TENMAT ADVANCED MATERIALS

FEROBIDE

## Weldable Tungsten Carbide Wear Protection for Centrifuges

**TENMAT** has developed innovative *FEROBIDE* wear protection for wet abrasion applications found in decanter centrifuges in order to resolve the major limitations of traditional wear protection materials.

Unlike traditional tungsten carbide, *FEROBIDE* uses a steel matrix to bond tungsten particles together. The unique forming process yields wet abrasion wear resistance better than most traditional tungsten carbides, whilst allowing tiles to be easily welded in place with no braze joint. This, combined with superior toughness, makes *FEROBIDE* the ideal choice for use in high speed and high wear applications typically found in centrifuges.

**TENMAT** is proud to be recipient of The Queen's Award; 2012 for Innovation, 2013 for International Trade.

## Applications

- Decanter centrifuge flights
- Solids discharge plates
- Solids discharge ports
- Centrifuge screens - "dog bones"

## Key Features

- Weldable
- Very high impact strength
- Superior resistance to chipping
- Full protection to working parts
- Excellent wet abrasion properties, proven by 3rd party ASTM tests
- Durable and long-life
- Easy to weld with standard tools
- High bonding strength to scroll

| | Bond Strength | Abrasion Resistance (ASTM G105) | Impact Resistance | Attachment to Steel | Delamination |
|---|---|---|---|---|---|
| WELDED FEROBIDE | **370 MPa** | **0.04 $mm^3$ loss** | **High resistance to chipping** | **Welded with workshop tools** | **Weld is strong and durable** |
| BRAZED TUNGSTEN CARBIDE | 85 MPa (typical) | 0.06 $mm^3$ loss | Low, readily chipped | Brazed only with specialist tools | Braze can fail when welding support plate to scroll |

*protect machinery, extend operational lifetime, increase working efficiency*


www.FEROBIDE.com

T: +44 (0) 161 872 21 81 | E: ferobide@tenmat.com

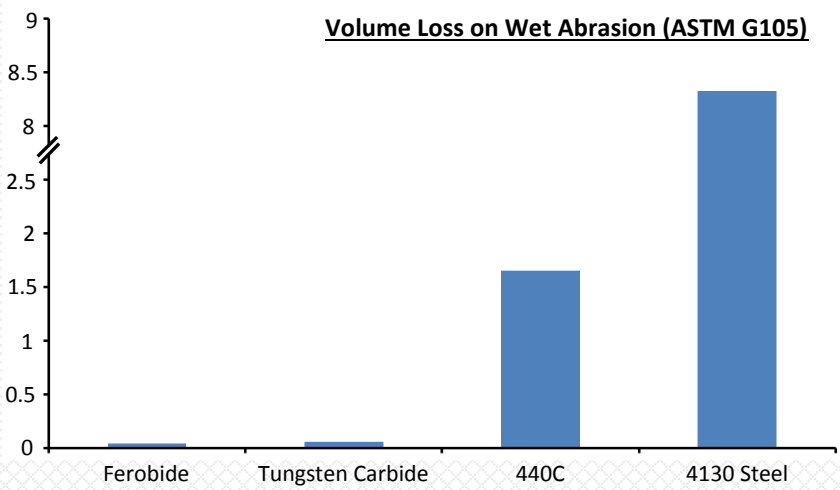
# Traditional Tungsten Carbide Without the Limitations

## Resistance to Abrasion

The abrasion resistance of *FEROBIDE* is many times higher than that of many popular wear protection materials. Together with an external 3rd party, Ferobide has been tested according to ASTM G105, experiencing a volume loss of only 0.04mm$^3$.

The wet abrasion resistance of *FEROBIDE* is:

- 200 times better than 4130 steel
- 40 times better than 440C steel
- 1.5 times better than tungsten carbide



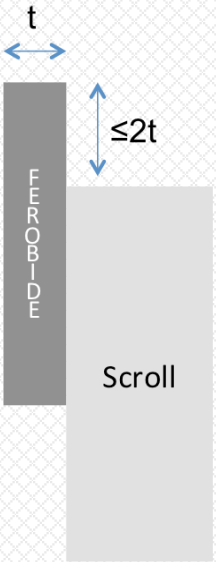

*Graph to show the material volume loss (mm$^3$) observed when a sample of each material was subjected to the ASTM G105 wear test.*

## Bond Strength

3rd party weld strength trials were conducted using stainless steel electrodes, proving that the weld joint of Ferobide to substrate exhibits a bonding strength of 360MPa on average. This is of a significantly higher strength than conventional braze joints, giving peace of mind in decanter centrifuge applications.

## Welding Instructions

1. With full P.P.E., grind the weld surface flat
2. Stainless steel MIG or MMA wire/rod is typically used for heavier duty centrifuges. Mild steel electrodes can also be used in milder conditions.
3. Keep heat input low
4. Position tiles with a maximum overhang from the scroll that correlates to the thickness of the tile. A simple clamp can be used on the edge of the tile to allow for quick tile position.
5. With full P.P.E., tack weld tiles into position and follow this with a full weld of the bottom and back of tile
6. Allow welds to cool naturally




Issue 8/16


**CORPORATE HQ**
**TENMAT Ltd.**
Ashburton Rd West
Manchester M17 1TD
Tel.: +44 161 872 2181
Email: marine@tenmat.com

**NORTH AMERICA**
**TENMAT Inc.**
23 Copper Drive
Newport, DE 19804
Tel.: +1 302 633 6600
Email: info@tenmatus.com

**FRANCE**
**TENMAT**
56 Avenue Foch
77370 Nangis
Tel.: +33 1 60 58 56 56
Email: info@tenmat.fr

**GERMANY**
**TENMAT**
Tel.: +49 7151 133 8468
Email: info@tenmat.de

**ITALY**
**TENMAT**
Via Dante, 2/48
16121 Genova
Tel.: +39 10 545 1343
Email: info@tenmat.it

**SWEDEN**
**TENMAT**
Stureplan 15
111 45 Stockholm
Tel.: +46 8 612 68 50
Email: info@tenmat.com