

Forged Aluminium Wheels

For Audi made by OTTO FUCHS
1969 - Today



The Wheel Story

Linked by Tradition

The story of success of the Fuchsfelge® started more than 40 years ago with the development of the Porsche 911.

But in one important detail a tank acted as inspiration for a Porsche. As Porsche was developing its 911 in 1962, the search was on for a very special wheel. This should have outstanding properties and at the same time open new occasions in terms of styling. It should be a light alloy wheel. In addition to its attractive appearance, the wheel should promise a significantly superior ride quality through its lower weight and the resulting reduction in unsprung mass.

Porsche had already gained experience with Aluminium alloy wheels although not in its cars. At this time the Porsche engineering services were also developing a light, air-portable tank for the German army. And their track rollers were made by OTTO FUCHS: forged and made of Aluminium.

The Porsche engineers recalled this as it became clear that cast wheels could not fulfil Porsche's requirements. Accordingly what was more logical than to contact OTTO FUCHS in Meinerzhagen with an inquiry about the wheels for the new sports car. OTTO FUCHS accepted the challenge and developed the first forged Aluminium alloy wheel for series production, the legendary Porsche "windmill" wheel - today renowned as "The Fuchsfelge®".

For more than twenty years it was offered either as standard or optional equipment. Even today, the original Fuchsfelge® can still be purchased from Porsche Classic. The ve-

hicle and its wheel became legendary. At the beginning of the 1970ies OTTO FUCHS together with Mercedes developed the so-called "baroque wheel". Present on the market for fifteen years, the baroque wheel on the Mercedes became a legend as well.

Audi and the Fuchsfelge

The partnership with Audi began back in the end of the 1960ies. Forged wheels from Meinerzhagen were already featured on such innovative vehicles as the NSU Ro80 - a vehicle that is still recalled today not only for its revolutionary aerodynamic bodywork and Wankel engine but also for its Fuchsfelge.

With the Ur-quattro in the early 1980ies, Audi entered new dimensions in driving dynamics. Always part of it: The Fuchsfelge. Because of its outstanding properties, lowest weight and maximum safety reserves, it additionally supports the excellent driving performance of this sport coupe - both on-road and off-road.

Those looking for something special relied on forged wheels from Meinerzhagen. In the mid of the 1990ies the Ingolstadt engineers remain true to the motto and trusted in Fuchs wheels for their top range vehicle - the Audi A8. The market launch of this high class car was accompanied by OTTO FUCHS's development of the automated manufacturing of so called forged lightweight wheels as basic equipment for high-end vehicles. The first 20" forged exclusive wheels, for the A8 as well, set new standards in the optional equipment.

Then and now - a forged Fuchsfelge from Meinerzhagen is available for almost every Audi model.



A Strong Partnership - For More Than 40 Years



The NSU Ro80 convinces with its aerodynamic body and its 'shapely legs' - the Fuchsfelge.



The Audi Ur-quattro: the pioneer with the first standard all-wheel drive in a sports coupe - and of course with Fuchs wheels.



Since the 1960s a must have for the Porsche 911 and from 2012 in 17" and 18" for the type 993 as well: the Fuchsfelge.

1909 | Audi was founded

1910 | OTTO FUCHS was founded

1969 | The forged Fuchsfelge fitted on the NSU Ro80

1980 | The Ur-quattro is running on forged wheels made by OTTO FUCHS as well.

1994 | Fuchs wheels for the A8: the large series production starts.

2005 | The first forged exclusive wheel in 21": also the Q7 has Fuchsfelgen.

2009
2010 | Audi and OTTO FUCHS celebrate their 100th anniversary

2012 | A partnership for more than 40 years - based on forging technology

The Forging Process

Forging - a complex process, which must provide the maximum in safety. In a series of steps, the wheel is prepared for its important task for a long automotive life.

Step 1: The cast bar

A cast block also produced by OTTO FUCHS of over 6 m in length is the starting material from which a blank is sawn off, exactly matching the later wheel.

Step 1:
The cast bar



Step 2: The pre-forging

In the first forging stage, the blank is forged into a rotationally symmetric piece under a force of 4,000 tonnes.

Step 2:
The pre-forging



Step 3: The styling forging

In the second forming stage, the styling is pressed into the pre-forged blank in a 7,000 tonnes press, which largely gives the wheel its later appearance.

Step 3:
The styling forging



Step 4: The clipping

In the last forging stage with 800 tonnes of press force, the ventilation holes and the hub are stamped out, and the burring of excess material around the circumference cut off.

