

Wearfaced Parts and Solutions

# CastoDur Diamond Plates®

*Enduring performance...*



*Stronger, with  
Castolin Eutectic*

## Active protection against abrasion and erosion

- Reduce maintenance costs thanks to the extended service life cycles of protected surfaces
- Increase plant availability by means of longer maintenance intervals for heavily loaded surfaces
- Conserve resources and protect the environment with exchangeable liners





### Preventive maintenance - for economic efficiency and environmental protection

Castolin Eutectic has committed itself to reducing wear on component surfaces that are subjected to mechanical and chemical loads for a century now. What has emerged as the results of the group's global activities are methods that not only reduce repair and maintenance costs, but also increase the service lives of plants and installations.

Castolin Eutectic, has become the worldwide leader in Wear and Fusion Technologies for maintenance and repair. One of the big successes achieved is the use of wear plate solutions. Castolin Eutectic is ready to respond to these new global challenges by providing the widest range of wearplates and weartubes on the market today, under the brand name Castodur Diamond Plates® (CDP) and CastoTube®.

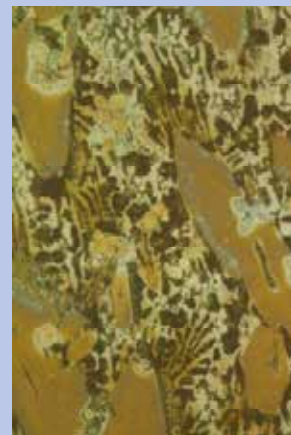
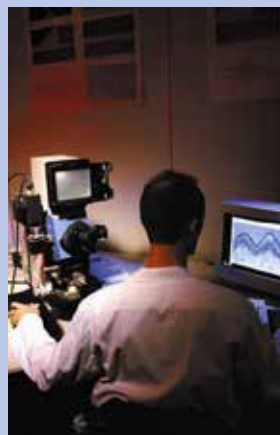


### Analysis and consulting on site

More than 2500 technicians and application specialists all over the world are at our customers' disposal for the detection and analysis of wear phenomena and the recommendation of suitable corrective maintenance solutions. Take advantage of our know-how and counselling on site!

### Research & development - co-operation with industrial partners

Castolin Eutectic runs and maintains its own technical centers which are involved in finding new approaches to wear abatement with leading research Institutes. This means that Castolin Eutectic is usually in a position to be able to offer an appropriate, cost-effective wear protection solution within a minimum of time.



**Castodur Diamond Plates® (CDP) and CastoTube® provide the basis for a comprehensive, particularly cost-effective wear protection system.**

### CDP and CastoTube® Composite Material

These composite materials consist of an easy-to-weld steel plate or tube overlaid with abrasion and erosion resistant alloys by means of arc welding, metal atomised or plasma powder coating.

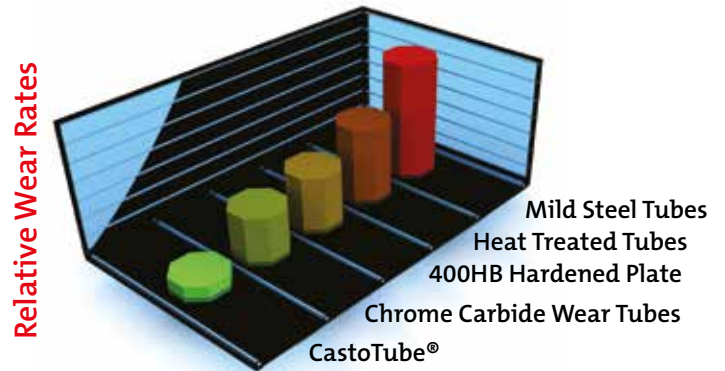
The CDP and CastoTube® production units use the latest robotized manufacturing technologies and vacuum fusion techniques to ensure the highest degree of process stability, regularity of anti-wear characteristics and surface finish.



