

BMW PLANT MUNICH.

FLEXIBILITY. INNOVATION. PASSION.



The BMW Group's parent plant.
Production in the heart of a metropolitan city.

**BMW
GROUP**
Plant Munich



PREFACE.

Dear Reader,

the heart of BMW beats in Munich. Here, right by the Olympic Park, are our parent plant as well as BMW Welt, the BMW Museum and our landmark BMW Headquarters. The beginnings of our plant date back to the year 1913. So it is truly the starting point for what has since become the BMW Group's global production network with 30 sites in 14 countries.

The plant's unique location in the center of a big city poses challenges for us on a daily basis. The confined space increases the complexity of logistics processes which are already demanding in the automotive industry in any case. If you visit our plant, you will learn that making a car is much more than assembling thousands of individual parts. It is all about the well-calculated interaction of our

different technologies, ranging from the press shop to the body shop and the paint shop and on to assembly and engine production.

The complexity we are facing will only grow further with the increasing electrification of our vehicle offering. Already today, we produce cars with conventional petrol or diesel engines on a single line together with plug-in hybrids. In the near future, the all-electric BMW i4 will complement our model range. In other words, our Munich site will soon produce all three types of drives on the same line.

To prepare Plant Munich for the upcoming challenges, the BMW Group has invested more than 700 million euros in innovative and sustainable production structures in the past few

years. Key projects include the expansion of the body shop and assembly as well as a new, resource-friendly paint shop.

But our greatest asset are the approx. 8,000 people who work at the plant. It is their expertise and experience, creativity and passion that allow us to create the perfect car and inspire our customers – a thousand times a day.

I hope you enjoy discovering BMW Group Plant Munich.



Dr. Robert Engelhorn
Director, BMW Group Plant Munich





BASED IN MUNICH, AT HOME AROUND THE GLOBE.

Over the course of the past 100 years, the BMW Group has transformed from a local Munich-based company to a global player. Today, its international production network comprises 30 locations in 14 countries on four

continents. The same standards for quality, safety and the considerate use of resources apply worldwide. Innovative production technologies and the high level of expertise of the workforce at all sites ensure that more

than 10,000 individual parts are assembled into premium vehicles 'made by BMW'. This also applies to BMW Group Plant Munich. The company's parent plant is one of the mainstays of the global production network.

The smooth cooperation of production, logistics, transport and administration on premises of 400,000 square meters in the heart of a metropolitan city is a major achievement in modern-day automotive engineering.

Location:	in the north of Munich, in the Milbertshofen neighborhood
Total premises:	400,000 sqm
Dimensions:	approx. 1,000 meters wide and 500 meters long
Workforce:	approx. 8,000 people with over 50 different nationalities
Vocational training:	more than 850 technical and commercial apprentices in 14 different professions at the Munich site
Production areas:	press shop, body shop, paint shop, assembly, engine production, equipment and seat production

Vehicle production range:	BMW 3 Series Sedan, BMW 3 Series Touring, BMW 3 Series Plug-in Hybrid, BMW 4 Series Coupé, BMW M4 Coupé
Engine production range:	3-, 4-, 8-, 12- cylinder petrol engines, 6- cylinder diesel engines, high- performance engines for BMW M models
Daily production output:	up to 1,000 vehicles and over 3,000 engines
Awards:	Lean Award 2015, Ludwig- Erhard-Preis 2016, Lean and Green Award 2016
Investment:	over 700 million euros between 2015 and 2018

STRENGTH THROUGH TRADITION, FUTURE FROM PASSION.

1922



Setup of
Plant Munich

1923



Start of production
of aircraft engines

1924



Production of the
first motorcycle,
the R32

1948



Start of production
of series motorcycle
models after WWII

1951



Start of automotive
production
(500 Series)

1955



Start of production
of the BMW Isetta

1961



Start of production
of the BMW 1500

1975



The first 3 Series
rolls off the
assembly line

19



Start of pr
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HISTORY OF PLANT MUNICH.










