



A large, dark grey rectangular block with a grid pattern, possibly a conveyor belt or filter, sits on the right side of the image. In the foreground, two large, dark grey circular components, likely castings, are shown in perspective. They appear to be made of a heavy-duty material, possibly steel. Red, jagged pieces of material, resembling crushed rock or mineral waste, are scattered across the background and partially cover the components, suggesting an industrial setting.

**HIGH WEAR RESISTANT
CASTINGS FOR THE TILE
AND BRICK INDUSTRY**



WALZEN IRLE GMBH

QUALITY WITH TRADITION

SINCE 1820

All around the world WALZEN IRLE is well known as a manufacturer of high quality castings. For almost 200 years of production our company stands for a wide experience, high technological competence as well as continuous research and development.

WALZEN IRLE produces rolls for the steel-, paper-, rubber-, plastic- and food-industry, roller shells and grinding plates for vertical mills (coal grinding, cement production and similar), runner rings and roller shells for the tile and brick industry, as well as castings for solid matter pumps (dredging industry).

All applications have one important target in common: Decrease the wear and increase the lifetime! Wear resistant finished castings by WALZEN IRLE are used in industrial areas in which wear plays a cost intensive role. This requires tools and components that are as resistant as possible under extreme wear demands.

INCREASE YOUR PROFIT – WITH OUR KNOWLEDGE!

RUNNER RINGS & ROLL SHELLS FOR THE TILE AND BRICK INDUSTRY

Fully developed technology and highest quality are the result of over 300 years of foundry experience. WALZEN IRLE is known worldwide for the production of rolls for a variety of industries.

For decades, we have experience in producing „high wear resistant castings“ for the treatment of mineral resources, specifically for the brick industry. Our customers are well-known manufacturers of machines and plants, as well as operators. They rely on our core competencies, which are:

- substantial knowledge of material and recommendations
- support with the construction and mechanics of superior work-pieces by our construction department
- our performance in research and development
- modern production facilities
- as well as a certified quality control system

This way we can guarantee products that fulfill the highest demands.



RUNNER RINGS

Application:
Ceramic-industry

Material:
K 40-520, K 40-560, SP-520



ROLL SHELLS

Application:
Ceramic-industry

Material:
Chilled cast iron as centrifugal composite casting with grey cast iron- or nodular iron core, K 40-520, K 40-560, SP-520, SA-480, CR 18.1-720



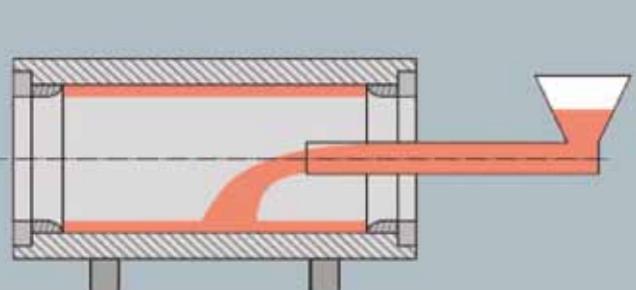
APPLICATION FIELDS AND IMPLEMENTATIONS

Our products are used in applications for processing mineral materials. With our quality control system (according to DIN ISO 9001) we are able to guarantee perfect product quality regarding dimensional precision and material properties. We offer a wide range of standard cast alloys and especially customized modified high-performance materials.

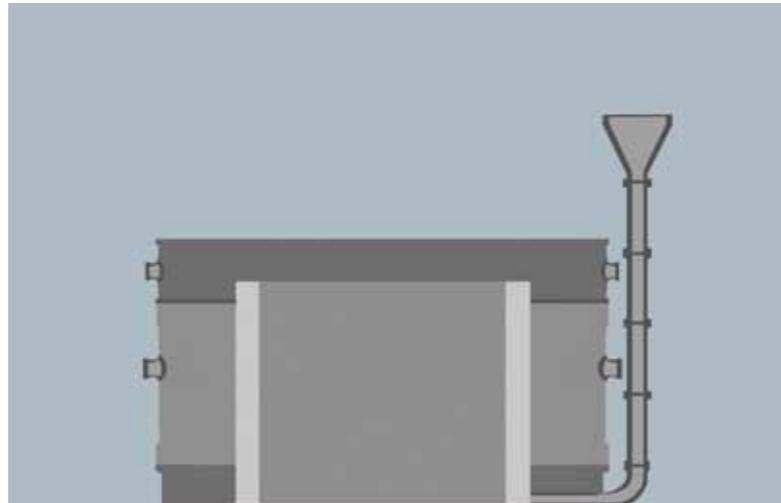
With our wide production capacities (regarding size and weight of work pieces) we are able to supply all types of roll shells, runner rings and other wearing tools which are in use.



