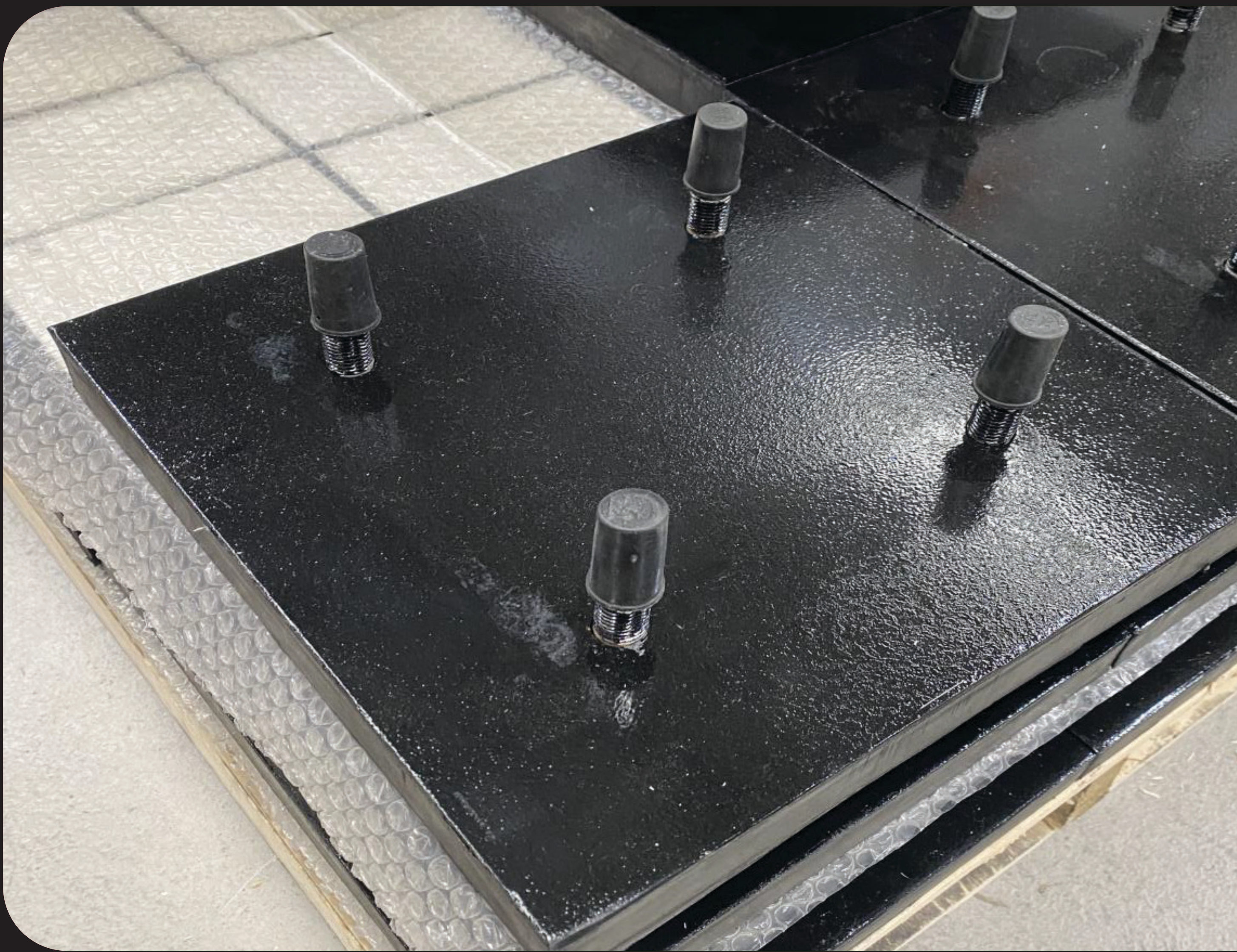
bolt-on™

Wear Panels

Elastotec manufactures a full range of “Bolt On” ceramic wear liners with all the features of traditional studded systems.



