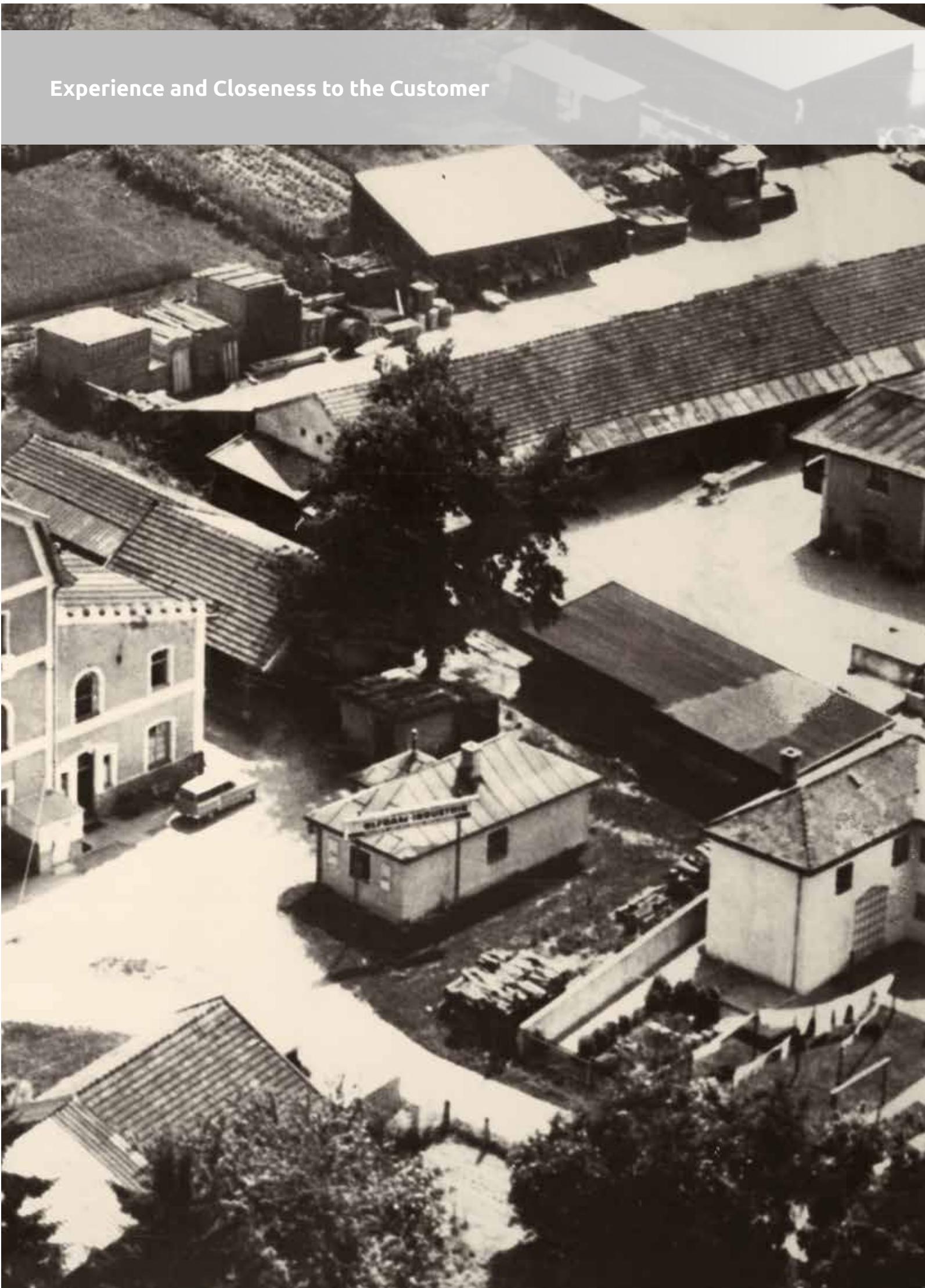




WOLFRAM INDUSTRIE
TUNGSTEN TECHNOLOGY GROUP

Our
expertise
is the most
important
element.

