

Carbon products



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The Manufacturing Process

The manufacture requires the use of graphite, coke and soot all of which need to be preground in accordance with exacting specifications to a predefined fineness, followed by homogenization and the addition of a binder which is precarbonized in a thermal process.



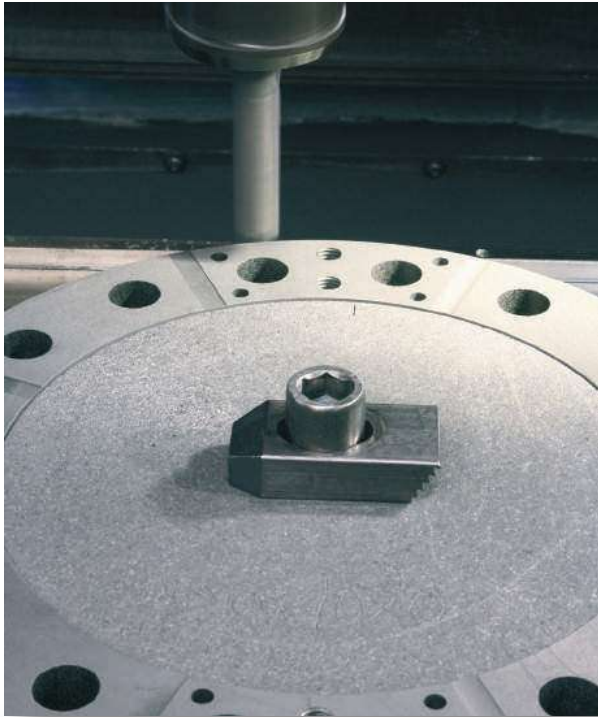
Resulting powder compound is then formed in hydraulic presses of varying capacity. Pressings are subsequently thermally processed at temperatures of 1000 to 1500 degree Centigrade.

For applications requiring superior impermeability and strength the material is further subjected to impregnation using various metals and/or resins. Thanks to this impregnation process carbon based materials acquire higher wear resistance without losing any of their excellent antifriction properties.

The manufacture of silicon carbides utilizes chemical sintering processes ensuring their impermeability as well as outstanding physical properties.



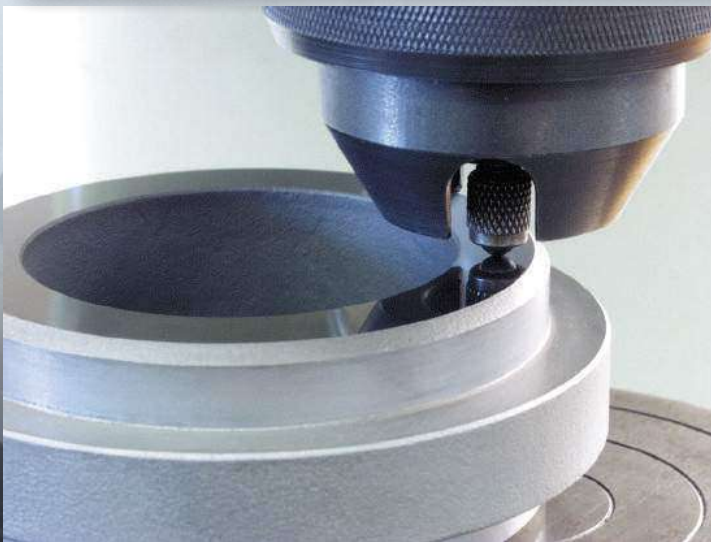
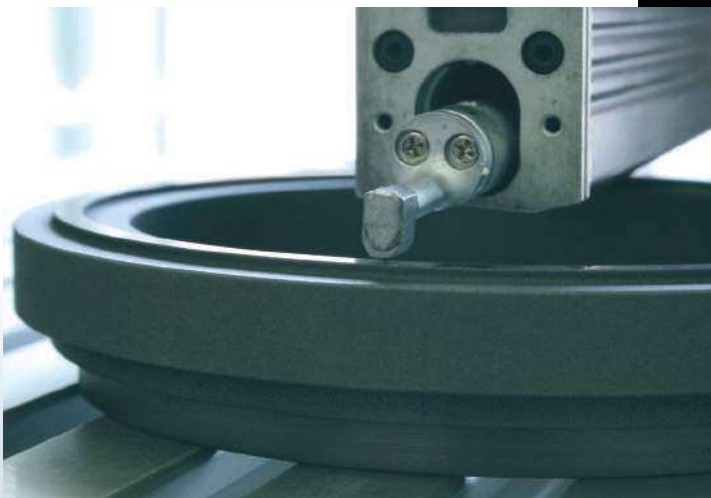
The thermally processed material is machined in accordance with technical documentation using machine tools, such as band saws, grinding machines, CNC lathes and machining centers, lapping and polishing machines.