### CDP and CastoTube® Higher Performance

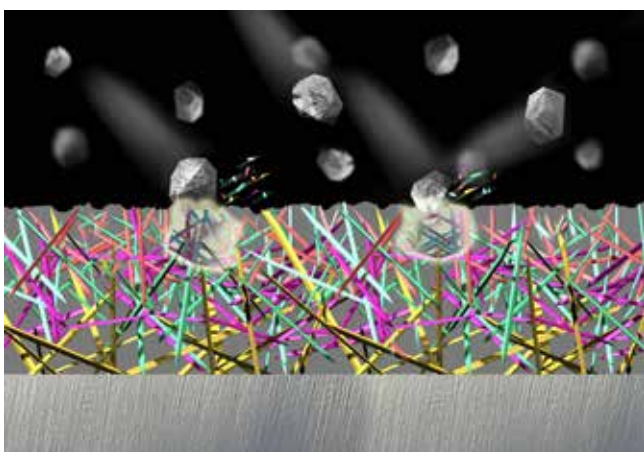
This diagram shows the way in which various substances are worn down in an abrasive environment: the thickness of the layer worn away from a CDP 4666 Plate over a specific period amounts to around 1/20 of that worn away from a plate made of standard mild steel.

### CDP and CastoTube® wear resistance

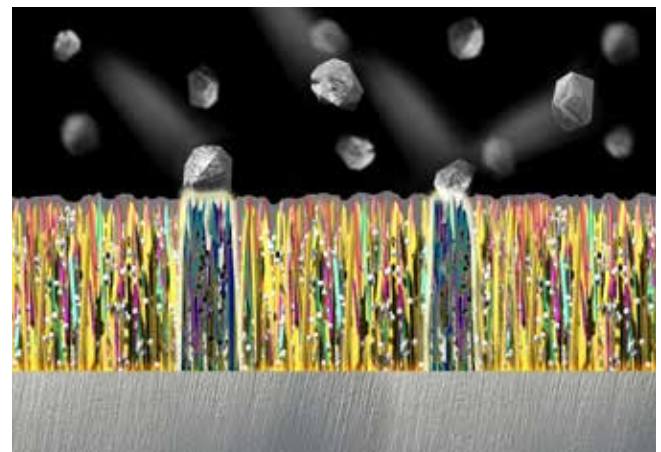


CastoTube® and CDP are engineered for exceptional wear resistance. This performance results from:

1. Ultra-hard phases anchored in a tough matrix. Their hardness is typically 2-3 times higher than the most abrasive media used in industrial processes.
2. Unique geometry of hard phases achieved by controlled cooling of weld solidification kinetics. These tend to nucleate as a dispersion between other needle shaped phases which are strongly oriented and firmly anchored within the matrix. This prevents premature “washing out” of the hard phases from the “softer” matrix by wear mechanisms.



Conventional weld structure with random oriented hard phases which wear out faster



Dense dispersion of strongly oriented hard phases maximise wear resistance



### CDP 4666 - Premium Quality

Weld cladded wear plate for extreme abrasion and erosion resistance. This is the real High Load resistant wearplate with a unique overlay and a complex carbide structure with high density of hard particles. The extremely hard boron and niobium hard particles finely dispersed in between the chromium carbides reduce their spacing and ensure the best protection from abrasive and erosive media of finer size.

Alloying elements: C, Cr, Nb, B

Hardness: 62-65HRC

Carbide content:>50%

### CDP 3952 - High Temperature Performance

Weld cladded wear plate for hot abrasion and erosion. This is a complex carbide alloy protected plate, with an improved structure for maximum high temperature abrasion resistance. Especially designed for extra fine erosive / abrasive medias and critical applications, where every additional day in service is critical.

