Novelis TipperLite® Aluminium

The alloy for tipper trucks

Novelis

Optimized to Build Tipper Trucks

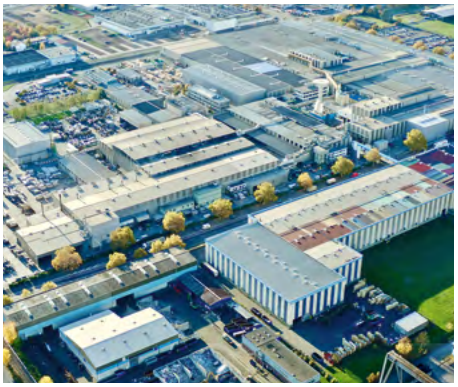
TipperLite® is a 5000 series alloy, which is high in magnesium, that has been optimized for the requirements of tipper truck engineering. It has been developed in collaboration with a number of tipper truck manufacturers, whose specific needs have been considered in the alloy's design process.

This high strength material offers a well-balanced property profile and shows excellent abrasion resistance, based on its performance in accordance with the industry standard Erichsen and Taber tests.

Test results also highlight TipperLite®'s superiority over existing 5000 series alloys and the material's excellent corrosion resistance. The workability of TipperLite® and the material's high bending capacity are equally outstanding.

Finally, the alloy is ideally suited for welding in combination with common filler metals (TIG/MIG).

Bending samples at 90° (above) and 180° (below)



Aerial view Koblenz site

160" hot rolling mill at Koblenz site

128" coil mill at Koblenz site

Our production facility at Koblenz offers ample scope for tipper truck design, with respect to material dimensions. The new material can be built into existing designs (as a drop-in solution) as well as incorporated in newly developed products.

Using TipperLite® allows the tipper truck manufacturers low-maintenance costs, and it requires less repair work with its enhanced durability, so it won't stretch the corporate budget of the end user.

Our annual output, shipped to customers around the world, is more than 150,000 tons (2019). Our range of semi-finished products – delivered in 130 different alloys – are not mass-produced items, but involve a high degree of cutting-edge technology to qualify for our customers' sophisticated applications, they are bespoke engineered solutions.

Our plant has various certifications and international environmental standards that have been obtained over the past 55 years of production, and 2008 saw one of the largest investments ever made at Koblenz facility, which involved the replacement of the existing 148" mill with a state-of-the-art 160" wide rolling mill. This is one of the most capable rolling mills in the aluminium sector, and so we are well-positioned to manufacture extremely large widths and lengths.

Mechanical properties[1] of TipperLite®

	Tensile strength[2] R_m [MPa]	Yield strength[1] $R_{p0,2}$ [MPa]	Elongation[1] A [%]	Hardness [HB]
Typ.	370	270	18	105
Min. 5 - <8 mm	340	240	10	-
Min. ≥8 - 10 mm	320	215	12	-

[1] Values at room temperature
[2] in LT direction

Dimensional range of TipperLite®

Thickness [mm]	Width [mm]	Length [mm]
5 - 10	max. 2,500	max. 12,000

Further dimensions on request

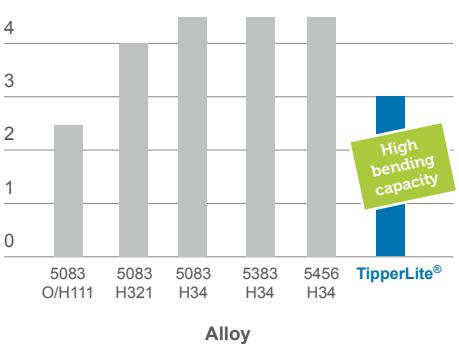
Physical properties of TipperLite®

Density [g/cm³]	E-Modulus [MPa]	Coefficient of thermal expansion [10⁻⁶/K]	Thermal conductivity[1] [W/(m·K)]	Electrical conductivity [MS/m]	[%IACS]	Melting range [°C]
2.66	71,000	23.9	116	17	29	568 - 638

[1] Values at room temperature

Bending capacity[1] of TipperLite®

[Factor[2]]



[1] Thickness range >6 mm, bending angle >90°
[2] Bending radii = factor x plate thickness

Bending[1] of TipperLite®

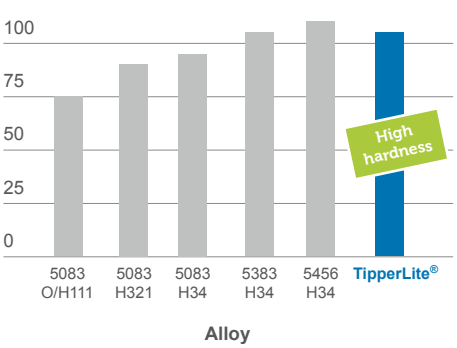
Thickness range [mm]	Bending radii [mm]
5 - 10	3.0 x Thickness

[1] in LT direction

TipperLite® can be bent to angles of more than 90° with the radii indicated. The radius of the mandrel is calculated from the material thickness and multiplied with the factors indicated.