Step 4:
The clipping



Step 5: The flow-forming

The outer edge of the wheel is heated. The complete rim area, from the outer to the inner flange, is rolled out - which is exactly what goes to make a Fuchsfelge®.

Step 5:
The flow-forming



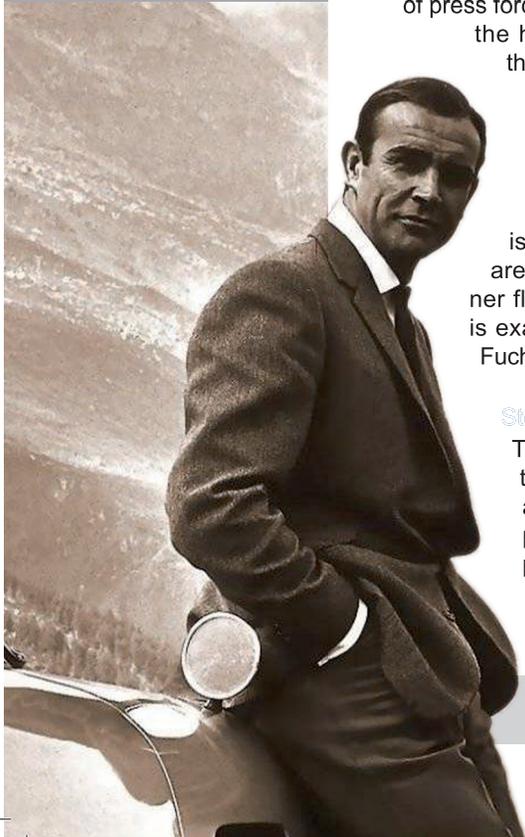
Step 6: The finishing

The finishing takes place in the last step: turning, drilling and deburring. The complex process is rounded off by painting.

Step 6:
The finishing



Shaken, not stirred - the detail makes the difference.
Looking at our forged wheels that means: Forged, not cast!



Visible Beauty And Invisible Safety

Forged aluminium wheels - made by OTTO FUCHS - combine visible beauty and invisible safety.

The superior properties of forged alloy wheels as compared to cast ones result from the applied material.

The OTTO FUCHS forging material, a forging alloy with at least 95% aluminium, is far superior to any cast material with respect to strength and ductility. Reduced wall-thickness and weight reduction are the result of the combination of best materials and most modern manufacturing and simulation techniques. Not least: In extreme driving situations the forged aluminium wheels offer greater safety margins than cast wheels.

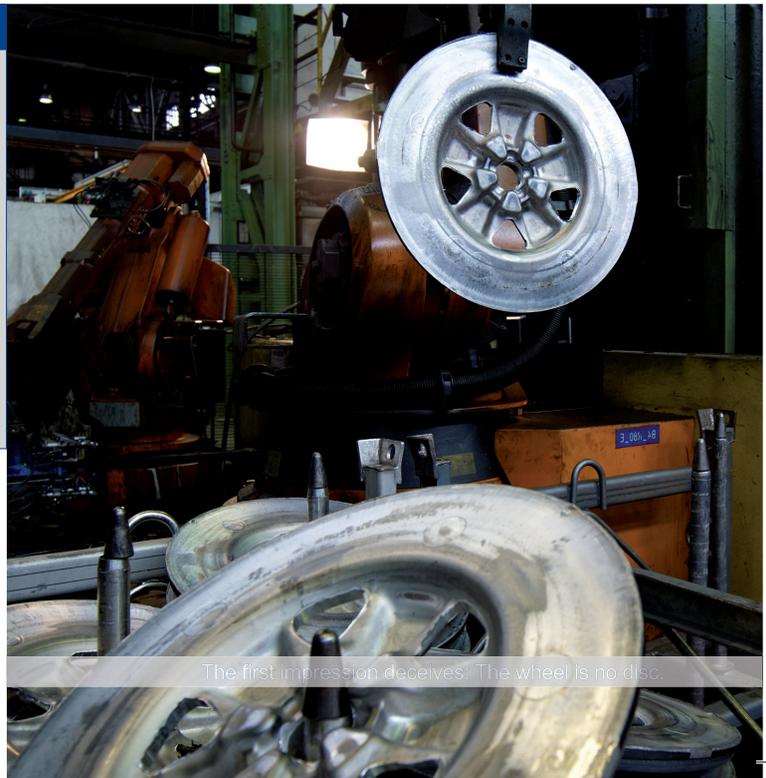
Another important advantage of forged alloys is the feasibility of polishing: the dense microstructure without porosity

and the low silicon content are not only responsible for the superior mechanical properties but also allow for high gloss polish of the wheel surface. Also in this regard forged wheels are setting the standards!