Finished product is subjected to exit quality control, involving checks of physical, mechanical and thermal properties of the material.

Dimensions and tolerances of finished pieces are checked for compliance with engineering drawings.





Axial Sliding Seal Rings

material: carbon graphite, electrographite
chemically sintered silicon carbide

impregnations: resin, antimony, tin and bearing metal

- sliding and seal rings
- mechanical seal rings
- seal rings for vacuum pumps, compressors and centrifugal pumps

Applications of axial seal rings:

- chemical industry and other aggressive media uses
- petrochemical industry, refineries and drilling platforms
- pharmaceutical and food industry (FDA grade impregnation materials)
- water treatment plants
- circulation pumps for cooling of nuclear power plants
- automotive coolant pumps

The unique properties of these materials, surpassing those of classical seal materials, can be used with advantage in the following applications:

- media with non-lubricating properties
- applications without additional lubrication
- corrosive media, e. g. acidic and/or caustic vapors and gases
- media with poor lubricating properties, such as water, aqueous solutions, gasoline
- superior sealing performance preventing working medium contamination with lubricant
- applications exposed to severe temperature fluctuations or thermal shock
- materials exhibiting high dimensional stability in extreme temperature applications

Recommended mating ring materials:

- silicon carbide
- tungsten carbide
- aluminum oxide
- stellite
- hard facing
- grey iron
- steel, alloy and nitrided steel
- ceramics
- glass





Axial and Radial Bearings

material: carbon graphite, electrographite
chemically sintered silicon carbide

impregnation: resin, antimony, bearing metal

- sleeve bearings
- bearings for hot and cold water pumps, industrial and chemical centrifugal pumps, high pressure gear and other types of pumps utilizing carbon based materials
- carbon bearings for a variety of machines and equipment

Applications of axial-radial sliding bearings:

- chemical industry and wherever aggressive media are used, petrochemical industry, refineries and drilling platforms
- pharmaceutical and food industry (FDA grade impregnation materials)
- water treatment plants
- circulation pumps for cooling of nuclear power plants, high pressure gear pumps

The unique **properties** of these materials, surpassing those of classical seal materials, can be used with advantage in the following applications:

- media with non-lubricating properties
- applications with corrosive media, e. g. acidic and/or caustic vapors and gases exceeding capabilities of classic materials
- media with poor lubricating properties, such as water, aqueous solutions, gasoline applications requiring high dimensional stability at high temperatures
- exposure to severe temperature fluctuations or thermal shock
- uniquely suitable for hot water circulating pumps, eliminating risk of corrosion

Recommended mating ring materials:

- silicon carbide
- tungsten carbide
- aluminum oxide
- hard facing
- grey iron
- steel, alloy and nitrided steel
- glass
- ceramics





Seal Rings, Guides and Steam Head Rings

material: carbon graphite, electrographite

impregnation: resin, antimony

- spherical seal rings for steam heads
- guides and rings for spherical seal rings of steam heads

Applications of spherical seal rings with convex/concave seal faces, and guides:

- steam head seals in pulp and paper industry
- steam head seals in rubber industry
- textile industry
- plastics manufacture

The unique **properties** of these products, surpassing those of classical seal materials, can be used with advantage in the following applications:

- uniquely suitable in steam and thermal oil heating applications using convex and/or concave shaped rings
- for compensation of vibrational, swivel and oscillatory movements
- popular in anti-friction applications in the presence or absence of a liquid media or where both states may alternate
- high temperature and/or pressure applications involving steam head seals
- wherever excellent anti-friction properties are required at high temperatures and pressures
- applications where absence of mating parts wear is of added benefit
- wherever specifications call for dimensional stability and thermal shock resistance





Segmented Seal and Piston Rings

material: electrographite

Impregnation: resin, antimony

- segmented seal rings
- segmented shaft seal rings for turbines
- segmented seal rings for compressors and shipborne pumps
- piston and guide rings for oil-less reciprocating compressors