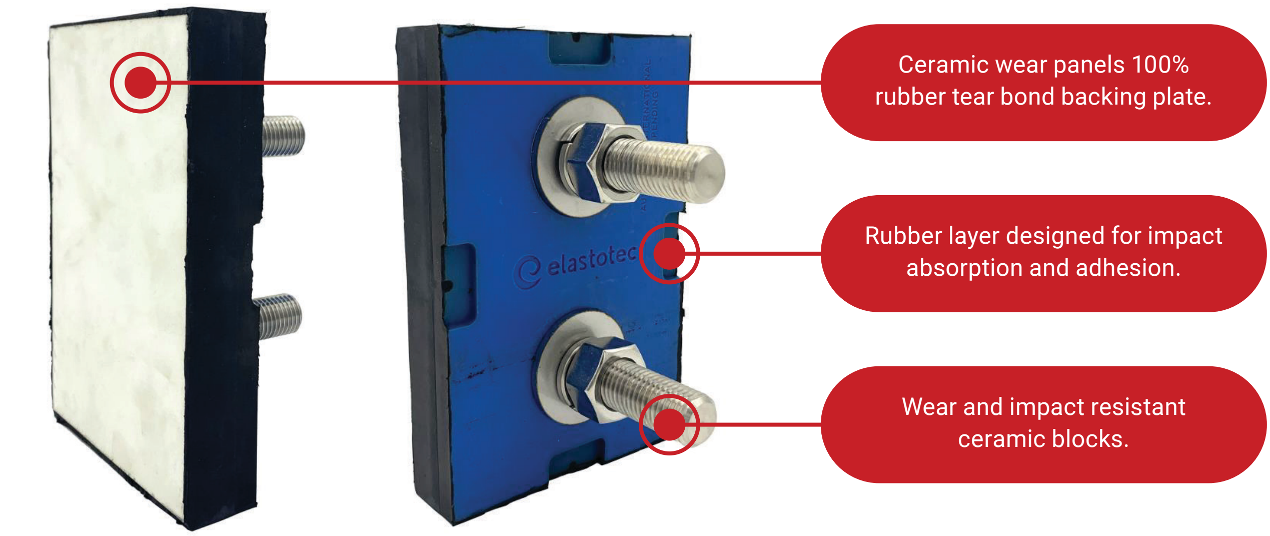
Engineered to Perform

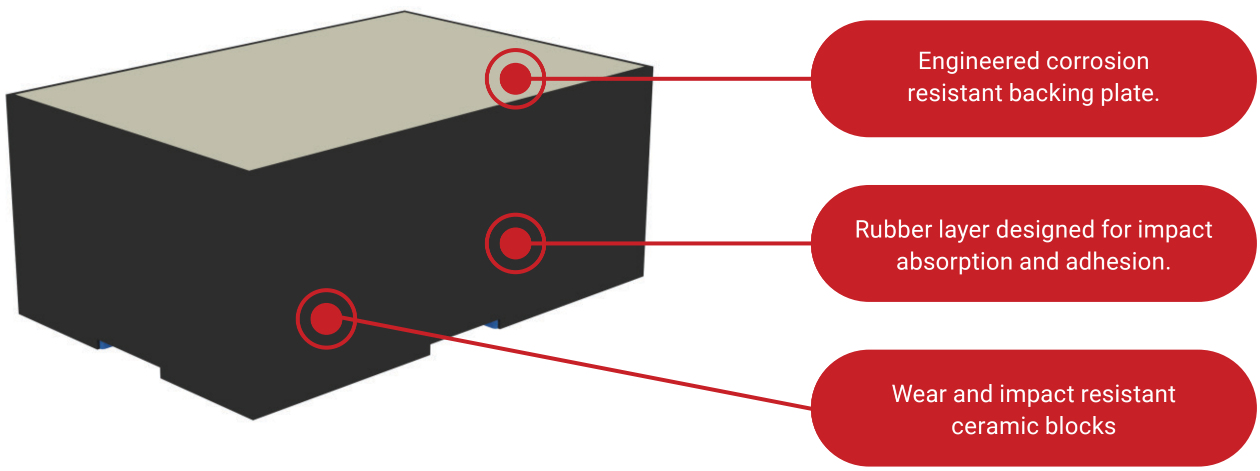
Key Features & Benefits

Bolt On studded attachment system

- Available with a full range of ceramic wear liner materials – Al2O3,ZTA,SiC
- Available with mild steel or stainless steel studs
- Available with mild steel or ETP (Engineering Thermoplastic) backing plates
- ETP (Engineered Thermoplastic) backing plates and S/S studs for wet and/or corrosive environments
- Can be cut to provide complex shapes and holes to fit equipment profiles and piping.

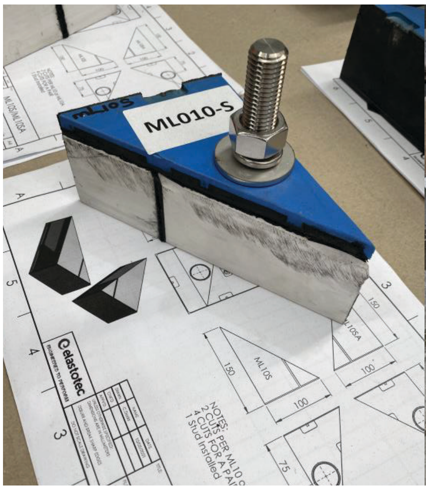
Bolt-On Studded Attachment Features





