

Goodfellow

Serving The Needs of Science and Industry Worldwide

Au service de la Science et de l'Industrie dans le monde entier

Weltweiter Lieferant für Wissenschaft und Industrie

Metals and Alloys
Métaux et Alliages
Metalle und Legierungen

Ceramics
Céramiques
Keramiken

Polymers
Polymères
Polymere

Composites
Composites
Verbundwerkstoffe



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Standard Price List for Niobium

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Introduction

Goodfellow is well known as a specialist supplier of small to medium size quantities of metals, alloys, ceramics, polymers and other materials to meet the research, development and specialist production requirements of science and industry worldwide. We realise that "small" means different things to different people, but we consider small to mean any quantity from a few grammes to a few kilos.

Goodfellow offers two distinct services to meet the requirements of our customers:

- The first meets the needs of our customers who need small quantities of products from our standard range of materials within 24-48 hours.
- The second service is for those who require larger quantities or further processing of our standard products or who need an item which falls within our general area of supply expertise.

The range of materials offered by Goodfellow is extensive, as are the forms in which the various products are available. This Catalogue provides a detailed overview of our standard products which are available from stock. Full details of all of these items, including prices and technical information, can be found in our web Catalogue at www.goodfellow.com.

Materials

Metals and Alloys

Goodfellow supplies virtually all of the pure metals from Aluminium to Zirconium as well as a comprehensive range of alloys. Most are available in a variety of forms, including rod, wire and foil. The Catalog details those materials which are available as standard products from stock. Custom-made items are also available, so please contact us if you are unable to identify the item you require.

Ceramics

The ceramic materials offered by Goodfellow have been carefully chosen, and include both the established as well as more recently developed products. All are available as either standard or custom-made products in a variety of forms and sizes. The Catalog details those items which are

available from stock. For ceramic components made to customer drawings, our Ceramic and Glass Division would be delighted to help. Please visit www.goodfellow-ceramics.com for further information.

Polymers

The range of polymers supplied by Goodfellow is broad and includes both the familiar as well as some of the more unusual or recently developed materials. The Catalog details those items which are available from stock; please contact us if you are unable to find the item you specifically require.

Compounds & Intermetallics

Goodfellow can supply aluminides, borides and silicides as well as other intermetallics and compounds. The majority of these items are made to order and the Catalog details those which are available. Please contact us with details of your requirements.

Composites

Some examples of these materials are listed in the Catalog. As some of these are manufactured on a custom-made basis, please contact us with details of your requirements.

Glasses

Goodfellow offers two distinct types of glass products. The first are generally silica-based and transparent. Generally, these products are made to order for customers, so we do not list them in our Catalog, however, they are available through the Goodfellow Ceramic and Glass Division. Please contact us with your requirements.

The second type of glass product is commonly referred to as "metallic glasses" or "glassy metals". In contrast to crystalline metals and alloys with highly ordered atomic structures, these are non-crystalline (amorphous) metals or, more usually, alloys. Our Catalogue details those glassy metals which are available from stock; please contact us if you are unable to find the item you specifically require.

Product Descriptions



Bar

A straight length of rectangular, square or oval section material.

Tolerances

Section dimensions:	≤ 10mm	± 10%
	> 10mm	± 1mm
Length:	< 100mm	± 1mm
	≥ 100mm	+ 5% / - 1%



Bolt

A threaded pin that can be screwed into a nut or a tapped hole to fasten items together. Bolts are available with different head styles and also in metric and inch-threaded sizes.

Tolerances

See item



Chopped Fibre

Fibres cut into short lengths called cut, staple or chopped fibre.

Tolerances

Fibre diameter:	± 25%
Number of strands:	± 10%
Tex number:	± 10%
Length:	+ 5% / - 1%



Crucible

A vessel in which other materials may be heated or melted, usually at high temperatures.

Tolerances

Height:	± 10%
Inside Dimensions:	± 10%
Outside Dimensions:	± 10%



Fabric

Woven fabrics are made by the regular interlacing of two arrays of yarns at right angles to each other, these being referred to as the warp and weft (see also Non-woven fabric).

Tolerances

Fabric thickness:	± 25%
Number of yarns:	± 10%
Tex number:	± 10%
Size (linear dimension):	< 100mm ± 5mm
	≥ 100mm ± 5%



Fibre

Yarns or tows consisting of several approximately parallel individual filaments, each filament usually being smaller in diameter than a monofilament. Yarns contain a defined number of filaments, typically three to several hundred; tows contain thousands of filaments whose number is only defined approximately. Both are primarily specified by their linear density measured in "tex", the weight in grams of a 1km length of material.

Tolerances

Fibre diameter:	± 25%
Number of strands:	± 10%
Tex number:	± 10%
Length:	+ 5% / - 1%



Film

A non-metallic sheet material with a thickness < 0.5mm.

Tolerances

Thickness:	± 20%
Size (linear dimension):	< 100mm ± 1mm
	≥ 100mm + 2% / - 1%



Flake

Flat, irregularly shaped pieces of material. A maximum flake size is indicated but individual flakes may vary greatly in size.

Tolerances

Dimensions shown are nominal

Product Descriptions



Foam

A low density, permeable structure of cells and continuous ligaments offering a high surface area to volume ratio, and also a high strength to weight ratio. Owing to the nature of this material, dimensions are nominal.



Foil

Thin sheets of pure metal and metal alloys. Due to their fragile nature, some foils are coated on one side with an acrylic or polyester support. Where foils are supported they are indicated in the detailed item description.

Tolerances

Thickness:	< 0.010mm	± 25%
	0.01-0.05mm	± 15%
	> 0.050mm	± 10%
Size (linear dimension):	< 100mm	± 1mm
	≥ 100mm	+ 2% / -1%



Granule

Pellets of an approximately regular shape. Granules may vary in size and, therefore, the dimensions stated are nominal. In addition, the shape of a granule may vary from item to item.

Tolerances

Dimensions shown are nominal



Honeycomb

A cellular structure similar in appearance to natural honeycomb. Owing to the nature of this material, dimensions are nominal.



Insulated Wire

A single or multiple flexible strand of metal or alloy with an insulating sheath.

Tolerances

Wire diameter:	± 10%
Length:	+ 5% / -1%
Insulation thickness:	Nominal values only



Laminate

Layers of material which have been bonded together by the use of heat, pressure and, possibly, adhesive.

Tolerances

Thickness:	± 10%
Size (linear dimension):	≤ 100mm ± 1mm
	> 100mm + 2% / -1%



Lump

A solid piece of material with no defined shape.

Tolerances

Dimensions shown are nominal



Mesh

Mesh is available as either a woven wire or electroformed product; in all cases, the quoted aperture sizes are nominal.

Wire mesh: a material which is woven from metal wires to provide a thin grid with a regular series of holes. Electroformed mesh: a product made by electroplating the mesh geometry through a mask onto a substrate which is subsequently etched away.

Tolerances

Thickness:	woven:	± 10%
	electroformed:	± 20%
Wire diameter:	± 10%	
Size (linear dimension):	< 100mm	± 1mm
	≥ 100mm	+ 2% / -1%

Product Descriptions



Metallised Film

Film which is coated with a metal. The thickness of the metal is measured and described in terms of the material's specific electrical resistance in ohms per square.

Tolerances

Thickness: $\pm 10\%$
 Size (linear dimension): $< 100\text{mm}$ $\pm 1\text{mm}$
 $\geq 100\text{mm}$ $+2\% / -1\%$



Microfoil

An extremely thin sheet of metal or alloy mounted on a permanent support. This support **cannot** be removed without destroying the Microfoil.

Tolerances

Thickness: $\pm 30\%$
 Size: $\pm 20\%$



Microleaf

An extremely thin sheet of metal mounted on a removable support. Microleaf is not available for metals which are too brittle to be free standing.

Tolerances

Thickness: $\pm 30\%$
 Size: $\pm 20\%$



Monofilament

A single strand of a non-metallic material.

Tolerances

Diameter: $\pm 20\%$
 Length: $+5\% / -1\%$



Non-Woven Fabric

Non-woven fabrics are made by methods other than weaving or knitting, the yarns and fibres being held together, often quite loosely, by means other than geometric interlacing. Due to the open and porous nature of this material, all other dimensions are nominal. conventional textile fabrics. Due to the open and porous nature of this material, all other dimensions are nominal.

Tolerances

Size (linear dimension): $< 100\text{mm}$ $\pm 5\text{mm}$
 $> 100\text{mm}$ $\pm 5\%$



Nut

Generally a flat piece of material with a threaded hole which can be screwed onto a bolt to fasten items together. Nuts typically have a hexagonal external shape. Nuts are available in metric and inch-threaded sizes.

Tolerances

See item



Powder

Small particles with an approximately defined size range. Those materials described as alloy precursors are not true alloys - they are made by sintering a blend of powders of the component metals to achieve alloying by diffusion. The resultant cake is ground and sieved to the required particle size range. Unless otherwise stated, the particle sizes shown are for guidance only. We do not guarantee either any particular size distribution between the quoted minimum and maximum sizes, or a specific particle shape.

Tolerances

Dimensions shown are nominal

Product Descriptions



Rod

A straight length of circular section material.

Tolerances

Diameter:	≤ 10mm	± 10%
	Polymer	+ 20%/-10%
	Ceramic	+ 20%/-10%
> 10mm	± 5%	
	Ceramic	+ 20%/-10%
	Polymer	+ 20%/-10%
Length:	< 100mm	± 1mm
	≥ 100mm	+ 5% / -1%



Sheet

Flat material with a thickness > 0.5mm.

Tolerances

Thickness:		± 10%
	Ceramic	± 20%
	Composite	± 20%
	Polymer	± 20%
Size (linear dimension):	< 100mm	± 1mm
	≥ 100mm	+ 2% / -1%



Single Crystal

A material grown as a monocrystal, generally to a specific orientation, dimension and surface finish. It may contain a dopant. Single crystals are usually made to order.

Tolerances

Orientation:	± 3°
Size:	Sizes shown are nominal



Sphere

A regular solid or hollow three-dimensional form in which every cross-section is a circle. Spheres are available with standard or precision tolerances, and can be supplied with different surface finishes depending on the material.

Tolerances

Diameter (standard):	± 5%
Diameter (precision):	see item



Sputtering Target

A high purity material used as a source for sputtering, a cold vapourisation process in which atoms are physically removed from the target surface by ion bombardment.

Tolerances

Thickness:	± 0.5mm
Size:	± 0.5mm



Tube

A hollow length of material normally circular in section. Most tubes are straight except those made of flexible polymer.

Tolerances

Outside diameter:	≤ 2mm	± 0.05mm
	Polymer	± 10%
	Ceramic	± 10%
≤ 5mm	± 0.1mm	
	Polymer	± 10%
	Ceramic	± 10%
> 5mm	± 5%	
	Polymer	± 10%
	Ceramic	± 10%
Wall thickness:	± 10%	
	Polymer	± 20%
	Ceramic	± 20%
Length:	< 100mm	± 1mm
	≥ 100mm	+ 5% / -1%



Washer

A thin, flat piece of material with a hole in the middle, used in conjunction with bolts and nuts to distribute the load of a threaded fastener.

Tolerances

See item

Product Descriptions



Wire

A single or multiple flexible strand of pure metal or alloy.

Tolerances

Wire diameter: $\pm 10\%$
Length: $+5\% / -1\%$

Hazards Information

HAZARDS

All materials listed in this catalogue, whatever the quantity supplied, are sold for research or development purposes. We make no warranty that the materials are fit for a particular purpose. In purchasing materials from this catalogue, customers should be aware that there may be hazards associated with their use and in the handling of them. Complete toxicological or hazard investigations are the responsibility of the customer. Ingestion or contact with the human body may be harmful. The responsibility for the safe use of our products rests with the customer. All materials should be handled by qualified personnel familiar with laboratory procedures and who are familiar with the nature of the material and any necessary precautions which should be taken in the handling, use and storage of the products. The customer shall be responsible for the control and use of the products offered in this catalogue whether alone or in combination with other articles or substances or in any other manner whatsoever.

HAZARD SYMBOLS



C

Corrosive

Chemicals which may destroy living tissue when in contact with them.



D

Dangerous when wet

Chemicals which, in contact with water or damp air, evolve highly flammable or toxic gases and vapours in dangerous quantities.



E

Explosive

Chemicals which may react exothermically without atmospheric oxygen, quickly evolving gases, and which under defined test conditions detonate, quickly deflagrate or upon heating explode when partially confined.



F+

Extremely Flammable

Chemicals which when finely divided (small particle size) are liable to ignite spontaneously.



Xn

Harmful

Chemicals which may cause death or acute or chronic damage to health when inhaled, ingested or absorbed via the skin.



F

Highly flammable

Chemicals which will ignite after contact with flame, or which will evolve highly flammable gases in contact with water.



Xi

Irritant

Non-corrosive chemicals which, through immediate, prolonged or repeated contact with the skin or mucous membrane may cause inflammation.