CASTING PROCESS



SPIN CASTING PROCESS



STATIC CASTING PROCESS

MANUFACTURING PROCESS

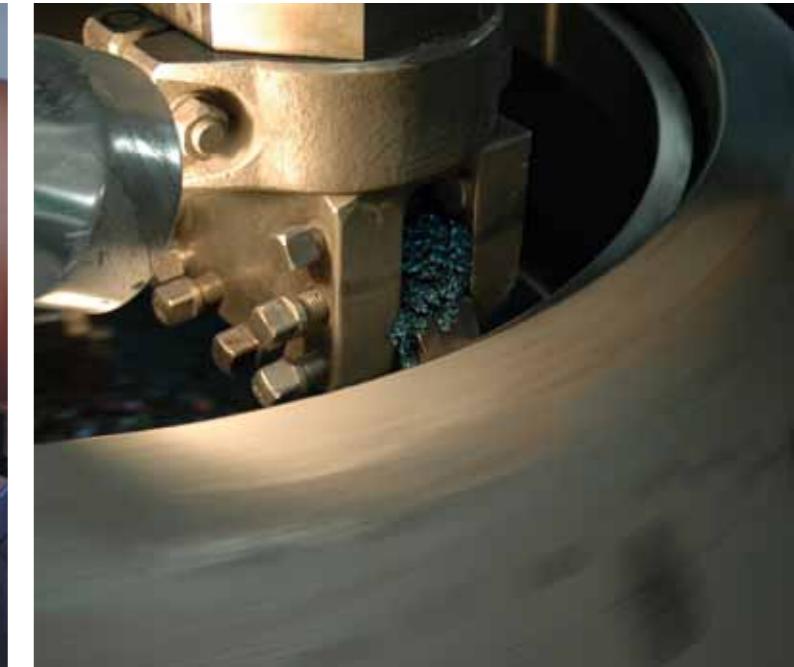
As an experienced and competent partner and manufacturer of high precision casting products we rely on our whole value added chain. From casting to machining and finishing our products, all is done in-house in our own premises. We are only using modern CNC controlled machines, such as horizontal and vertical lathes, milling, drilling and grinding machines.

Runner rings for wet pan mills are manufactured in static casting process and roll shells for preliminary and fine roller mills in a composite centrifugal casting process. Within the horizontal centrifugal casting process, liquid iron is poured into a high speed rotating iron mold. This process allows you to manufacture composite cast roll shells with the hard outside work layer and inner soft iron core.

Products with cylindrical shapes can be cast in the process with sand mold as well as chilled cast iron mold. The chilled casting technique offers a defined direction of solidification starting from the surface of the product. As a result the matrix of the material consists of a fine grained structure. In case of cast iron with high carbide content this material matrix with more detailed distribution of the solidified carbides creates an increase in wear resistance.

The high wear resistant material increases the life time and reduces the auditing expenses.

Besides the production of all types of already in use runner rings and roll shells for the tile and brick industry WALZEN IRLE manufactures as well parts, i.e. grinding rolls and grinding path made from high wear resistant cast material – Ni-Hard / Chrome cast – for ultrafine grinding of ceramic materials. The sand cast parts are produced by hand molding and our capacity high wear resistant parts is limited to 35 tons finish machined weight.



MATERIALS

K 40-520 | K 40-560

Chilled Cast Iron - Single Poured

Microstructure and main properties

Single poured chilled cast iron products consist in the hard surface layer of white cast iron with a microstructure of cementite (Fe_3C) and transformed austenite (Le-deburite Eutectic).

The thickness of the usable chilled layer can be up to 20 mm depending on the roll diameter. The core material is grey iron consisting mainly of a pearlitic matrix with lamellar graphite. Between the outer chilled layer and the core there is a mottled zone consisting of a mixture of grey and white solidified cast iron.

The surface hardness of the chilled cast iron is determined by the amount of cementite (Fe_3C) in the microstructure and the type of transformed austenite. A pearlitic, bainitic or martensitic matrix can be obtained by using special alloying elements. An increase in hardness and wear resistance will cause a decrease in thermal and mechanical capability.

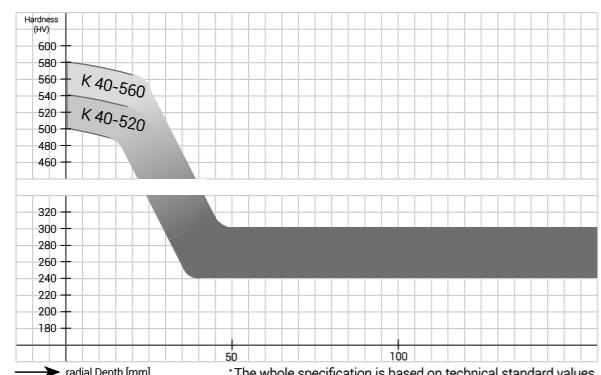
The grade K40 describes the amount of cementite (Fe_3C) in the microstructure.

