

30 years of experience in grinding media production

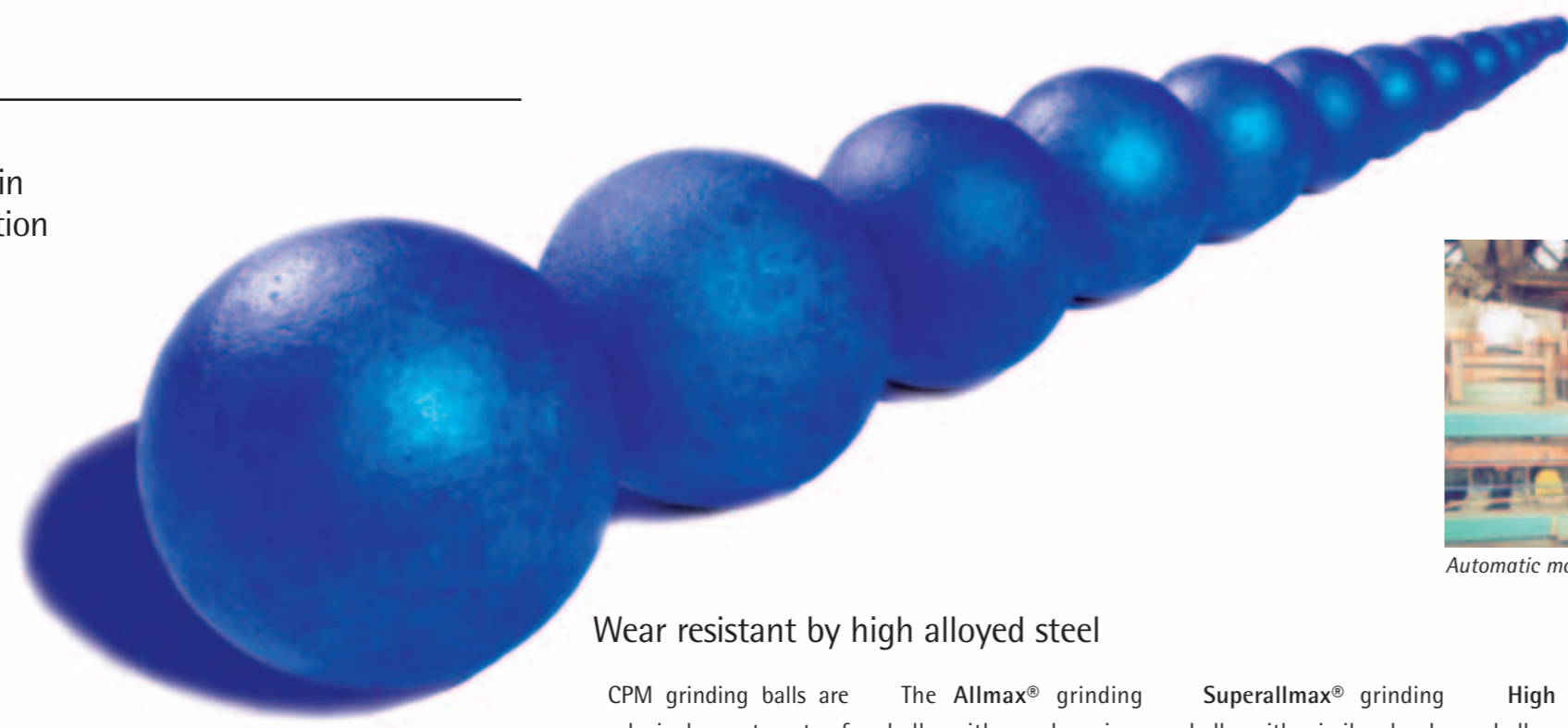
CPM – Christian Pfeiffer Mezzomerico – is the newest subsidiary of the internationally successful Christian Pfeiffer Group.