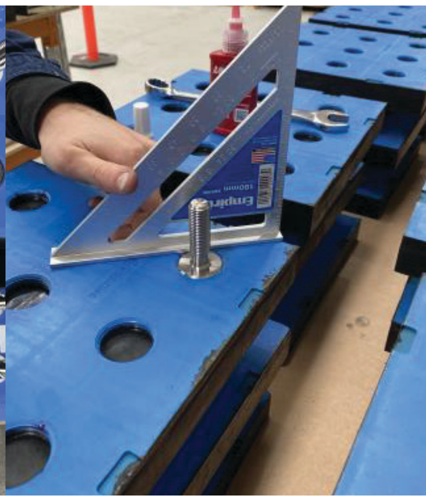
Bolt-On Wear Panels – Cutting

Elastotec has a state of the art facility for cutting all types of ceramic wear liner materials. Capability includes straight cuts, chamfer cuts, circular and elliptical cuts and complex profiles




Bolt-On Wear Panels – Wet And Corrosive Environments

For operating conditions that are wet and corrosive Elastotec can manufacture ceramic wear liners with ETP (Engineering Thermoplastic) backing plates and S/S studs.


Bolt On Wear Panels – Sizes

Elastotec has a developed a range of high performance ceramic wear panels for use in the mining industry