Experience and Closeness to the Customer



Innovation born of more than 100 years' experience.

Wolfram Industrie is a family-run SME. Since 1911, we have been specializing in the development, production and processing of metallurgically superior products based on tungsten and molybdenum.

Over more than 100 years, we have developed the expertise that enables us to produce customized and innovative solutions for our customers, both now and in the future. With around 120 employees at our sites in Traunstein and Dachau, we represent experience, continuity and a focus on finding solutions that are "made in Germany".



Our expertise



Only one thing is rarer
than the earths from which
we make our products:
Our expertise.

Tungsten and molybdenum are refractory metals with unique properties. Tungsten is a pure metal; the one with highest melting point. Its characteristics include a high density, hardness and stability. Molybdenum is also a highly stable, ductile metal with the highest boiling point in its section of the periodic table.

Unlike most ferrous metals, tungsten and molybdenum are not obtained by smelting ore. They are produced through complex processes involving reduction, addition, sintering, compaction and annealing.

These processes cannot be fully automated. The human factor remains crucial, along with the experience that goes with it. Only the expertise of our employees ensures the physical and chemical properties that are needed. As a result, they create the basis of a range of products used in every conceivable application. Once you become aware of this expertise, the enthusiasm for your own skill and creativity just grows and grows.



Wolfram Industrie is the quality market leader in Germany, the only manufacturer to produce from powder and also the only one to use raw materials that are sourced exclusively from Europe.

Delivering quickly and serving customers' individual needs calls for more than just 'off-the-shelf' products.

For us, having finished and semi-finished products permanently available for delivery is part and parcel of what we do. Things only become challenging when you have a very specific problem to solve at short notice, ideally in a batch size of one. So when things get challenging, that's when we offer the skills we have amassed over the years. Special solutions or configurations for customized production processes or end product properties are the situations in which our capabilities really shine.

Based on data sheets, sketches, technical drawings and 3D models, we develop the ideal solution in direct dialog with you. And if you prefer us to, we'll do it right there on your premises.

And all this from a batch size of just one.



If you make particular demands of our products for which there are no standard sizes or shapes, then we are your ideal partner. We will create your solution quickly and in direct contact with you. In all other cases, we're sure to have the perfect product in stock.



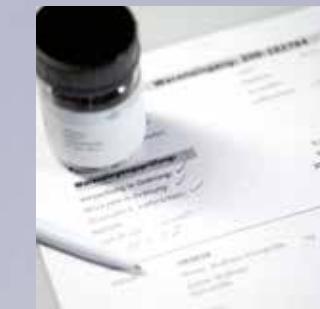


The great thing about our developments is that they're always your solutions.

Exceptional-quality, semi-finished or finished products can only be made from high-quality raw materials. So even when our materials are being selected and delivered, we check their quality against our own high-standard plant specifications. In our quality assurance department and our laboratory, we check after each further stage of production – until release and delivery to you – whether a product meets our strict internal quality guidelines. This expertise makes us your ideal partner for the development of products that fit your specialist applications.

With our research and development department, we not only safeguard the quality of our materials and production processes for specialist solutions, but also do the same for our standard solutions. We offer and sell to you only what we have developed, produced, checked and double-checked ourselves.

In short, we are constantly checking our processes so that you can rely 100% on our work.



Strict goods inwards checks



Measuring machine coordinates



Plant standard



In-house logistics

Others think on grand scales, whereas we focus on the details.



As a family-run SME, we are aware of our responsibility toward our workforce, location and regional structures, which form the foundations of our success. Becoming the quality market leader in our industry is only possible if you have decades of experience and the collective expertise of the company's workforce and its owners. It is therefore essential for us that we produce in Germany. Since we have long since been able to convince and impress customers worldwide with this fundamental belief, it is both an affirmation and obligation to develop our company and portfolio of services in a sustainable and continuous way.