Alloying elements: C, Cr, Nb, Mo, V, W

Hardness: 63-65HRC

Carbide content:>50%

Max service temp: 600°C

### CDP 4624 - Top Value / Performance

Weld cladded wear plate for abrasion and erosion resistance. This is a chromium carbide alloy wearplate, ideal for applications, where the right balance between price and service life is required, thus maintaining the Castolin high standard welding quality and smooth surface.

Alloying elements: C, Cr

Alloy hardness: 57-62HRC

Carbide content:>30%

Max Service Temp of coating: 350°C

### Dimension

Base material: mild steel

Plate dimensions: 1500 x 3000 mm

Surface coating: 1220 x 2740 mm (3.34 m<sup>2</sup>)

Thickness of metal base + protective layer:

	3+3	5+3	6+4	8+4	8+5
CDP 4624	X	X	X	X	X
CDP 4666		X	X	X	X
CDP 3952		X	X	X	X

	10+5	15+5	20+5	10+10
CDP 4624	X	X	X	X
CDP 4666	X	X	X	
CDP 3952	X	X	X	

Standard cutting techniques - e.g. plasma arc, water jets or laser - can be applied. CastoDur Diamond Plates can be adapted to different shapes easily.

### Standard or XuperWave

- Our wearplates are available with straight beads (standard) or with the exclusive XuperWave bead pattern.
- Linear wear resistance is increased by 30% with XuperWave geometry. XuperWave, whose beads and crack morphology provide non parallel geometry to wear flow direction.



### Ground CDP

Available with flat and smooth surface.





Our CastoTube® are internally wearface-welded with the exceptional wear resistance alloy of the CDP 4666. Alternative alloys and different base steel compositions for extreme service conditions are available on request.



Maximum length: 3 m

### Advantages

- Absence of harmful linear weld joints
- Exceptional wear resistance
- Perfectly round cross section
- Spiral welding minimises distortion
- Lightweight for handling
- Easy-to-join by welding or mechanical means

## CDP Wearstrips Range

Ideal for the protection of earth moving machines buckets and shovels. Wearstrips are applied on the whole external surface or only on the areas in contact with the soil by using tack welding procedures.

### CDP 4666 Strips

1200 x 60mm	6+4 8+5
1350 x 60mm	6+4 8+5
1350 x 100mm	8+5 10+5

### CDP 4666 TP 100 Strips

1500 x 100mm	8+5 15+5
1500x 120mm	8+5

### CDP 6504 PTA Strips

1200 x 100mm	6+3
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### Dimension

Base metal: mild steel  
Diameter: 125 mm-300mm  
Maximum length: 3 m  
Coating thickness: 3mm-4.5mm

Inner diameter:  
Virtually any from range  
125 - 300 mm can be produced  
by applying a different wearfacing  
thickness inside the standard base tube.



### Flange joints

CastoTube® can be fitted with standard flanges so that the replacement of worn out tubes can be done quickly and easily.

### Elbows

Elbows are fabricated by cutting CastoTube® into wedges and reassembling them according to customer specifications for the pipe bend geometry.



### Strips Weld Geometry



## CDP Powder Plate Range

### CDP 112

Powder Coated wear plate for extreme abrasion and erosion. The deposit consists of a wear resistant Ni Cr B Si matrix and additions of fine dispersed tungsten carbides (WC), designed for resistance to wear by erosion and low stress abrasion both in wet and dry forms.

Wearfacing alloy: Ni Cr B Si + W carbides

Matrix hardness: 60 HRC

Carbide hardness: > 1,700 HV0.03

Carbide content: 35%

Max. service Temp: 700°C



### Dimension

Base materials:

mild or stainless steel

Plate dimension A: 850 x 1250mm

Coated surface A: 800 x 1200mm (0.96 m<sup>2</sup>).

Thickness of metal base + protective layer:



### CDP 496

Powder Coated wear plate to combat erosion. The Ni Cr B Si alloy deposit offers excellent resistance to wear by metal-to-metal friction, erosion and a wide range of corrosive conditions.