Applications of radial-axial piston seal and composite rings

- fan shaft seals
- shipborne equipment seals - namely compressors and pumps
- water turbine seals - namely Francis and Kaplan types
- oil-less compressor seals

The unique **properties** of these materials, surpassing those of classical seal materials, can be used with advantage in the following applications:

- unique properties for high temperature applications without supplementary lubrication
- favourable chemical properties of these materials eliminate the risk of corrosion in aggressive media, such as acids, hydroxides, vapors and gases exceeding capabilities of classic seal materials
- applications specifically excluding the use of metallic seal materials
- suitable where temperature changes at shaft speedup cause differential expansion in shaft materials which might result in equipment damage.





Stainless Steel Encapsulated Rings and Bushings

material: carbon graphite, electrographite

impregnation: resin, antimony

- encapsulated slip rings and bearings

Applications of axial-radial slip rings and bearings:

- chemical industry for use in aggressive media
- petrochemical industry, refineries and drilling platforms
- pharmaceutical and food industry (FDA grade impregnation)
- water treatment plants
- circulation pumps for cooling of nuclear power plants
- high pressure gear pumps

The unique **properties** of these products, surpassing those of classical seal materials, can be used with advantage in the following applications:

- uniquely suitable for handling media exhibiting poor lubricating characteristics, such as water, aqueous solutions and gasoline
- whenever close contact with shaft is called for, independent from temperature
- overall higher strength of the encapsulated rotational bearing assembly





Vanes and Guides

material: carbon graphite, electrographite

impregnation: resin, antimony

- sliding vanes
- slides and guides
- seal washers
- proportioning slides

Applications of vanes, slides and guides:

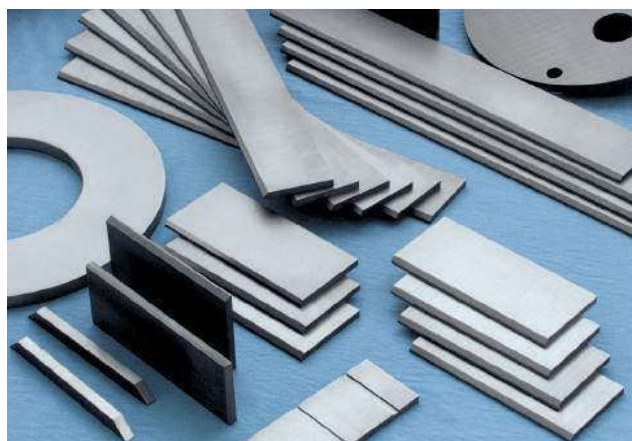
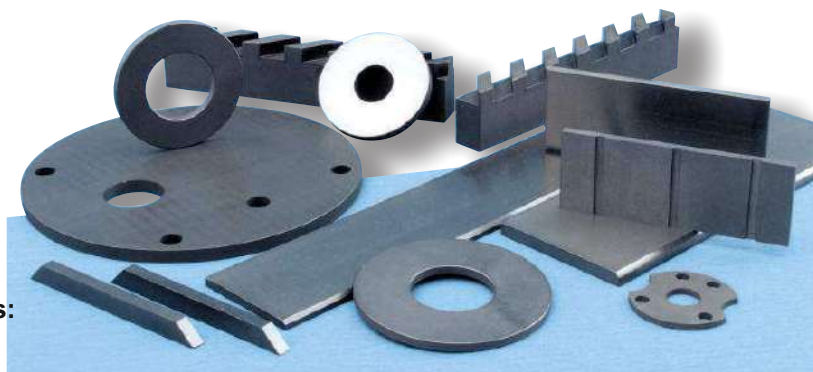
- printing equipment
- packaging machinery
- textile machinery
- medical use pumps
- centrifugal pumps
- portable compressors
- fresh air handling equipment
- flange mounted pumps
(applications requiring lubrication)
- beverage vending machines
(applications requiring lubrication)
- bulk material handling equipment e. g. cement

The unique **properties** of these products, surpassing those of classical seal materials, can be used with advantage in the following applications:

- compressors and vacuum pumps where lubrication cannot be used
- use with supplementary lubrication when handling media exhibiting poor lubricating characteristics

Recommended mating materials:

- aluminum oxide
- hard facing
- grey iron
- steel, alloy and nitrided steel
- carbon graphite
- electrographite





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