Made in Germany

Products manufactured in Bavaria with social and environmental responsibility and raw materials procured without conflict in Europe for the constantly growing global market: These are the hallmarks of Gesellschaft für Wolfram Industrie mbH Traunstein and Bayerische Metallwerke GmbH, Dachau.





Physical properties of tungsten

Symbol	W
CAS number	7440-33-7
Atomic number	74
Atomic mass	183.85
Grid type	cubic body-centered
Density (at 20 °C)	19.25 g/cm ³
Melting point	3425 °C/3698 K
Boiling point	5930 °C/6203 K
Specific heat (at 20 °C)	138 J/(kg·K)
Linear thermal coefficient of expansion (at 20 °C)	4.5 · 10 ⁻⁶ m/(m·K)
Modulus of elasticity (at 20 °C)	407 GPa
Shear modulus	156 GPa
Tensile strength	750–4700* N/mm ²
Therm. conductivity (at 20 °C)	170 W/(m·K)
Electr. conductivity (at 20 °C)	0.181 [1/(μΩ·cm)]
Spec. electr. resistance	0.055 Ω·mm ² /m
Hardness	300–520* HV10

* Dependent on degree of deformation

Physical properties of molybdenum

Symbol	Mo
CAS number	7439-98-7
Atomic number	42
Atomic mass (relative to ¹² C ¹²)	95.94
Grid type	cubic body-centered
Density (at 20 °C)	10.2 g/cm ³
Melting point	2620 °C/2893 K
Boiling point	4612 °C/4885 K
Specific heat (at 20 °C)	254 J/(kg·K)
Linear thermal coefficient of expansion, 0–100 °C	5.2 · 10 ⁻⁶ m/(m·K)
Modulus of elasticity	329 GPa
Shear modulus	125 GPa
Tensile strength	500–2000* N/mm ²
Therm. conductivity (at 20 °C)	1.42 W/(m·K)
Electr. conductivity (at 20 °C)	0.179 [1/(μΩ·cm)]
Spec. electr. resistance	0.056 Ω·mm ² /m
Hardness	150–320* HV10

* Dependent on degree of deformation

Chemical properties of tungsten

INTERACTING MATERIAL	CONDITION	BEHAVIOR
Water	cold/warm	resistant
Hydrochloric acid HCl	cold	resistant
	warm	slight attack
Sulfuric acid H ₂ SO ₄	cold	resistant
	warm	slight attack
Nitric acid HNO ₃	cold	resistant
	warm	slight attack
Hydrofluoric acid, pure HF	cold/warm	resistant
Aqua regia	cold	resistant
	warm	strong attack
Caustic soda, molten	in air	strong attack
Air and oxygen	up to 400 °C	resistant
	over 400°C	Oxidation
	over 850°C	Sublimation
Hydrogen	at all temperatures	resistant
Nitrogen	up to 2100°C	resistant
	over 2200°C	Nitration
Carbon dioxide CO ₂	over 1200°C	Oxidation
Sulfur dioxide SO ₂	over 700°C	Oxidation

Chemical properties of molybdenum

INTERACTING MATERIAL	CONDITION	BEHAVIOR
Water	cold/warm	resistant
Hydrochloric acid HCl	cold	resistant
	warm	slight attack
Sulfuric acid H ₂ SO ₄	cold	resistant
	warm	slight attack
Nitric acid HNO ₃	cold/concentrated	slight attack
	warm	strong attack
Hydrofluoric acid, pure HF	cold/warm	resistant
Aqua regia	cold/concentrated	slight attack
	warm	strong attack
Caustic soda, molten	in air	strong attack
Air and oxygen	up to 350°C	resistant
Hydrogen	at all temperatures	resistant
Nitrogen	up to 1100°C	resistant
Carbon dioxide CO ₂	up to 1100°C	resistant
Sulfur dioxide SO ₂	in red heat	Oxidation

Better through
experience.

More information can be found on our website.

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