

1. SCOPE

The scope of this document is to provide engineers with a basic overview of comparable material trade names primarily applicable to abrasion resistant and structural steel plate used in the construction and repair of mining equipment.

Using Bisalloy as the benchmark, it takes a broad view of the tensile and hardness properties of the material and classifies it with respect to the nominal strength levels.

The properties of abrasion resistant material are achieved in a number of ways. These may include increasing the hardenability by quenching and tempering or adding micro alloying elements which enhance the microstructure of the steel as well as quenching and tempering.

The former method relies upon high hardness's (tensile strength) to achieve the required properties. The latter however, utilises a microstructure containing very hard precipitates consisting of Chromium or Titanium Carbides without unduly increasing the hardness level. The benefits of this are that whilst still maintaining the abrasion resistance, the formability and weldability of the material may be improved.

If replacing one brand of material with another, as the abrasive properties may be different, it is strongly recommended that caution is exercised. In addition, the type of abrasion during service should also be taken into account prior to replacement.

There are various types of abrasion which can take place during service and these depend upon the particular industrial application. Based upon this tests have been developed to assess the abrasion resistance of the material and also the effect it may have on the produce.

The tests include the following.

Test Type	Service condition
Dry Sand Rubber Wheel (DSRW)	Low stress sliding abrasion
Dry Sand Steel Wheel (DSSW)	High stress sliding abrasion for very hard materials
Ore Abravity Test (OAT)	Determines the abrasion index of ore and extent of particle degradation
Pin On Drum (POD)	High stress abrasion
Paddle Tester	Medium stress, sliding and impact
Pendulum Groove Test (PGT)	Gouging abrasion
Taber Abrader	General abrasion test
Wet Sand Rubber Wheel (WSRW)	Low stress scratching abrasion

Abrasion Resistant Material Trade Name Comparison

		Bisalloy	SSAB	Industeel	ASM	Total Steel of Australia	
Nominal Increase in Tensile and Hardness Properties	+ 0 -	Bisalloy 500 (500 HB)	Hardox 500 ¹ (500 HB)	Fora 500 (500 HB)	Sumihard 500 (510 HB)	JFE-EH500A (477 HB) JFE-EH500 (477 HB)	JFE-EH500LE (477/556 HB)
	+ 0 -	Bisalloy 425 (440 HB)	Hardox 450 (450 HB)	Creusabro 8000(470 HB) Fora 450 (440 HB)		JFE-EH450 (441 HB)	
	+ 0 -	Bisalloy 400 (400 HB)	Hardox 400 (400 HB)	Fora 400 (400 HB)	Sumihard 400 (415 HB)	JFE-EH400A (401 HB) JFE-EH400 (401 HB)	JFE-EH-SP (401 HB)
	+ 0 -	Bisalloy 360 ² (380HB)				JFE-EH360 (361 HB) JFE-EH360A (361 HB)	JFE-EH360LE (361/440 HB)
	+ 0 -	Bisalloy 320 (340 HB)	Weldox 960 ³ Weldox 900 ³	Creusabro 4800(320 HB)	Sumiten 980S ³	JFE-EH320 (321 HB)	
	+ 0 -	Bisalloy 80 (255 HB)	Weldox 700 ³		Sumiten 780S ³	JFE Hiten 780 ³	

1. No tensile value on data sheet, comparison based upon hardness value only.
2. Bisalloy 360 made to order.
3. No hardness value stated on data sheet, comparison based upon tensile properties. These materials may be considered to be structural steel plate.

DISCLAIMER: While every effort has been made and all reasonable care taken to ensure the accuracy of the material contained herein, the authors, editors and publishers of this publication shall not be held to be liable or responsible in any way whatsoever and expressly disclaim any liability or responsibility for any injury or loss of life, any loss or damage costs or expenses, howsoever incurred by any person whether the reader of this work or otherwise including but without in any way limiting any loss or damage costs or expenses incurred as a result of or in connection with the reliance whether whole or partial by any person as aforesaid upon any part of the contents of this publication. Should expert assistance be required, the services of a competent professional person should be sought.



PO Box 6165, Silverwater NSW 1811
 Unit 50, 8 The Avenue of the Americas, Newington NSW 2127
 Ph: +61 (0) 2 9748 4443 Fax: +61 (0) 2 9748 2858
 Email: info@wtia.com.au Webpage: www.wtia.com.au



NDNP TECHNOLOGY DIFFUSION ACTIVITY # 27	 Welding Technology Institute of Australia ABN 69 003 696 526	Document No: 9.4.6QR-0003
	NATIONAL DIFFUSION NETWORKS PROJECT TECHNOLOGY QUESTIONNAIRE Mining Industry Group “Abrasion resistant material trade name comparison”	Revision No: Rev 0
		Page 1 of 2 Date: 19 June 2006

As part of the WTIA National Diffusion Networks Project the Mining Industry Sector has identified the need for a simple and readily available guide for cross referencing abrasion resistant materials. The WTIA has prepared a guidance note “Abrasion resistant material trade name comparison” that covers the common materials used in the mining and processing industries. As a valued technology expert in this area we would like you to be part of the Technology Expert Group to review this poster. Please complete this questionnaire so that we can gauge the success of meeting this need.

Objective 1: Identify the need for a simple and readily available guide to welding symbols

Fabrication and maintenance workshops need a guide to interpret the trade names of common abrasive steels so the appropriate one can be used. How well does the guidance note achieve these aims?

poor average good very good

Comments: _____

Objective 2: Identify appropriate technology receptors

This document was written for Designers, Maintenance Engineers and Welding Coordinators involved in Fabrication and Repairs for the mining Industry. Are these people the appropriate individuals we should be targeting?

yes no

What other types of companies and/or personnel do you suggest we target? _____

Objective 3: Identify current best practice for repair & maintenance welding

The note was written to reflect current materials used in fabrication, repair and maintenance of welded mining equipment. Do you envisage opportunities for the use of this practice in industry?

yes no

If yes, what and where, if no why not? _____

Objective 4: Is the information provided clear, concise and accurate?

yes no

If not, why? _____

Objective 5: Broad dissemination of technology to the Mining Industry

Please indicate how best to disseminate this poster to the appropriate Industry Recipients

Free Website Download Hard Copy Poster CD Format Poster

If hardcopy poster, what size? A1 A2 A3 Laminated What selling price? \$

If CD format poster, what selling price? \$

Any other format for the information? _____

