

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

Goodfellow Cambridge Limited

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Goodfellow (Shanghai) Trading Co., Ltd

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SHANGHAI
200070
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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	GBP 251.00	GBP 350.00	GBP 645.00	GBP 1039.00	
549-773-386	25 mm	GBP 383.00	GBP 547.00	GBP 1039.00	GBP 1695.00	

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	GBP 561.00	GBP 783.00	GBP 1177.00
724-058-956	50 x 50 mm	GBP 980.00	GBP 1572.00	

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	GBP 484.00	GBP 674.00	GBP 1005.00
006-907-808	50 x 50 mm	GBP 826.00	GBP 1159.00	

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	GBP 283.00	GBP 372.00	GBP 557.00
969-992-824	50 x 50 mm	GBP 484.00	GBP 657.00	
396-237-556	100 x 100 mm	GBP 1104.00		

Sizes LT	Quantity	1pc	2pcs	5pcs
Web Code	Size	1pc	2pcs	5pcs
729-350-177	25 x 25 mm	GBP 353.00	GBP 466.00	GBP 696.00

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	GBP 276.00	GBP 363.00	GBP 542.00	GBP 755.00	GBP 1415.00
50 x 50 mm	GBP 470.00	GBP 470.00	GBP 1383.00		
100 x 100 mm	GBP 1102.00	GBP 2130.00			
150 x 150 mm	GBP 2378.00				

Sizes LT

Web Code
 121-525-399

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	GBP 304.00	GBP 399.00	GBP 596.00	GBP 831.00	GBP 1556.00

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	GBP 287.00	GBP 356.00	GBP 517.00
6 mm	GBP 342.00	GBP 434.00	GBP 643.00
8 mm	GBP 397.00	GBP 513.00	GBP 771.00
10 mm	GBP 453.00	GBP 594.00	GBP 901.00
15 mm	GBP 590.00	GBP 788.00	GBP 1568.00
25 mm	GBP 892.00		

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	GBP 258.00	GBP 338.00	GBP 502.00	GBP 725.00	GBP 1353.00
50 x 50 mm	GBP 435.00	GBP 587.00	GBP 1321.00		
100 x 100 mm	GBP 1053.00	GBP 2031.00			
150 x 150 mm	GBP 2267.00				

Sizes LT

Web Code
 442-841-470

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	GBP 284.00	GBP 371.00	GBP 552.00	GBP 797.00	GBP 1488.00

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	GBP 277.00	GBP 341.00	GBP 494.00
6 mm	GBP 327.00	GBP 413.00	GBP 609.00
8 mm	GBP 377.00	GBP 485.00	GBP 725.00
10 mm	GBP 428.00	GBP 558.00	GBP 844.00
15 mm	GBP 553.00	GBP 735.00	GBP 1505.00
25 mm	GBP 858.00		

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	GBP 202.00	GBP 237.00	GBP 310.00	GBP 396.00
50 x 50 mm	GBP 281.00	GBP 349.00	GBP 487.00	
100 x 100 mm	GBP 440.00	GBP 573.00		

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	GBP 392.00	GBP 527.00	GBP 1203.00		
100 x 100 mm	GBP 959.00	GBP 1842.00			
150 x 150 mm	GBP 2055.00				

Sizes LT

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

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	GBP 237.00	GBP 308.00	GBP 454.00	GBP 666.00	GBP 1235.00
50 x 50 mm	GBP 431.00	GBP 580.00	GBP 1323.00		

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	GBP 265.00	GBP 325.00	GBP 467.00
6 mm	GBP 309.00	GBP 387.00	GBP 568.00
8 mm	GBP 353.00	GBP 451.00	GBP 671.00
10 mm	GBP 398.00	GBP 515.00	GBP 776.00
15 mm	GBP 508.00	GBP 671.00	GBP 1385.00
25 mm	GBP 791.00		

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

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	GBP 941.00	GBP 1806.00			
150 x 150 mm	GBP 2014.00				