Wearfacing alloy: Ni Cr B Si

Hardness: 57 HRC

Max. service Temp: 700°C



	2+1	4+2
CDP 112	X	X
CDP 496	X	X

	6+2	6+4	8+2	10+2
CDP 112	X	X	X	X
CDP 496	X			

Standard cutting techniques - e.g. plasma arc, water jets or laser - may be applied. CastoDur Diamond Plates can be adapted to different shapes easily.

### Performance:

	CDP 496	CDP 112
Abrasion	XX	XXXX
Erosion	XXX	XXXX
Corrosion	XXXX	XX
Metal/Metal	XXXXX	X
Friction		

### Advantages

CDP Powder Plates are produced by overlaying an easy-to-weld steel plate with a metal powder alloy fused in a furnace under protected atmosphere. The main advantage of these products is the 100% dilution free overlay obtained, that ensures maximum protection even with just a few millimetres of deposit thickness. Lightweight and therefore easy to handle Easily formed, and therefore also suitable to tight bending radius.

## CDP PTA Coated Range

### CDP 6504

PTA coated wear plate for the most demanding applications. The tungsten carbides are the ultimate solution for combined erosive and abrasive wear while Plasma Transferred Arc (PTA) is one of the most sophisticated coating technologies, with an average dilution rate of only 5-8%.

Wearfacing alloy: Ni Cr B Si + W carbides

Matrix hardness: 54 HRC

Carbide hardness: 1,700 HV0.03

Carbide content: 60%

Max. service Temp: 700°C

### Dimension

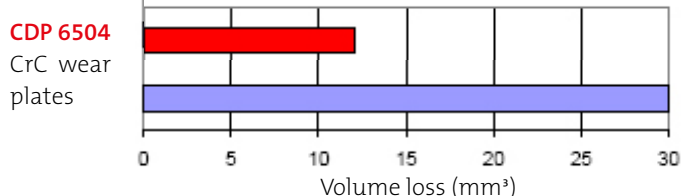
Base materials: mild or alloyed steels

Plate dimension: 1200 x 1200 mm

Plate thickness: 6mm

Coating thickness: 3mm

### Wear Resistance (ASTM G65A)

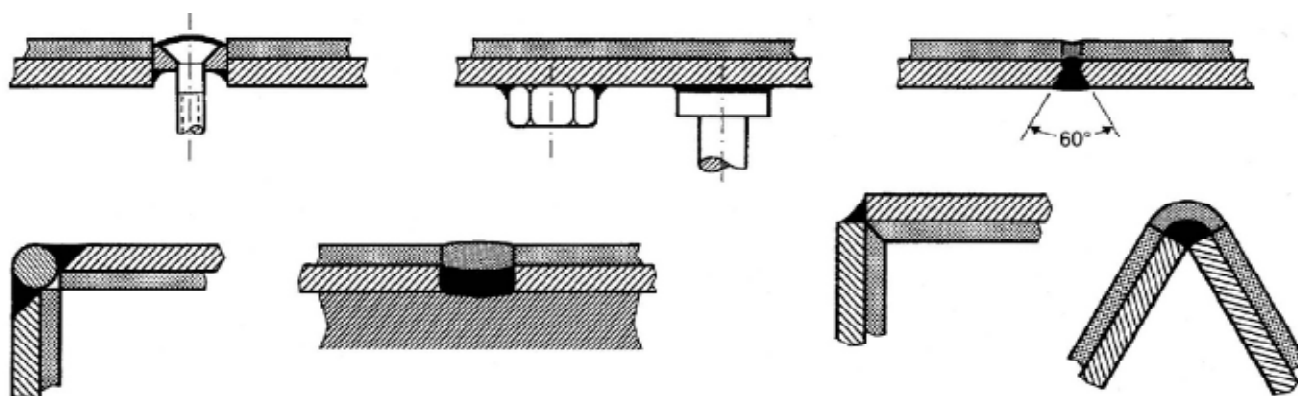




Due to Castolin Eutectic’s production know-how, the residual stress during welding and powder metal coating is low and well distributed in the base material. This quality is the basis for the extremely good formability of CDP wear plates and CastoTube®. CDP can be worked almost like any other construction steel, with very few limitations. Cutting, for example, can be performed by plasma, water jet or laser. Joining can be by welding, bolting, etc.