Hardness[1] of TipperLite®

[HB]



[1] Values at room temperature

Pilot caster at Koblenz site

At our research facilities, the process parameters of alloys are optimized on the basis of experimental series.

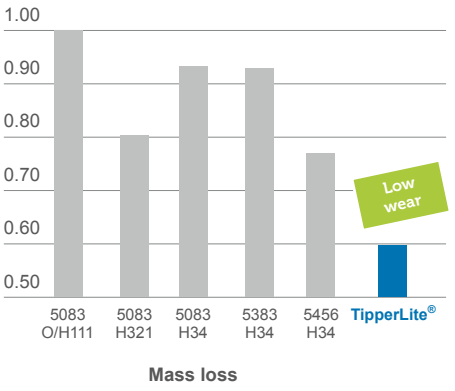
A unique new pilot caster was launched in Koblenz in 2014 which provides additional support to our customer research facilities. This new equipment, which allows the optimization of specific alloying process parameters, is an important step on the road to volume production.

Our research and technology centers closely cooperate with the RWTH Aachen and their numerous institutes, where we are involved in various research institutions.

Innovator in Sustainable Aluminum Solutions

Wear resistance of TipperLite®

Standardized mass loss



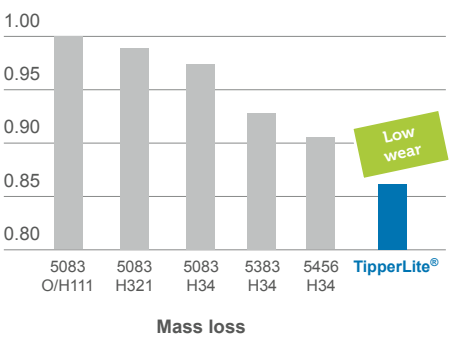
Wear test according to Erichsen

The mass loss of the sampled material following a fixed test period is displayed and standardized to the result of 5083 O/H111. The wear resistant test was conducted using an Erichsen-317 test device (ISO 8251) which involves a wheel covered with grinding paper which moves back and forth over a test sample applying a specified force. The grade of the grinding paper is specified and used for all samples.

All material samples (ranging from 5-10mm in thickness) have been tested in an external test laboratory in Germany using a number of samples.

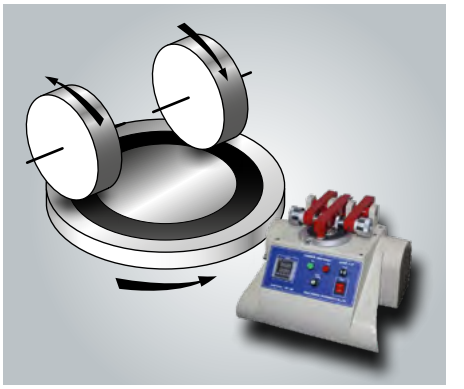
Wear resistance of TipperLite®

Standardized mass loss



Taber test

The mass loss of the sampled material following a fixed test period is displayed and standardized to the result of 5083 O/H111. The test was conducted with a standardised set-up according to Taber in which two abrasion wheels with a specified surface are rotated with specified force on a rotating material sample. The two abrasion wheels are rotating in opposite directions, which means that the material abrasion takes place crosswise.



Aluminium designed to meet the highest standards

The benefits of TipperLite®

- Excellent abrasion resistance
- High hardness
- High strength
- Superior bending capacity
- Ideally suited for welding
- Excellent corrosion resistance
- Durable / extended service life
- Low maintenance and repair costs
- Higher level of design freedom due to excellent processability
- Property profile geared to specific needs in tipper truck construction
- The use of commercially available welding filler wires & rods is possible

TipperLite®

We would like to thank the following partners for their support with images: Ernst Scherer Baustoffe GmbH & Co. KG, Schmitz Cargobull AG, Wilhelm Schwarzmüller GmbH and Stas NV.

Not just aluminium, Novelis Aluminium.™

Novelis Inc. is driven by its purpose to shape a sustainable world together. As a global leader in innovative products and services and the world's largest recycler of aluminum, we partner with customers in the aerospace, automotive, beverage can and specialties industries to deliver solutions that maximize the benefits of lightweight aluminum throughout North America, Europe, Asia and South America. Novelis is a subsidiary of Hindalco Industries Limited, an industry leader in aluminum and copper, and the metals flagship company of the Aditya Birla Group, a multinational conglomerate based in Mumbai, India.

Novelis Koblenz GmbH
Carl-Spaeter-Straße 10
56070 Koblenz · Germany
Tel. +49 (0) 261 891 0

Visit **novelis.com** or contact
info.koblenz@novelis.adityabirla.com to learn more.

novelis.com

Novelis