MAKURI TECHNOLOGY

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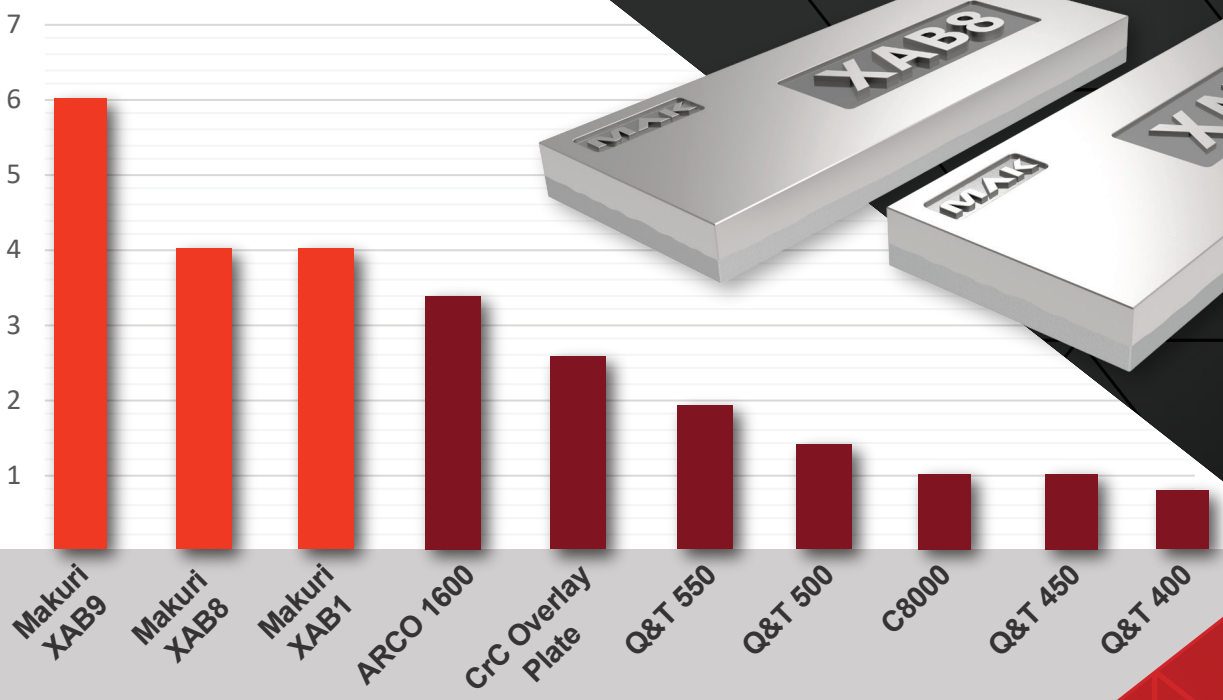
Document no. MI-F02-001
Issued Aug 2025

Makuri MAK-Hard Forged Bimetallic Wearplate

Makuri eXtreme ABrasion resistant wear plates in XAB 8 and XAB 9 grades can contain various levels of Titanium, Tungsten, Vanadium, Niobium and Molybdenum alloyed with iron and carbon to form extremely low friction, and high abrasion, impact and corrosion resistant wear surface. This material is forge bonded onto construction-grade steel to form an extremely tough bimetallic wear plate.

XAB 8 is for heavy-duty applications and XAB 9 is for extreme-duty applications.

Independent University testing at TUNRA*, shows they can outperform all AR, Q&T, Chrome Carbide Overlay (CCO) and other well-known propriety brand name wear plates in the market as shown in the chart below.



Wear Life Ratio Under High Impact, Coarse Particle Abrasion

*Source: TUNRA (2022), "Liner Impact Testing, report # 10818" University of Newcastle, New South Wales

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Technical Details

General Characteristics	
Wear Surface Appearance	Similar to stainless steel with a smooth grey surface and little no stress relief cracking allowing ingress of acids
Wear Surface Roughness and Friction	Low friction, hard, high density materials that polish up with use to further reduce digging friction, hold-ups and carry back

Applications	XAB 8	XAB 9
Heavy Duty Abrasion & Impact	✓	✓
Extreme Duty Abrasion & Impact		✓

Alloying Elements and %		
Titanium (Ti), Tungsten (W), Vanadium (V), Molybdenum (Mo), Niobium (Nb), Manganese (Mn), Chromium (Cr), Carbon (C)	31.5%	35%

Carbide Hardness		
Hardness Brinell Tungsten Ball (HBW)	653	710
Hardness Rockwell C Scale (HRC)	60	63

Corrosion Resistance		
High		✓
Very High	✓	

New generation, Makuri forged bimetallic wear material, has significant benefits over both abrasion resistant (AR) also known as quenched and tempered (Q&T) plates and all types of chrome carbide weld overlay clad plates.

Thickness	Width x Length	XAB 8	XAB 9
5/5 mm	1000 mm x 3000 mm	✓	
6/6 mm		✓	
8/8 mm		✓	
10/10 mm		✓	✓
12/12 mm		✓	✓
17/13 mm		✓	✓
20/13 mm		✓	✓
25/13 mm		✓	✓

Cutting		
Recommended		
Plasma cutting with 150 amps or higher	✓	✓
Alternative		
Cutting wheel silicon carbide	✓	✓
Air carbon arc cutting	✓	✓
Oxy aceteylene	✘	✘

Rolling Radii Internal & External	
Internal	
Internal Rolling radius <20mm total thickness	20 x total plate thickness
Internal Rolling radius 20<30mm total thickness	30 x total plate thickness
Internal Rolling radius >30mm total thickness	40 x total plate thickness
External	
External Rolling radius <20mm total thickness	50 x total plate thickness
External Rolling radius 20<30mm total thickness	70 x total plate thickness
External Rolling radius >30mm total thickness	90 x total plate thickness

Welding & Hardfacing	
Installation welding of Base plates	Don't weld up into the hard facing
Hard facing matching welds or repairing forged overlay	MAK-Hard Chrome Titanium XAB grade

LONGER LIFE - In mining conditions lasts around 1.5 to 2 x longer than the same thickness weld overlay chrome carbide plates and 6 to 8 x longer than 400 BHN AR plate so thinner liners can last longer and save weight

EXTREME ABRASION RESISTANCE – The very fine highly dispersed multi alloy carbide grain structure allows for eXtreme ABrasion resistance and allows it to earn the coveted Makuri XAB title

HIGH TOUGHNESS - This same grain structure also allows for very high Impact resistance, even at high thicknesses where the carbides will not crack and break off

LOW FRICTION - smooth continuous surface, with a minimum of relief cracks, reduces hang up and carry back for greater production

LOW CORROSION – Due to both high chrome content and the extremely dense and low porosity forged wear layer it does not allow for ingress of high or low pH or salt based materials

EASY TO MEASURE - Can be residual thickness measured using UTT

DESIGN BENEFITS

Makuri forged bimetallic wear plates provide never before seen design and application options for both mobile equipment buckets and dippers and also in process plant chutes that allow for:

- Same liner life with maximum reduced weight, or
- Same liner weight with maximum increase in life, or
- Many possible combinations of lower weight plus increases in life – both are achievable in many applications and is typically what the end results is.