

UnionOcel

Your partner in steel

COROPLATE®

Composite wear plates

Protects equipment, reduces costs.



Wear protection in metallurgy

chutes, separators, bunkers, blast furnace bells, rotary chutes,
blast furnace armor sheets, agglomerate dosing drums,
conveyor points, gas cleaning systems, blower fans



Wear protection in the cement industry

clinker chutes, cyclones, blower fans,
chutes, separators, crusher lining,
screw conveyors



Wear protection in the energy industry

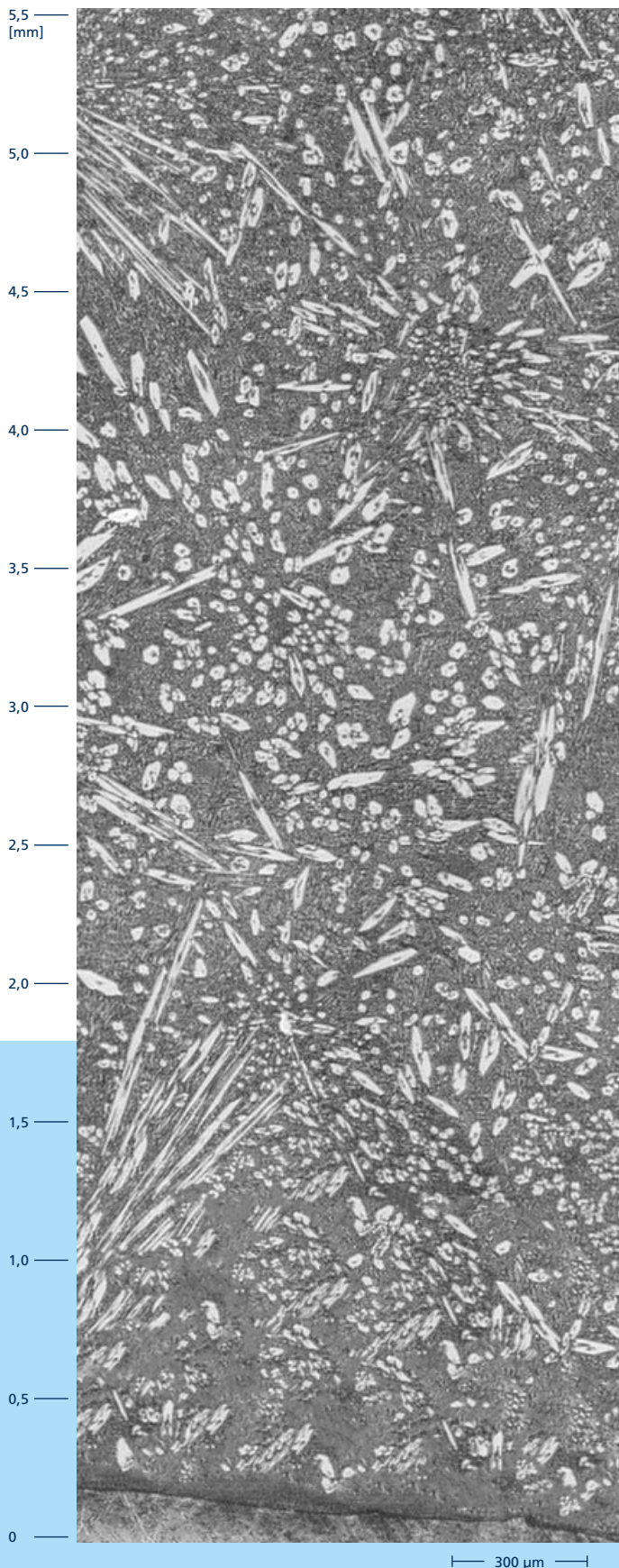
coal conveyors, piping, bunkers, coal dust pipe elbows,
burner shovels and rings



Wear protection in sand and stone quarries

excavator shovels, bunkers, chutes,
loaders, screw conveyors

Manufacture of composite Plates COROPLATE® Π (Powder Injection)