The company, previously known as GST Europa SpA, was founded in 1968 and gained an excellent reputation with the production of grinding balls and cylpebs over the years.

Christian Pfeiffer Mezzomerico is one of the largest manufacturers of high chromium grinding media in the world. An annual production of about 7,000 metric tons of grinding balls with more than 80 % exported all over the world. The largest consumer is the cement industry. Other operational areas are the raw meal, coal grinding for power plants as well as the mining industry.

Grinding balls are used to grind material by impact and pressure. The specific characteristics of each ball – diameter, chromium and carbon content – allow the optimised operation of each grinding system.

CPM manufactures grinding balls from 15 to 120 mm diameter and cylpebs from 12 x 12 mm to 35 x 35 mm size.



Wear resistant by high alloyed steel

CPM grinding balls are exclusively cast out of high-alloyed steel with a chromium content of 13 % to 31 %.

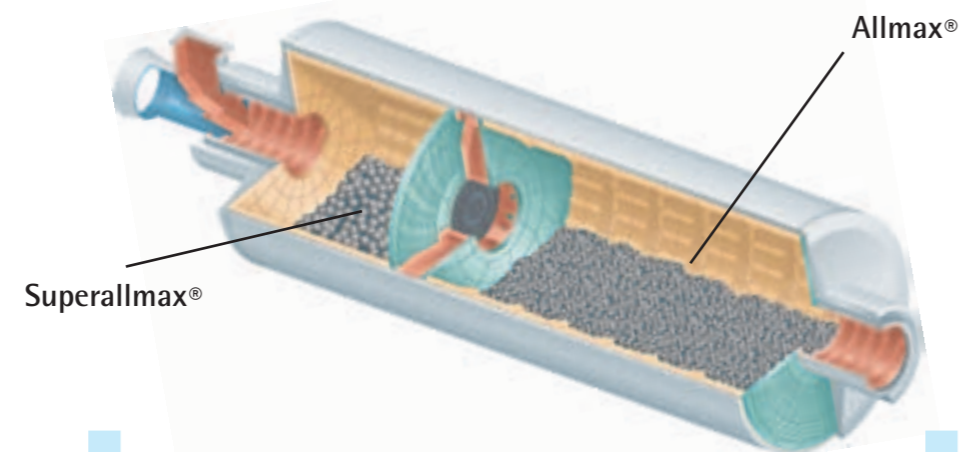
Intensive R&D as well as a precise knowledge of the entire grinding process allow our engineers to determine the optimal alloys for the individual requirements of each grinding plant.

Three different alloys have been introduced to the market:

The **Allmax®** grinding balls with a chromium content of 13 % are especially suitable for the application in cement grinding (raw material and clinker). The high hardness of 60 to 65 HRC ensures a minimum wear rate. These balls are normally filled in the second and third compartment of tube mills for cement and raw material grinding.

Superallmax® grinding balls with similar hardness have a higher chromium content (19 % or higher). They are best suited for use in the first grinding compartment of a raw or cement mill where abrasion resistance as well as a high impact resistance is required.

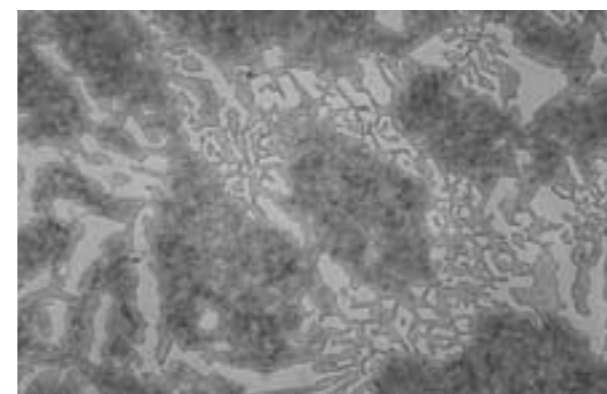
High chrome Allmax® balls – especially used in the mining industry – are chosen according to the customers' requirements and grinding application and have a higher chromium content from 20 % up to over 30 %. The balls are characterised by their extremely low wear rate and are most suitable for dry or wet grinding of corrosive and highly abrasive components like bauxite and coal as well as iron, copper and gold ores.