Since 1922, the plant has been located in Munich's northern neighborhood of Milbertshofen.

Up to 1951, the production range of Plant Munich was limited to aircraft engines and motorcycles. The automotive production in Munich began with the BMW 501. Only four years later, the plant made the first BMW Isetta. The summer of 1962 saw the production launch of the first model of the 'New Class', the BMW 1500.

In 1975, the plant in Munich started the production of the BMW 3 Series, which has remained the most successful model series of the BMW brand to this day. It is currently produced at the plant in its sixth generation. In 1987, BMW presented its Z1 roadster, a sports car with front mid-engine that went into limited small-series production in 1988.

Since the 1990s, the engine production team in Munich has been building all large-volume engines and high-performance drivetrains. Another highlight in the site's history is the exclusive Z8 roadster; 5,700 cars were made by hand between March 2000 and July 2003. Since 2011, the now sixth generation of the BMW 3 Series has

been rolling off the plant's assembly lines. The BMW 4 Series Coupé followed in 2013, the BMW M4 Coupé in 2014. The latest milestone: in 2016, Plant Munich built 700 BMW M4 GTS cars, a limited edition based on the M4.

1988	1999	2008	2011	2012	2013	2014	2015	2016
								
Production of the Z1 (hand-built)	Assembly of the Z8 in a workshop specifically installed for this purpose	Production of the MINI E series	Start of production of the sixth generation BMW 3 Series	Start of production of the fifth generation BMW 3 Series Touring	Start of production of the BMW 4 Series Coupé	Start of production of the BMW M4	Start of production of the BMW 330e Plug-in Hybrid	M4 GTS limited edition (700 cars)

BMW GROUP PLANT MUNICH – VEHICLE PRODUCTION RANGE.



BMW 3 Series Sedan

BMW 3 Series Plug-In

BMW M4 Coupé

-Hybrid

BMW 3 Series Touring



BMW 4 Series Coupé



BMW M4 GTS

PRESS SHOP.

My name is Isuf Haxhosaj. I am a disposer and line inspector at the Munich press shop. I have been working for the BMW Group for three years.



The production of a car starts here in the press shop. Every day, we produce over 32,000 car body parts. In the press lines, sheet steel passes through several process steps to receive its final shape. We only use galvanized sheet metal, a first measure to protect cars from corrosion. The presses fully automatically draw, bend and punch the sheet steel in several steps to give it the desired shape. The car body of a BMW 3 Series comprises over 400 different pressed parts – from the tank cap to the side frame. 20 different kinds of steel, ranging in sheet thickness from 0.7 to 2.2 mm, are processed.

At the heart of the press shop is a state-of-the-art high-speed servo press line which works at 17 strokes/minute. This facility processes about the same

amount of steel in only twelve days that was required to build the Eiffel Tower.

The workforce of the press shop consists of about 400 highly qualified people in production, quality assurance, maintenance, and logistics.

Press lines are fully automated, and a team of specialists – electricians, mechanics, toolmakers, logistics and quality assurance experts – takes care of the facilities. My colleagues and I steer, program and check the machines and tools as well as pressed parts and their quality. The entire process makes highly efficient use of material, and the recycling rate stands at an impressive 99 percent.

BODY SHOP.

I am Marek-Dariusz Turkiewicz. I work in the production of body and side frames and am responsible for electrical maintenance. I have been with the company for 37 years.

In the body shop, we connect the individual steel parts produced at the press shop to form a body-in-white ready for painting. The result is a highly safe car body with the highest-possible reduction in weight. A car body weighs about 442 kg and consists entirely of zinc sheet. My 1,070 colleagues and I produce about 990 car bodies a day for the BMW 3 and 4 Series as well as the BMW M4 Coupé.

The procedures at the body shop are almost fully automated. Our over 800 industrial robots carry out the highly complex production tasks with maximum precision and place more than 6,000 welding points per vehicle accurate to a tenth of a millimeter. Thanks to the high level of automation, we can produce all vehicle types

manufactured at the plant on a single line.

