

# Composite Liner Solutions



We bring innovation and experience that translates into customized designs focused on the achievement of operational objectives.

As a leading mill liner solutions provider, we specialize in delivering innovative products tailored to suit AG/SAG, Ball, and Rod Mills. Our goal is to optimize mill performance, enhance throughput, develop sustainable options, improve availability, and prioritize safety.

Our solutions achieve maximum performance and operational efficiency, reducing the cost per tonne processed for our customers.

Composite liners use materials such as rubber, steel, and cast inserts; they offer different advantages against a variety of wear mechanisms such as corrosion, abrasion, and impact. Through multiple simulations, our engineering team can determine the most suitable profile and material to achieve mill optimization and throughput.

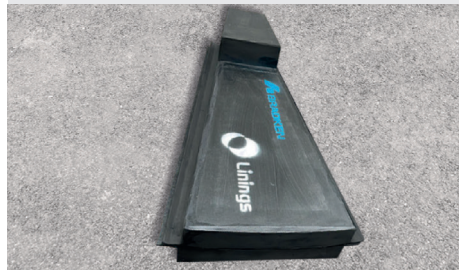
## Linings® Polywear R60A



Rubber liner wear resistant and structural steel.

Its application is for ball mills and SAG mills.

## Linings® Polywear SL

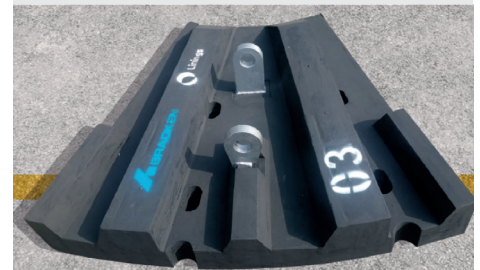


Rubber lining with rolled steel and structural steel inserts.

It is used in Shell liners for SAG and Ball mills.

Feed and discharge lids.

## Linings® Polywear SCL



This liner uses wear resistant rubber, structural steel with high chrome inserts and rolled steel.

It is the ideal solution when you are looking to increase life span and process more mineral.

## Composites offer the opportunity to save weight which can:

- Reduce power draw
- Increase charge in the mill
- Strategically move weight around the mill through design
- Increase size and reduce parts in the mill
- Can extend campaign life
- Can reduce ball requirements to achieve grind
- Match with steel to optimize wear-life and maintenance shuts



**Our Innovation. Your Advantage.**

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# Benefits

It is differentiated by its geometry, materials and experience which translates into:

Energy savings	- 3%	-	- 7%
Tonnage Increase	+ 5%	-	+ 10%
Life Expectancy	+ 30%	-	+ 50%
Reduction of Stoppage	- 25%	-	- 50%
P80 Reduction (ball mills only)	- 5%	-	- 10%

\*Customised designs that contribute to lower costs per tonne processed

\*\*The values and results vary according to the operating conditions of each plant. However, the values presented are an average of the improvements achieved by our customers

# Raw Materials

## Rubber Compound: NR/BR or NR

Properties	Specifications (Pass/Fail)			Test method
Density	Kg/l	1.05-1.15		ISO 2781
Hardness	Shore A	60-70		ISO 48
Tensile Strength	MPa	min 17		ISO 37
Elongation at Break	%	min 450		ISO 37
Tear Resistance	kN/m	min 50		ISO 34 C
Dry Abrasion	mm <sup>3</sup>	max 40		ISO 4649

## Steel: ASTM- A36

Properties	Grade B				
Chemical Composition	C	Mn	P	S	Si
	0.25	0.8 - 1.2 max	0.040 max	0.050 max	0.40 max

Properties	F	R	A	Equivalent
Mechanical	Kg/mm <sup>2</sup>	Kg/mm <sup>2</sup>	%	
	24 min	41 min	18 min	DIN 17100 St 37-2

## Metallic Insert: ASTM A532 White Cast Iron IID

Properties	Designation	Chemical Composition				
		C	Mn	Si	Ni	Cr
Chemical composition	20% Cr	2.0-3.3	2 max	1.0 -2.2		18 -23
		Mo	Cu	P	S	
		3.0 max	1.2 max	0.1 max	0.060 max	
Hardness	Brinell	660 ± 40	Test Method E10 (Brinell)			
Weld repair	Not permitted					
Heat treatment requirements	Hardened and stress relieved					
Micro structure	Carbides, martensite, bainite, austenite: and in exceptional cases minor amounts of graphite or pearlite					

## Metallic Insert: 500 HBW Wear Resistant Steel

Properties	C	Mn	Si	Ni	Cr
Chemical Composition	Max 0.3%	Max 1.6%	Max 0.7%	Max 1.5%	Max 1.4%
	Mo	B	P	S	
	Max 0.6%	Max 0.004%	Max 0.025%	Max 0.01%	
Hardness	Brinell		500 ± 40	Yest Method ISO 6506-1	



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