### Joining and attachment

You determine the way in which you use CDP - to line your basic construction or as a self-supporting CDP structure. You can use CDP composites in various ways: Retro-fitting CDP preforms using screws, rivets or spot welding. Simply replace protective CDP panels as required. We also supply panels cut in accordance with your specifications, ready for installation.



	Electrode	Cored Wire	Solid Wire
Joining of base metals	EutecTrode 6666	EnDOtec DO*66 S	CastoMag 45250
	EutecTrode XHD 646	EnDOtec DO*02	CastoMag 45554
	EutecTrode XN 2222	EnDOtec DO*22	CastoMag 45612
Coating repairs	EutecTrode 5006	EnDOtec DO*31	
	EutecTrode XHD 6710	EnDOtec DO*11	

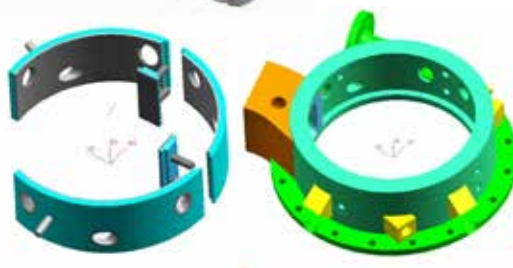
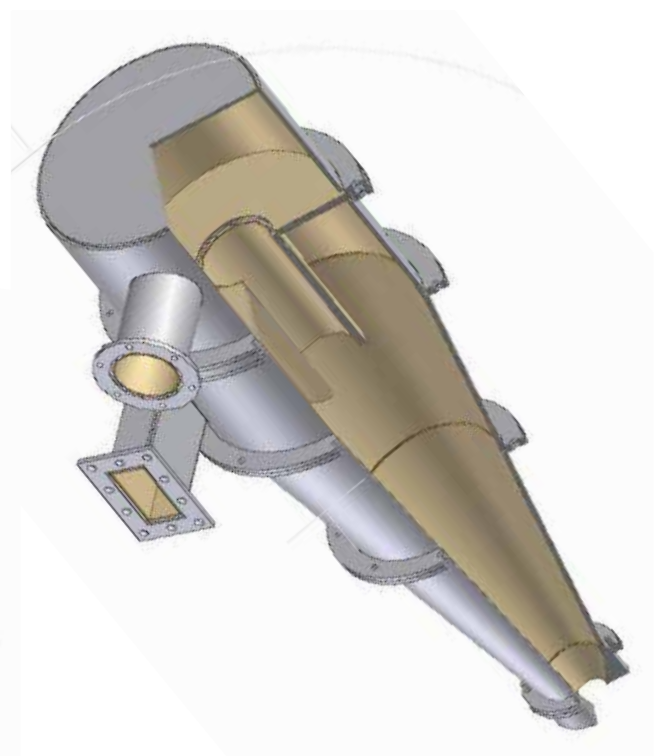


**State of the art in heavy machinery construction**

Castolin Eutectic manufactures complete finished solutions ready for immediate installation in accordance with your engineering specifications and to suit your individual requirements. Even sophisticated designs can be realised with CDP and CastoTube®.

**CAD Design**

Castolin Eutectic design large complex part using CAD. The different parts of complex installation are cut to size in an underwater CNC plasma-arc cutting plant, which is directly interfaced to our CAD system. Used as wear protection media CDP and CastoTube® products provide a particularly economically efficient solution. There is almost no installation for which CDP surface protection would not be suitable!