We apply different welding and joining techniques, such as spot welding, soldering, bolting and adhesive bonding as well as the innovative laser welding. Due to their sophisticated design, the intricate processing as well as the high and ultra-high strength steels used, BMW car bodies are among the safest in the global automotive market.

My highly qualified colleagues and I constantly monitor the quality of welding points and ensure the car bodies' dimensional accuracy and perfect surface quality. In quality assurance, we apply state-of-the-art methods, such as ultrasound, camera and laser

technology, as well as traditional test methods using hammer and chisel. On top of that, we are responsible for maintenance and repair of the machines as well as a smooth production process.



PAINT SHOP.

My name is Ayhan Firtin. I joined the BMW Group 19 years ago. I work in the paint shop, as a quality specialist in the area of microscopy fault detection.



A brilliant color, maximum corrosion protection and a supreme appearance: in the paint shop, the car bodies receive their color and shine. A priority here is the application of eco-friendly processes, such as the use of water-based paint coats and state-of-the-art application procedures. In early 2017, we commis-

sioned a new, highly innovative and, most importantly, resource-friendly paint shop.

On a total of 13,500 square meters, we paint about 1,000 car bodies of the BMW 3 and 4 Series every day. Innovative six-axle robots give us maximum flexibility in terms of paint technology and thus allow us to respond flexibly to customers' special wishes, such as for special colors or

matte paints. In areas that require manual tasks, the ergonomic design of the workstations is a top priority.

The new facility sets new standards, in particular when it comes to resource conservation, sustainability and environmental protection. It applies the innovative, highly efficient IPP (Integrated Paint Process) technology – another important step toward the sustainable production right in the heart of Munich. Compared to the previous facility, natural gas consumption and exhaust emissions have dropped by nearly 50 percent. Energy consumption is also down 25 percent – the equivalent of the average annual energy consumption of 4,000 two-person households.





ASSEMBLY.

I am Agnieszka Ruda and I work in the finish area of the vehicle assembly. My tasks focus on the car wash, the short test track and the test facility. I have been with BMW for six years.

In the assembly at Plant Munich, we complete about 1,000 cars daily in about 335 work cycles. The top priorities here are the customer's wishes and individualization options.

Depending on the customer order, assembly calls up the painted car bodies from the high-bay storage unit. This is when the order-based production of the car begins, in line with the customer's individual vehicle configurations. A challenging aspect of our work is the high number of variants: for the BMW 3 Series alone, we offer approx. 20,000 interior options.

To ensure a safe production process despite this huge number of variants, we assemble modules like the cockpit, front end, seats, doors and drivetrain

from the individual parts in separate assembly spaces first before delivering them at the right time and in the right order – just in sequence – to the main line where some of these modules can be fitted fully automatically. At a conveyor belt of about 3,5 kilometers in length, we can work on 535 cars at the same time. High ergonomic standards and tools such as handling devices, roller stools and swiveling assemblies provide us with the easiest and healthiest options to do our jobs. Fitting the engine, transmission and chassis to the car body – a process known as the 'marriage' – is the highlight in assembly: the drivetrain gives the individually fitted car body its heart and soul, turning it into a real car. And soon it will be a finished BMW.



SEAT PRODUCTION.

My name is Astrit Ahmeti. I work in seat production where I mount front seats. I joined the company three years ago.

In seat production, we make all seats for the vehicles produced at the Munich vehicle plant – several hundred different types in total that vary depending on customer requirements and country specifications, ranging from the base model to various special equipment options and ultimately to a completely customized seat.