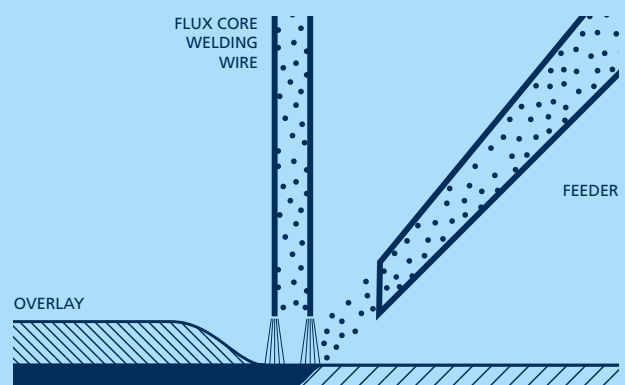
Advantages of this method:

- a/ High content of primary carbides throughout the entire cross-section to the fusion zone.
- b/ Easier control of the hardsurfacing process compared to using only alloying powder (Metal Arc), which means:
 - good connection with the steel base plate, hence no cold joints where the overlay would detach from the base plate;
 - fusion of all alloying elements, hence no unmelted particles in the structure as opposed to Metal Arc, where these would detach from the overlay structure upon abrasion;
 - lower fusion of overlay blends with the base plate as with the Metal Arc method, creation of softer surface cracks and consequently better mechanical processing (rolling, bending);
 - homogenous and reproducible overlay.
- c/ Smoother surface in comparison with the Metal Arc method.

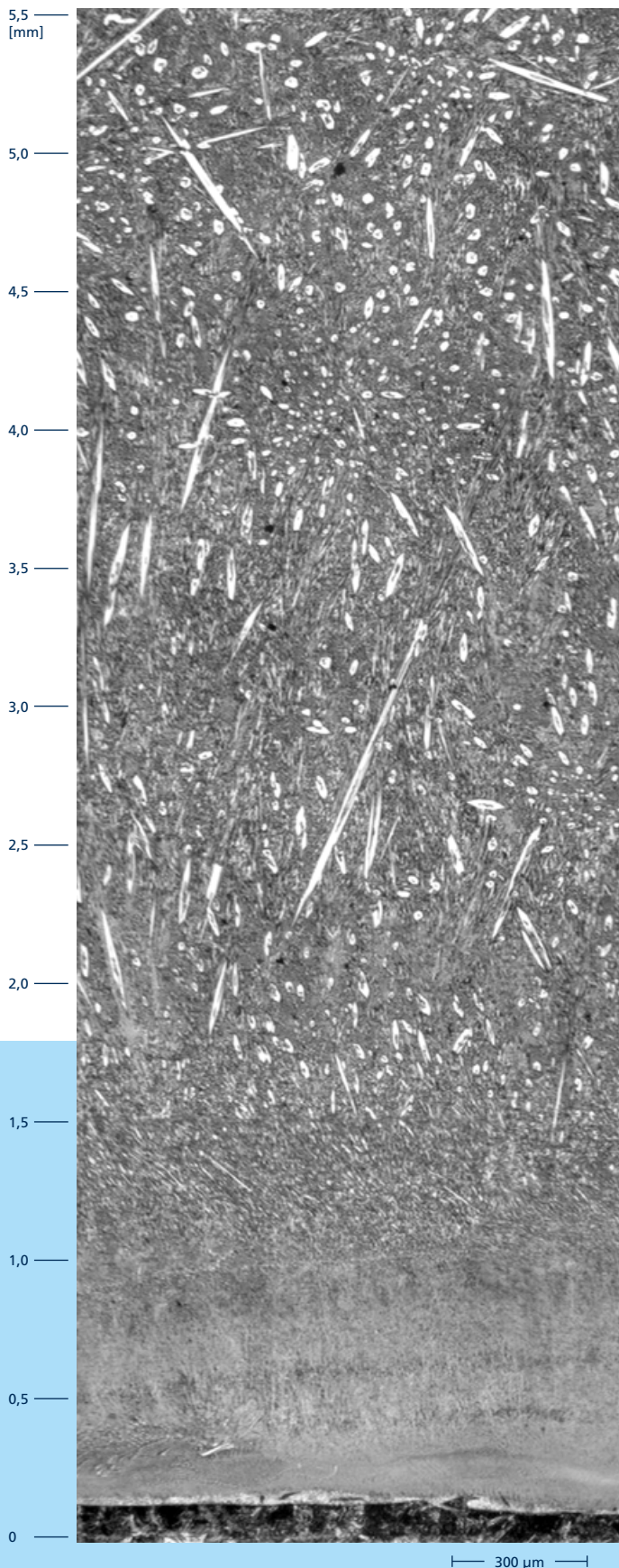
Disadvantages of this method:

It is necessary to apply higher welding parameters compared to welding with wire-only.

Illustration of the production process



Manufacture of composite Plates COROPLATE® Using flux cored welding wire



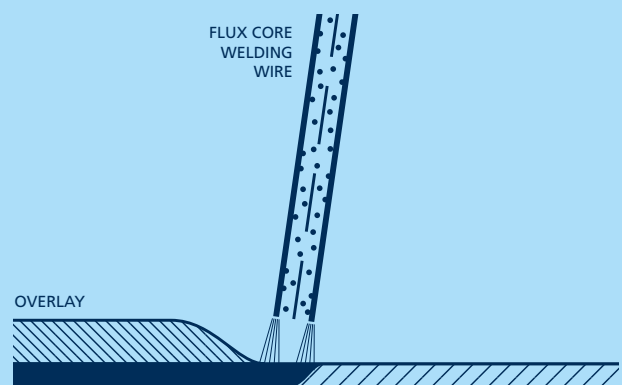
Advantages of this method:

- a/ Homogenous and reproducible overlay.
- b/ Less sophisticated welding machine required – easier welding process in comparison with the π and Metal Arc methods.

Disadvantages of this method:

- a/ Lower primary carbide content in comparison with the π and Metal Arc methods.
- b/ More blending of the overlay with the steel base plate, which means worse parameters for rolling and bending.

Illustration of the production process



COROPLATE® composite plates

Standard formats, cutting and fixing

1/Standard formats

medium: 1,150×2,400 mm
 (for the 3+3 thickness, the format is 1,100×2,350)
 large: 1,400×2,900 mm

2/Standard thicknesses

3+3 mm, 5+3 mm, 6+4 mm, 8+5 mm,
 10+5 mm, 15+5 mm, 10+10 mm, 15+10 mm

3/Base steel plates

structural steel: S235JRG2 or S355J2G3
 boiler steel: P265GH, 16Mo3 or 13CrMo4-5

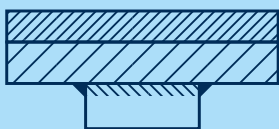
4/Cutting

plasma, laser, water jet

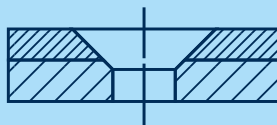


5/Fixing options

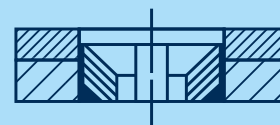
a/ Welding to the base steel plate.



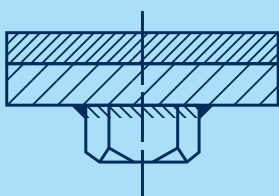
b/ Creating a recess for the screw using electrical discharge machining.



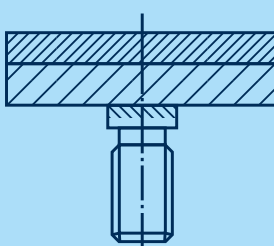
c/ Cutting a hole using plasma and welding an insert for a countersunk screw.



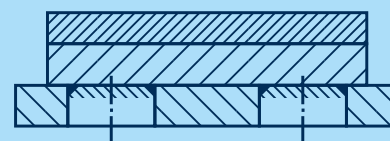
d/ Welding a threaded nut to the base steel plate.



e/ Welding the screw (threaded rod).



f/ Welding to the base steel plate using plug welds.