Automatic mould and casting plant



Cast from induction furnace



Microstructure with chromium carbides dispersed in a martensitic matrix (x400)

Grinding Balls

Horizontal moulding process

At CPM, the grinding ball materials are melted in modern induction furnaces with a capacity of 48 t. Periodical chemical and micrographic analysis as well as hardness tests at all process levels assure a perfect finish product.

Quality assurance at all process levels

Wear resistance is supported by the microstructure matrix with optimised chromium carbides. Grinding balls are cast by a horizontal moulding process. Large diameter balls have one ingate only.

This one ingate assures:

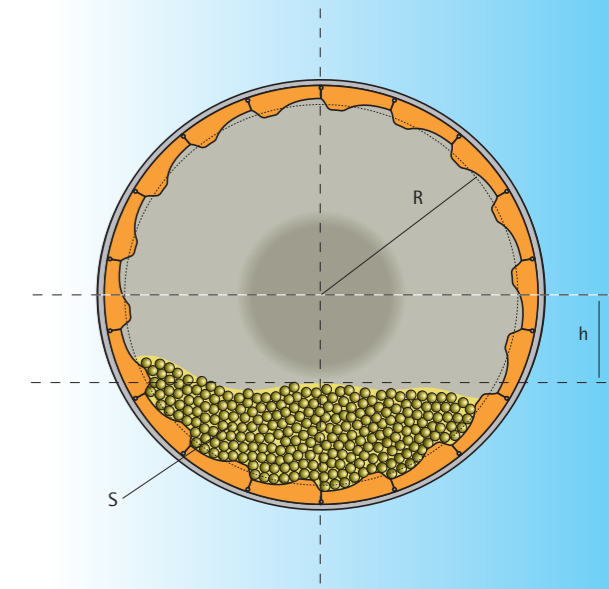
- geometrically round shape of the ball
- a perfect microstructure
- complete saturation in the first cut area
- no blowholes

By optimised multistage heat treatment and air quenching, the remaining austenite content is reduced to a minimum and consequently offers a high breakage resistance.

Determination of filling ratio [%]

$$[\%] = \frac{S}{(\pi \times R^2)}$$

whereby: $S = R^2 \times \arcsin(h/R) - h\sqrt{R^2 - h^2}$



Range of products		
Diameter	Weight	Surface
[mm]	[kg/ball]	[m ² /t]
120	6.870	6.56
110	5.290	7.18
100	3.980	7.90
90	2.900	8.90
80	2.000	10.00
70	1.360	11.50
60	0.850	13.80
50	0.500	16.20
40	0.250	20.00
35	0.170	22.50
30	0.104	27.70
25	0.062	31.90
23	0.048	34.90
20	0.032	40.50
18	0.024	42.40
15	0.013	54.40

round in round

Regular analysis assures an economical operation of the grinding circuit

High chromium alloyed grinding balls of CPM are of the latest state of art. The wear and breakage resistance of the ball alloy allows a reliable and economical operation of the grinding circuit.

Continuous analysis in our expert lab in addition to a precise knowledge regarding all of the mechanical and process technology of modern grinding plants form the basis for our production of a high quality product. This you can always trust.



R&D in our own lab

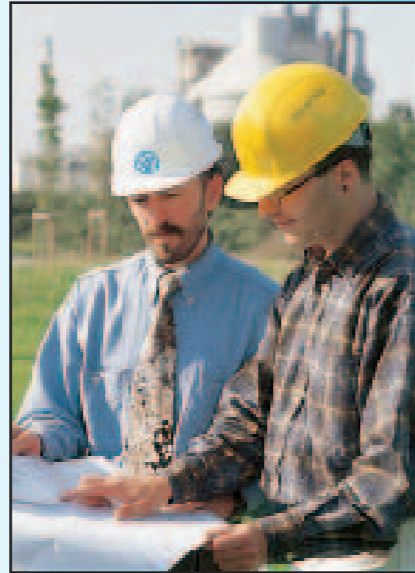
CPM is certified according to ISO 9002 since 1995.