R

Radioactive

Chemicals which will emit ionising radiation without being subject to irradiation. General precautions for Toxic chemicals apply to those of low activity. For chemicals of medium or high activity special regulations apply.



T

Toxic

Chemicals which may cause death or acute or chronic damage to health when inhaled, ingested or absorbed via the skin.



T+

Very Toxic

Chemicals which in low quantities cause death or acute or chronic damage to health when inhaled, ingested or absorbed via the skin.

General Information

Analyses

Typical Analysis :

Where appropriate a typical analysis is given. All figures are parts per million (ppm) by weight unless otherwise stated. It must be emphasised that this data is "typical" and no guarantee is given that the material supplied will conform to these analyses. The compositions shown under alloy headings are generally weight percent. Exceptions are the glassy alloys and the rare earth magnets where the convention of using atomic ratio is followed.

Purity

Purities listed are quoted with respect to total metallic impurities. Typical analyses may give additional information about likely non-metallic impurities.

High Purity

For materials described as High Purity, the actual analysis of metallic impurities will be supplied free of charge. For other items, an actual analysis can be supplied and a charge will be made for the analysis and for the sample used.

If you require an analysis please tell us whether you require analysis of metallic impurities only or metallic and gaseous. Where an analysis is required the shipment of your order may be delayed.

Supports

Some items from our range of foils need to be supported on one side of the foil to enable both you and us to handle these very delicate materials. Two types of support can be used, the choice being governed by the material. Wherever possible we use a temporary support, a permanent support only being used when the material is brittle (for example Chromium or Manganese).

The temporary support is Acrylic, approximately 0.2mm thick. This may be removed by dissolving in 2-Propanone (Acetone).

Our permanent support is Polyester, thickness 0.125mm, which is hot-press laminated to one face of the foil. It **cannot** be removed without destroying the foil.

Microfoil is mounted on a permanent 3.5µm polyester support. This support **cannot** be removed without destroying the Microfoil.

Microleaf is mounted on a specially treated support which allows separation of the metal film from the support. Full instructions on the method of removal are issued with each Microleaf supplied.

Light Tight (LT) & Not Light Tested (NLT)

Light tight (LT) foils are supplied without visible pinholes after examination without magnification. Foils 0.025mm or more in thickness are supplied LT unless otherwise stated.

Foils less than 0.025mm thick are normally supplied Not-Light Tested (NLT), and will normally contain pinholes but may occasionally be free from pinholes. Foils less than 0.025mm in thickness can often be supplied LT but may incur additional charges. Please specify if you require LT foils

Vacuum tight

Vacuum tight foils show no detectable leakage when tested with a helium mass spectrometer with a sensitivity of 10^{-9} atm-cm³.s⁻¹.

Continuous Lengths

If you require material in continuous lengths please tell us when you place your order. Unless otherwise specified, we reserve the right to supply in more than one length.

Technical Data and Information

All information and technical data are given as a guide only. Although every effort has been made to ensure that the information is correct, no warranty is given as to its completeness or accuracy.

Tolerances

For details of our standard tolerances, please refer to the Product Description section. In many cases, closer tolerances are available but may be subject to an extra charge. If you have any special requirements it is important that you tell us at the time of ordering. This includes special tolerances, dimensional uniformity or any other special requirement which you may have (for example edge finish, packaging, labelling etc.). Please indicate precisely what is required and we shall do our best to meet your specification.

Order information

General Information

There are over 70,000 stock packs listed and if you cannot find what you need amongst them, please ask for special sizes, thicknesses, tolerances, dimensions or larger quantities. We are also able to offer many other pure metals, alloys, polymers and ceramics to special order.

Prices

All the prices listed are total (lot) prices for the sizes and quantities listed. Prices are subject to change without notice.

Prices shown include delivery except for those items marked as "special offer" or dangerous goods with transport restriction. They do not include value added tax, any import duties or local taxes.

Transport Restriction

Some of the materials supplied by Goodfellow are subject to special transport restrictions. Additional shipment charges may apply which are dependent on destination. Please check the individual item on our website or contact us for details of the charges.

If you intend to have the material transported or sent onwards please ensure that you are aware of the relevant transport restrictions.

Delivery

Split shipment

All orders are accepted for one shipment on one date to one address. A charge will be made for split shipments made at the customer's request.

Special Analysis, Supports or Tolerances

An extra charge is made for non-standard supports, alternative tolerances and certificates of analysis. The analysis is free of charge for items marked "High Purity".

Cancellations

A charge for cancellation of orders may be made. The amount will depend on the circumstances.

Express Service

An administration charge of £10 will be made for any order received for which same day shipment within the UK is requested.

Shipment

We aim to have all items listed in this catalogue in stock in the quantities and sizes listed. We can only undertake to despatch an order on a particular date. The date of delivery at the customer's address is subject to the normal variations of the delivery service used.

Despatch

Orders will normally be despatched within 48 hours of receipt.

Non delivery

If we have notified you of despatch of goods and you have not received delivery within 7 days, please contact us.

Insurance

All consignments will be insured by us against the usual risks unless we are instructed in writing to the contrary.

Export Restrictions

A UK Government export licence may be required for some items to some destinations. If the item you require needs a special export licence or an end-use statement we will inform you at the time you order.

Materials Handling

Many of our materials are extremely delicate and it is essential every care is taken when handling them. Special attention is drawn to the extreme fragility of Microfoil, Microleaf and thinner and finer materials.

All materials are carefully packed to ensure safe transport of goods to your address. We do not accept responsibility for damage caused by mishandling once the outer transit packaging has been removed.

Terms of payment

Our normal terms of payment are net 30 days from date of invoice. Any alternative terms of payment are to be agreed with us in writing at the time of placing an order. Customers may be asked to pay cash with order or cash against pro-forma invoice with their first order. In order to establish a credit account we will require details of your bankers, along with two trade references.

Order information

Credit account

We endeavour to keep our costs down and customers are requested to pay our invoices on time. We reserve the right to delay delivery if there are overdue invoices on the account. Accounts which remain unpaid beyond the due date may incur an interest charge at a rate of 2% per month.

Credit card payments

We also accept payment using the following credit and charge cards:

Mastercard, VISA, American Express, DELTA and Switch.

VAT

VAT number: GB 212 8527 79

UK

VAT will be added to the invoice at the rate ruling at the date of invoice. Where a customer is exempt, VAT will be charged unless we receive a copy of the exemption form at the time the order is placed.

EU

Customers registered for VAT who provide their local registration number will not be charged UK VAT.

Customers who are exempt from VAT will not be charged UK VAT provided we are given a copy of their exemption form at the time the goods are ordered.

Customers not registered for VAT or who fail to give us their registration number will be charged UK VAT at the current rate.

Export

All exports to countries outside the EU are zero-rated for UK VAT unless the invoice is being paid from within the EU.

Return of goods

We will only accept return of goods provided we are contacted BEFORE the goods are returned. When we agree to the return we will issue a Goods Return Number and give instructions for the method of return of the goods. Goods will not be accepted for return without a valid Goods Return Number. Due to the nature of some of our materials, it is imperative that you check any possible transport restrictions with your proposed freight company.

Claims

Great care is taken during manufacture and packing and all items are carefully inspected before shipment. Any claim in respect of short delivery, incorrect material or defective quality must be notified to us in writing within three days of delivery. Please retain ALL packaging for our inspection. Our liability for any such claim shall not exceed the cost of replacement of the goods free of charge, or crediting the customer with the invoice value thereof.

Goods ordered in error

We do not accept responsibility for customers' errors in ordering. The amount of credit for returned goods will be at our discretion. Where we accept returned goods a restocking charge will be made.

Conditions of sale

All orders, contracts and quotations are subject to our standard terms and conditions of sale.

Information and statements provided are indicative only and do not form part of any offer or contract.

Exclusions

We supply materials according to our specification. All conditions warranties and representations regarding the quality, fitness for purpose or state, size, shape, capacity or colour of goods supplied whether expressed or implied by common law or statute or otherwise are hereby expressly excluded. We shall not be liable for any damage direct or consequential arising from the use of goods supplied by us however such damage is caused, nor for delay in delivery.

Law

Customers in the USA: Contracts between Goodfellow Corporation and the customer shall be deemed to be subject in all respects to the laws of the Commonwealth of Pennsylvania, or the United States of America.

Customers in France: Contracts between Goodfellow SARL and the customer shall be deemed to be subject in all respects to French law unless otherwise agreed in writing

Customers in Germany: Contracts between Goodfellow GmbH and the customer shall be deemed to be subject in all respects to German law unless otherwise agreed in writing

Order information

Customers in the UK and all other countries: Contracts between Goodfellow Cambridge Limited and the customer shall be deemed to be subject in all respects to English law unless otherwise agreed in writing.

Copies of our General Terms and Conditions are available upon request or can be downloaded from our websites at www.goodfellow.com or www.goodfellowusa.com.

Company Details

Company Structure

The Goodfellow Group consists of five companies:

Goodfellow Cambridge Limited

Goodfellow was established in the City of London in 1946. The Company now has subsidiary operations in France, Germany and North America with the Group's research laboratories, workshop facilities & central administration located in Huntingdon, England.

Goodfellow Corporation

Established at the same time as our associate company in Germany, Goodfellow Corporation was set up to service the requirements of our customers in the USA.

Goodfellow GmbH

Since 1989, this member of the Goodfellow group of companies has been serving the needs of our German speaking customers within Europe.

Goodfellow SARL

Goodfellow established an operation in France in 1993 to meet the needs of our French-speaking customers in Europe.

Goodfellow (Shanghai) Trading Co., Ltd

Goodfellow established a representative office in Shanghai in 2006, and in 2012 followed this with the creation of a fully-fledged trading company, servicing the research and specialist manufacturing requirements of the Chinese market.

COMPANY DETAILS

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Goodfellow (Shanghai) Trading Co., Ltd

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Conditions of Sale

1 GENERAL

1.1 In these Conditions:

1.1.1 the following expressions shall have the following meanings:-

- "Buyer" the individual firm company or other party from whom an order to supply Goods and/or Services is received by the Seller;
- "Conditions" the standard terms and conditions of sale of the Seller as set out herein and includes any additional terms and conditions of sale agreed in writing by the Seller;
- "Contract" a contract for the Supply of Goods and/or Services by the Seller to the Buyer;
- "Date of Delivery" the date on which delivery of the Goods or Services takes place pursuant to Condition 7;
- "Goods" the goods which the Seller is to supply (or, in relation to Condition 11, the goods in respect of which the Seller is to provide Services) under the Contract and includes any of them or any part of them and where the context so admits includes raw materials, processed materials and/or manufactured products whether processed or manufactured by the Seller or not;
- "Prepayment" a payment to be made by the Buyer pursuant to Condition 6.2 to be used at the Seller's discretion for the purchase of materials and/or towards the costs of labour and other costs relating to the supply of Goods;
- "Recommendations for Use" the recommendations (if any) relating to the storage, handling, application and/or use of the Goods contained in the published literature of the Seller (or, if relevant, a Supplier) or any recommendations made in Writing by an authorised representative of the Seller (or, if relevant, a Supplier);
- "Seller" Goodfellow Cambridge Limited and any subsidiary or holding company or associate (as such terms are defined in the Companies Act 1985 (as amended)) of the said company;
- "Services" the work or services or any of them to be provided by the Seller under the Contract;
- "Supplier" any person, firm or company who or which supplies materials to the Seller which make up the Goods which are to be supplied to the Buyer;

1.1.2 words importing the singular number shall include the plural and vice versa, words importing one gender shall include all genders, and words importing persons shall include bodies corporate, unincorporated associations and partnerships

- 1.2 If satisfactory references and information on the Buyer are not provided within seven days of a request therefore by the Seller, or if, following the provision of such information, the Seller is unable to obtain satisfactory trade indemnity or similar cover in respect of its dealings with the Buyer, the Seller may terminate the Contract and the rights and liabilities of the parties shall be the same as if the Contract had been cancelled in accordance with the provisions of Condition 10.2
- 1.3 The seller reserves the right to assign, sub-contract the Contract or any part thereof. The Buyer shall not be entitled to assign the benefit or burden of the Contract without the consent in writing of the Seller
- 1.4 In relation to all obligations of the Buyer under these Conditions, the time of performance is of the essence
- 1.5 The legal construction of these Conditions shall not be effected by their headings which are for convenience of reference only