From a high performance material in combination with highly developed calculation- and simulation software, modern manufacturing technology and decades of experience together with high graded craftsmanship, result exclusive masterpieces of forging technology. By their low weight forged wheels effectively support the car manufacturer targets of reduction of weight, energy consumption and carbon emission. Their sophisticated styling as well as the exclusive surface appearance considerably contribute to the desirability of the whole vehicle.

Overview of the Advantages

- lowest weight (weight saving of up to 25 %) resulting in reduction of the vehicle weight and consequently
- improved driving comfort and perfect handling
- maximum safety reserves
- maximum clearance to the brake callipers
- exclusive high-gloss surface finish in durable quality
- great potential for attractive styling



The first impression deceives: The wheel is no disc.

The FUCHS Diversity

OTTO FUCHS only manufactures forged aluminium wheels. Depending on purpose, wheel styling and quantity, we distinguish between two main types of forged wheels: the Forged Exclusive Wheel and the so called Forged Lightweight Wheel.

The Forged Exclusive Wheel

The forged exclusive wheels especially focus on sophisticated styling potential as well as on their functional advantages, lowest weight and maximum safety reserves. These kinds of wheel are produced in dimensions up to 22". The surface finish is high gloss polished - either in part or as a whole. Special varnishes and paintings complete the overall appearance of particular vehicles.

Forging quality made in Germany. Because of their attractive styling and the great technical effort, these wheels are highly demanded as optional equipment. Forged wheels are exclusively made in Germany and the manufacturing process still includes manual work stages.

Since the introduction of the first Audi A8, Audi relies on Exclusive Forged Wheels made by OTTO FUCHS. Currently Exclusive forged wheels are available as optional fitment for AUDI A6, A7, A8, the SUV Q7, the super sports car R8 as well as for different S and RS models.

The Forged Lightweight Wheel

Our forged lightweight wheels are focused on weight reduction, improved aerodynamics and maximum clearance for the brake callipers. The development of light forged wheels aims at minimum weight, attractive styling and a competitive price for standard equipment.

Climate protection is more important than ever before. Our wheels considerably contribute to vehicle weight reduction and, as a result, to continuous reductions of fuel consumption.

Forged Lightweight Wheels were also featured on such innovative and environmentally friendly vehicles as e.g. the Audi A2 and VW's 3-litre-Lupo. Starting with the A4, Audi consequently relies on the advantages of forging technology. Therefore the A4, A5, A6, A7, A8 as well as the TT and the SUVs Q3, Q5 and Q7 - as standard equipment - roll on forged lightweight wheels



The Lightest Wheel in its Class

In close co-operation with our customers we are continuously developing new benchmarks: For the AUDI R8 sports car the challenge was to build a wheel with the lowest weight ever reached in this axle load class - of course fulfilling the strict requirements of the OEM.

The result: a true Fuchsfelge® in the size 8½ J x 19" and a wheel weight of 9.25 kg for the front axle. Thereby a new record was set!

The Fuchsfelge On Land And In The Air - Locomotion In Every Situation

Automobile

The Forged High-End Wheel



Since 2006 the Forged High-End Wheel completes our range of forging wheels for automobiles. Even the smallest series runs - upwards from just 300 wheels per year (18" up to 22") - can be achieved due to the use of a simplified tooling concept. For example the special security car, the Audi A8 L Security for our Chancellor, rolls on forged Fuchs wheels.

Aeroplane

Forged Wheels for Aeroplanes



The first aircraft wheels were made for Dunlop in England in the early 1960s. Today OTTO FUCHS is one of the leading global manufacturers of forged aluminium wheels for airplanes. Due to the low weight and improved safety and robustness, only forged wheels from high-strength alloys are worldwide in use for aircraft applications.

Motorcycle

Forged Motorcycle Wheels



Not only in the automotive sector, but also in the motorcycle branch, the trend is moving towards the exclusive segment. Also our wheels for motorcycles are characterized by lowest weight, dynamic styling and sporty, dynamic and agile handling.

Truck

Forged Truck Wheels



Since the 1980s we have been producing multi-component truck wheels. In 2010 OTTO FUCHS and the Bergischen Patentachsenwerke BPW, developed the so called ECO Wheel, an aluminium forged wheel for heavy trucks. Due to their considerably lower weight, forged wheels have significant advantages in comparison to standard-steel as well as cast aluminium wheels.