Service

Advantages for you:

One of which is our comprehensive service. From individual recommendations, detailed planning, up to reliable



installations. Even afterwards, we are there for you if questions arise, or if you require anything, and naturally for maintenance and inspection.

If you would like to have more information on our products and services ... Call us. It will be a pleasure for us to assist you.

Our offices are located worldwide. Contact us at the location nearest to you.



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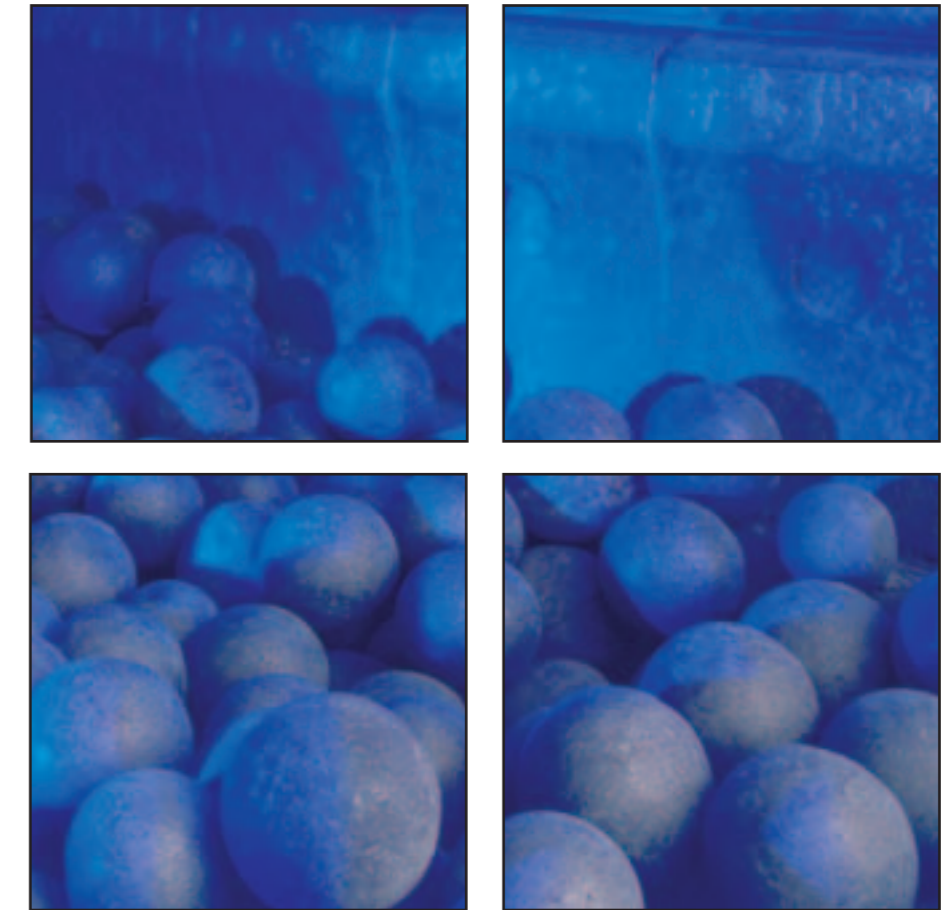
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Christian Pfeiffer
Systems and components

Konzept und Gestaltung: Kuhn & Halbur/CPB, Lippstadt - L-P+S/D-Hr. / 1,5-00 dt. / 12,00

Allmax® Grinding Balls



Christian Pfeiffer
Systems and components