COROPLATE® composite plates

Options for cold forming

1/Rolling

minimum Ø 250 mm depending on material thickness and part length



2/Bending

Only segmented bending possible, tool selection upon agreement with UnionOcel technicians depending on the dimensions and thickness of the part to be bent.



Ready-made structures

- pipe bends
- cyclones
- blower fans
- trays
- screw conveyors for mixers mixing worms
- rotary chutes



COROPLATE® composite plates

Quality assurance

All Corodur products including the COROPLATE® composite plates are manufactured in accordance with DIN EN ISO 9001:2008.

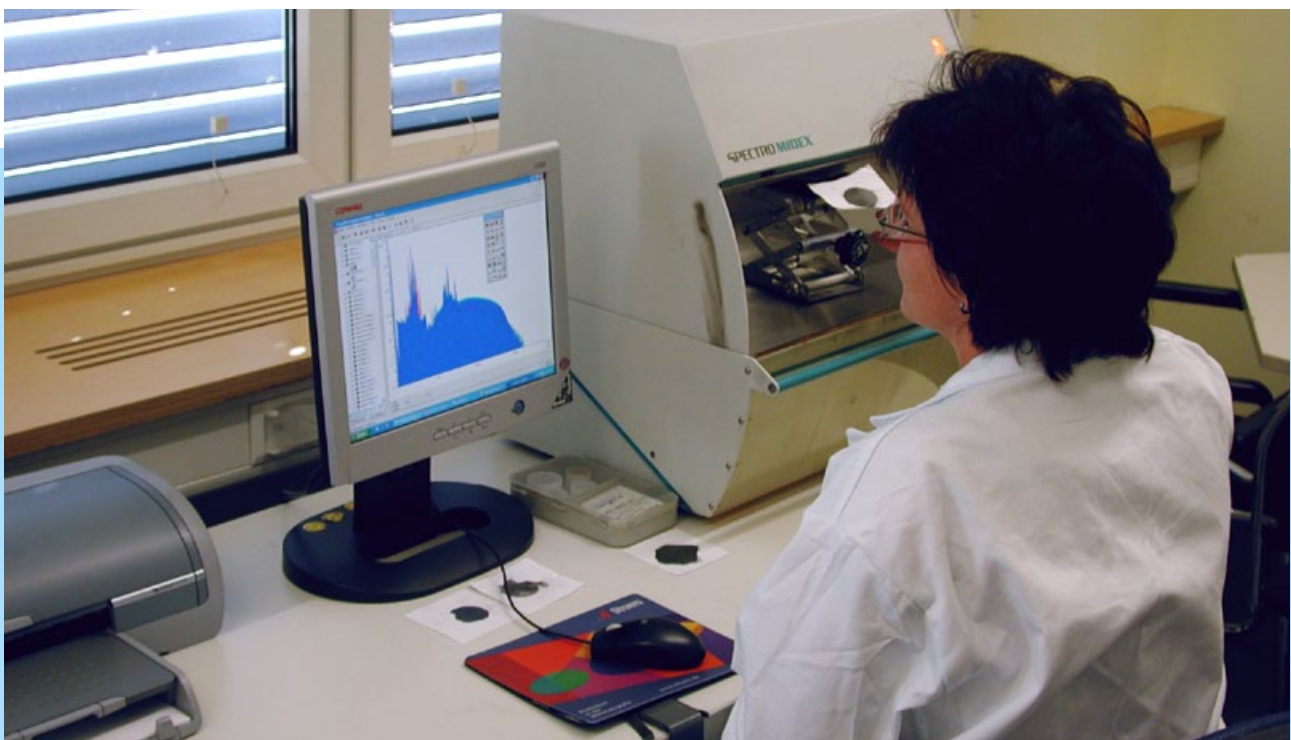
Corodur has its own professional laboratory at its disposal, equipped with the following technologies:

- REM/EDX scanning electron microscope;
- Spektrolab spectrometer;
- CSA spectrometer;
- Midex X-ray fluorescence spectrometer;
- hardness-meter
- I-Seed high-speed camera.

