ArcelorMittal

Amstrong®

High Strength Steels with proven performance

XCarb®

Towards net zero steel

Commitment towards net zero steel.

XCarb® brings together ArcelorMittal's reduced and low carbon-emissions products and steelmaking activities, as well as wider initiatives and green innovation projects, into a single effort focused on achieving demonstrable progress towards net-zero steel.

XCarb® recycled and renewably produced steel is applied to steels produced in an electric arc furnace (EAF) using high levels of scrap and 100-percent renewable electricity.

Our XCarb® steel certificates allow customers to reduce their or their customers's scope 3 emissions. These can be purchased directly from ArcelorMittal Europe – Flat Products in conjunction with a corresponding steel order.

More about XCarb®:
europe.arcelormittal.com/xcarb

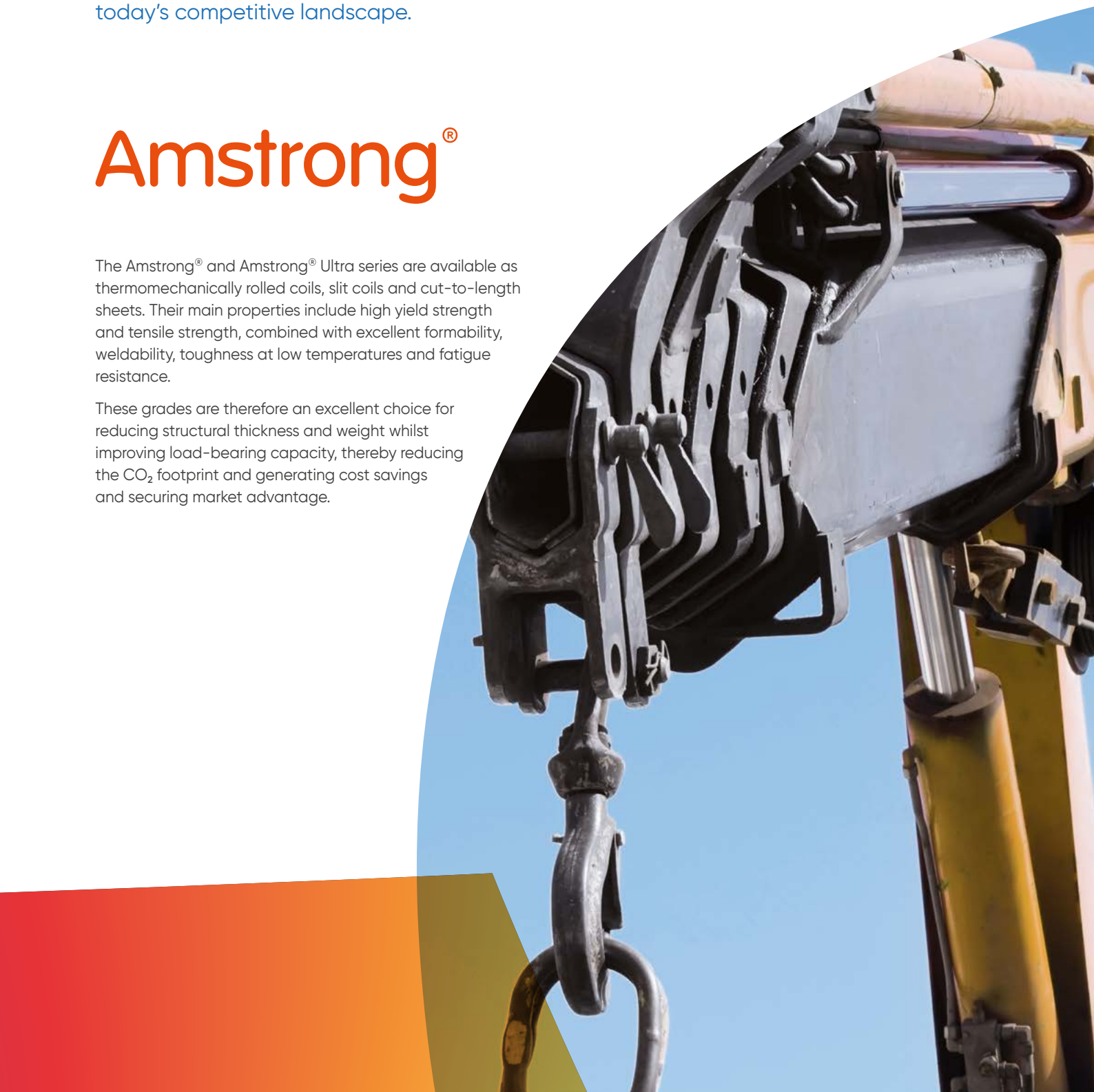
At ArcelorMittal, we are committed to providing steel solutions that enable our clients to achieve their most ambitious objectives. **Amstrong® High Strength and Ultra High Strength Steels** embody this dedication, delivering outstanding performance and reliability for even the most demanding applications.