2 ORDERS

- 2.1 Notwithstanding that the Seller may have given a detailed quotation or estimate either verbally or in writing no order shall be binding on the Seller unless and until it has been acknowledged in writing by the Seller or the Goods are delivered or the Services are provided by the Seller to the Buyer pursuant to the order
- 2.2 In order to avoid duplication of orders the Buyer shall be responsible for ensuring that any confirmation of an order previously placed is prominently marked as being a confirmation and not a new order. The Buyer acknowledges that any order or confirmation of order which is not so marked may be treated and accepted by the Seller as a new order to create a Contract in addition to any Contract arising out of the previously placed order
- 2.3 These Conditions are incorporated in the Contract and together with any matter set out in the Seller's quotation or acceptance/acknowledgement of order contain the entire obligations between the Seller and the Buyer. In the case of any inconsistency between any letter or quotation incorporating or referring to these Conditions and any order, letter or form of contract sent by the Buyer to the Seller, whatever may be their respective dates, the provisions of these Conditions shall prevail. In the event of the Seller entering into the Contract without the Seller having submitted a written quotation or other letter or document incorporating or referring to these Conditions but in circumstances where the Buyer has had prior notice of these Conditions then all Goods or Services supplied shall be subject to these Conditions
- 2.4 No variation of the Contract by the Buyer shall be binding upon the Seller unless made in Writing and signed on behalf of the Seller. In the event of such variation the Buyer shall indemnify and keep indemnified the Seller in full against all loss, which term shall include (but without prejudice to the generality thereof) loss of profit, costs (including the cost of labour and materials), damages, charges and expenses incurred (directly or indirectly) by the Seller as a result of such variation

- 2.5 Any representations (except fraudulent misrepresentations) or warranties made by or on behalf of the Seller prior to the Contract (whether verbally or in writing) are hereby expressly excluded and shall be of no effect

3 DESCRIPTION

- 3.1 Any figures, statements, descriptions, illustrations, photographs, drawings, weights or any other matters contained in the Seller's catalogues, pamphlets, price lists or advertising literature are not guaranteed to be accurate and are intended merely to represent a general picture of the Seller's products and shall not form part of the Contract nor be regarded as a warranty or representation relating to the Goods or Services
- 3.2 The Seller reserves the right to amend the specification of its products and services from time to time so that the descriptions thereof as set out in its catalogues, pamphlets, price lists or advertising literature may not be identical with those set out in the Seller's quotation and the Buyer is advised to check the specification set out in the Seller's quotation before placing an order

4 SPECIFICATIONS AND INTELLECTUAL PROPERTY

- 4.1 Where goods are supplied to the Buyer's own specification, or where standard goods of the Seller are altered in accordance with the Buyer's instructions the Buyer warrants and undertakes full responsibility for the suitability and fitness of the specification, pattern or design but also that such specification, pattern or design does not infringe any patent, trade mark, registered design, copyright or any other proprietary right of any third party and the Buyer shall indemnify and keep the Seller indemnified in full against any loss, damage or expense whatsoever (including costs) which the Seller may incur in or arising from the performance of the Contract by reason of any infringement of any such patent, trade mark, registered design, copyright or any other proprietary right
- 4.2 The Seller reserves the right to change the Buyer's specification as required to ensure that the Goods comply with any health, safety or other statutory requirement or provision and no such change by the Seller will constitute a breach of contract or impose upon the Seller any liability whatsoever
- 4.3 Unless otherwise agreed in writing, the Seller will be the sole owner of all inventions, formulations, tools, patterns, designs or other similar items and the copyright in all documents and drawings made or produced by it in preparing a quotation for the Buyer or in the course of work on any Contract with the Buyer

5 QUOTATIONS

- 5.1 The Seller's quotations are provisional in so far as they are subject to alteration by reference to any changes in the price of raw materials, any item to be acquired by the Seller from a third party, rates of wages, other costs of production and any other circumstances beyond the Seller's control taking place between the date of the quotation and the Buyer's placing of an order in respect thereof

6 PRICE

- 6.1 The Seller shall be entitled to adjust the Contract price of the Goods or Services whether before or after the making of the Contract in the event of any variation in the cost to the Seller of supplying the same or any part thereof caused by:-
- 6.1.1 any increase in the cost of materials required by the Seller for the completion of the Contract; or
- 6.1.2 any increase in wages or production and manufacturing costs or other overheads; or
- 6.1.3 any other reason whatsoever beyond the control of the Seller including (but without prejudice to the generality of the foregoing) fluctuations in exchange rates between monetary currencies the action of any government or any other authority or any labour problems
- 6.2 In the Seller's absolute discretion, a Prepayment in respect of the Contract may be required to be paid by the Buyer to the Seller on the terms set out in this Condition. The Prepayment shall be applied as follows:-
- 6.2.1 in the event that the Contract is performed in full by both parties the Prepayment shall be retained by the Seller in reduction of the total price payable by the Buyer under the Contract;
- 6.2.2 in the event that the Buyer is either in default of any of its obligations under the Contract or cancels or suspends the Contract in accordance with Condition 10 the Prepayment shall be set off by the Seller against its proper costs losses or damages arising in connection with the default and/or cancellation or suspension
- 6.3 Unless otherwise stated, the price set out in the Seller's quotation includes the cost of packaging, carriage, and (save as provided in Condition 6.4) insurance. In respect of supplies of Goods in the United States of America, Canada and Japan the price also includes import duties and sales taxes (if any). In respect of supplies of Goods in other countries the price does not include import duties or VAT or sales taxes which will be extra charges based on prevailing rates
- 6.4 Where the Buyer requests a particular means of delivery, the price set out in the Seller's quotation does not include insurance, which is to be arranged at the responsibility of the Buyer.

7 DELIVERY

- 7.1 Delivery of Goods shall be deemed to be effected by the Seller at the following times:-
- 7.1.1 where Goods are collected by or on behalf of the Buyer by its servants or agents, or where Goods are collected in

Conditions of Sale

- accordance with a means of delivery specifically requested by the Buyer, when the same are collected;
- 7.1.2 where delivery of the Goods is to be the responsibility of the Seller, when they arrive prior to unloading at the Buyer's premises;
- 7.1.3 where Goods are sold FOB or CIF, when they pass the ship's rail or are loaded onto the aircraft
- 7.2 Delivery of Services shall be deemed to be effected by the Seller at the time of completion by the Seller of the Services
- 7.3 Whilst the Seller will make every reasonable effort to complete the Contract by the date or dates therein specified for delivery of Goods or provision of Services such date or dates shall only constitute the times by which the Seller expects to effect such delivery and if no time is agreed delivery will be within a reasonable time but the performance of the Contract by the Seller shall not be the essence of the Contract, the Seller's failure to so deliver by the due date or dates shall not constitute a breach of Contract and the Seller shall not in any circumstances be responsible for any direct or consequential loss or damage of any kind whatsoever resulting therefrom. The Seller may wholly or partly suspend deliveries of Goods or provision of Services and the Buyer shall accept late delivery of such Goods or Services unless the Buyer has cancelled the Contract in accordance with the provisions of Condition 10.3

8 QUANTITIES INSTALMENTS AND STORAGE

- 8.1 Where Goods are delivered or Services are by instalment each instalment shall be deemed to be sold under a separate Contract and the party in default in respect of any instalment shall be liable accordingly, but no default in respect of any one instalment shall effect due performance of the Contract as regards other instalments
- 8.2 The Seller will endeavour to deliver the quantity of Goods ordered and every delivery shall be deemed to comply with the order. If there is a surplus or shortage of Goods which is no more than 10% of the quantity specified in the order the Buyer shall be deemed to have accepted the Goods and shall pay for the actual quantity delivered
- 8.3 If Goods or Services are to be delivered by instalments, the Seller shall be entitled to invoice each instalment as and when delivery is made and payment for all delivered instalments shall be due notwithstanding the non-delivery of other instalments or other default by the Seller. Failure by the Buyer to make payment by the due date for any one instalment for whatever reason shall entitle the Seller to suspend deliveries of Goods or provision of Services under the Contract but without prejudice to any other right the Seller may have under any of the other provisions of these Conditions
- 8.4 Notwithstanding that risk shall have passed to the Buyer pursuant to Condition 15 the Seller may in its absolute discretion arrange for storage of the Goods either at the request of the Buyer or as a result of the failure by the Buyer to take delivery of the Goods under Condition 7. The Seller may insure the goods whilst in storage and the Buyer shall indemnify and keep indemnified the Seller in full against all costs, losses, damages and expenses whatsoever arising in connection with the storage provided for hereunder and such costs, losses, damages and expenses will be added to and form part of the price of the Goods
- 8.5 Unless otherwise agreed between the Buyer and the Seller, the Seller shall be entitled in its absolute discretion and without giving prior notice to the Buyer at the expiration of 3 months to sell or otherwise dispose of Goods kept in storage as provided in Condition 8.4

9 TERMS OF PAYMENT

- 9.1 Unless otherwise agreed the price shall be due and payable at the Seller's offices 30 days after the date of the Seller's invoice
- 9.2 If the Buyer does not pay the whole or any part of the price on the required day then the Buyer shall pay to the Seller on request interest on the amount outstanding from the required day until the actual date of payment at the rate of 2% p.a. over the base rate of Barclays Bank plc from time to time in force which shall accrue on a daily basis
- 9.3 Condition 12 shall apply in the event of any alleged defect or failure in or of the Goods or Services and the Buyer shall not delay or refuse to make payment in any such event
- 9.4 The Buyer shall not be entitled to withhold payment of any amount due to the Seller by reason of any disputed claim by the Buyer in connection with the Contract nor shall the Buyer be entitled to set off against any amount payable under the Contract to the Seller any amount which is not then due and payable by the Seller or for which the Seller disputes liability
- 9.5 All payments payable to the Seller under the Contract shall become due immediately upon termination of the Contract despite any other provision.

10 SUSPENSION AND CANCELLATION

- 10.1 If the Buyer shall commit any breach of the Contract and fail to remedy the same within 7 days of receiving the Seller's request in writing so to do or any distress or execution is levied upon any goods or property of the Buyer or the Buyer makes any voluntary arrangement with its creditors or becomes subject to an administration order or (being an individual or firm) becomes bankrupt or (being an incorporated company) passes a resolution for winding up (otherwise than for the purpose of amalgamation or reconstruction), or a Court makes an order to that effect, or an encumbrancer takes possession, or an administrative receiver or receiver is appointed, of any of the property or assets of the Buyer, or the Buyer ceases, or threatens to cease, to carry on business or is unable to pay its debts within the meaning of section 123 Insolvency Act, 1986, or the Seller reasonably apprehends that any of the events mentioned above is about to occur in relation to the Buyer and notifies the Buyer accordingly, the Seller may:-
- 10.1.1 stop any Goods in transit and suspend any further deliveries;

and/or

- 10.1.2 suspend work on the Contract; and/or
- 10.1.3 determine the Contract forthwith and if the Goods or Services, or any part of them have been delivered but not paid for, the price shall become immediately due and payable notwithstanding any previous agreement to the contrary but without prejudice to the Seller's right to any unpaid price for Goods or Services delivered under the Contract and to damages for loss (both direct and consequential) suffered in consequence of such determination
- 10.2 If the Buyer requires cancellation of the Contract this will only be accepted at the sole discretion of the Seller and unless otherwise agreed in writing only upon condition that any costs, charges or expenses (both direct and consequential) incurred by the Seller up to the date of cancellation and the value of all loss or damage (both direct and consequential) incurred by the Seller by reason of such cancellation will be reimbursed by the Buyer to the Seller forthwith. Acceptance by the Seller of any cancellation by the Buyer will only be binding upon the Seller if it is made in writing
- 10.3 In the event of the Seller other than in any of the circumstances set out in Condition 10.1 being prevented or hindered from completing the Contract either wholly or in part in accordance with the terms thereof for any reason whatsoever beyond its reasonable control which, for the avoidance of doubt and without prejudice to the generality of the foregoing, shall include governmental action, war, riot, civil commotion, fire, flood, epidemic, labour disputes (including labour disputes involving the work force or any part thereof of the Seller or Supplier), restraints or delays affecting shipping or carriers, licensing, exporting or importing restrictions, currency restrictions and Acts of God then further performance of the Contract shall be suspended for the period during which the Seller is so prevented provided that in the event of the Contract being suspended for a continuous period of more than 3 months then either party may give the other notice in writing to terminate the Contract forthwith and in such circumstances the Buyer shall pay for all Goods or Services supplied to the date of such termination such payment to be made on or before the last day following the month during which termination was effected. The Seller shall be under no liability whatsoever to the Buyer for any direct or consequential loss or damage suffered by the Buyer as a result of the Seller's inability to perform its obligations under the Contract in these circumstances
- 10.4 The Seller's rights contained in Condition 17 (but not the Buyer's rights) shall continue beyond the discharge of the parties' primary obligations under the Contract consequent upon its termination
- 10.5 The termination of the Contract for whatever reason will be without prejudice to the rights and duties of either party accrued prior to termination

