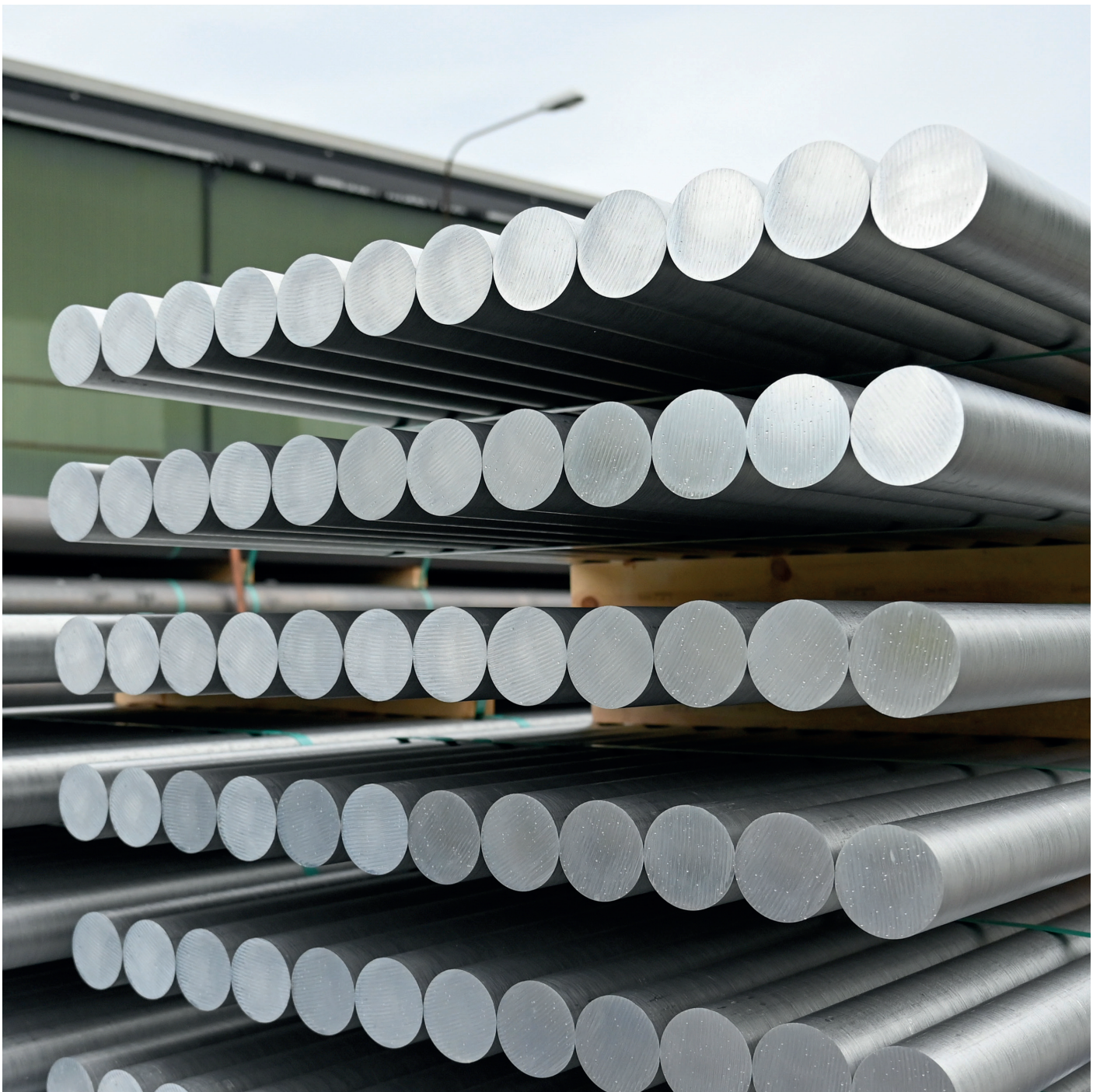




HyForge™  
High-Quality Aluminium Forging Stock





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# Forging the future of automotive



Forged aluminium is the ideal choice when high performance and safety is needed while maintaining a lightweight design for greater energy efficiency.

More and more automotive OEMs are switching to closed die forging to produce critical components such as wheel suspension parts. This advanced process delivers high strength, dimensional accuracy and durability required for safe and reliable performance on the road.

Hydro offers a full range of high-quality aluminium cast forging stock in diameters ranging from 50 to 110 mm.

HyForge™ forging stock is ready-to-use material that can be fed directly into the customer's forging process without any further processing steps (except preheating) such as extrusion or machining.



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# Application areas and key features



## Forging application areas

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Steering knuckles

Control arms

Wheel carriers

Drive train parts

Battery Boxes

Crash Management Systems

Pneumatic / hydraulic systems

Bicycles, motorbike parts

## Key features of cast forging stock

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All commonly used 6xxx alloys available

High quality surface

Uniform grain size distribution

Isotropic properties

Ready-to-use

100% Ultrasonic Testing according to Class A

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# Product Specifications

Our HyForge™ forging stock production is based on primary and secondary aluminium. Consistent high metal quality is ensured by using top-grade raw materials, standardized production processes and continuous quality control.

HyForge™ is tailored to meet individual customer specifications and can be customized for variants of common forging alloy groups.

Our forging stock meets the specifications in accordance to ISO and EN standards.

Hydro's R&D work focuses on the continuous improvement of conventional alloys as well as the development of new generation alloys which meet the ever-increasing demands of customers for improved material properties.