Customers can choose between different seat options, such as regular or sports seats, with or without lumbar support, and with

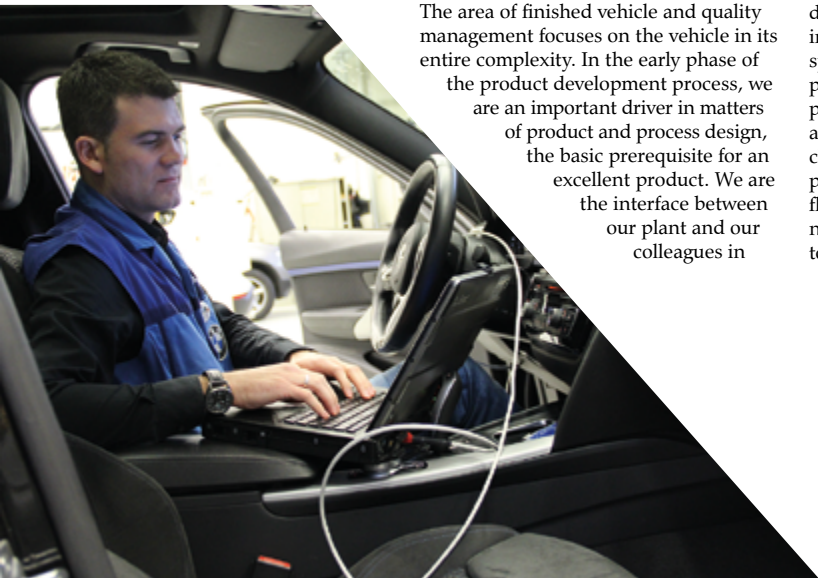
either mechanical seat adjusters or power seats. A wide range of upholstery options is available as well so that customers can select their personal favorites from among numerous colors and materials, such as fabric or leather.

We apply polyol and isocyanate (polyurethane) to produce the foam parts used to pad the seats; these materials are merged in a high-pressure procedure. Depending on the exact mix of these two materials, the result is a softer or firmer foam part. This allows us to achieve the ideal firmness for each section. The completed seats are assigned consecutive numbers and provided to the assembly line just-in-sequence as ‘car sets’ of two seats each.



FINISHED VEHICLE AND QUALITY MANAGEMENT.

I am David Jobst, Ph. D. I have been with the BMW Group for eight years now and am responsible for the validation of the finished vehicle in the area of driver assistance systems.



The area of finished vehicle and quality management focuses on the vehicle in its entire complexity. In the early phase of the product development process, we are an important driver in matters of product and process design, the basic prerequisite for an excellent product. We are the interface between our plant and our colleagues in

development and ensure the smooth integration of a new vehicle or new special equipment in the plant's production processes. Zero faults in production are our top priority. We are also responsible for validating all vehicle characteristics and its suitability for production. We guarantee a product's flawlessness, especially in the case of a new model launch, and allow no errors to slip through.

An efficient and effective problem-solving process makes sure that identified solutions are always sustainable. Changes in series production are smoothly transferred to the production process. In doing so, we apply a quality management system which is always up to certification levels. We see our efforts as successful when we manage to exceed our customers' expectations.



LOGISTICS.

My name is Athanassios Triantafyllidis. I have worked for BMW for 22 years now. I work in logistics where I drive the tigger train from the westward plant expansion to assembly.

About 800 people at BMW and at service providers make up the physical logistics team, and we are responsible for the smooth supply to the vehicle production.

We provide all materials in the right quality to the right place in assembly at the right time. Every day, about 1.3 million parts in close to 9,000 containers are provided. To be able to supply the lines, we have to unload 300 trucks at the plant in two shift operations. We sort parts, arrange them in sequence and transport the respective containers just-in-sequence to assembly by forklift, pallet truck or tigger train.

Sustainability is an important issue for us, and not only when it comes to the ergonomic design of our workstations.

Ecological sustainability is becoming increasingly important as well in an urban environment. This is why we have commissioned a fully electric e-truck to deliver parts at the plant. Our experiences with this truck have been so positive that we are now planning to expand the pilot project.



BMW GROUP PLANT MUNICH – ENGINE PRODUCTION PROGRAM.