11 INSPECTION AND CLAIMS FOR DEFECTS

- 11.1 The Goods are of a highly specialised nature and must be treated with the utmost care. It is essential that the Buyer checks that they correspond in all respects with the Buyer's requirements. Any discrepancies should be notified to the Seller immediately. The Buyer undertakes to ensure that all Goods are unpacked and handled only by persons qualified to deal with such specialised products, to safeguard against injury to the Goods or to the Buyer's personnel
- 11.2 The Buyer shall inspect the Goods and carry out tests to ensure the Goods conform with the description of the Goods or Services in the Buyer's orders within 7 days of Delivery and whether or not the Buyer carries out such obligation to inspect and test no claims for non-delivery, shortages in quantity of units delivered, defective Goods or Services, non-conformity to description or partial loss or damage to Goods will be accepted by the Seller unless:-
- 11.2.1 they are notified in writing by the Buyer to the Seller within 10 days after the Date of Delivery (in the case of partial loss, damage, non-conforming or defective Goods or Services) or 14 days after the date of the invoice (in the case of non-delivery);
- 11.2.2 the Goods in respect of which a claim is made together with all the relevant packing are preserved intact as received for a period of 35 days from notification of any such claim and the Buyer permits the Seller or its servants or agents full and free right of access to inspect the Goods and investigate the claim; and
- 11.2.3 if the Buyer fails to give the appropriate notice as specified in Condition 11.2.1, the Buyer's claim will be deemed to have been waived and will be absolutely barred
- 11.3 It is in all cases the responsibility of the Buyer to ensure by testing or otherwise that the Goods are fit and suitable for the purposes for which the Buyer requires them in the conditions in which they will be used. The Buyer acknowledges that the Seller shall be under no liability of any description to the Buyer if the Goods prove to be unsuitable for whatever reason for application or use notwithstanding that the Seller may, at the request of the Buyer, have given in good faith technical or other advice in relation to the proposed application or use of the Goods and the Buyer shall indemnify and keep indemnified the Seller in full against any and all liability of any kind arising out of or connected with the application or use of the Goods
- 11.4 Section 3 Sale and Supply of Goods Act 1994 shall not apply
- 11.5 The Seller will not accept the return of Goods in any circumstances unless it has first issued a Goods return number and such number is quoted with the returned Goods

12 WARRANTY

- 12.1 In substitution for all and any other rights which the Buyer might or would have had but for these Conditions and subject to Condition 11,

Conditions of Sale

the Seller shall make good by replacement any failure in the Goods or Services which results from defects in the Seller's materials or workmanship and which appear not later than 2 months after the Date of Delivery and shall replace any Goods or Services which do not conform with the description in the Buyer's order

- 12.2 Notwithstanding the provisions of Condition 12.1, in the case of a claim falling within Condition 12.1, the Seller reserves the right at its sole discretion to credit the Buyer in full the price paid by the Buyer to the Seller
- 12.3 The Seller's liability under this Condition shall automatically cease if:
- 12.3.1 the Buyer has not paid for all Goods or Services supplied under any Contract by the due date or is otherwise in breach of this or any other Contract made with the Seller; or
- 12.3.2 the Seller or its servants or agents are denied full and free right of access to the allegedly defective Goods; or
- 12.3.3 the Buyer has not properly maintained the Goods or has not complied with any Recommendations for Use; or
- 12.3.4 the defect or failure is caused by a breach by the Buyer of its undertakings and warranties contained in Condition 17; or
- 12.3.5 the Buyer has failed to notify the Seller in writing of any defect or suspected defect within 14 days of the same coming to the knowledge of the Buyer
- 12.4 The warranty set out in Condition 12.1 shall be in lieu of any warranties conditions or undertakings whether express or implied by statute, common law or otherwise howsoever which warranties, conditions and undertakings are hereby expressly excluded, except that such exclusions will not apply to any implied condition that the Seller has or will have the right to sell the Goods when the property is to pass
- 12.5 Nothing in these Conditions excludes or limits the liability of the Seller for death or personal injury caused by the Seller's negligence or fraudulent misrepresentation
- 12.6 SUBJECT TO CONDITIONS 12.4 AND 12.5
- 12.6.1 the seller's total liability in contract, tort (including negligence or breach of statutory duty), misrepresentation or otherwise, arising in connection with the performance or contemplated performance of the contract shall be limited to the price paid for the goods or services under the contract; and
- 12.6.2 the seller shall not be liable to the buyer for any indirect or consequential loss or damage (whether for loss of profit, loss of business, depletion of goodwill or otherwise), costs, expenses or other claims for consequential compensation whatsoever (however caused) which arise out of or in connection with the contract

13 CONSUMER SALES

- 13.1 Where the Goods are sold under a consumer sale (as defined by the Sale of Goods Act 1979) the statutory rights of the Buyer are not affected by these conditions

14 TITLE TO GOODS

- 14.1 Full legal and beneficial ownership of the Goods shall be retained by the Seller notwithstanding that the risk in the same shall pass to the Buyer at the time of delivery until the Seller has received payment in full in respect of
- 14.1.1 The Goods; and
- 14.1.2 All other sums which become due and owing by the Buyer to the Seller on any account whatsoever
- 14.2 Until ownership of the Goods has passed to the Buyer the Buyer shall hold the Goods in a fiduciary capacity and as bailee of the Seller and shall at all times take proper care of the same and will not obliterate or obscure any identifying mark or their packaging and will keep the Goods separate from any other goods and in such manner that they may be clearly identified as belonging to the Seller and the Buyer hereby grants to the Seller the right to enter on the Buyer's premises at any time during the continuation of the Contract to check that the Buyer is complying with the obligation contained in this Condition. The Buyer will return the Goods to the Seller if it receives a request whether verbally or in Writing so to do prior to payment in full as aforesaid having been made and the Seller will then repay any part of the purchase price it has already received in respect of the Goods less a reasonable amount in respect of its costs and expenses in connection with the Contract
- 14.3 For the purposes of Condition 14.1, the expression "the Buyer" includes any subsidiary or holding company or associate of the Buyer (as such terms are defined in the Companies Act 1985 (as amended))
- 14.4 The Seller will have the right to maintain an action against the Buyer for the price of the Goods notwithstanding that property in the Goods has not been passed

15 RISK AND INSURANCE

- 15.1 The risk in the Goods shall pass to the Buyer at the time of delivery as provided for in Condition 7
- 15.2 Notwithstanding the reservation of title contained in Condition 14, the Buyer shall insure the Goods and/or any products made wholly or partly therefrom for the full amount of the price payable under the Contract with an insurance office of repute from the time of delivery of the Goods until the date title in the Goods passes to the Buyer pursuant to Condition 14.1

16 EXPORT TERMS

- 16.1 In these Conditions "Incoterms" means the international rules for the interpretation of trade terms of the International Chamber of Commerce

as in force at the date when the Contract is made. Unless the context otherwise requires, any term or expression which is defined in or given a particular meaning by the provisions of Incoterms has the same meaning in the Contract

- 16.2 Where the Goods are supplied for export from the United Kingdom then unless otherwise agreed in writing between the Buyer and the Seller

- 16.2.1 the provisions of Incoterms shall (subject to any special terms agreed in writing between the Buyer and the Seller) apply but if there is any conflict between the provisions of Incoterms and these Conditions, the latter shall prevail.
- 16.2.2 the Buyer shall be responsible for complying with any legislation or regulations governing the importation of the Goods into the country of destination and (save in respect of the United States of America, Canada and Japan) for the payment of any duties and taxes thereon unless payment for these is included in the Contract
- 16.2.3 the Buyer shall be deemed to have satisfied itself that such Goods comply with the safety regulations of any country or state in which the Goods are to be used outside the United Kingdom and the Buyer shall indemnify and keep indemnified the Seller in full for any loss or damage whatsoever which the Seller may incur if such Goods do not comply with such safety regulations

- 16.3 The Goods shall not be used in any country other than that for which the Seller was aware they were originally ordered without the Seller's consent in writing

- 16.4 The Buyer undertakes not to offer the Goods for resale in any country notified by the Seller at or before the time the Buyer's order is placed, or to sell the Goods to any person if the Buyer knows or has reason to believe that person intends to resell the Goods in any such country

17 BUYER'S WARRANTIES

- 17.1 The Buyer warrants to the Seller that:
- 17.1.1 the Buyer will install, operate or otherwise use or store the Goods strictly in accordance with the Recommendations for Use and with all relevant or applicable statutory or other regulations governing the installation, operation, use or storage of the Goods; and
- 17.1.2 any collection vehicle, container, ship or other means of transport provided by the Buyer or any agent of the Buyer will comply with all relevant legislation and regulations relating to health and safety requirements; and
- 17.1.3 the storage and transport facilities and all parts thereof and all equipment used in connection therewith is suitable for storage (both short term and long term) and transport of the Goods and complies with any statute, regulation, bye law or other rule having the force of law and relating to the storage of goods of the nature of the Goods; and
- 17.1.4 the Buyer will ensure that the Goods are stored in conditions appropriate to goods of that nature and will comply with any recommendations as to the storage of Goods notified to it by the Seller from time to time; and
- 17.2 The Buyer shall indemnify and keep indemnified the Seller in full against any claim, loss or damage (including, without limitation, damage to the reputation of the Seller) arising directly or indirectly from any breach of the warranty contained in Condition 17.1

18 SEVERANCE

- 18.1 If at any time any one or more of the provisions or part thereof of these Conditions becomes or is invalid, illegal or unenforceable in any respect under any law or is held by a court to be invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions hereof and the remainder of such provision shall not in any way be affected or impaired thereby

19 JURISDICTION

- 19.1 These Conditions and each and every Contract made pursuant to them shall be governed by and construed in all respects in accordance with the laws of England and the Seller and the Buyer hereby agree to submit to the non-exclusive jurisdiction of the English Courts

20 NOTICES

- 20.1 Any notice required or permitted to be given by either party to the other under these Conditions shall be in writing addressed to that other party at its registered office or principal place of business or such other address as may at the relevant time have been notified pursuant to this provision to the party giving notice
- 20.2 Any notice given pursuant to clause 20.1 shall be deemed to have been served:
- 20.2.1 if delivered by hand, on the first Business Day following delivery;
- 20.2.2 if sent by post, on the third Business Day after posting if the address of the recipient is in the country of despatch, otherwise on the seventh Business Day after posting;
- 20.2.3 if sent by facsimile transmission, on the first Business Day following successful transmission
- 20.3 In proving service it shall be sufficient proof in the case of a notice sent by post, that the envelope containing the same was properly stamped, addressed and placed in the post and, in the case of facsimile transmission, that it was properly addressed and successfully transmitted
- 20.4 In this Condition 20, "Business Day" shall mean any day other than Saturday, Sunday or any other day which is a public holiday in the place at which the notice is left or to which such notice is despatched

21 WAIVER

Conditions of Sale

21.1 No waiver by the Seller of any breach of any provision of the Contract by the Buyer shall be considered as a waiver of any subsequent breach

of the same or any other provision and the Seller shall not be prejudiced by any forbearance or indulgence granted by it to the Buyer

Niobium

Nb

Discovered in 1801 by C. Hatchett in London, England.

Niobium is a silver coloured metal which is generally found in conjunction with tantalum, the two elements being separated by fractional crystallisation of their respective fluoro-complexes. It has an abundance of 20 ppm in the earth's crust. As a pure metal, is very reactive and forms an extremely stable oxide when exposed to air which enhances its corrosion resistance. Niobium will react with a variety of non-metals at elevated temperatures.

Niobium and its alloys have high melting points and are, therefore, used in high temperature engineering products (for use at temperatures in excess of 1200C). It is also used as an alloying agent for certain steels where it greatly improves the strength of the resulting material. Niobium also finds applications in atomic reactors due to its corrosion resistance and, when combined with either tin (Nb₃Sn) or zirconium, it has a high degree of superconductivity.

Atomic Properties

Atomic number	41
Atomic radius - Goldschmidt	0.147 nm
Atomic weight	92.9064 amu
Crystal structure	Body centred cubic
Electronic structure	Kr 4d ⁴ 5s ¹
Photo-electric work function	4.3 eV
Thermal neutron absorption cross-section	1.15 Barns
Valences shown	2, 3, 4, 5

Electrical Properties

Electrical resistivity @20C	16 µOhmcm
Temperature coefficient @0-100C	0.0026 K ⁻¹
Superconductivity critical temperature	9.25 K

Thermal Properties

Coefficient of thermal expansion @0-100C	7.2 x10 ⁻⁶ K ⁻¹
Latent heat of evaporation	7360 J g ⁻¹
Latent heat of fusion	290 J g ⁻¹
Specific heat @25C	268 J K ⁻¹ kg ⁻¹
Thermal conductivity @0-100C	53.7 W m ⁻¹ K ⁻¹

Natural isotope distribution

Mass No.	%
93	100

Ionisation potential

No.	eV
1	6.88
2	14.3
3	25.0
4	38.3
5	50.5
6	103

Mechanical Properties

Material condition	Soft	Hard	Polycrystalline
Bulk modulus			170.3 GPa
Hardness - Vickers	115	160	
Izod toughness	10-120 J m ⁻¹		
Poisson's ratio			0.397
Tensile modulus			104.9 GPa
Tensile strength	330	585	MPa
Yield strength	240	550	MPa

Physical Properties

Boiling point	4742 C
Density @20C	8.57 g cm ⁻³
Melting point	2468 C



Microfoil

CONTRACT COATING of customers' own components or assemblies is available to special order.