Developed through a process of continuous innovation and close collaboration, these materials offer the strength and durability needed to support progress across a range of industries. Choosing Amstrong® steels means gaining access to high-performance materials designed for adaptability and excellence in today's competitive landscape.

Amstrong®

The Amstrong® and Amstrong® Ultra series are available as thermomechanically rolled coils, slit coils and cut-to-length sheets. Their main properties include high yield strength and tensile strength, combined with excellent formability, weldability, toughness at low temperatures and fatigue resistance.

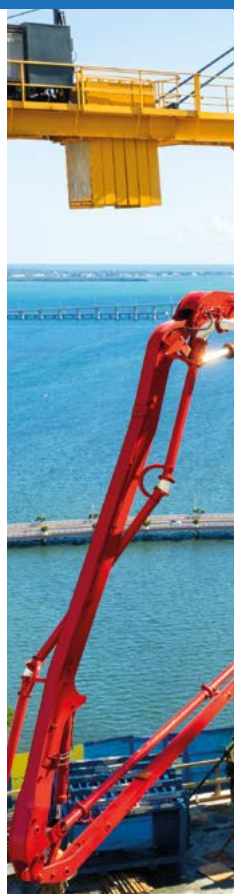
These grades are therefore an excellent choice for reducing structural thickness and weight whilst improving load-bearing capacity, thereby reducing the CO_2 footprint and generating cost savings and securing market advantage.



Amstrong®

Amstrong® High Strength Steels can be used with considerable advantage in a wide range of applications, including:

- Truck trailers and tippers
- Container construction
- Truck-mounted cranes and construction cranes
- Excavators and construction vehicles
- Agricultural vehicles and machinery
- Concrete mixers and pumps
- Freight and passenger rail cars
- Light poles
- Safety barriers
- Racks, shelving and many more...



Chemistry and mechanical properties

The Amstrong® and Amstrong® Ultra product ranges are manufactured according to very strict production processes, which make it possible to provide an outstanding range of properties. These grades also have better ductility and bendability than standard High Strength Low Alloy (HSLA) grades. They are therefore perfect for demanding processes, allowing trouble-free operations and ensuring constant properties from one batch of material to the next. This results in a better yield on the production line and helps to achieve the most severe tolerances on the finished steel parts. With low phosphorus (P) and silicon (Si) content, the chemical composition of these grades makes them suitable for hot-dip galvanising. Amstrong® grades fully meet or exceed all the requirements of EN 10149-2 for equivalent grades. Compared to the requirements of the EN 10149-2 standard, all Amstrong® grades come with a toughness guarantee of 40 J minimum at -20 °C (1) and mechanical properties guaranteed in the rolling and transverse directions.

A 'Tough' version, with a guarantee of 27 J minimum at -40 °C(1), is available for grades Amstrong® 355MC/420MC/460MC/500MC/550MC, called Amstrong® 355MCT/420MCT/460MCT/500MCT/550MCT respectively.
'Tough' versions of other grades can also be provided on request.
For higher grades ranging from minimum guaranteed yield strength 650 to 1100 MPa, please check out the Amstrong® Ultra brochure.

(1) Guarantees in the rolling direction, for standard 10 x 10 mm Charpy samples – for low thicknesses, subsize test samples are used and required values are decreased proportionally.