Sizes LT

Web Code

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

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	GBP 229.00	GBP 297.00	GBP 437.00	GBP 654.00	GBP 1212.00
50 x 50 mm	GBP 377.00	GBP 517.00	GBP 1181.00		
100 x 100 mm	GBP 1035.00	GBP 1986.00			

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	GBP 260.00	GBP 318.00	GBP 458.00
6 mm	GBP 302.00	GBP 378.00	GBP 554.00
8 mm	GBP 345.00	GBP 439.00	GBP 652.00
10 mm	GBP 387.00	GBP 500.00	GBP 764.00
15 mm	GBP 491.00	GBP 648.00	GBP 1362.00
25 mm	GBP 779.00		

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	GBP 489.00	GBP 646.00	GBP 1023.00		
200 x 300 mm	GBP 725.00	GBP 1075.00			

Sizes LT

Web Code

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

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	GBP 180.00	GBP 208.00	GBP 266.00	GBP 337.00	GBP 443.00
50 x 50 mm	GBP 242.00	GBP 295.00	GBP 405.00	GBP 532.00	GBP 720.00
100 x 100 mm	GBP 365.00	GBP 471.00	GBP 682.00	GBP 936.00	

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	GBP 269.00	GBP 315.00	GBP 420.00
6 mm	GBP 288.00	GBP 342.00	GBP 462.00
8 mm	GBP 307.00	GBP 369.00	GBP 504.00
10 mm	GBP 326.00	GBP 395.00	GBP 546.00
15 mm	GBP 373.00	GBP 462.00	GBP 652.00
25 mm	GBP 467.00	GBP 595.00	GBP 862.00
50 mm	GBP 702.00	GBP 928.00	

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	GBP 914.00	GBP 1752.00			
150 x 150 mm	GBP 1954.00				

Sizes LT

Web Code

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

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	GBP 221.00	GBP 285.00	GBP 418.00	GBP 637.00	GBP 1179.00
50 x 50 mm	GBP 360.00	GBP 504.00	GBP 1147.00		
100 x 100 mm	GBP 1005.00	GBP 1927.00			

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	GBP 256.00	GBP 312.00	GBP 447.00
6 mm	GBP 295.00	GBP 368.00	GBP 538.00
8 mm	GBP 335.00	GBP 425.00	GBP 630.00
10 mm	GBP 375.00	GBP 483.00	GBP 749.00
15 mm	GBP 474.00	GBP 624.00	GBP 1328.00
25 mm	GBP 760.00		

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	GBP 896.00	GBP 1716.00			
150 x 150 mm	GBP 1913.00				

Sizes LT

Web Code

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

Size	Quantity				
	1pc	2pcs	5pcs	10pcs	20pcs
25 x 25 mm	GBP 219.00	GBP 283.00	GBP 415.00	GBP 626.00	GBP 1156.00
50 x 50 mm	GBP 357.00	GBP 495.00	GBP 1124.00		
100 x 100 mm	GBP 985.00	GBP 1887.00			

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	GBP 255.00	GBP 311.00	GBP 445.00
6 mm	GBP 294.00	GBP 366.00	GBP 535.00
8 mm	GBP 333.00	GBP 423.00	GBP 626.00
10 mm	GBP 373.00	GBP 480.00	GBP 738.00
15 mm	GBP 470.00	GBP 618.00	GBP 1305.00
25 mm	GBP 747.00		

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	GBP 167.00	GBP 191.00	GBP 242.00	GBP 303.00	GBP 395.00
50 x 50 mm	GBP 221.00	GBP 269.00	GBP 365.00	GBP 476.00	GBP 640.00
100 x 100 mm	GBP 331.00	GBP 423.00	GBP 609.00	GBP 822.00	
150 x 150 mm	GBP 440.00	GBP 578.00	GBP 854.00		
214 x 300 mm	GBP 666.00	GBP 943.00			

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	GBP 247.00	GBP 285.00	GBP 367.00
6 mm	GBP 264.00	GBP 309.00	GBP 405.00
8 mm	GBP 280.00	GBP 332.00	GBP 442.00
10 mm	GBP 297.00	GBP 356.00	GBP 479.00
15 mm	GBP 339.00	GBP 415.00	GBP 572.00
25 mm	GBP 422.00	GBP 532.00	GBP 758.00
50 mm	GBP 630.00	GBP 827.00	