NB004200	Thickness.....	0.025µm	Area density.....	21µg.cm⁻²
	Purity.....	99.9%	Support.....	Permanent Mylar 3.5µm

Web Code	Disc diam.	Quantity	1 disc	2discs	5discs	10discs
030-371-154	10 mm	USD 497.00	USD 691.00	USD 1274.00	USD 2052.00	
549-773-386	25 mm	USD 756.00	USD 1080.00	USD 2052.00	USD 3348.00	

Typical Analysis : Starting Material : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10.
 This item is normally made to order for delivery within 4-5 weeks.



Foil

NB000100	Thickness.....	0.001mm	Purity.....	99.9%
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Sizes LT	Quantity	1pc	2pcs	5pcs
Web Code	Size	1pc	2pcs	5pcs
318-578-354	25 x 25 mm	USD 1108.00	USD 1547.00	USD 2325.00
724-058-956	50 x 50 mm	USD 1936.00	USD 3105.00	

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

NB000110	Thickness.....	0.002mm	Purity.....	99.9%
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Sizes LT	Quantity	1pc	2pcs	5pcs
Web Code	Size	1pc	2pcs	5pcs
741-200-591	25 x 25 mm	USD 955.00	USD 1332.00	USD 1985.00
006-907-808	50 x 50 mm	USD 1632.00	USD 2289.00	

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

NB000120	Thickness.....	0.0025mm	Purity.....	99.9%
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NLT Sizes	Quantity	1pc	2pcs	5pcs
Web Code	Size	1pc	2pcs	5pcs
485-300-449	25 x 25 mm	USD 559.00	USD 736.00	USD 1100.00
969-992-824	50 x 50 mm	USD 956.00	USD 1298.00	
396-237-556	100 x 100 mm	USD 2181.00		

Sizes LT	Quantity	1pc	2pcs	5pcs
Web Code	Size	1pc	2pcs	5pcs
729-350-177	25 x 25 mm	USD 698.00	USD 920.00	USD 1375.00

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

Niobium

Nb



Foil

NB000130 Thickness 0.003mm

Purity..... 99.9%

NLT Sizes

Web Code

931-102-066
 848-400-938
 405-629-176
 064-548-309

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	USD 545.00	USD 717.00	USD 1070.00	USD 1492.00	USD 2795.00
50 x 50 mm	USD 929.00	USD 1260.00	USD 2732.00		
100 x 100 mm	USD 2178.00	USD 4207.00			
150 x 150 mm	USD 4699.00				

Sizes LT

Web Code
 121-525-399

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	USD 600.00	USD 788.00	USD 1177.00	USD 1642.00	USD 3074.00

Discs

Web Code
 442-977-475
 372-186-855
 523-356-821
 419-606-514
 450-814-576
 351-818-847

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 566.00	USD 702.00	USD 1020.00
6 mm	USD 675.00	USD 857.00	USD 1269.00
8 mm	USD 785.00	USD 1014.00	USD 1522.00
10 mm	USD 895.00	USD 1172.00	USD 1779.00
15 mm	USD 1166.00	USD 1557.00	USD 3098.00
25 mm	USD 1762.00		

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

NB000140 Thickness 0.004mm

Purity..... 99.9%

NLT Sizes

Web Code
 604-940-476
 129-209-921
 963-789-689
 753-925-670

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	USD 510.00	USD 667.00	USD 991.00	USD 1431.00	USD 2672.00
50 x 50 mm	USD 859.00	USD 1160.00	USD 2610.00		
100 x 100 mm	USD 2080.00	USD 4011.00			
150 x 150 mm	USD 4479.00				

Sizes LT

Web Code
 442-841-470

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	USD 561.00	USD 733.00	USD 1090.00	USD 1574.00	USD 2940.00

Discs

Web Code
 343-429-272
 928-660-786
 082-594-869
 324-357-716
 544-713-601
 089-208-851

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 547.00	USD 674.00	USD 976.00
6 mm	USD 646.00	USD 815.00	USD 1203.00
8 mm	USD 745.00	USD 958.00	USD 1433.00
10 mm	USD 846.00	USD 1102.00	USD 1667.00
15 mm	USD 1092.00	USD 1452.00	USD 2973.00
25 mm	USD 1694.00		

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

NB000210 Thickness 0.005mm

Purity..... 99.9%

Size

Web Code
 315-713-889
 464-230-654
 028-825-165

Size	Quantity			
	1pc	2pcs	5pcs	10pcs
25 x 25 mm	USD 399.00	USD 469.00	USD 613.00	USD 783.00
50 x 50 mm	USD 555.00	USD 690.00	USD 962.00	
100 x 100 mm	USD 868.00	USD 1133.00		

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

NB000150 Thickness 0.006mm

Purity..... 99.9%

NLT Sizes

Web Code
 248-715-299
 566-912-103
 115-897-123

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
50 x 50 mm	USD 775.00	USD 1041.00	USD 2377.00		
100 x 100 mm	USD 1893.00	USD 3638.00			
150 x 150 mm	USD 4059.00				

Sizes LT

Web Code
 622-038-787
 135-591-261

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	USD 468.00	USD 608.00	USD 897.00	USD 1315.00	USD 2439.00
50 x 50 mm	USD 852.00	USD 1146.00	USD 2614.00		

Discs

Web Code
 706-470-595
 308-815-507
 601-945-277
 243-151-173
 393-894-842
 236-857-901

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 523.00	USD 641.00	USD 923.00
6 mm	USD 610.00	USD 765.00	USD 1123.00
8 mm	USD 698.00	USD 891.00	USD 1326.00
10 mm	USD 786.00	USD 1018.00	USD 1532.00
15 mm	USD 1003.00	USD 1326.00	USD 2736.00
25 mm	USD 1563.00		

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

Niobium

Nb



Foil

NB000160

Thickness **0.007mm**

Purity **99.9%**

NLT Sizes

Web Code
 167-690-981
 483-486-927

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
100 x 100 mm	USD 1858.00	USD 3567.00			
150 x 150 mm	USD 3979.00				

Sizes LT

Web Code
 821-248-503
 088-364-328
 007-901-071

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	USD 453.00	USD 586.00	USD 863.00	USD 1293.00	USD 2395.00
50 x 50 mm	USD 744.00	USD 1022.00	USD 2332.00		
100 x 100 mm	USD 2044.00	USD 3924.00			

Discs

Web Code
 933-659-614
 707-460-046
 432-510-050
 063-760-792
 970-093-751
 261-716-367

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 515.00	USD 629.00	USD 904.00
6 mm	USD 597.00	USD 747.00	USD 1094.00
8 mm	USD 681.00	USD 867.00	USD 1287.00
10 mm	USD 765.00	USD 987.00	USD 1510.00
15 mm	USD 971.00	USD 1280.00	USD 2691.00
25 mm	USD 1539.00		

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

NB000230

Thickness **0.0075mm**

Purity **99.9%**

NLT Sizes

Web Code
 710-454-230
 421-980-489

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
150 x 150 mm	USD 967.00	USD 1276.00	USD 2020.00		
200 x 300 mm	USD 1432.00	USD 2123.00			

Sizes LT

Web Code
 022-559-474
 481-169-765
 429-769-633

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	USD 355.00	USD 410.00	USD 526.00	USD 665.00	USD 876.00
50 x 50 mm	USD 477.00	USD 584.00	USD 800.00	USD 1052.00	USD 1423.00
100 x 100 mm	USD 722.00	USD 930.00	USD 1347.00		

Discs

Web Code
 146-046-679
 255-827-650
 978-454-306
 306-794-214
 349-281-180
 660-143-777
 517-971-664

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 532.00	USD 623.00	USD 829.00
6 mm	USD 569.00	USD 676.00	USD 913.00
8 mm	USD 606.00	USD 728.00	USD 996.00
10 mm	USD 643.00	USD 781.00	USD 1079.00
15 mm	USD 736.00	USD 912.00	USD 1287.00
25 mm	USD 922.00	USD 1175.00	USD 1703.00
50 mm	USD 1388.00	USD 1834.00	

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

NB000170

Thickness **0.008mm**

Purity **99.9%**

NLT Sizes

Web Code
 132-565-356
 669-366-517

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
100 x 100 mm	USD 1805.00	USD 3461.00			
150 x 150 mm	USD 3859.00				

Sizes LT

Web Code
 621-059-031
 035-767-421
 810-698-352

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	USD 436.00	USD 562.00	USD 826.00	USD 1259.00	USD 2328.00
50 x 50 mm	USD 711.00	USD 995.00	USD 2266.00		
100 x 100 mm	USD 1985.00	USD 3807.00			

Discs

Web Code
 965-389-448
 673-686-735
 210-847-794
 355-963-781
 495-472-909
 934-121-004

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 505.00	USD 616.00	USD 883.00
6 mm	USD 583.00	USD 727.00	USD 1063.00
8 mm	USD 662.00	USD 840.00	USD 1245.00
10 mm	USD 742.00	USD 954.00	USD 1479.00
15 mm	USD 936.00	USD 1232.00	USD 2623.00
25 mm	USD 1501.00		

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

Metal – Niobium

Niobium

Nb



Foil

NB000180

Thickness **0.009mm**

Purity..... **99.9%**

NLT Sizes

Web Code

215-112-914
475-793-271

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
100 x 100 mm	USD 1769.00	USD 3390.00			
150 x 150 mm	USD 3779.00				

Sizes LT

Web Code

594-845-614
803-880-181
943-664-245

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	USD 433.00	USD 558.00	USD 819.00	USD 1237.00	USD 2284.00
50 x 50 mm	USD 705.00	USD 978.00	USD 2221.00		
100 x 100 mm	USD 1946.00	USD 3729.00			

Discs

Web Code

852-062-694
507-825-077
478-134-419
766-806-920
850-873-456
359-186-021

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 504.00	USD 613.00	USD 879.00
6 mm	USD 581.00	USD 724.00	USD 1057.00
8 mm	USD 659.00	USD 835.00	USD 1237.00
10 mm	USD 737.00	USD 948.00	USD 1459.00
15 mm	USD 929.00	USD 1221.00	USD 2578.00
25 mm	USD 1476.00		

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

NB000250

Thickness **0.01mm**

Purity..... **99.9%**

Size

Web Code

746-461-533
307-692-636
461-576-213
697-035-993
129-493-191

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	USD 329.00	USD 378.00	USD 479.00	USD 599.00	USD 781.00
50 x 50 mm	USD 437.00	USD 531.00	USD 720.00	USD 941.00	USD 1264.00
100 x 100 mm	USD 653.00	USD 836.00	USD 1203.00	USD 1624.00	
150 x 150 mm	USD 869.00	USD 1142.00	USD 1687.00		
214 x 300 mm	USD 1316.00	USD 1863.00			

Discs

Web Code

829-999-409
749-933-386
741-673-975
709-247-107
655-893-398
986-670-840
333-856-643

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 488.00	USD 564.00	USD 726.00
6 mm	USD 521.00	USD 610.00	USD 799.00
8 mm	USD 554.00	USD 657.00	USD 873.00
10 mm	USD 587.00	USD 703.00	USD 946.00
15 mm	USD 669.00	USD 819.00	USD 1130.00
25 mm	USD 833.00	USD 1051.00	USD 1498.00
50 mm	USD 1244.00	USD 1633.00	

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

NB000270

Thickness **0.0125mm**

Purity..... **99.9%**

Size

Web Code

732-082-794
510-344-522
793-070-406
133-807-575

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	USD 283.00	USD 320.00	USD 398.00	USD 491.00	USD 634.00
50 x 50 mm	USD 365.00	USD 436.00	USD 581.00	USD 750.00	USD 1000.00
100 x 100 mm	USD 528.00	USD 667.00	USD 947.00	USD 1268.00	
150 x 150 mm	USD 692.00	USD 899.00	USD 1313.00		

Discs

Web Code

052-565-927
570-740-705
342-593-842
824-233-467
029-179-206
647-401-467
925-186-780

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 423.00	USD 486.00	USD 635.00
6 mm	USD 448.00	USD 521.00	USD 691.00
8 mm	USD 473.00	USD 556.00	USD 747.00
10 mm	USD 498.00	USD 592.00	USD 802.00
15 mm	USD 560.00	USD 680.00	USD 942.00
25 mm	USD 684.00	USD 856.00	USD 1220.00
50 mm	USD 996.00	USD 1297.00	

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

Metal – Niobium

Niobium

Nb



Foil

NB000190

Thickness **0.02mm**

Purity **99.9%**

NLT Sizes

Web Code

280-345-022
833-828-244

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
100 x 100 mm	USD 1103.00	USD 2057.00			
150 x 150 mm	USD 2280.00				

Sizes LT

Web Code

790-920-299
204-252-273
288-380-212
553-674-331

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	USD 279.00	USD 340.00	USD 505.00	USD 821.00	USD 1451.00
50 x 50 mm	USD 397.00	USD 645.00	USD 1389.00		
100 x 100 mm	USD 1213.00	USD 2263.00			
150 x 150 mm	USD 2508.00				

Discs

Web Code

478-944-170
868-015-644
501-957-857
744-729-145
091-148-923
393-620-259

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 417.00	USD 491.00	USD 685.00
6 mm	USD 451.00	USD 539.00	USD 763.00
8 mm	USD 485.00	USD 588.00	USD 881.00
10 mm	USD 519.00	USD 638.00	USD 1076.00
15 mm	USD 603.00	USD 876.00	USD 1732.00
25 mm	USD 1010.00		

Typical Analysis : Fe 200, Ta 2000, Ti 30, C 50, H 5, N 50, O 100.