Chemical composition

Amstrong®	C (%)	Mn (%)	P (%)	S (%)	Si (%)	Al (%)	Nb (%)	V (%)	Ti (%)	Mo (%)	B (%)	C_{eq} (CEV)	Galvanisability
240MC	**≤ 0.100**	**≤ 0.80**	**≤ 0.020**	**≤ 0.020**	**≤ 0.03**	**≥ 0.015**	**≤ 0.025**	**≤ 0.200**	**≤ 0.150**	-	-	**≤ 0.18**	Cat A/Class 1
280MC	**≤ 0.080**	**≤ 0.80**	**≤ 0.020**	**≤ 0.015**	**≤ 0.03**	**≥ 0.015**	**≤ 0.025**	**≤ 0.200**	**≤ 0.150**	-	-	**≤ 0.23**	Cat A/Class 1
315MC	**≤ 0.100**	**≤ 0.70**	**≤ 0.020**	**≤ 0.015**	**≤ 0.03**	≥ 0.015	**≤ 0.045**	≤ 0.200	≤ 0.150	-	-	**≤ 0.25**	Cat A/Class 1
355MC	**≤ 0.100**	**≤ 1.40**	**≤ 0.020**	**≤ 0.015**	**≤ 0.03**	≥ 0.015	**≤ 0.065**	≤ 0.200	≤ 0.150	-	-	**≤ 0.32**	Cat A/Class 1
390MC	**≤ 0.100**	**≤ 1.50**	**≤ 0.020**	**≤ 0.012**	**≤ 0.03**	**≥ 0.015**	**≤ 0.065**	**≤ 0.200**	**≤ 0.150**	-	-	**≤ 0.36**	Cat A/Class 1
420MC	**≤ 0.110**	**≤ 1.50**	**≤ 0.020**	**≤ 0.012**	**≤ 0.03**	≥ 0.015	**≤ 0.065**	≤ 0.200	≤ 0.150	-	-	**≤ 0.38**	Cat A/Class 1
460MC	≤ 0.120	**≤ 1.50**	**≤ 0.020**	**≤ 0.012**	**≤ 0.03**	≥ 0.015	**≤ 0.080**	≤ 0.200	≤ 0.150	-	-	**≤ 0.40**	Cat A/Class 1
500MC	≤ 0.120	≤ 1.70	**≤ 0.020**	**≤ 0.012**	**≤ 0.03**	≥ 0.015	≤ 0.090	≤ 0.200	≤ 0.150	-	-	**≤ 0.42**	Cat A/Class 1
550MC	**≤ 0.100**	**≤ 1.70**	**≤ 0.020**	**≤ 0.012**	**≤ 0.03**	≥ 0.015	≤ 0.090	≤ 0.200	≤ 0.150	-	-	**≤ 0.44**	Cat A/Class 1
600MC	≤ 0.120	≤ 1.90	**≤ 0.020**	≤ 0.015	**≤ 0.03**	≥ 0.015	≤ 0.090	≤ 0.200	≤ 0.220	-	-	**≤ 0.44**	Cat A/Class 1

Values in **bold** are tighter than the EN 10149-2 standard
Galvanisability according to EN 10149-2 and NFA 35-503
V + Nb + Ti ≤ 0.22%

Mechanical properties

Amstrong®	Direction	R_e (MPa)	R_m (MPa)	A_{80} (%)		A $5.65\sqrt{S_o}$ (%)	Bending ratio (th)*			Min. impact toughness KV (J) (1)	
				< 2	2-3	≥ 3	< 6	6-13	≥ 13	at -20 °C ≥ 6	at -40 °C ≥ 6
240MC	R	240 - 320	340 - 450	≥ 27		≥ 32	0			≥ 40	
	T	260 - 340	340 - 450	≥ 26		≥ 31					
280MC	R	280 - 350	370 - 450	≥ 26		≥ 30	0			≥ 40	
	T	300 - 380	370 - 450	≥ 25		≥ 29					
315MC	R	315 - 395	415 - 495	≥ 25		≥ 28	0			≥ 40	
	T	340 - 420	420 - 500	≥ 23		≥ 27					
355MC	R	355 - 435	430 - 520	≥ 22		≥ 25	0			≥ 40	
	T	380 - 460	440 - 530	≥ 21		≥ 24					
355MCT	R	355 - 435	430 - 520	≥ 22		≥ 25	0			≥ 40	≥ 27
	T	380 - 460	440 - 530	≥ 21		≥ 24					
390MC	R	390 - 480	460 - 560	≥ 20		≥ 24	0			≥ 40	
	T	420 - 500	470 - 570	≥ 19		≥ 23					
420MC	R	420 - 520	490 - 600	≥ 18		≥ 22	≥ 0.2		≥ 0.5	≥ 40	
	T	450 - 550	500 - 600	≥ 17		≥ 21					
420MCT	R	420 - 520	490 - 600	≥ 18		≥ 22	≥ 0.2		≥ 0.5	≥ 40	≥ 27
	T	450 - 550	500 - 600	≥ 17		≥ 21					
460MC	R	460 - 560	520 - 640	≥ 15		≥ 18	≥ 0.6	≥ 1		≥ 40	
	T	490 - 590	530 - 640	≥ 14		≥ 17					
460MCT	R	460 - 560	520 - 640	≥ 15		≥ 18	≥ 0.6	≥ 1		≥ 40	≥ 27
	T	490 - 590	530 - 640	≥ 14		≥ 17					
500MC	R	500 - 600	560 - 700	≥ 15	≥ 16	≥ 19	≥ 0.6	≥ 1		≥ 40	
	T	530 - 630	570 - 700	≥ 14	≥ 15	≥ 18					
500MCT	R	500 - 600	560 - 700	≥ 15	≥ 16	≥ 19	≥ 0.6	≥ 1		≥ 40	≥ 27
	T	530 - 630	570 - 700	≥ 14	≥ 15	≥ 18					
550MC	R	550 - 650	620 - 750	≥ 12		≥ 14	≥ 0.8	≥ 1.5		≥ 40	
	T	580 - 680	630 - 750	≥ 11		≥ 13					
550MCT	R	550 - 650	620 - 750	≥ 12		≥ 14	≥ 0.8	≥ 1.5		≥ 40	≥ 27
	T	580 - 680	630 - 750	≥ 11		≥ 13					
600MC	R	≥ 600	650 - 820	≥ 11		≥ 13	≥ 1.5			≥ 40	
	T	≥ 620	660 - 820	≥ 10		≥ 12					