Castolin offers a comprehensive range of solutions for virtually all wear-intensive fields of heavy industry in the form of CDP plates and CastoTube®.

- Mines and quarries
- Sand and gravel pits
- Shredders and recycling plants
- Iron and steel mills
- Cement and ready-mix concrete plants, brickworks
- Foundries and coking plants
- Incineration and thermal electric power plants



Dedusting pipeline



Vibratory casting gutter, foundry industry



Cyclone tubes in the exhaust filter of a power plant.



Fan



Feed screw



Chain conveyor bed



Feeding hopper

### Industry Programs-Tour guide

Castolin Eutectic - with their wealth of experience in wear protection – have developed a series of “Industry Programs” that look at specific applications of wear throughout major global industries that encounter significant High Load, High Wear issues. Tour guides show the various plant equipment and processes specific to each industry, common wear problems encountered in these environments and applications with their solutions, cost savings and benefits. Castolin Eutectic programs are:

- CemTec
- Waste & Recycling
- Pulp & Paper
- Tool & Die
- SteelTec
- Power Plant
- AutoTec





**Applications for Power Stations**

- Slag removal systems
- Mill linings
- Transfer chutes
- Fans
- Pipelines
- Coal bunker
- Chain conveyor

**Applications for Cement Industry**

- De-dusting plant
- Fans and Fan casing
- Clinker transportation pipe lines
- Mixer linings
- Mill linings
- Sifter cabinet
- Baffle plate
- Cyclone and Separator

**Applications for Sand, Gravel and Mining Industry**

- Skip lorry
- Bucket
- Front-end loader
- Crusher linings
- Conveyor systems
- Slides
- Chutes
- Channels

**Pulp and Paper**

- Cyclones
- Transportation channels
- Fans
- Pipelines
- Barking drum
- Mixing equipment

**Applications for Steel Industry**

- Bunker
- Channels
- Blast furnace gas systems
- Broach ram
- Chutes
- Sintering systems

**Mixer-using Industries**

- Ready-mixed concrete
- Concrete block industry
- Asphalt Industry
- Foundries
- Recycling Industry



The unique TEROLINK database of Castolin Eutectic contains almost 7,000 fully documented approved applications from around the globe. The case studies include photographs, technical data, detailed descriptions, alternatives and cost-saving analyses of successful customer applications with CDP.



- Optimum wear resistance to abrasion, erosion, metal-metal friction
- Low constant rate of wear: facilitates the planning of preventive maintenance activities
- Can be reproduced easily thanks to CAD archiving of machining data and robot-aided manufacture
- Very high degree of hardness combined with excellent forming characteristics for cold rolling and bending
- Considerable extension to service life thanks to excellent homogeneity and specific metallurgical properties
- Base material has good welding characteristics
- May be cut using plasma arc, water jet and laser techniques
- Perfectly homogeneous surface in spite of large-area hardfacing
- Castolin Eutectic Engineering for customer-specific components

Castolin Eutectic offers a comprehensive range of solutions to wear problems. We use the know-how that we have gathered over 100 years to give support in many areas of industry, providing wear-protective coatings for metallic base materials, combining metallic alloys and repairing damaged machine components.

In addition to this, Castolin Eutectic is the leader in the market for advanced welding technology and has a comprehensive range of supplementary materials at its disposal for welding, brazing and powder-metal spraying applications, as well as the equipment and installations required to process these materials.

### Castolin Eutectic main office Location



A global network of offices, development centers and service centres guarantees proximity to the customer and orientation to his specific problems.

### Product Portfolio - Largest in the Industry



### Training

To increase customer know-how in wear technology and repair techniques, we have developed a full line of seminars and training programs, teaching all relevant personnel from welders and engineers to sales teams and managing directors.

Together with our sister company, the Messer Group, we can offer our customers a very powerful range of products and services.

# *Stronger, with Castolin Eutectic*



## **Your resource for protection, repair and joining solutions**

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