MATERIALS

OCC® -440; -480; -520; -560; -600

Oil Mill **C**hilled **C**ast

Microstructure and main properties

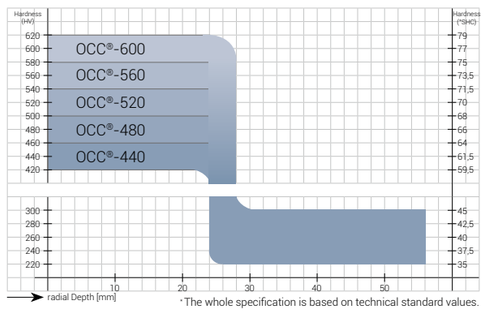
The microstructure of the 30-60 mm thick shell material contains 30-50% carbides of cementite and metallic matrix.
The surface hardness and wear resistance is determined by the amount of carbides in the microstructure and the structure of the matrix.
A pearlitic, bainitic or martensitic matrix of the shell can be obtained with special alloying elements. The increase of hardness and wear resistance will cause a decrease in thermal and mechanical capability.

Mechanical Properties*

	Shell-Material	Journal- and Core-Material		
		Nodular Iron	Grey Iron	Forged Steel
Tensile Strength (N/mm²)	200-270	350-450	160-240	> 590
Bending Strength (N/mm²)	330-450	650-820	300-450	Yield point (N/mm²) > 340
Alternating Bending Strength (N/mm²)	70-80	130-180	80-130	-
Modulus of Elasticity (kN/mm²)	170-185	160-180	110-130	> 205

*The whole specification is based on technical standard values.

Hardness Penetration Curve*



*The whole specification is based on technical standard values.

ORT® -400; -440; -480

Oil Mill **R**oll **T**ough

Microstructure and main properties

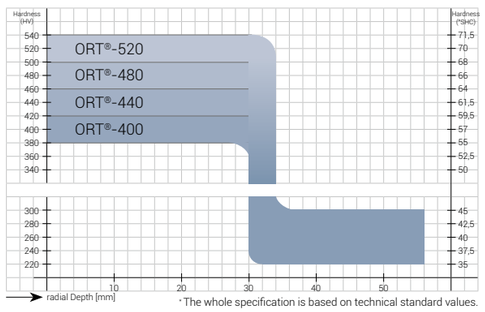
ORT® rolls have a fine-grained material structure subject to a special casting process which leads to an increase of the strength.
The ORT® rolls have a uniform resistance over the total roll barrel.
The improved strength and thermal properties of the material reduces the risk of pitting and micro spallings in the roll barrel/edges to the maximum possible extent.

Mechanical Properties*

	Journal- and Core-Material		
	ORT®-400;-440	ORT®-480;-520	Forged Steel
Tensile Strength (N/mm²)	350-450	330-430	>590
Bending Strength (N/mm²)	660-820	540-710	Yield point (N/mm²) >340
Alternating Bending Strength (kN/mm²)	120-150	100-130	-
Modulus of Elasticity (kN/mm²)	160-180	160-180	>205

*The whole specification is based on technical standard values.

Hardness Penetration Curve*



*The whole specification is based on technical standard values.

OCE® -520; -560; -600; -640

Oil **C**ylinder **E**terno

Microstructure and main properties

The distinguishing feature of the OCE® grade is the radial orientated microstructure from the roll surface to the roll centre.
Depending on the demands of the application OCE® rolls can be delivered either in single or double poured quality.
OCE® has an application designed matrix and is most commonly provided with a hardness range of 500-660 HV.

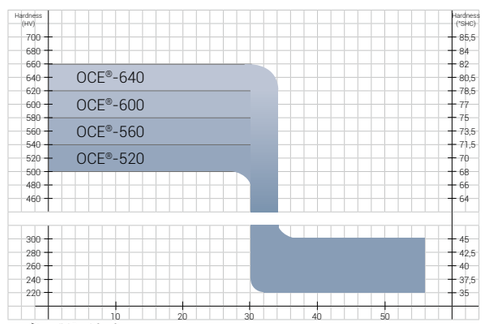
Ask for our special materials **OCE® 600 Ultra** and **OCE® 450 Ultra Matt** and get to know the advantages of these upgraded materials!

Mechanical Properties*

	Shell-Material	Journal- and Core-Material		
		Nodular Iron	Grey Iron	Forged Steel
Tensile Strength (N/mm²)	250-400	350-450	160-240	> 590
Bending Strength (N/mm²)	400-650	650-820	300-400	Yield point (N/mm²) > 340
Modulus of Elasticity (kN/mm²)	160-180	150-180	120-140	> 205

*The whole specification is based on technical standard values.

Hardness Penetration Curve*



*The whole specification is based on technical standard values.

OCR® -400; -440; -480

Oil Mill **Chr**ome

Microstructure and main properties

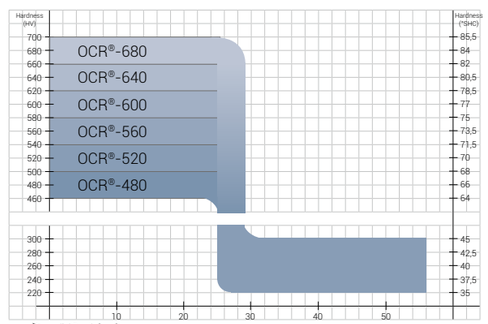
The amount of Cr-carbides (up to 35%) determines the wear resistance, toughness and mechanical strength of the material. The composition can be adjusted to best address the needs of the application.
When properly maintained, OCR® rolls offer a superior wear resistant surface. Further positive properties are the high compression and thermal resistance of the material. Cr-carbide content (up to 35%) and details of heat treatment will be set according to the specific roll application in order to achieve surface hardnesses up to 700 HV. Hardness and wear resistance are constant over the usable shell layer.

Mechanical Properties*

	Shell-Material	Journal- and Core-Material		
		Nodular Iron	Grey Iron	Forged Steel
Tensile Strength (N/mm²)	300-450	350-450	160-240	> 590
Bending Strength (N/mm²)	500-750	650-820	300-450	Yield point (N/mm²) > 340
Modulus of Elasticity (kN/mm²)	160-180	160-180	110-130	> 205

*The whole specification is based on technical standard values.

Hardness Penetration Curve*

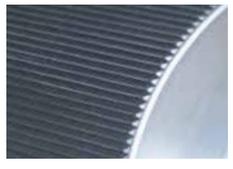


*The whole specification is based on technical standard values.

ROLL SERVICE

SIWACO is a competent partner in terms of roll service, repairs incl. Re-rolling of food rolls.
From around 200 years of IRLE GROUP experience, we are very familiar with the wear behavior and the ability to repair and optimize rolls for the food industry.
The technical advice regarding the optimal service for your rollers is an essential part of our service offer.

OUR OFFERED SERVICES



- State of the art entry inspection with defining the scope of the service and repair
- Re-grinding of roll barrel and establishing the roll body end relief
- Repair of cracks or spallings on roll body edges
- Repair of roll shafts with potential spray coatings on bearing seats or replacement of damaged shafts
- Re-corrugation of cracking mill rolls. Defining and controlling the specifications of the flutes. Single tool method is used.
- Cleaning and servicing of thermal controlled rolls. High precision grinding of all different roll body shapes.
- Dyn. Balancing of rolls
- Preparation of detailed inspection reports

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