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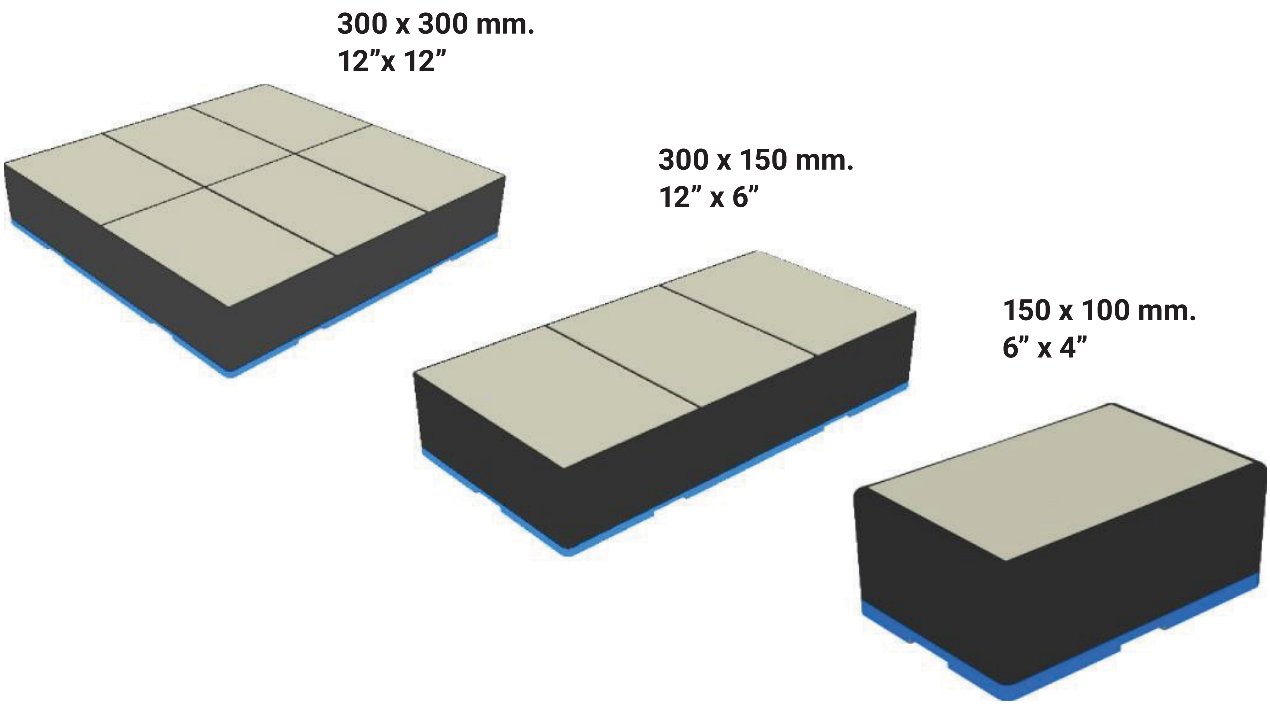


Overall panel thickness (mm)	(in)	Ceramic thickness (mm)	(in)	Rubber thickness (mm)	(in)	ETP Backing plate thickness (mm)	(in)
25	1	12	1/2	5	1/5	8	5/16
38	11/2	25	1	5	1/5	8	5/16
63	21/2	50	2	5	1/5	8	5/16

Note: Custom sizes are available in bolt on wear liners in all ceramic materials.

Elastotec has formulated a range of wear resistant ceramics. In house ability to test key ceramic properties including Vickers Hardness, Flex Crack Toughness and Wear Resistance has enabled Elastotec to optimise the ceramic performance and confirm these properties on each production batch. Elastotec wear panels can be made in a range of ceramic materials to suit a variety of end use applications.

Aluminium oxide Al203	92%	Economic cost with reasonable wear resistance.
Aluminium oxide Al203	96%	Improved wear resistance.
Aluminium oxide Al203	99%	Highest hardness, highest wear resistance grade of aluminium oxide.
Toughened aluminium oxide	ZTA	Aluminium oxide with improved fexural crack resistance - used in applications that require some impact resistance and exceptional wear resistance.
Zirconium oxide ceramic	YTZ	Combines very good abrasion resistance with exceptional flex crack toughness.

Ceramic Oxide Properties

Typical values

Material	AL2O3 92%		AL2O3 95-97%		AL2O3 99%		ZTA Toughened Aluminia Oxide		ZIR	
Density (g/cc3) (lb/ft3)	**3.60**	225	3.77	235	3.83	239	4.10	256	4.10	256
Flexural strength (Mpa) (psi)	**220**	31,908	300	43,511	330	47,860	400	58,000	400	58,000
Impact resistance (Mpa m1/2)	**3.70**	50	4.10	5	4.20		4.50		7.50	
Vickers hardness (Hv20)	**950**		1150		1200		1350		1350	
Wear resistance (cm3)	**0.25**		0.16		0.10		0.05		0.05	

Rubber

Elastotec has a strong background and knowledge of elastomers. The elastomer is the lowest cost raw material in a ceramic wear panel but provides critical functions of retention of the ceramic tiles and cushioning from impact. Elastotec has developed a high strength (>20 Mpa Tensile Strength), high resilience (>50% resilience) elastomer with in built adhesion promoters. As with the ceramics Elastotec has in house testing capability for all these elastomer physical properties and can guarantee 100% rubber tear bonds between the ceramic and the polymer backing plate for each and every panel.

