

**Production
process**

**Basic performance of WKL wear-
resistant steel**

**Market price
comparison**

**WKL-ABC
metallographic
structure diagram**

**Excellent quality
control**

(Entrusted test organization: Harbin Welding Institute Huatong Welding Industry)

1. Product specification and implementation standards

Thickness mm	Model	Length mm	Width mm	Levelness error mm	Thickness error mm
4-12	WKL-A	3000-3500	1200	<500 (length) 0.5mm > 1000 (length) 1mm	Total thickness $\pm 3\%$
4-18	WKL-B	3000-3500	1200	<500 (length) 0.5mm > 1000 (length) 1mm	Total thickness $\pm 3\%$
6-10	WKL-C	3000-3500	1200	<500 (length) 0.5mm > 1000 (length) 1mm	Total thickness $\pm 3\%$

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2. Mechanical properties

Conventional mechanical properties (using standard sample with
thickness of 10mm (6+4))

Type	Yield point MPa	Tensile strength MPa	Hardness	
			Original hardness	Hardness after use
WKL-A	345	450	HRC61	HRC61

3. Wear resistance

Wearing test shall comply with standard GB/T1244-2006

Calculation of volume wear rate: $\delta_v = \Delta m / (P \cdot F \cdot L)$

Among which: δ refers to volume wear rate to impact, unit: mm³ /Nm, Δ refers to wear loss to impact,
unit: mg, P refers to density of the test material, taking 7.85g/ cm³ ;F refers to applied load, unit: N ; L
refers to wear stroke, unit: m.

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3-1. Wear resistance to impact

- ✓ Test material: WKL-B, Swedish HARDO*400 and HARDO*500, American Xinggegang (XGG) SA1750CR; grinding impact material: bearing steel GCr15
- ✓ Test equipment: multi-functional friction wearing test machine of model M-200
- ✓ Test parameters: rotation speed of the upper sample:180 rpm; rotation speed of the lower sample: 200 rpm; impact frequency: 230 times/ min, impact load: 200N, impact contact force: 40Mpa; medium: standard quartz sand; grain size: 100-150 mesh, flow rate of quartz sand: 1.5-2kg/h; sample period: 90000 rotations.。
- ✓ Test result: as shown in the table, **the wear resistance to impact of WKL-B is comparable to American XGG and is improved by about 80% compared to HARDOX 400 and 500.**

Comparison of impact wear of the following materials

Sample No.	Material	Wear loss (mg)	Volume wear loss($10^{-6}\text{mm}^3/\text{Nm}$)
1	WKL-B	109.25	5.34
2	American XGG SA1750CR	108.97	5.32
3	Mn13	215.25	9.67
4	Swedish Hardox400	210.38	9.41
5	Swedish Hardox500	192.61	8.72

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3.2. Sliding wear performance

- ✓ △Test material /WKL-B, MNB, Swedish HARDOX400, HARDOX500 and American XGG SA1750CR; friction object: GCR-15 bearing steel
- ✓ △Test equipment: multi-functional friction wear test machine of model M-200
- ✓ △Test parameters: test load: 600N, rotation speed: 200 rpm, sliding wear time: 2h, quartz flow rate: 1.5-2.0kg/h
- ✓ WKL-B is comparable to American XGG and is improved by more than 90% and 70% compared to HARDOX 400 and 500 respectively as shown in the table below.

• Wear resistance comparison of different materials

Sample No.	Material	Wear loss (mg)	Volume wear loss $W_v(\times 10^{-6} \text{mm}^3/\text{Nm})$	Wear rate (Yanzhan, XGG, HARDOX)
1	WKL-B	174.53	12.23	1
2	American XGG	173.97	12.21	1
3	Swedish Hardo*450	464.81	26.13	2.13
4	Swedish Hardo*500	421.52	23.54	1.92

Based on the above test comparison, the composite wear-resistant steel plate of Wuxi Weikelai is comparable to American XGG, and is even better than American XGG wear-resistant material concerning certain process index.