NB000301

Thickness **0.025mm**

Purity **99.9%**

Temper **As rolled**

Size

Web Code

186-804-743
976-777-034
097-134-937

Size	Quantity			
	1pc	2pcs	5pcs	10pcs
25 x 25 mm	USD 221.00	USD 252.00	USD 315.00	USD 390.00
50 x 50 mm	USD 287.00	USD 345.00	USD 462.00	USD 598.00
100 x 100 mm	USD 419.00	USD 531.00	USD 756.00	USD 1107.00

Discs

Web Code

442-822-683
352-830-236
103-781-002
972-636-474
579-558-096
444-758-135
594-765-409

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 333.00	USD 380.00	USD 479.00
6 mm	USD 351.00	USD 406.00	USD 520.00
8 mm	USD 369.00	USD 432.00	USD 562.00
10 mm	USD 388.00	USD 458.00	USD 603.00
15 mm	USD 434.00	USD 523.00	USD 706.00
25 mm	USD 525.00	USD 653.00	USD 912.00
50 mm	USD 756.00	USD 981.00	

Typical Analysis : Fe 200, Ta 2000, Ti 30, C 50, H 5, N 50, O 100.

NB000300

Thickness **0.025mm**

Purity **99.9%**

Temper **Annealed**

NLT Sizes

Web Code

536-219-511
226-195-611

Size	Quantity		
	1pc	2pcs	5pcs
25 x 25 mm	USD 221.00	USD 252.00	USD 315.00
50 x 50 mm	USD 287.00	USD 345.00	USD 462.00

Sizes LT

Web Code

127-320-160
981-870-814

Size	Quantity		
	1pc	2pcs	5pcs
25 x 25 mm	USD 244.00	USD 277.00	USD 346.00
50 x 50 mm	USD 345.00	USD 414.00	USD 554.00

Typical Analysis : Fe 200, Ta 2000, Ti 30, C 50, H 5, N 50, O 100.

NB000316

Thickness **0.05mm**

Purity **99.9%**

Temper **As rolled**

Size

Web Code

396-703-315
691-044-715
668-463-709
460-243-541

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	USD 208.00	USD 233.00	USD 285.00	USD 348.00	USD 446.00
50 x 50 mm	USD 261.00	USD 307.00	USD 402.00	USD 514.00	USD 681.00
100 x 100 mm	USD 366.00	USD 456.00	USD 637.00	USD 846.00	
150 x 150 mm	USD 471.00	USD 604.00	USD 872.00		

Coil

Web Code

246-677-575
165-381-376
762-311-992

Length	Quantity
	1 Reel
0.2 m	USD 558.00
0.5 m	USD 770.00
1 m	USD 1078.00

Discs

Web Code

123-769-424
814-993-715
347-283-412
918-525-779
141-008-607
004-904-075
862-768-306

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 325.00	USD 369.00	USD 462.00
6 mm	USD 340.00	USD 390.00	USD 495.00
8 mm	USD 354.00	USD 411.00	USD 528.00
10 mm	USD 369.00	USD 432.00	USD 561.00
15 mm	USD 406.00	USD 483.00	USD 643.00
25 mm	USD 479.00	USD 587.00	USD 807.00
50 mm	USD 663.00	USD 848.00	

Typical Analysis : Fe 200, Ta 2000, Ti 30, C 50, H 5, N 50, O 100.

Metal – Niobium

Niobium

Nb



Foil

NB000315

Thickness **0.05mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code
 022-275-977
 784-490-244

Size	Quantity			
	1pc	2pcs	5pcs	10pcs
25 x 25 mm	USD 208.00	USD 233.00	USD 285.00	USD 348.00
50 x 50 mm	USD 261.00	USD 307.00	USD 402.00	

Discs

Web Code
 824-038-500
 004-815-866
 601-977-005
 247-129-724
 891-221-033
 402-632-419

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 325.00	USD 369.00	USD 462.00
6 mm	USD 340.00	USD 390.00	USD 495.00
8 mm	USD 354.00	USD 411.00	USD 528.00
10 mm	USD 369.00	USD 432.00	USD 561.00
15 mm	USD 406.00	USD 483.00	
25 mm	USD 479.00		

Typical Analysis : Fe 200, Ta 2000, Ti 30, C 50, H 5, N 50, O 100.

NB000330

Thickness **0.1mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code
 449-380-860
 172-602-643
 575-329-125
 916-139-437

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	USD 208.00	USD 236.00	USD 294.00	USD 364.00	USD 473.00
50 x 50 mm	USD 268.00	USD 321.00	USD 429.00	USD 555.00	
100 x 100 mm	USD 389.00	USD 491.00	USD 698.00		
150 x 150 mm	USD 509.00	USD 662.00			

Coil

Web Code
 517-436-629
 679-585-114
 948-142-199

Length	Quantity
	1 Reel
0.2 m	USD 604.00
0.5 m	USD 847.00
1 m	USD 1256.00

Discs

Web Code
 721-517-037
 189-625-010
 703-125-201
 890-659-297
 332-403-279
 550-407-893
 800-977-671

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 320.00	USD 366.00	USD 463.00
6 mm	USD 337.00	USD 390.00	USD 501.00
8 mm	USD 354.00	USD 414.00	USD 539.00
10 mm	USD 371.00	USD 438.00	USD 577.00
15 mm	USD 413.00	USD 497.00	USD 671.00
25 mm	USD 497.00	USD 617.00	USD 860.00
50 mm	USD 709.00	USD 917.00	

Typical Analysis : Fe 200, Ta 2000, Ti 30, C 50, H 5, N 50, O 100.

NB000344

Thickness **0.125mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code
 122-201-429
 275-178-551
 397-314-852
 664-357-340
 044-668-082

Size	Quantity			
	1pc	2pcs	5pcs	10pcs
25 x 25 mm	USD 202.00	USD 228.00	USD 282.00	USD 348.00
50 x 50 mm	USD 257.00	USD 306.00	USD 405.00	USD 522.00
100 x 100 mm	USD 367.00	USD 462.00	USD 651.00	USD 870.00
150 x 150 mm	USD 478.00	USD 617.00	USD 898.00	
300 x 300 mm	USD 808.00	USD 1219.00		

Coil

Web Code
 583-509-112
 938-642-138

Length	Quantity
	1 Reel
0.2 m	USD 730.00
0.5 m	USD 1092.00

Discs

Web Code
 283-617-411
 452-182-802
 522-854-398
 356-798-191
 599-766-139
 970-772-800
 346-608-298

Diameter	Quantity			
	10 discs	20 discs	50 discs	100 discs
4 mm	USD 317.00	USD 362.00	USD 456.00	USD 600.00
6 mm	USD 333.00	USD 384.00	USD 491.00	USD 649.00
8 mm	USD 348.00	USD 406.00	USD 525.00	USD 698.00
10 mm	USD 363.00	USD 428.00	USD 560.00	USD 747.00
15 mm	USD 402.00	USD 482.00	USD 646.00	USD 869.00
25 mm	USD 479.00	USD 591.00	USD 818.00	USD 1113.00
50 mm	USD 672.00	USD 864.00		

Typical Analysis : Fe 200, Ta 2000, Ti 30, C 50, H 5, N 50, O 100.

Metal – Niobium

Niobium

Nb



Foil

NB000350

Thickness **0.15mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code

607-316-037
 217-295-515
 834-929-729
 268-501-919

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	USD 208.00	USD 236.00	USD 294.00	USD 364.00	USD 472.00
50 x 50 mm	USD 268.00	USD 321.00	USD 429.00	USD 555.00	USD 742.00
100 x 100 mm	USD 389.00	USD 491.00	USD 698.00	USD 936.00	
150 x 150 mm	USD 509.00	USD 662.00	USD 968.00		

Coil

Web Code
 797-067-954
 854-234-172

Width 152mm

Length	1 Reel
	0.2 m USD 607.00
0.5 m USD 852.00	

Discs

Web Code
 846-471-445
 922-754-652
 282-703-574
 968-931-289
 220-420-441
 416-567-327
 135-968-915

Diameter	Quantity			
	10 discs	20 discs	50 discs	100 discs
4 mm	USD 320.00	USD 366.00	USD 463.00	USD 609.00
6 mm	USD 337.00	USD 390.00	USD 501.00	USD 663.00
8 mm	USD 354.00	USD 414.00	USD 539.00	USD 717.00
10 mm	USD 371.00	USD 438.00	USD 577.00	USD 770.00
15 mm	USD 413.00	USD 497.00	USD 671.00	USD 904.00
25 mm	USD 497.00	USD 617.00	USD 860.00	
50 mm	USD 709.00	USD 917.00		

Typical Analysis : Fe 200, Ta 2000, Ti 30, C 50, H 5, N 50, O 100.

NB000360

Thickness **0.25mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code

326-029-915
 753-747-140
 218-391-826
 298-983-654
 372-957-146

Size	Quantity			
	1pc	2pcs	5pcs	10pcs
25 x 25 mm	USD 182.00	USD 206.00	USD 256.00	USD 318.00
50 x 50 mm	USD 232.00	USD 278.00	USD 370.00	USD 479.00
100 x 100 mm	USD 334.00	USD 422.00	USD 598.00	USD 801.00
150 x 150 mm	USD 436.00	USD 566.00	USD 826.00	
300 x 300 mm	USD 742.00	USD 1166.00		

Coil

Web Code
 619-648-150
 456-018-041

Width 300mm

Length	1 Reel
	0.2 m USD 669.00
0.5 m USD 1030.00	

Discs

Web Code
 002-254-471
 281-810-777
 226-340-854
 292-607-843
 575-983-526
 997-946-828
 743-357-326

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 297.00	USD 341.00	USD 433.00
6 mm	USD 311.00	USD 361.00	USD 465.00
8 mm	USD 325.00	USD 381.00	USD 497.00
10 mm	USD 339.00	USD 401.00	USD 529.00
15 mm	USD 375.00	USD 452.00	USD 609.00
25 mm	USD 446.00	USD 552.00	USD 769.00
50 mm	USD 625.00	USD 807.00	

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

NB000361

Thickness **0.25mm**
 Temper **Annealed**

Purity **99.9%**
 Condition **Flattened**

Size

Web Code

798-720-471
 106-803-534
 989-347-449
 058-964-351
 966-459-980

Size	Quantity			
	1pc	2pcs	5pcs	10pcs
25 x 25 mm	USD 184.00	USD 209.00	USD 262.00	USD 326.00
50 x 50 mm	USD 237.00	USD 285.00	USD 381.00	USD 495.00
100 x 100 mm	USD 344.00	USD 436.00	USD 620.00	USD 833.00
150 x 150 mm	USD 451.00	USD 587.00	USD 859.00	
300 x 300 mm	USD 772.00	USD 1269.00		

Discs

Web Code
 952-792-150
 174-324-120
 978-579-728
 164-426-693
 797-756-230
 565-390-196
 208-832-926

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 298.00	USD 343.00	USD 436.00
6 mm	USD 313.00	USD 364.00	USD 470.00
8 mm	USD 328.00	USD 385.00	USD 503.00
10 mm	USD 343.00	USD 406.00	USD 537.00
15 mm	USD 380.00	USD 459.00	USD 621.00
25 mm	USD 455.00	USD 565.00	USD 789.00
50 mm	USD 643.00	USD 832.00	

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

Metal – Niobium

Niobium

Nb



Foil

NB000365

Thickness **0.30mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code

919-666-418
 958-302-308
 787-797-947
 269-506-197
 767-891-209

Size	Quantity			
	1pc	2pcs	5pcs	10pcs
25 x 25 mm	USD 185.00	USD 211.00	USD 264.00	USD 329.00
50 x 50 mm	USD 240.00	USD 288.00	USD 386.00	USD 501.00
100 x 100 mm	USD 349.00	USD 442.00	USD 630.00	USD 846.00
150 x 150 mm	USD 458.00	USD 596.00	USD 880.00	
300 x 300 mm	USD 784.00	USD 1314.00		