The metal is treated in-line with state-of-the-art degassing and a ceramic foam filter, securing a low Hydrogen level and excellent metal cleanliness.



#### Heat treatment / Temper

Non-Homogenized / F

#### Surface roughness

Rz < 25 µm

#### As cast grain size

< 100 µm

#### Hydrogen

< 0,2 ml H<sub>2</sub>/100 g Al measured with Alscan

#### Pore size

< 50 µm

#### Sawn ends

square to 90° ± 0.5°, Rz < 25 µm

#### Marking

Laser Marking / Data Matrix Code and labelling on demand

#### Main alloy types

(mm)

#### EN 573-3:2009 (D) Numeric

EN AW-6005A  
EN AW-6060  
EN AW-6061  
EN AW-6082  
EN AW-6110  
EN AW-6181

#### EN 573-3:2009 (D) Chemical symbols

EN AW-AJ SiMg(A)  
EN AW-AJ MgSi  
EN AW-AJ Mg1SiCu  
EN AW-AI Si1MgMn  
EN AW-AI Mg0,9Si0,9MnCu  
EN AW-AI Si1Mg0,8

Other diameters and alloys on request



## HyForge™ specifications

# Husnes plant (Norway)

The main benefit of the Hycast Low Pressure Casting (LPC) technology used at our Husnes plant is an extremely narrow contact area between the mould and the molten metal. Friction and inverse segregation are nearly eliminated, resulting in highly uniform material properties and a very smooth and consistent surface quality of the forging ingots. Scalping is therefore not needed.

### Material base

Primary aluminium

### Technology

LPC, vertical DC

### Inverse Segregation Zone / Surface

As cast, unpeeled, ISZ < 120 µm

### Hydrogen

< 0,2 ml H<sub>2</sub>/100 g Al measured with Alscan

### Ultrasonic Testing

100% UST according to ASTM B594-13 Class A (FBH 1,2 mm)

### Diameters and dimensions

(mm)

Diameter	Diameter tolerance	Length tolerance	(kg/m)	Length
90	+/- 0,3	-0/+10	17,2	6000-7000 3000-3350
105	+/- 0,3	-0/+10	23,4	6000-7000 3000-3350
110	+/- 0,3	-0/+10	25,7	6000-7000 3000-3350

Other diameters on request



HyForge™ specifications

## Rackwitz plant (Germany)

In the continuous horizontal casting line at our Rackwitz plant, all process steps such as melting, casting, ultrasonic testing, peeling, inspection and packing, are lined up.

The peeling step allows a certain flexibility on the final diameter of the forging ingot.

### Material base

Recycled aluminium

### Technology

ISZ removed

### Inverse Segregation Zone / Surface

Peeled

### Hydrogen

< 0,2 ml H<sub>2</sub>/100 g Al measured with Alscan

### Ultrasonic Testing

100% UST according to ASTM B594 Class A (FBH 2 mm single)

### Diameters and dimensions

(mm)

As Cast diameter	Peeled diameters	Diameter tolerance after peeling	Length	Length tolerance
84	76-80	+/- 0,2	5000-6000	-0/+10
76	68-72	+/- 0,2	5000-6000	-0/+10
62	55-58	+/- 0,2	5000-6000	-0/+10
54	50	+/- 0,2	5000-6000	-0/+10

Other diameters on request

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# Quality and environmental awareness

Quality Assurance in all steps of our production processes ensures accuracy and consistency in our products. Good working environments, low emission and discharge rates and optimal energy efficiency ensure that our production has the least possible effect on the environment.

Our focus on quality and environmental awareness is documented in the certificates for the following standards:

- ISO 9001:2015 – Quality management system
- ISO 14001:2015 – Environmental Management System
- IATF 16949:2016 – Automotive quality management system
- ISO 45001:2018 – Occupational health and safety management system
- ISO 50001: 2018 – Energy Management System
- Aluminium Stewardship Initiative – certified against both Performance Standard and Chain of Custody
- Environmental Product Declarations (EPDs) are available



HyForge™

# Low-carbon primary or recycled material

From our hydro power based primary plant in Husnes, HyForge™ is delivered with a certified low-carbon footprint according to the Hydro REDUXA 4.0 brand principles. Hydro REDUXA 4.0 sets a new standard for carbon footprint in production of aluminium.

The plant in Rackwitz is equipped with a state-of-the-art melting furnace giving the plant the ability to deliver material with a high recycling share of more than 85%,<sup>1)</sup> and an industry leading content of post-consumer scrap (PCS).

The combination of new furnace technology and in-house competence in recycling enables the plant to deliver low-carbon recycling material with a footprint of 4 kg CO<sub>2</sub>/ Kg Al, and below.

<sup>1)</sup> according to ISO 14021



## From mine to metal

Kilograms of CO<sub>2</sub> equivalents in the Hydro REDUXA value chain

Bauxite		0.1
	∨	+
Alumina		1.0
	∨	+
Anodes		0.2
	∨	+
Electricity		0.1
	∨	+
Electrolysis		1.6
	∨	+
Casting		0.1
	∨	+
Other		0.8
	∨	
		< 4.0
	∨	
Building and construction		
	∨	
Automotive		
	∨	
Industrial design		
	∨	
High-voltage cables		
	∨	
Packaging		



*Industries that matter*

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Hydro is a leading aluminium and energy company committed to a sustainable future. Our purpose is to create more viable societies by developing natural resources into products and solutions in innovative and efficient ways.