1/Raw material quality assurance

Raw materials are supplied only by approved suppliers. All raw materials undergo a strict examination in our own laboratory, where the following is tested:

- chemical analysis;
- grain size and shape analysis of the supplied alloying elements;
- volumetric density test.



2/COROPLATE® composite plate quality assurance

All COROPLATE® composite plates **are supplied with a EN 10204/3.1 certificate**. The certificate includes the parameters of the base steel plate (certificate 3.1) and the parameters of the overlay (chemical composition and hardness).

The customer enjoys the **guarantee of all parameters stated in the material data sheet for the sheet metal to be purchased**.

Note: For the 2.2 certificate, the manufacturer does not guarantee the parameters measured on the sheet metal, but measured only on the input (welding) material (wire).

A production batch is 10 plates. This means that from every 10th plate a sample is taken and carefully examined. Based on the results a certificate is issued for the whole batch.

Quality control during production of COROPLATE composite plates is carried out the way that all parameters declared by manufacturer in the 3.1 certificate are secured.



3/Welded structures quality assurance

Welded structures are examined in accordance with the production-independent DIN EN ISO 9001 quality control. Weld inspection is carried out according to the customer's requirements.



COROPLATE® composite plates in metallurgy



COROPLATE® composite plates

in cement plants



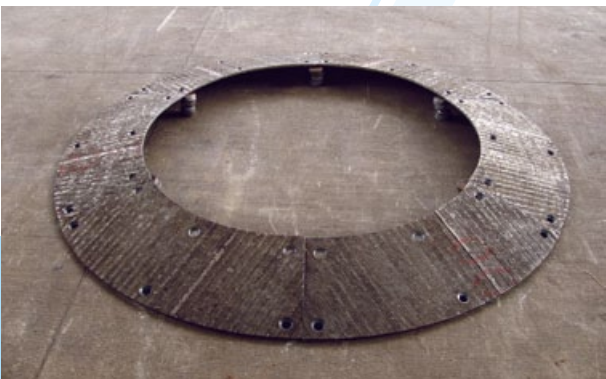
COROPLATE® composite plates

in power plants



COROPLATE® composite plates







in other industries




Composite plates COROPLATE®

Basic grades




The COROPLATE® composite plates are available in the following basic grades. All sheet metals are certified according to EN 10204/3.1 (analysis as per DIN EN ISO 6847, hardness as per DIN 32524, part 4).


| | | C content [%] | Cr content [%] | Other | Hardness | Applications |
|------------------------|---|---------------|----------------|--------------|--------------|--|
| COROPLATE® 55π |  | 4.5–5 | 26.5–28.5 | – | 60–62 HRC | blower fan lining, pipes, cyclones, chutes, thermal stability up to 350 °C |
| COROPLATE® 56π |  | 4.5–6 | 28.5–32 | – | 60–62 HRC | blower fan blades, chutes, milling plates, crusher lining, thermal stability up to 350 °C |
| COROPLATE® 143π |  | 4.5–5.5 | 28.5–32 | Nb 0.8–1,3 % | 60–62 HRC | blower fan blades, chutes, milling plates, crusher lining, thermal stability up to 350 °C |
| COROPLATE® 60 |  | 3.5–4.5 | 20–22 | Nb 5.5–6,5 % | 60–62 HRC | blower fan blades, chutes, milling plates, crusher lining, thermal stability up to 450 °C |
| COROPLATE® 143T |  | 4.5–5 | 30–32 | Mo 2.5–3 % | 61–63 HRC | blower fan blades, pump parts, lining and paneling, thermal stability up to 550 °C |
| COROPLATE® 68π |  | 4–5 | 32–37.5 | B 1–1.8 % | 66–68 HRC | screens, burner parts, clinker, slag and agglomerate crusher parts, thermal stability up to 800 °C |

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