Composite overlay wear plates

Our standard and complex carbide ranges of welded overlay plates have wear resistant properties far exceeding those of quenched and tempered abrasion resistant steels. This is achieved through the formation of very fine and evenly distributed chromium and complex carbides throughout the thickness of the welded layers. In-house developed technology and state of the art equipment ensure our products are distinguished by their:

- Homogeneity throughout the welded deposit thickness
- Regular appearance
- High quality consistency
- Functionality
- Ability to be cut, formed and welded to produce fabrications - this is achieved through the use of low carbon structural steel as the base material for all Welding Alloys’ overlay materials.

In addition to abrasion resistance, Welding Alloys also offers materials specifically designed to resist material loss caused by high impact, elevated temperatures and corrosion, as well as a combination of these wear mechanisms.

**Hardplate™**

- Heavy duty composite overlay wear plate
- Base material and overlay thickness selected according to the application
- Selection of various overlay materials available depending on the area of use and the wear mechanics involved
- The preferred solution for maintenance of wear areas

**Hardlite™**

- Ultra-thin welded overlay wear plate, overall thickness of less than 5 mm
- Ideally suited for areas of high wear, where weight restrictions apply
- Easily formable, despite its very high hardness
- Thanks to its light weight, it is most suitable for wear protection of moving parts, i.e.fan blades

**Tuffplate™**

- Impact resistant composite overlay wear plate
- Designed to be used in areas of high impact wear or without the addition of abrasion
- Ideally suited for areas of material transfer and transportation

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### Standard Dimensions

<table>
<thead>
<tr>
<th>Type</th>
<th>Size</th>
<th>Overlay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardplate™</td>
<td>1500 x 3000 mm</td>
<td></td>
</tr>
<tr>
<td>Hardlite™</td>
<td>1000 x 2000 mm</td>
<td></td>
</tr>
<tr>
<td>Tuffplate™</td>
<td>1500 x 3000 mm</td>
<td></td>
</tr>
</tbody>
</table>

### Standard Thickness

<table>
<thead>
<tr>
<th>Type</th>
<th>Base Plate</th>
<th>Overlay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardplate™</td>
<td>5 – 15 mm</td>
<td></td>
</tr>
<tr>
<td>Hardlite™</td>
<td>2 – 3 mm</td>
<td></td>
</tr>
<tr>
<td>Tuffplate™</td>
<td>5 – 10 mm</td>
<td></td>
</tr>
</tbody>
</table>

Other dimensions and thicknesses available on request

At Welding Alloys Group we understand that not all needs are the same and that not all off-the-shelf products will suit the needs of all our customers, all the time. For this reason we also offer customised overlay solutions to address specific needs and circumstances. As examples, these could be wear resistant overlays on wear-resistant steels, stainless steel or heat-resistant steels or stainless steel overlays on carbon steel.

**Welding Technology**

During the production of Welding Alloys’ Composite Overlay Material, great emphasis is put on the control of dilution and cooling rates. High dilution rates affect the final weld chemistry, and although hardness might still be in the acceptable range, the weld metallurgy will not be. Hardness is not a direct measurement of wear resistance and should only be used as a guideline when testing the weld overlay.

Welding Alloys has developed state of the art automated welding equipment, using dedicated welding consumables and appropriate welding procedures to ensure dilution is kept to a minimum and weld metallurgy is at its optimum ensuring the highest possible carbide levels which are distributed throughout the entire thickness of the overlay.

The majority of our plate products are produced using both slinger and oscillated bead techniques. Both of these welding methods have been refined to produce overlay composition and weld metal metallurgy that favors carbide formation and distribution throughout the overlay thickness.

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### Comparative wear test

<table>
<thead>
<tr>
<th>Abrasive particle</th>
<th>Composite wear plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large chip</td>
<td>Abrasive particle</td>
</tr>
<tr>
<td>Small chips</td>
<td>Abrasive particle</td>
</tr>
</tbody>
</table>

**Example of Applications**

- Hoppers
- Truck, Tray Liners
- Cyclones & Classifiers
- Pipes & Pipe Bends
- Dust Extraction
- Fan Blades & Casings
- Conveyor Liners
- General Wear Liners
- Screens and Grates
- Mixers and Mixer Blades
- Mills & Mill Liners
- Chutes
- Chute Systems
- Impact Zones
- Scrapers
- Furnace Chutes

**Principal Industries**

- Steelmaking and Processing
- Dredging
- Cement & Bricks
- Public Works
- Mining & Quarries
- Petrochemical, Oil & Gas
- Recycling & Waste
- Glass & Ceramics
- Agriculture & Forestry
- Paper & Pulp

**Graph**

The graph above reflects results from ASTM G-65 wear testing performed by an independent laboratory. The results compare the wear life of various products tested. As an example, Hardplate™ 100 has outlasted 500 BHN quenched and tempered material by a factor of 10 and Hardplate™ 300, by a factor of 7.

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### Manufacturing and Plate Processing

For more information on plate processing, cutting, forming, welding, finishing and other services, please refer to our comprehensive Workshop and Plate Processing Manual available from any of our subsidiaries or our website.

All Welding Alloys plate products can be thermal processed by means of plasma or laser cutting and joined by means of welding. None of these thermal processes affect the wear resistance in the heat affected zones. Effective eliminating preferential wear typically seen in these areas when quenched and tempered materials are used.

Welding Alloys products are used across the globe in various industries and applications where loss of material due to wear occurs. Examples of these industries are:

1. Mining & Quarries
2. Public Works
3. Cement & Bricks
4. Petrochemical, Oil & Gas
5. Recycling & Waste
6. Glass & Ceramics
7. Agriculture & Forestry
8. Paper & Pulp
Our Technical ‘Spark’ Solves Your Industrial Challenges

WA Consumables
The go-to provider of advanced welding consumables

WA Machines
The go-to provider of automated equipment for wear protection

WA Integra™
The go-to provider of engineered wear protection solutions

A worldwide presence

Local presence
WA distributors or sales representatives
Welding Alloys Subsidiaries
Strategic Trading Partners

www.welding-alloys.com

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