Mechanical Properties*

	Shell-Material	Core-Material
Tensile Strength (N/mm ²)	200-250	140-200
Modulus of Elasticity (kN/mm ²)	170-185	90-110

* The whole specification is based on technical standard values.

Hardness Penetration Curve*



* The whole specification is based on technical standard values.

K 40-520 | K 40-560

Chilled Cast Iron - Double Poured with Grey Iron- or Nodular Iron Core

Microstructure and main properties

Double poured chilled cast iron products consist in the hard surface layer of white cast iron with a microstructure of cementite (Fe_3C) and transformed austenite (Le-deburite Eutectic).

The surface hardness and wear resistance is defined by the amount of cementite in the matrix and the formation of the metallic matrix.

The increase of the hardness of the material and the extension of the wear resistance result in reduction of thermal and mechanical capacity of the cast iron.

The grade K40 indicates the amount of cementite (Fe_3C) in the microstructure.

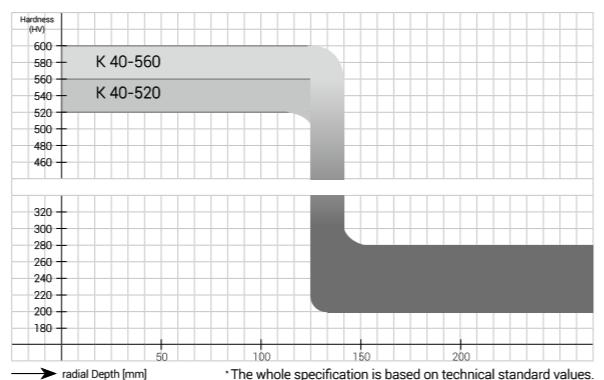
The compound cast product consists of the high wear resistant and hard outer shell whereas the core material will be Grey (G) or Nodular (S) iron. The thickness of each layer is adjusted to the optimum needed for each application.

Mechanical Properties*

	Shell-Material	Core-Material
Tensile Strength (N/mm ²)	200-250	350-450
Modulus of Elasticity (kN/mm ²)	170-185	160-180

* The whole specification is based on technical standard values.

Hardness Penetration Curve*



* The whole specification is based on technical standard values.

SP-520

Pearlitic Nodular Iron

Microstructure and main properties

Nodular iron material grades are characterized by the ball (spherical) shape of the graphite within the cast iron. This increases the mechanical strength and ductility tremendously.

Upon required wear resistance the cast iron will be adjusted with variable amounts of cementite (carbides) which decreases continuously in radial direction from the surface to the core. In the opposite direction the amount of spherical graphite is increasing.

The perlitic basis reaches a hardness range in between 300-540 HV.

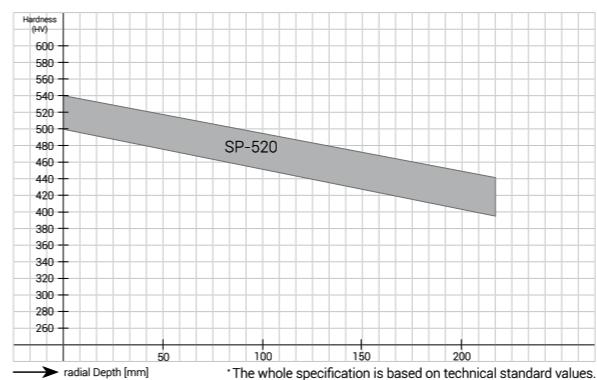
Due to application, demand of wear resistance and mechanical or thermal loads the nodular iron grade is cast as static single poured iron or spin cast double poured iron.

Mechanical Properties*

	SP
Tensile Strength (N/mm ²)	330-480
Modulus of Elasticity (kN/mm ²)	160-180

* The whole specification is based on technical standard values.

Hardness Penetration Curve*



* The whole specification is based on technical standard values.

SA-480

Acicular Nodular Iron

Microstructure and main properties

Nodular iron material grades are characterized by the ball (spherical) shape of the graphite within the cast iron. This increases the mechanical strength and ductility tremendously.

Upon required wear resistance the cast iron will be adjusted with variable amounts of cementite (carbides) which decreases continuously in radial direction from the surface to the core. In the opposite direction the amount of spherical graphite is increasing.

