

Cleveland Plant

PRODUCT CAPABILITIES



H.C. Starck



Engineered Material Solutions

Cleveland PLANT

Built in 1961, H.C. Starck's Cleveland plant is located in Northeastern Ohio. A flat metal rolling operation, the Cleveland plant is equipped with rolling mills and annealing furnaces to process molybdenum and tungsten from starting ingots as thick as 3" to finished product as thin as 0.0003".

The processing is metallurgically straight forward, consisting primarily of rolling and annealing. High temperature rolling is performed without tension, while cold rolling is performed under tension. Copper or nickel is hot bonded to both surfaces of the molybdenum sheet. The

plant is equipped for chemical cleaning, belt grinding, and surface conditioning. Leveling operations control the flatness of the sheet and plate to published specifications. Cutting operations include water jet and abrasive saws to hot and cold slitting and shearing.

Cleveland's products are used in four main markets: electronic, medical equipment, aerospace and high temperature applications.



PRODUCT CAPABILITIES

The following product brief reflects a general guide to standard products available from H.C. Starck's Cleveland facility. H.C. Starck invites your questions about custom specified products.

MOLYBDENUM MILL PRODUCTS

Vacuum Arc Cast:

Pure Molybdenum (99.97% minimum) and TZM.

Powder Metallurgy:

Pure Molybdenum (99.95% minimum), TZM, Z-6 and OSD MoLa

- **Plate**
0.1875" (4.8 mm) to 2" (50.8 mm) thick to 24" (610 mm) wide
- **Sheet**
0.005" (0.127 mm) to 0.187" (4.8 mm) thick to 24" (610 mm) wide
- **Foil**
0.0003" (0.008 mm) to 0.0049" (0.12 mm) thick to 12" (305 mm) wide

CLAD PRODUCTS

- **Copper Clad Molybdenum**
Molybdenum clad both sides with copper. Minimum product thickness is 0.002" (0.05 mm) for 13% and 20% copper per side.
- **Nickel Clad Molybdenum**
Molybdenum clad on one or both sides, with 5% nickel. Minimum product thickness is 0.002" (0.05 mm).

TUNGSTEN MILL PRODUCTS

Tungsten purity 99.95% minimum

- **Plate**
0.1875" (4.8 mm) to 1" (25.4 mm) thick to 24" (610 mm) wide
- **Sheet**
0.005" (0.127 mm) to 0.187" (4.8 mm) thick to 24" (610 mm) wide
- **Foil**
0.001" (0.025 mm) to 0.0049" (0.124 mm) thick to 6" (152 mm) wide



OTHER PRODUCTS AND SERVICES

• MP35N

A nickel, chromium, molybdenum and cobalt-based alloy with outstanding strength and corrosion resistance. Ideal for applications in the marine, chemical and medical fields. Material is available from 0.002" (0.05 mm) to 1.5" (38.1 mm) thickness to a maximum of 24" (610 mm) width.

• Toll Rolling

H.C. Starck's Cleveland facility offers toll rolling services for difficult-to-process metals such as tantalum, niobium, mechanically alloyed materials and other complex alloys. Our capabilities for rolling temperatures range from ambient to 1700°C in widths up to 24" (610 mm). High temperature rolling can be performed using resistance heated hydrogen atmosphere furnaces or gas-fired furnaces. Starting material can be as thick as 3.250" (83 mm) and can be rolled to as thin as 0.003" (0.08 mm).

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The conditions of your use and application of our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations, are beyond our control. Therefore, it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether they are suitable for your intended uses and applications. This application-specific analysis at least must include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by H.C. Starck. All information is given without warranty or guarantee. It is expressly understood and agreed that the customer assumes and hereby expressly releases H.C. Starck from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance and information. Any statement or recommendation not contained herein is unauthorized and shall not bind H.C. Starck. Nothing herein shall be construed as a recommendation to use any product in conflict with patents covering any material or its use. No license is implied or in fact granted under the claims of any patent. In case of order please refer to issue number of the respective product data sheet. All deliveries are based on the latest issue of the product data sheet and the latest version of our General Conditions of Sale and Delivery.

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