

Titanium

In 1795 the German chemist Heinrich Klaproth found a new non-Ferrous metal. Due to its properties he was reminded of a generation of strong divine beings from Greek mythology and named the element Titanium (Ti).

A lot of designers and engineers understand Ti as an exotic, rare and expensive material although Ti is ranked the 4th most available metals on our planet, but sourcing is not easy!

The ore has to be reduced to Ti sponge by the complex Kroll-process. From the sponge an Ingot is smelted that is further processed. Finally machining Ti to a finished part requires more time and working steps when compared to standard steel, due to titanium's strong mechanical properties.

But once done, titanium parts have breathtaking performance and support many different technical solutions.

Atlas, one of the Titans,
carrying the world

Titanium properties at a glance

- Corrosion free, even in hot salt water
- Resistant against almost all chemicals
- Low density, light weight
- Antibacterial / Antiallergenic properties
- High strength and heat resistant
- Non-magnetic

Hallmarks Ti DIN parts are made
from Ti Grade 2 and 5!!!

Material characteristics comparison

Material	Mat#	density [g/cm ³]	tensile strength [N/mm ²]
Titan Gr 1 (pure Ti)	3.7024	4,51	240
Titan Gr 2 (pure Ti)	3.7034	4,51	345
Titan Gr 3 (pure Ti)	3.7055	4,51	450
Titan Gr 4 (pure Ti)	3.7027	4,51	550
Titan Gr 5 (Ti6Al4V)	3.7164	4,43	895
Titan Gr 7	3.7235	4,51	345
Titan Gr 9	3.7194	4,51	620
Titan Gr 11	3.7225	4,50	240
Titan Gr 12	3.7105	4,50	483
Titan Gr 23 Ti6Al4V ELI	3.7164	4,47	860
Steel C60	1.0601	7,83	710
Stainless Steel X5CrNi18-10	1.4301	7,90	660
Stainless Steel X5CrNiMo17-12-2	1.4401	8,00	670
Aluminium Al 99.5	3.0255	2,70	140
Aluminium AlCu4PbMgMn	3.1645	2,85	370

Hallmark Ti DIN parts

Grade 5 (Ti6Al4V):

A strong and common titanium alloy that **complies with metric property class 8.8** (ISO 898-1). Class 10.9 is available on request.

Grade 2 (pure Titanium):

Chemical Applications often use Grade 2 to avoid contamination. Hallmark can provide all DIN parts in Grade 2. Titanium Grade 2 meets property class 4.6. Also DIN parts <M3 often use Grade 2 for easier production purposes.

If you have a special request we can provide DIN as well as semi-finished products also in **Molybdenum, Tantalum, Zirconium** or other Non Fe materials.

Typical Titanium applications (and why)

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|---|---|
| • Electronic / Electroplate / Galvanize | (anticorrosion, non-magnetic) |
| • Chemical & Petrol Industry | (anticorrosion, temperature) |
| • Water treatment / desalination | (anticorrosion, anti-bacterial) |
| • Boating, Yachting, Watersport | (weight, anticorrosion, strength) |
| • Aerospace & Military | (weight, anticorrosion, strength) |
| • Bicycle | (weight, anticorrosion, strength) |
| • RC Models / Drones | (weight, anticorrosion, strength) |
| • Motorsport | (weight, anticorrosion, strength) |
| • Medical & Healthcare | (antibacterial, antiallergenic, strength) |
| • Food industry | (antibacterial) |
| • Jewelry | (antibacterial, antiallergenic, strength) |
| • Heavy duty applications | (weight, anticorrosion, strength) |
| • High temperature applications | (strength over temp) |

We boost your Application

- DIN part production since 2002
- CNC machined parts
- Forged screw heads
- Rolled threads
- Annealed to remove machining stress
- Property class 8.8 (10.9 on request)
- All finished goods are 100% inspected (incl. thread gauge)
- ISO 9001 (TÜV Rheinland) certified production

Experience

Productivity

Performance

Safety

Efficiency

Reliability

Quality

Hallmark rare metals Co. Ltd.
Unit 04 7/F Bright Way Tower
No. 33 Mong Kok Road
Kowloon, Hong Kong

Hallmark
rare metals

Hallmark **Germany**
Industriestr. 27a
63834 Sulzbach am Main
+49 (6028) 94826201

www.Hallmark-rare-metals.com

contact@Hallmark-rare-metals.com