Coil

Web Code
 343-018-097
 877-251-778

Length	Quantity	
	1 Reel	
0.2 m	USD 708.00	
0.5 m	USD 1170.00	

Discs

Web Code

656-469-848
 058-732-835
 341-607-564
 700-941-232
 617-655-009
 206-885-547
 860-693-914

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 299.00	USD 343.00	USD 438.00
6 mm	USD 314.00	USD 365.00	USD 472.00
8 mm	USD 329.00	USD 387.00	USD 506.00
10 mm	USD 344.00	USD 408.00	USD 541.00
15 mm	USD 382.00	USD 462.00	USD 626.00
25 mm	USD 459.00	USD 570.00	USD 797.00
50 mm	USD 651.00	USD 843.00	

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

NB000370

Thickness **0.5mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code

586-743-586
 342-940-462
 867-551-139
 443-888-053

Size	Quantity			
	1pc	2pcs	5pcs	10pcs
25 x 25 mm	USD 199.00	USD 230.00	USD 294.00	USD 372.00
50 x 50 mm	USD 266.00	USD 326.00	USD 446.00	USD 586.00
100 x 100 mm	USD 402.00	USD 518.00	USD 750.00	
150 x 150 mm	USD 538.00	USD 710.00		

Discs

Web Code

750-238-839
 779-850-731
 481-343-476
 167-931-297
 991-412-288
 926-535-339
 816-922-088

Diameter	Quantity		
	10 discs	20 discs	50 discs
4 mm	USD 306.00	USD 354.00	USD 454.00
6 mm	USD 325.00	USD 381.00	USD 497.00
8 mm	USD 344.00	USD 408.00	USD 540.00
10 mm	USD 363.00	USD 435.00	USD 583.00
15 mm	USD 411.00	USD 502.00	USD 690.00
25 mm	USD 506.00	USD 637.00	
50 mm	USD 746.00		

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

NB000374

Thickness **0.75mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code

565-338-550
 034-796-982
 072-621-421
 837-142-830

Size	Quantity			
	1pc	2pcs	5pcs	10pcs
25 x 25 mm	USD 208.00	USD 244.00	USD 316.00	USD 403.00
50 x 50 mm	USD 286.00	USD 354.00	USD 490.00	
100 x 100 mm	USD 442.00	USD 574.00		
150 x 150 mm	USD 597.00			

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

NB000380

Thickness **1.0mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code

267-854-356
 481-787-610
 223-453-091
 931-627-209

Size	Quantity			
	1pc	2pcs	5pcs	10pcs
25 x 25 mm	USD 220.00	USD 261.00	USD 343.00	USD 441.00
50 x 50 mm	USD 310.00	USD 388.00	USD 544.00	USD 725.00
100 x 100 mm	USD 490.00	USD 642.00	USD 1145.00	
150 x 150 mm	USD 670.00	USD 1036.00		

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

NB000400

Thickness **1.5mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code

231-585-824
 948-229-048
 528-635-091
 079-385-133

Size	Quantity			
	1pc	2pcs	5pcs	10pcs
25 x 25 mm	USD 243.00	USD 293.00	USD 394.00	USD 513.00
50 x 50 mm	USD 356.00	USD 452.00	USD 646.00	
100 x 100 mm	USD 581.00	USD 771.00		
150 x 150 mm	USD 840.00			

Typical Analysis : B <10, Cu <5, Fe 30, Mo 10, Ni <5, Si 100, Ta 500, Ti <10, W <100, Zr <10, C 25, H <10, N 20, O 100.

Metal – Niobium

Niobium

Nb



Foil

NB000420

Thickness **2.0mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code
 412-609-138
 576-146-218
 018-286-942

Size	Quantity		
	1pc	2pcs	5pcs
25 x 25 mm	USD 258.00	USD 313.00	USD 426.00
50 x 50 mm	USD 385.00	USD 493.00	
100 x 100 mm	USD 639.00		

Typical Analysis : B < 10, Cu < 5, Fe 30, Mo 10, Ni < 5, Si 100, Ta 500, Ti < 10, W < 100, Zr < 10, C 25, H < 10, N 20, O 100.

NB000430

Thickness **3.0mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code
 000-731-782
 091-463-362

Size	Quantity
	1pc
150 x 150 mm	POA
300 x 300 mm	POA

Typical Analysis : B < 10, Cu < 5, Fe 30, Mo 10, Ni < 5, Si 100, Ta 500, Ti < 10, W < 100, Zr < 10, C 25, H < 10, N 20, O 100.

NB000450

Thickness **6.0mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code
 227-644-499
 944-005-805

Size	Quantity
	1pc
150 x 150 mm	POA
300 x 300 mm	POA

Typical Analysis : B < 10, Cu < 5, Fe 30, Mo 10, Ni < 5, Si 100, Ta 500, Ti < 10, W < 100, Zr < 10, C 25, H < 10, N 20, O 100.



Sputtering Target

NB009200

Thickness **2.0mm**

Purity **99.9%**

Size

Web Code
 789-254-165

Disc diam.	Quantity
	1disc
50.8 mm	POA

Typical Analysis : B < 10, Cu < 5, Fe 30, Mo 10, Ni < 5, Si 100, Ta 500, Ti < 10, W < 100, Zr < 10, C 25, H < 10, N 20, O 100.
 These targets are normally available for immediate shipment from stock. Other sizes are available to special order.

NB009300

Thickness **3.0mm**

Purity **99.9%**

Size

Web Code
 554-382-963
 432-914-583
 290-047-914

Disc diam.	Quantity
	1disc
25.4 mm	POA
50 mm	POA
75 mm	POA

Typical Analysis : B < 10, Cu < 5, Fe 30, Mo 10, Ni < 5, Si 100, Ta 500, Ti < 10, W < 100, Zr < 10, C 25, H < 10, N 20, O 100.
 These targets are normally available for immediate shipment from stock. Other sizes are available to special order.

NB009600

Thickness **6.0mm**

Purity **99.9%**

Size

Web Code
 185-428-209
 338-941-422
 367-676-838

Disc diam.	Quantity
	1disc
25.4 mm	POA
50 mm	POA
75 mm	POA

Typical Analysis : B < 10, Cu < 5, Fe 30, Mo 10, Ni < 5, Si 100, Ta 500, Ti < 10, W < 100, Zr < 10, C 25, H < 10, N 20, O 100.
 These targets are normally available for immediate shipment from stock. Other sizes are available to special order.



Wire

NB005100

Diameter **0.05mm**
 Temper **As drawn**

Purity **99.85%**

Length

Web Code
 214-652-880
 831-608-735
 951-099-038
 887-380-485
 922-561-725

Length	Quantity
	1 Reel
1 m	USD 205.00
2 m	USD 233.00
5 m	USD 298.00
10 m	USD 393.00
20 m	USD 590.00

Typical Analysis : Al 10, B 2, Ca 10, Cd 5, Co 20, Cr 50, Cu 10, Fe 50, Hf 100, Mn 50, Mo 100, Ni 50, Pb 5, Si 50, Sn 10, Ta 380, Ti 100, V 100, W 100, Zr 200, C 10, H 7, N 45, O 20.

Niobium

Nb



Wire

NB005105

Diameter **0.1mm**
 Temper **Annealed**

Purity **99.9%**
 Condition **Clean**

Length
Web Code
 623-793-993

Quantity	
Length	1 Reel
1 m	USD 206.00

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

NB005110

Diameter **0.125mm**
 Temper **Annealed**

Purity **99.9%**

Length
Web Code
 027-717-939
 464-743-088
 193-027-688
 610-655-581

Quantity	
Length	1 Reel
5 m	USD 262.00
10 m	USD 330.00
25 m	USD 430.00
50 m	USD 627.00

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

NB005115

Diameter **0.18mm**
 Temper **Annealed**

Purity **99.9%**

Length
Web Code
 269-895-876
 157-211-305
 151-998-926
 425-329-615
 454-988-319

Quantity	
Length	1 Reel
0.5 m	USD 166.00
1 m	USD 187.00
5 m	USD 276.00
25 m	USD 475.00
100 m	USD 850.00

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

NB005120

Diameter **0.25mm**
 Temper **Annealed**

Purity **99.9%**

Length
Web Code
 331-949-096
 493-634-431
 704-300-482
 037-554-822
 694-356-922
 794-619-399

Quantity	
Length	1 Reel
0.5 m	USD 150.00
1 m	USD 164.00
5 m	USD 224.00
25 m	USD 360.00
100 m	USD 609.00
200 m	USD 820.00

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

NB005125

Diameter **0.5mm**
 Temper **Annealed**

Purity **99.9%**

Length
Web Code
 910-754-629
 844-336-425
 542-051-181
 756-391-450
 548-929-302
 616-173-484

Quantity	
Length	1 Reel
0.5 m	USD 171.00
1 m	USD 194.00
5 m	USD 292.00
25 m	USD 512.00
50 m	USD 678.00
100 m	USD 1006.00

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

NB005130

Diameter **1.0mm**
 Temper **Annealed**

Purity **99.9%**

Length
Web Code
 709-880-131
 735-018-599
 877-315-453
 421-788-008
 723-505-799

Quantity	
Length	1 Reel
0.5 m	USD 193.00
1 m	USD 225.00
5 m	USD 361.00
10 m	USD 463.00
20 m	USD 608.00

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

Metal – Niobium

Niobium

Nb



Wire

NB005135

Diameter **1.25mm**
 Temper **Annealed**

Purity **99.9%**

Length

Web Code
 187-508-101
 196-084-755
 526-715-282
 046-030-474
 790-162-057

Quantity	
Length	1 Reel
0.5 m	USD 210.00
1 m	USD 250.00
5 m	USD 416.00
10 m	USD 541.00
20 m	USD 717.00

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

NB005140

Diameter **1.5mm**
 Temper **Annealed**

Purity **99.9%**

Length

Web Code
 611-748-529
 468-562-907
 438-221-000
 570-363-046
 777-630-552
 203-824-218

Quantity	
Length	1 Reel
0.5 m	USD 228.00
1 m	USD 275.00
2 m	USD 341.00
5 m	USD 472.00
10 m	USD 620.00
20 m	USD 878.00

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.



Insulated Wire

NB005851

Conductor diameter **0.05mm**
 Insulation **Polyimide**

Insulation thickness **0.007mm**

Length

Web Code
 601-623-317
 202-918-023
 364-753-538
 594-195-036
 274-382-066

Quantity	
Length	1 Reel
1 m	USD 207.00
2 m	USD 236.00
5 m	USD 303.00
10 m	USD 411.00
20 m	USD 625.00

NB005850

Conductor diameter **0.05mm**
 Insulation **PTFE (Polytetrafluoroethylene)**

Insulation thickness **0.008mm**

Length

Web Code
 727-811-626
 976-450-902
 056-365-389
 045-670-576

Quantity	
Length	1 Reel
1 m	USD 227.00
2 m	USD 274.00
5 m	USD 448.00
10 m	USD 736.00

NB005855

Conductor diameter **0.10mm**
 Insulation **Polyimide**

Insulation thickness **0.01mm**

Length

Web Code
 440-362-873
 194-138-730
 704-705-702
 555-763-014
 974-395-969

Quantity	
Length	1 Reel
1 m	USD 207.00
2 m	USD 236.00
5 m	USD 303.00
10 m	USD 411.00
20 m	USD 625.00

NB005860

Conductor diameter **0.125mm**
 Insulation **Polyimide**

Insulation thickness **0.01mm**

Length

Web Code
 413-608-687
 786-793-334
 415-968-258
 527-236-381
 769-123-080

Quantity	
Length	1 Reel
1 m	USD 207.00
2 m	USD 236.00
5 m	USD 303.00
10 m	USD 411.00
20 m	USD 625.00

NB005865

Conductor diameter **0.250mm**
 Insulation **PTFE (Polytetrafluoroethylene)**

Insulation thickness **0.04mm**

Length

Web Code
 354-286-536

Quantity	
Length	1 Reel
1 m	USD 207.00

Typical Analysis : Not applicable

Niobium

Nb



Rod

NB007905	Diameter 1.5mm Temper Annealed	Purity 99.9%
Size	Quantity	
Web Code	Length	1pc
765-978-807	300 mm	USD 289.00
Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.		

NB007907	Diameter 1.6mm Temper Annealed	Purity 99.9% Condition Centreless ground	
Size	Quantity		
Web Code	Length	1pc	2pcs
237-876-470	150 mm	USD 230.00	USD 276.00
953-826-141	300 mm	USD 264.00	USD 324.00
Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.			

NB007910	Diameter 2.0mm Temper Annealed	Purity 99.9%				
Size	Quantity					
Web Code	Length	1pc	2pcs	5pcs	10pcs	20pcs
235-934-284	100 mm	USD 209.00	USD 250.00	USD 339.00	USD 444.00	USD 618.00
491-778-626	200 mm	USD 237.00	USD 290.00	USD 403.00	USD 534.00	USD 839.00
472-334-032	500 mm	USD 293.00	USD 369.00	USD 529.00	USD 887.00	
041-761-214	1000 mm	USD 357.00	USD 459.00	USD 846.00		
Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.						