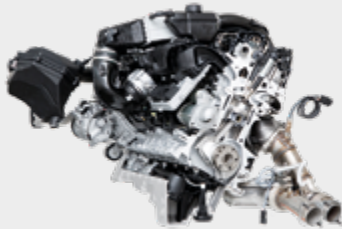
3-cylinder petrol engines



4-cylinder petrol engines



8-cylinder petrol engines



6-cylinder high-performance engines



8-cylinder high-performance engines



12-cylinder petrol engines

ENGINE PRODUCTION – ASSEMBLY.

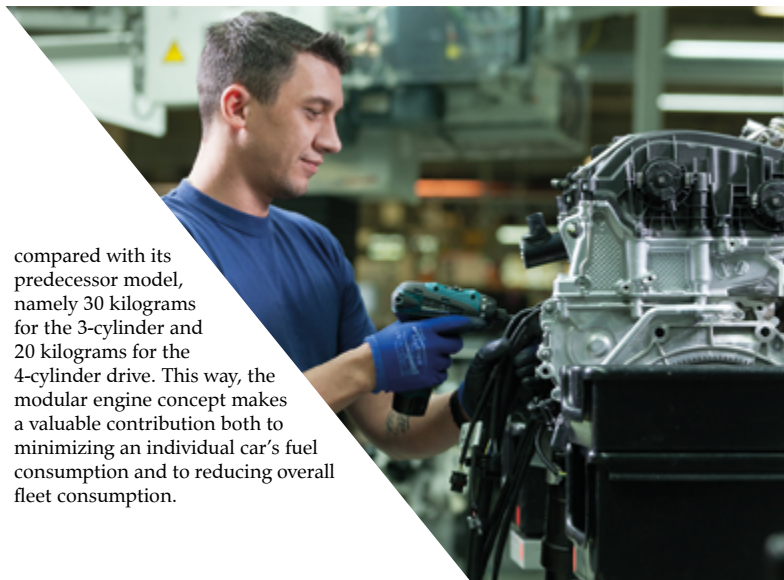
My name is Rafal Nierada. I joined the company five years ago and work in engine production, more specifically in the assembly of modular engines.

For decades, the production of engines has been a core competence of BMW, the 'Bavarian Engine Works'. Engines are a vital element of the proverbial 'sheer driving pleasure', combining outstanding driving characteristics with minimum fuel consumption and CO₂ emissions.

Plant Munich is BMW's only site that combines automotive core production with engine production. At the same time, the Munich-based engine production has the longest history of the company's facilities of this kind. We manufacture the entire range of BMW Group engines, from 3-cylinder engines to the high-performance drive-trains for the current BMW M models, as well as the 12-cylinder drives for Rolls-Royce and BMW automobiles.

Before being fitted into the vehicle, each engine undergoes specific test cycles, such as the cold test that allows for a full function test in close to no time and without the use of fuel. The throughput time for an engine is between six and twelve hours. The approx. 450 individual parts needed to make an engine are finely machined with a precision of a thousandth of a millimeter and then mounted. We supply our engines to the vehicle plants in the global production network.

State-of-the-art modular 3- or 4-cylinder engines are equipped to meet the constant changes in legal requirements regarding CO₂ emissions as well as the increasing electrification. A remarkable achievement is the significant reduction in weight of this engine generation



compared with its predecessor model, namely 30 kilograms for the 3-cylinder and 20 kilograms for the 4-cylinder drive. This way, the modular engine concept makes a valuable contribution both to minimizing an individual car's fuel consumption and to reducing overall fleet consumption.

ENGINE PRODUCTION – LOGISTICS.



I am Remziye Demircan and I have been working for the BMW Group for four and a half years. I am responsible for parts picking for the 3- and 4-cylinder engines.

My about 340 colleagues in physical logistics and I cooperate very closely with the engine assembly and mechanical production. Logistics applies the just-in-sequence supply principle. Contrary to mechanical production, assembly is provided with engine parts on two floors. Attachment parts that are identical for all engine variants

are directly provided to the respective line. Variant-specific parts, however, are prepared on the lower floor and delivered to the engine assembly line via conveyor belts in so-called 'engine sets', boxes that resemble shopping carts.