Fuchs Wheels For Your Audi

The Fuchsfelge has many different facets: Regardless of whether as a forged lightweight wheel as standard equipment or as a forged exclusive wheel as optional equipment: The Fuchsfelge is an unmistakable characteristic of your Audi by which it easily can be recognised.

Audi A6, A7, A8



| Type | Wheel Size | Surface | Audi part no. |
|------|---------------|----------------|---------------|
| A6 | 7J x 17, ET25 | 3 Layer Silver | 4G0 601 025 A |
| A7 | 8J x 17, ET38 | 3 Layer Silver | 4G8 601 025 H |
| A8 | 8J x 17, ET30 | 3 Layer Silver | 4H0 601 025 _ |

Audi A7, A8, S8 quattro, TT-RS, Q7



| Type | Wheel Size | Surface | Audi part no. |
|-----------------|----------------|------------------------------|----------------|
| A8 (D3) | 9J x 20, ET46 | BiColor, high gloss polished | 4E0 601 025 AT |
| S8 quattro (D3) | 9J x 20, ET46 | fully polished | 4E0 601 025 BE |
| TT-RS | 9J x 20, ET52 | BiColor, high gloss polished | 8J0 601 025 BA |
| Q7 | 10J x 21, ET44 | BiColor, high gloss polished | 4L0 601 025 L |
| | 10J x 21, ET44 | fully polished | 4L0 601 025 S |
| A7, A8 (D4) | 9J x 20, ET37 | BiColor, high gloss polished | 4H0 601 025 AA |
| | 9J x 20, ET37 | fully polished | 4H0 601 025 AB |

Audi TT



| Type | Wheel Size | Surface | Audi part no. |
|------|----------------|----------------|---------------|
| TT | 7J x 17, ET47 | 3 Layer Silver | 8J0 601 025 G |
| | 8½J x 17, ET50 | 3 Layer Silver | 8J0 601 025 A |

Audi A7, A8



| Type | Wheel Size | Surface | Audi part no. |
|--------|---------------|------------------------------|----------------|
| A7 | 9J x 20, ET37 | BiColor, high gloss polished | 4H0 601 025 AE |
| A8 | 9J x 20, ET37 | BiColor, high gloss polished | 4H0 601 025 N |
| A7, A8 | 9J x 20, ET37 | 3 Layer Silver | 4H0 601 025 AG |

Audi A6



| Type | Wheel Size | Surface | Audi part no. |
|------|----------------|------------------------------|---------------|
| A6 | 8½J x 20, ET45 | BiColor, high gloss polished | 4G0 601 025 G |

Audi Q5



| Type | Wheel Size | Surface | Audi part no. |
|------|---------------|----------------|---------------|
| Q5 | 7J x 17, ET37 | 3 Layer Silver | 8R0 601 025 E |
| | 8J x 17, ET39 | 3 Layer Silver | 8R0 601 025 G |

Audi R8



| Type | Wheel Size | Surface | Audi part no. |
|------|----------------|------------------------------|----------------|
| R8 | 8½J x 19, ET42 | BiColor, high gloss polished | 420 601 025 AC |
| | 11J x 19, ET50 | BiColor, high gloss polished | 420 601 025 AD |
| | 8½J x 19, ET42 | High gloss polished | 420 601 025 AE |
| | 11J x 19, ET50 | High gloss polished | 420 601 025 AF |
| | 8½J x 19, ET42 | Titanium Grey Matt | 420 601 025 AT |
| | 11J x 19, ET50 | Titanium Grey Matt | 420 601 025 BA |

Audi R8 V10



| Type | Wheel Size | Surface | Audi part no. |
|--------|----------------|------------------------------|----------------|
| R8 V10 | 8½J x 19, ET42 | BiColor, high gloss polished | 420 601 025 AK |
| | 11J x 19, ET50 | BiColor, high gloss polished | 420 601 025 AL |
| | 8½J x 19, ET42 | High gloss polished | 420 601 025 AM |
| | 11J x 19, ET50 | High gloss polished | 420 601 025 AN |

Audi R8 GT



| Type | Wheel Size | Surface | Audi part no. |
|-------|----------------|--------------------|----------------|
| R8 GT | 8½J x 19, ET42 | Titanium Grey Matt | 420 601 025 AP |
| | 11J x 19, ET50 | Titanium Grey Matt | 420 601 025 AQ |
| | 8½J x 19, ET42 | Matt-polished | 420 601 025 AR |
| | 11J x 19, ET50 | Matt-polished | 420 601 025 AS |
| | 8½J x 19, ET42 | 3 Layer Black | 420 601 025 BH |
| | 11J x 19, ET50 | 3 Layer Black | 420 601 025 BJ |

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