Typical Elastomer Properties

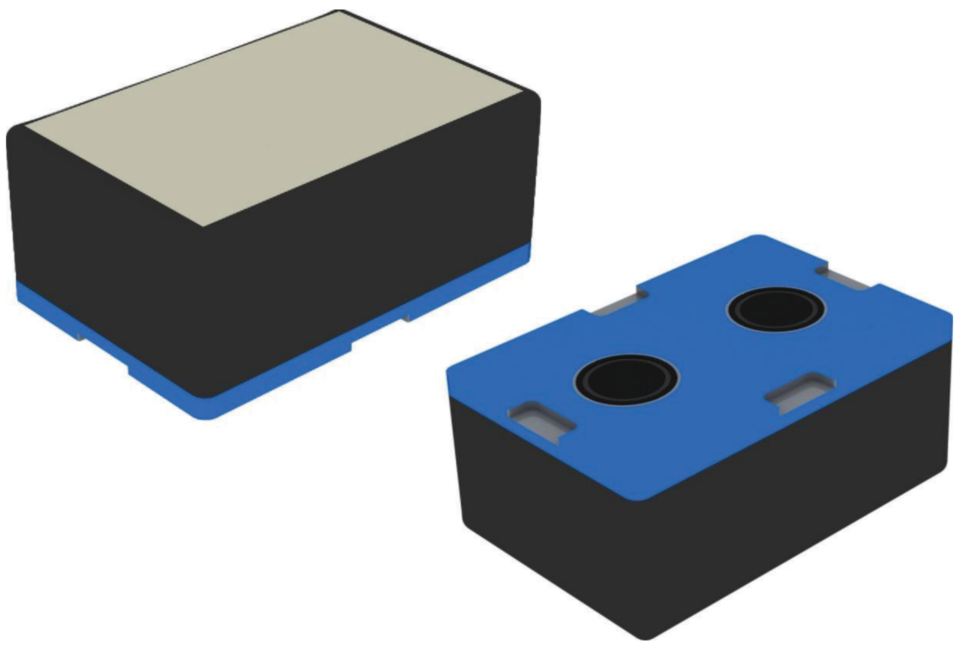
Typical values

Tensile strength	**20 Mpa**	**2900 psi**
% Elongation	550%	
Hardness	55+/-5	
Resilience	60%	
Abrasion loss DIN53516	100 mm3	0.006 in3 volume loss

Backing Plates

Elastotec has backing plates available in mild steel and also engineering thermoplastic (ETP). The ETP offers a number of unique features - reduced weight, corrosion resistance, increased impact resistance and reduced cost. For many years the automotive and appliance industries have been using engineering thermoplastics as metal replacements to reduce cost and increase performance. Elastotec is applying this technology to the wear panels it manufactures to provide the same benefits to the mining industry.

Ceramic Panel (Plastic Backing Plates)



Brazed White Iron (AS2027-CrMo 15-3) Wear Panel

High Chromium-Molybdenum Cast Alloy Combined with Mild Steel:

Brazed White Iron AS2027-CrMo is a mild steel base plate metallurgically bonded with copper shim to white iron using a vacuum furnace heat treatment process, it produces a high abrasion resistant material used in applications where medium impact, high sliding abrasion with large lump material is a concern as the wear mechanism. White Iron should be also considered if there are medium or high dynamic stresses. The as-cast hardness is typically 63HRC depending on the thickness of the casting. White iron is a premium grade material over the least expensive Ni-hard 4 or Hardox materials but will maximize service life by approximately 5-6 times dependent of applications.