** Minimum mandrel diameter for 180° bend*
(1) The impact energy is verified for products with a nominal thickness ≥ 6 mm as defined in the relevant EN standard. It is possible to have impact energy verified on request for nominal thickness ≥ 5 mm. Impact toughness below 5 mm is guaranteed without testing.

Dimensional feasibility

One of the most outstanding features of the Amstrong® range is its dimensional feasibility. This enables tangible production benefits such as:

- Stock optimisation for maximum flexibility
- Improved nesting/productivity of the cutting line and higher material yield
- Manufacture of larger and simpler parts, reducing the number of welds needed resulting in lower production costs.

Amstrong® and Amstrong® Ultra steel grades are available as mill finish coils or pickled and oiled. Amstrong® products are also available with improved surface finish. For the most demanding surface needs, our grades can be ordered with Micro Adhesive Scale (MASC).
We're constantly improving our dimensional availability, for further information please consult us.

Feasibility mill finish coils, mill edge

MC versions	Max width (mm)															
Thickness (mm)	1.2	1.5	1.8	2	3	4	5	6	7	8	10	12	15	16	17	20
Amstrong® 240MC	1000	1550	1640	1840	2050	2135		2050							1370	
Amstrong® 280MC		1350	1450	1600	2030	2130			2030	1880	1710	1370				
Amstrong® 315MC	985	1550		1600	1885	2135		2150						2050	1370	
Amstrong® 355MC	985	1550		1600	1830	2050		2150								
Amstrong® 390MC			1100	1250	1580	2040		2150								
Amstrong® 420MC			1350	1510	1600	2000		2150						1370		
Amstrong® 460MC		1270	1330	1510	1750	2040		2150					2051			
Amstrong® 500MC		1180	1330		1580	2020		2150				2050				
Amstrong® 550MC			1300		1600	2020		2150			1935	1550				
Amstrong® 600MC				1300	1520	1700	1900	2135			2050					

MCT versions	Max width (mm)												
Thickness (mm)	1.5	1.8	2	3	4	5	6	7	8	10	12	15	16	17
Amstrong® 355MCT	1250	1420	1535	1790	2050	2135						2050		
Amstrong® 420MCT		1000	1270	1580	2040	2150						2050		1370
Amstrong® 460MCT		1000	1270	1580	2040	2150								
Amstrong® 500MCT			1230	1500	2020	2150								
Amstrong® 550MCT			1230	1500	2020	2150								

Feasibility pickled and oiled – up to 15 mm on request

MC versions	Max width (mm)											
Thickness (mm)	1.2	1.5	1.8	2	3	4	5	6	8	10	12	13
Amstrong® 240MC	1275	1550	1640	1840	2035	2110		1765	1525			
Amstrong® 280MC		1320	1470	1570	1885	1730		1590				
Amstrong® 315MC	1275	1550			1885	2110			1525			
Amstrong® 355MC	1275	1550			1740	2040	2110		1550	1525		
Amstrong® 390MC			1100	1275	1585	2040	2097		1270			
Amstrong® 420MC		1350		1510	1660	2040	2097		1525			
Amstrong® 460MC		1270	1330	1510	1587	2040	2070		1525			
Amstrong® 500MC		1180	1330	1335	1660	2020	2070		1525			
Amstrong® 550MC			1300		1608	2020	2070		1525			
Amstrong® 600MC				1300	1608	1699	1660	1525				