NB007916	Diameter 2.5mm Temper Annealed	Purity 99.9%
Size	Quantity	
Web Code	Length	1pc
893-040-159	93 mm	USD 240.00
027-368-287	935 mm	USD 457.00
Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.		

NB007918	Diameter 4.0mm Temper Annealed	Purity 99.9% Condition Centreless ground
Size	Quantity	
Web Code	Length	1pc
783-412-051	83 mm	USD 276.00
Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.		

NB007920	Diameter 5.0mm Temper Annealed	Purity 99.9%			
Size	Quantity				
Web Code	Length	1pc	2pcs	5pcs	10pcs
220-159-215	100 mm	USD 287.00	USD 365.00	USD 539.00	USD 828.00
519-908-243	200 mm	USD 342.00	USD 443.00	USD 737.00	USD 1323.00
988-530-815	500 mm	USD 451.00	USD 672.00		
566-359-484	1000 mm	USD 649.00	USD 1167.00		
Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.					

NB007925	Diameter 5.6mm Temper Annealed	Purity 99.9%			
Size	Quantity				
Web Code	Length	1pc	2pcs	5pcs	10pcs
249-047-844	100 mm	USD 284.00	USD 361.00	USD 531.00	USD 804.00
197-898-795	200 mm	USD 338.00	USD 437.00	USD 712.00	USD 1274.00
409-508-398	500 mm	USD 444.00	USD 648.00		
618-639-149	1000 mm	USD 625.00	USD 1118.00		
Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.					

Metal – Niobium

Niobium

Nb



Rod

NB007930

Diameter **10.0mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code
 366-444-417
 805-553-176
 694-137-773
 767-216-103

Length	Quantity			
	1pc	2pcs	5pcs	10pcs
100 mm	USD 373.00	USD 486.00	USD 932.00	USD 1712.00
200 mm	USD 462.00	USD 729.00	USD 1616.00	
500 mm	USD 841.00	USD 1549.00		
1000 mm	USD 1525.00			

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

NB007935

Diameter **12.7mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code
 510-779-652
 902-014-286
 751-783-453
 972-925-043

Length	Quantity		
	1pc	2pcs	5pcs
50 mm	USD 294.00	USD 371.00	USD 640.00
100 mm	USD 356.00	USD 516.00	USD 1088.00
200 mm	USD 501.00	USD 874.00	
500 mm	USD 1039.00		

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

NB007940

Diameter **20.0mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code
 954-221-474
 277-686-515
 710-820-317
 852-543-967

Length	Quantity		
	1pc	2pcs	5pcs
25 mm	USD 330.00	USD 426.00	USD 833.00
50 mm	USD 406.00	USD 654.00	USD 1439.00
100 mm	USD 633.00	USD 1138.00	
200 mm	USD 1118.00		

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

NB007941

Diameter **25mm**

Purity **99.9%**

Size

Web Code
 526-636-538

Length	Quantity
	1pc
100 mm	USD 719.00

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

NB007942

Diameter **30.0mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code
 286-271-066
 505-577-099
 365-477-248

Length	Quantity	
	1pc	2pcs
25 mm	USD 406.00	USD 619.00
50 mm	USD 570.00	USD 990.00
100 mm	USD 942.00	

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

NB007945

Diameter **42mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code
 008-735-032
 401-726-008

Length	Quantity	
	1pc	2pcs
50 mm	USD 845.00	USD 1540.00
100 mm	USD 1492.00	

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

NB007950

Diameter **50.0mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code
 245-629-538
 846-662-797

Length	Quantity
	1pc
50 mm	POA
100 mm	POA

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

Metal – Niobium

Niobium

Nb



Rod

NB007960

Diameter **63.5mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code
 342-036-641
 770-303-997
 943-327-539

Quantity

Length	1pc
50 mm	POA
100 mm	POA
200 mm	POA

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

NB007975

Diameter **75mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code
 281-391-935

Quantity

Length	1pc
100 mm	POA

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

NB007995

Diameter **100mm**
 Temper **Annealed**

Purity **99.9%**

Size

Web Code
 843-975-957

Quantity

Length	1pc
100 mm	POA

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.



Tube

NB007110

Outside Diameter **1.0mm**
 Inside Diameter **0.5mm**
 Temper **As drawn**

Wall Thickness **0.25mm**
 Purity **99.9%**

Size

Web Code
 672-650-391
 081-297-072
 162-128-774
 266-098-341

Quantity

Length	1pc	2pcs	5pcs
100 mm	USD 385.00	USD 491.00	USD 878.00
200 mm	USD 475.00	USD 700.00	USD 1525.00
500 mm	USD 814.00	USD 1477.00	
1000 mm	USD 1461.00		

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

NB007200

Outside Diameter **2.54mm**
 Inside Diameter **2.44mm**
 Temper **Annealed**

Wall Thickness **0.05mm**
 Purity **99.9%**

Size

Web Code
 992-106-300
 305-032-476
 287-996-678
 143-827-946

Quantity

Length	1pc	2pcs	5pcs
100 mm	USD 373.00	USD 474.00	USD 810.00
200 mm	USD 458.00	USD 646.00	USD 1389.00
500 mm	USD 746.00	USD 1341.00	
1000 mm	USD 1325.00		

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

NB007300

Outside Diameter **5.0mm**
 Inside Diameter **4.4mm**
 Temper **As drawn**

Wall Thickness **0.3mm**
 Purity **99.9%**

Size

Web Code
 262-293-598
 786-693-218
 336-655-089
 081-887-465

Quantity

Length	1pc	2pcs	5pcs
100 mm	USD 360.00	USD 457.00	USD 742.00
200 mm	USD 441.00	USD 591.00	USD 1253.00
500 mm	USD 677.00	USD 1205.00	
1000 mm	USD 1188.00		

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

Metal – Niobium

Niobium

Nb



Tube

NB007600

Outside Diameter **10.0mm**
 Inside Diameter **9.2mm**
 Temper **As drawn**

Wall Thickness **0.4mm**
 Purity **99.9%**

Size

Web Code

150-997-789
 659-447-160
 371-432-553
 614-825-393

Length	Quantity		
	1pc	2pcs	5pcs
100 mm	USD 401.00	USD 515.00	USD 980.00
200 mm	USD 498.00	USD 782.00	USD 1730.00
500 mm	USD 916.00	USD 1682.00	
1000 mm	USD 1665.00		

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.

NB007700

Outside Diameter **16.0mm**
 Inside Diameter **13mm**
 Temper **As drawn**

Wall Thickness **1.5mm**
 Purity **99.9%**

Size

Web Code

787-722-816
 271-211-608
 754-582-456

Length	Quantity		
	1pc	2pcs	5pcs
100 mm	USD 434.00	USD 573.00	USD 1206.00
200 mm	USD 557.00	USD 963.00	
500 mm	USD 1142.00		

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.



Powder

NB006022

Max. Particle size **74micron**

Purity **99.85%**



Web Code

604-762-273
 548-472-559
 595-280-435
 410-057-186

Weight	Quantity	
		1 Pot
20 g	USD 298.00	
50 g	USD 399.00	
100 g	USD 514.00	
200 g	USD 825.00	

Typical Analysis : B < 10, Ca 10, Co 10, Cu 50, Fe 100, Mg 10, Mn 10, Mo 10, Ni 10, Si 50, Sn 10, Ta 700, Ti 10, W 100, Zr 10, C 150, H 100, N 150, O 3000.
 Hazardous goods, additional shipment charges apply which are dependent on destination. Please check the individual item on our website or contact us for further details.



Lump

NB006101

Max. Lump size **5mm**
 Condition **Pellets**

Purity **99.9%**

Web Code

727-577-943
 705-871-193
 758-764-186

Weight	Quantity	
		1 Pot
50 g	USD 302.00	
100 g	USD 476.00	
200 g	USD 824.00	

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.
 Nominally 3mm diameter x 3mm length pellets. Please ask for prices for larger quantities.

NB006100

Max. Lump size **10mm**
 Condition **Pellets**

Purity **99.9%**

Web Code

664-159-568
 019-947-009
 493-381-204

Weight	Quantity	
		1 Pot
50 g	USD 284.00	
100 g	USD 427.00	
200 g	USD 727.00	

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.
 Nominally 6.35mm diameter x 6.35mm length pellets. Please ask for prices for larger quantities.

Metal – Niobium

Niobium

Nb



Sphere

NB006840

Diameter **4.0mm**
 Purity **99.9%**

Tolerance **±100µm**
 Grade **Precision Sphere**

Quantity
Web Code
 483-354-077

Quantity
Spheres **1 Pot**
 10 pcs USD 321.00

Typical Analysis : Al < 10, B 2, Ca < 10, Co < 10, Cr < 10, Cu < 10, Fe < 10, Mg < 10, Mn < 10, Mo < 10, Ni < 10, Si < 10, Sn < 10, Ta 255, Ti 20, W < 100, Zr < 10, C 25, H < 10, N 35, O 230.



Single Crystal

Although this crystal is normally held in stock ready for immediate shipment it is an example of crystals which may be grown to order with a delivery forecast of 4-10 weeks. When requesting a quotation please specify the material, dimensions, orientation, type and concentration of dopants, surface finish and quantity required.

NB002138

Oriented **(100)**
 Length **5mm**

Diameter **12mm**
 Purity **99.999%**

Web Code
 454-013-187

Quantity
1pc
 USD POA

Typical Analysis : Not applicable

NB002139

Oriented **(100)**
 Length **10mm**

Diameter **12mm**
 Purity **99.999%**

Web Code
 308-730-679

Quantity
1pc
 USD POA

Typical Analysis : Not applicable

NB002111

Oriented **(100)**
 Diameter **12mm**
 Condition **Polished on 1 side to 1 micron**

Thickness **2mm**
 Purity **99.999%**

Web Code
 317-199-997

Quantity
1pc
 USD POA

Typical Analysis : Not applicable

NB002110

Oriented **(100)**
 Diameter **12mm**
 Condition **Unpolished**

Thickness **2mm**
 Purity **99.999%**

Web Code
 382-028-253

Quantity
1pc
 USD POA

Typical Analysis : Not applicable

NB002059

Oriented **(110)**
 Length **10mm**

Diameter **6mm**
 Purity **99.999%**

Web Code
 069-925-129

Quantity
1pc
 USD POA

Typical Analysis : Not applicable

NB002119

Oriented **(110)**
 Length **10mm**

Diameter **12mm**
 Purity **99.999%**

Web Code
 470-131-959

Quantity
1pc
 USD POA

Typical Analysis : Not applicable

NB002113

Oriented **(110)**
 Diameter **12mm**
 Condition **Polished on 1 side to 1 micron**

Thickness **2mm**
 Purity **99.999%**

Web Code
 614-049-937

Quantity
1pc
 USD POA

Typical Analysis : Not applicable

Metal – Niobium

Niobium

Nb



Single Crystal

NB002112

Oriented (110)
 Diameter 12mm
 Condition Unpolished

Thickness 2mm
 Purity 99.999%

Quantity

Web Code
 021-460-814

1pc
 USD POA

Typical Analysis : Not applicable

NB002060

Oriented (110)
 Length 25mm

Diameter 6mm
 Purity 99.999%

Quantity

Web Code
 202-067-528

1pc
 USD POA

Typical Analysis : Not applicable

NB002120

Oriented (110)
 Length 25mm

Diameter 12mm
 Purity 99.999%

Quantity

Web Code
 258-448-673

1pc
 USD POA

Typical Analysis : Not applicable

NB002061

Oriented (110)
 Length 50mm

Diameter 6mm
 Purity 99.999%

Quantity

Web Code
 740-647-538

1pc
 USD POA

Typical Analysis : Not applicable

NB002121

Oriented (110)
 Length 50mm

Diameter 12mm
 Purity 99.999%

Quantity

Web Code
 681-660-859

1pc
 USD POA

Typical Analysis : Not applicable

NB002129

Oriented (111)
 Length 10mm

Diameter 12mm
 Purity 99.999%

Quantity

Web Code
 120-214-448

1pc
 USD POA

Typical Analysis : Not applicable

NB002115

Oriented (111)
 Diameter 12mm
 Condition Polished on 1 side to 1 micron

Thickness 2mm
 Purity 99.999%

Quantity

Web Code
 560-750-707

1pc
 USD POA

Typical Analysis : Not applicable

NB002114

Oriented (111)
 Diameter 12mm
 Condition Unpolished

Thickness 2mm
 Purity 99.999%

Quantity

Web Code
 126-458-179

1pc
 USD POA

Typical Analysis : Not applicable

NB002130

Oriented (111)
 Length 25mm

Diameter 12mm
 Purity 99.999%

Quantity

Web Code
 708-598-188

1pc
 USD POA

Typical Analysis : Not applicable

Metal – Niobium

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