The matrix of the SA-480 grade is acicular.

The main alloying materials Ni and Mo will provide the acicular matrix whereas the acicular matrix reaches higher tensile strength and wear resistance properties compared to perlitic matrix.

Heat treatment processes will be adjusted for optimum results in respect to hardness, tensile strength and toughness required for each application.

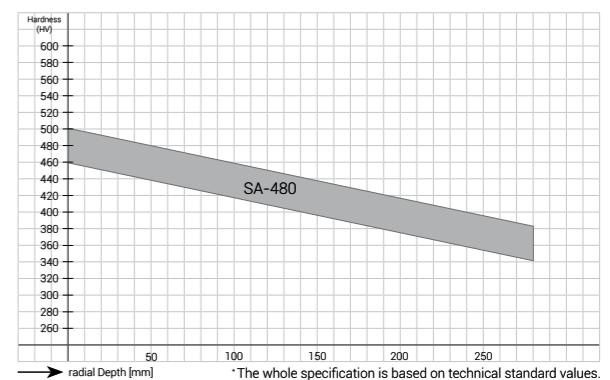
Due to application, demand of wear resistance and mechanical or thermal loads the nodular iron grade is cast as static single poured iron or spin cast double poured iron.

Mechanical Properties*

	SA
Tensile Strength (N/mm ²)	360-500
Modulus of Elasticity (kN/mm ²)	160-180

* The whole specification is based on technical standard values.

Hardness Penetration Curve*



* The whole specification is based on technical standard values.

MATERIALS

CR 18.1-720

CR-Steel

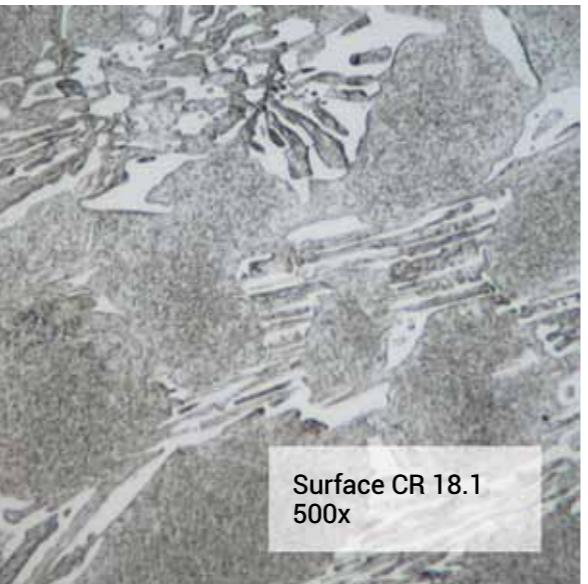
Microstructure and main properties

The microstructure of the wear resistant chrome alloys consists of chromium rich eutectic Cr-carbides of the type M_7C_3 in a matrix of martensite with fine dispersed secondary carbides.

Due to the special structure of the Cr-Carbides the chrome alloy has superior mechanical strength and toughness in comparison to other carbide containing materials. Further positive properties are high pressure- and thermal resistance.

Due the heat treatment a surface hardness up to 780 HV (>60 HRC) can be achieved.

The grade CR18.1 describes the amount (18%) of eutectic Cr-carbides in the microstructure.

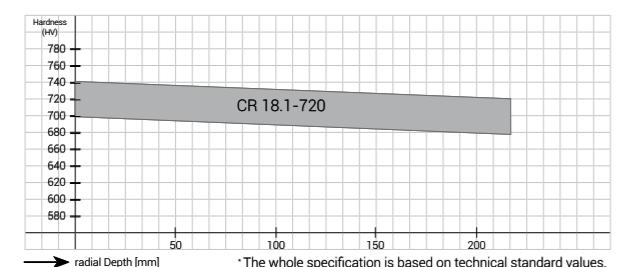


Mechanical Properties*

	CR 18.1
Tensile Strength (N/mm ²)	550-700
Modulus of Elasticity (kN/mm ²)	200-210

*The whole specification is based on technical standard values.

Hardness Penetration Curve*



IRLE DEUZ GmbH

Holding Company

www.irle-group.com

WALZEN IRLE GmbH

www.walzenirle.com

SIWACO GmbH

www.siwaco.com

IRLE KAY JAY ROLLS Pvt. Ltd.

www.ikjrolls.com

WALZEN IRLE GmbH

Huettenweg 5 · 57250 Netphen · Germany

phone +49 (0)2737 / 504-0

fax +49 (0)2737 / 504-111

email information@walzenirle.com

web www.walzenirle.com



A Member of the
IRLE GROUP