MCT versions	Max width (mm)								
Thickness (mm)	1.5	1.8	2	3	4	5	6	8	10
Amstrong® 355MCT	1195	1380	1525	1740	2035	2110		1550	1525
Amstrong® 420MCT		1000	1275	1660	2040	2070			
Amstrong® 460MCT		1000	1270	1580	2040	2070			
Amstrong® 500MCT			1230	1500	2020	2070			
Amstrong® 550MCT			1230	1500	2020	2070			

Processing

Amstrong® and Amstrong® Ultra products have a low carbon equivalent value and can therefore be easily welded using various welding techniques. When required as sheets, they can be supplied with tight flatness tolerance thanks to the use of selected cut-to-length lines. They are therefore perfectly suited for oxy-fuel, plasma or laser cutting. Laser-cutting ability is also improved thanks to the low carbon and silicon content. For further Information please contact us prior to order.

Availability

Amstrong® and Amstrong® Ultra products are manufactured in several European ArcelorMittal steel mills, which means that you will always have easy access to them wherever you are located. They can also be found in stock at various Steel Service Centres.

Since ArcelorMittal operates a policy of continuous development, our product range and dimensional feasibility is naturally constantly changing. We therefore advise you to regularly check the dedicated leaflet and product data sheets A20 and A22 in our online product catalogue at industry.arcelormittal.com/catalogue *– remember that stock sizes vary over time.*

Innovative High Strength Steels for sustainability

ArcelorMittal's High Strength Low Alloy grades, such as Amstrong® 500MC and Amstrong® Ultra 700MC, offer exceptional weight-saving benefits, thanks to thinner, stronger steel that is easier to weld. These advanced materials translate into lower material costs, fuel savings, and significant CO_2 reductions over a product's lifetime.

The use of thinner High Strength Low Alloy steels provides several advantages. It enables faster cutting, forming, and welding processes due to less material and lower energy requirements, resulting in increased productivity and reduced costs. Thinner sheets also enhance precision, are easier to handle and transport, and allow for more complex designs.

Using XCarb® recycled and renewably produced Amstrong® for construction and mining machinery results in a 75% lower carbon footprint compared with traditional manufacturing.

Develop your product with us.

Trailer chassis

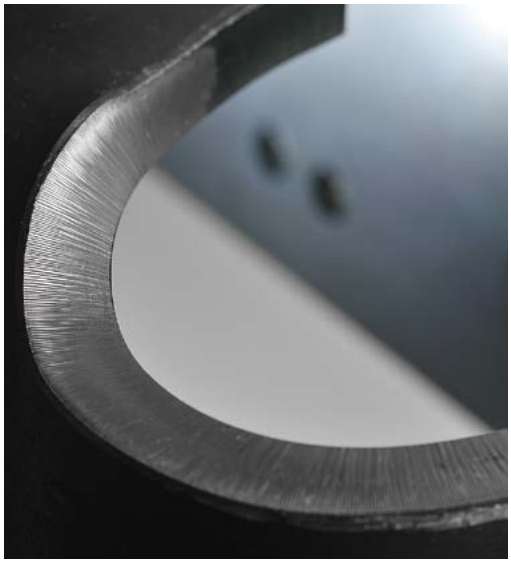
Amstrong® Ultra 700MC and Amstrong® 500MC enable **39% weight reduction** and **38% CO_2 savings** during material production compared to structural steel. We provide full support, from design through welding, ensuring optimised fatigue performance for your trailer chassis.

Tipper

Entire body composed of Amstrong® Ultra 700MC and Amstrong® 420MC structural components, **20% weight** and **CO_2 reduction** compared with structural steel grades. T-bone hook replaced with Amstrong® 500MC, **35% weight reduction** and **25% cost saving**.

Racking system

Amstrong® and Amstrong® Ultra products are a perfect alternative to standard structural steel grades to create **low maintenance** racking systems which are very **cost effective** over their entire lifetime.



Trailer part made of 12 mm Amstrong® Ultra 700MC, laser cut and bent.

Case study

Trailer material optimisation with Amstrong®and Amstrong® Ultra steels

A trailer chassis built using Amstrong® 500MC and Amstrong® Ultra 700MC achieves:

- **29% material cost reduction** compared to traditional structural steel.
- **700 litres of fuel savings annually**, assuming an average of 150,000 km driven per year.
- **900 kg CO_2 emissions reduction** each year, thanks to lightweight materials and fuel efficiency.
- **0.4–0.6 litres per 100 kilometres** of fuel savings can be achieved.

By utilising these innovative high-strength steels, our customers gain a competitive edge while supporting their sustainability goals.

For more information about Amstrong® steels: amstrong.arcelormittal.com

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