ENGINE PRODUCTION – MECHANICAL PRODUCTION.

My name is Manuel Nagel. I joined the BMW Group six years ago and work in the production area for cylinder heads.

We are a total of about 600 colleagues in mechanical production.

All common techniques to process blanks are used here, including drilling, machining, milling, honing and sanding. At our five production lines, we process three different engine

components, which we subsequently deliver to assembly.

One of these components is the cylinder head: our cylinder heads consist of a firm but lightweight aluminum alloy. We manufacture cylinder heads for 3-, 4- and 6-cylinder engines as well as

8- and 12-cylinder V engines on two lines.

On two other lines, we make aluminum crankcases for 8-cylinder engines. The fifth line makes steel crankcases for the 12-cylinder drives.



INNOVATION.

The BMW Group is continuously developing its production network further, applying innovative technologies in the fields of digitalization, ergonomics and sustainability. These innovations offer a multitude of new possibilities in production. The goal is to operate a production system with stable, efficient and flexible processes and a strong focus on top quality.

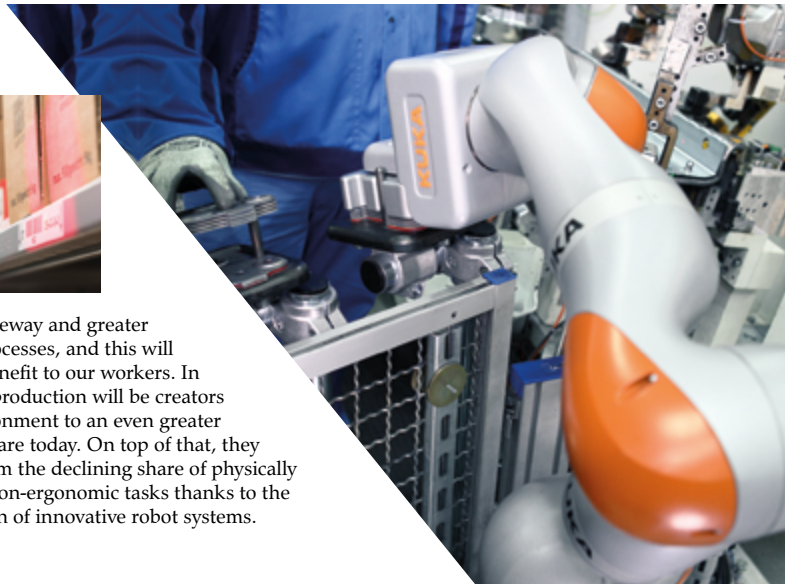
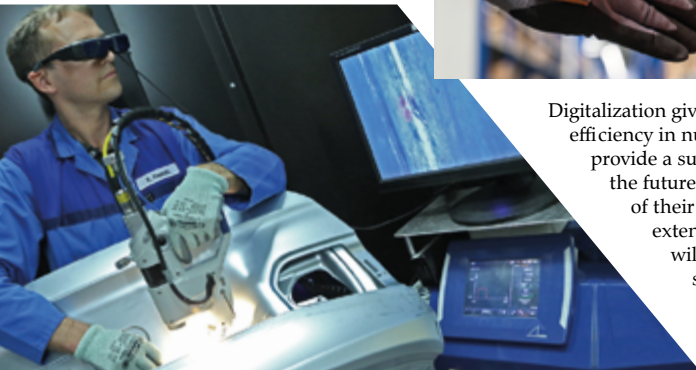
Complex processes in production can be made even more efficient by applying new technologies. In the long term, these developments will modernize the work environment even further.

However, not everything that is technically feasible makes sense when taking into consideration the economic, safety

and reliability issues under the conditions of large series production.