Application:

Applications involving high sliding abrasion protection such as:

- Discharge Chutes
- Feed Chutes
- Transfer Chutes
- Hoppers
- Conveyor Skirts
- Ore Bins

Composition:

	C	Mn	Si	Cr	Mo
Min%	2.0	0.5	0.5	14.0	0.8
Max%	3.3	1.5	1.5	27.0	0.3

Mechanical and Physical Properties

Specific Density (g/cm³)	≥7.85g/mm³
Hardness (HRC) (Dependent on Thickness)	≥63
Welding Interface Shear Strength (MPa)	≥350
Average Impact - Joules	≥156

White Iron (ASTM A532-Cr25) Wear Panel

Hypereutectic high chrome white iron:

White Iron ASTM A532-Cr25 is a hypereutectic high chromium casting. It produces a high abrasion resistant material used in applications where low impact, high sliding abrasion with large lump material is a concern as the wear mechanism. White Iron should be also considered if there are medium or high dynamic stresses. The as-cast hardness is typically 650BHN depending on the thickness of the casting. This alloy has good corrosion resistance alloy. It can be machined and faced for fit purposes but can't be drilled. White iron is a premium grade material over the least expensive Ni-hard 4 or Hardox materials but will maximize service life by approximately 5-6 times dependent of applications.

Application:

Applications involving high sliding abrasion protection such as:

- Mining Crusher Liners
- Feed Chutes
- Transfer Chutes
- Dredge Pumping
- Impellers
- Mining Crusher parts

Composition:

	C	Mn	Si	Cr	Mo
Min%	2.5			23.0	
Max%	3.5	1.0	1.5	30.0	1.5

Mechanical and Physical Properties

Specific Density (g/cm^3)	≥7.6g/cm^3
Hardness (HRC) (Dependent on Thickness)	≥650
Welding Interface Shear Strength (MPa)	≥429
Average Impact - Joules	≥136

Chromium Carbide Overlay Studded Wear Panels

Manufactured high-performance wear plates using welding techniques, combining carbides with mild steel plates for superior wear and impact resistance in industrial applications.

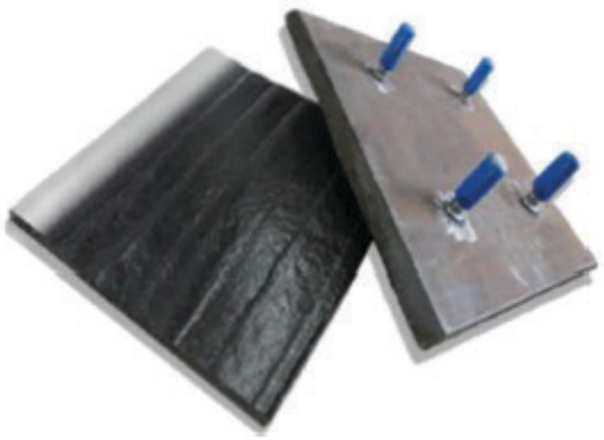
Materials:

Base material is a mild steel backing plate in various thicknesses finished to a weldable condition for attaching mild steel arc studs or welding direct onto the parent metal.

Materials come in a variety of sizes and thicknesses

ELA-X for standard high-abrasion applications with moderate impact requirements.

ELA-I for severe abrasion conditions with high impact loads, where enhanced impact resistance from niobium carbides is beneficial



Application:

Applications involving high sliding abrasion protection such as:

- Discharge Chutes
- Feed Chutes
- Transfer Chutes
- Hoppers
- Conveyor Skirts
- Ore Bin

Composition:

Specifications	ELA-X Anti Wear Chromium Carbide	ELA-I Bifunctional Multiple Carbide
Product Type	Chromium Carbide Overlay	Multiple Carbide Overlay
Hardness	HRC 58-62	HRC 57-61
Carbon Content	>3.5%	>3.2%
Chromium Content	>20%	>20%
Special Additives	-	Niobium >2.2%
Operating Temperatures	<600°C (>550 HV)	<600°C (>500 HV)
ASTM G65A	0.14-0.19	0.15-0.20

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An elastotec™ brand

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