Digitalization gives us new leeway and greater efficiency in numerous processes, and this will provide a sustainable benefit to our workers. In the future, people in production will be creators of their work environment to an even greater extent than they are today. On top of that, they will benefit from the declining share of physically strenuous, non-ergonomic tasks thanks to the application of innovative robot systems.



NATURALLY SUSTAINABLE.

To demonstrate sustainability in all actions and economic activities is a success model the BMW Group has applied for many years. The company's 'Clean Production' strategy is an inherent part of the BMW Group's global production network. The teams at BMW Group Plant Munich constantly work on developing innovative, sustainable production processes as well; these help avoid air pollution, conserve resources and reduce energy consumption.

The BMW Group is one of the world's most sustainable automakers. Especially given its location in the midst of a city, the Munich site has always been known for its particularly eco-friendly and sustainable production.

BMW Group Plant Munich considers itself a responsible partner of the City of Munich and sets great store by the harmonious cooperation with its neighbors. The protection of local residents from production-related noise is a key consideration at the plant, which is met by the reduction

of noise emissions, the application of innovative sound absorbers, ventilators and soundproofing, as well as the optimization of transport logistics.

Today, production at the site causes almost no non-recyclable waste. Waste, wastewater and emissions have been reduced almost to zero, and noise emissions and vibrations have been reduced to a minimum. The total amount of waste for disposal per vehicle produced is 200 grams, the recycling rate stands at 99 percent.





The plant has a rail link via which about two thirds of all the vehicles produced here are dispatched in the most eco-friendly manner. On top of that, this method of transport keeps noise emissions that could bother people in the surrounding neighborhood to a minimum.

Plant Munich is also a pioneer in matters of eco-friendly city logistics: as the first car factory worldwide, the site uses three fully electric trucks for parts deliveries in public road traffic.

The vehicles are powered exclusively with electricity from renewable sources. Combined with the alternative drivetrain, this makes the 40-ton e-truck carbon-free and very quiet; the particulate pollution is also negligible. Compared to a diesel truck, the e-truck saves 11.8 tons of CO₂ annually, corresponding to almost three trips around the world in a BMW 320d Efficient Dynamics.

FOCUS ON THE PEOPLE.

The success of BMW Group Plant Munich is first and foremost based on its people. Their commitment, their identification with the company and most of all their expertise have a significant share in the success of Plant Munich.

Each employee is an important element of the complex production network and thus ultimately responsible for the outstanding product quality.

The corporate culture, which is fully incorporated in the mindset of the workforce at BMW Group Plant Munich, strongly builds on own initiative and responsibility, continuous

control of one's work quality, and the willingness to undergo training for new tasks.

As part of an intelligent network, our employees ensure the transfer of knowledge across plant boundaries. In addition, their commitment ensures that when a new model is introduced production starts on schedule and at

top product quality – right from the word go.

Over 300 working time models, a consistent profit-sharing scheme, the possibility of accepting work assignments abroad, the cooperation with colleges and universities, comprehensive on-the-job and advanced training programs, as well as the highest share

of female workers in the automotive industry are only a few examples for the BMW Group's sustainable HR strategy.

In order to ensure the high qualification level of the workforce also for the years to come, the BMW Group trains more than 850 young people in 14 different professions in Munich.



DIVERSITY, AN INHERENT PART OF OUR SELF-IMAGE.

Diversity at the BMW Group is a triad consisting of a mix of different nationalities and ages as well as an appropriate mix of male and female staff.



This is how, in the future, the BMW Group as a global player will be able to maintain the skills needed to perfectly serve existing sales markets, tap new markets and changing customer groups, as well as make best use of our people's skills in light of the demographic change.

Workers at BMW Group Plant Munich come from over 50 different countries. The age average is 42.5 years.

A VIEW BEHIND THE SCENES.

Experience the fascination of production at BMW Group Plant Munich up close and let one of our guides introduce you to the world of industrial production.



The plant tour program is as versatile as the interests of our visitors. Tours through the production area are offered to both groups and individuals.

We are looking forward to your inquiry:

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Communications Production Network BMW Group

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