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	GBP 143.00	GBP 162.00	GBP 201.00	GBP 249.00	GBP 321.00
50 x 50 mm	GBP 185.00	GBP 221.00	GBP 294.00	GBP 380.00	GBP 506.00
100 x 100 mm	GBP 267.00	GBP 338.00	GBP 479.00	GBP 642.00	
150 x 150 mm	GBP 350.00	GBP 455.00	GBP 665.00		

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	GBP 214.00	GBP 246.00	GBP 321.00
6 mm	GBP 227.00	GBP 264.00	GBP 350.00
8 mm	GBP 239.00	GBP 282.00	GBP 378.00
10 mm	GBP 252.00	GBP 300.00	GBP 406.00
15 mm	GBP 283.00	GBP 344.00	GBP 477.00
25 mm	GBP 346.00	GBP 433.00	GBP 618.00
50 mm	GBP 504.00	GBP 657.00	

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

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	GBP 558.00	GBP 1041.00			
150 x 150 mm	GBP 1154.00				

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	GBP 141.00	GBP 172.00	GBP 256.00	GBP 415.00	GBP 735.00
50 x 50 mm	GBP 201.00	GBP 326.00	GBP 703.00		
100 x 100 mm	GBP 614.00	GBP 1146.00			
150 x 150 mm	GBP 1270.00				

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	GBP 211.00	GBP 249.00	GBP 347.00
6 mm	GBP 228.00	GBP 273.00	GBP 386.00
8 mm	GBP 245.00	GBP 298.00	GBP 446.00
10 mm	GBP 263.00	GBP 323.00	GBP 545.00
15 mm	GBP 305.00	GBP 443.00	GBP 877.00
25 mm	GBP 511.00		

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	GBP 112.00	GBP 127.00	GBP 159.00	GBP 197.00
50 x 50 mm	GBP 145.00	GBP 175.00	GBP 234.00	GBP 303.00
100 x 100 mm	GBP 212.00	GBP 269.00	GBP 383.00	GBP 560.00

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	GBP 168.00	GBP 192.00	GBP 243.00
6 mm	GBP 178.00	GBP 205.00	GBP 263.00
8 mm	GBP 187.00	GBP 219.00	GBP 284.00
10 mm	GBP 196.00	GBP 232.00	GBP 305.00
15 mm	GBP 220.00	GBP 265.00	GBP 357.00
25 mm	GBP 266.00	GBP 331.00	GBP 462.00
50 mm	GBP 383.00	GBP 496.00	

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	GBP 112.00	GBP 127.00	GBP 159.00
50 x 50 mm	GBP 145.00	GBP 175.00	GBP 234.00

Sizes LT

Web Code

127-320-160
981-870-814

Size	Quantity		
	1pc	2pcs	5pcs
25 x 25 mm	GBP 123.00	GBP 140.00	GBP 175.00
50 x 50 mm	GBP 175.00	GBP 209.00	GBP 280.00

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	GBP 105.00	GBP 118.00	GBP 144.00	GBP 176.00	GBP 226.00
50 x 50 mm	GBP 132.00	GBP 155.00	GBP 204.00	GBP 260.00	GBP 345.00
100 x 100 mm	GBP 185.00	GBP 231.00	GBP 322.00	GBP 428.00	
150 x 150 mm	GBP 238.00	GBP 306.00	GBP 441.00		

Coil

Web Code

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

Length	Quantity
	1 Reel
0.2 m	GBP 283.00
0.5 m	GBP 390.00
1 m	GBP 546.00

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	GBP 165.00	GBP 187.00	GBP 234.00
6 mm	GBP 172.00	GBP 197.00	GBP 251.00
8 mm	GBP 179.00	GBP 208.00	GBP 267.00
10 mm	GBP 187.00	GBP 219.00	GBP 284.00
15 mm	GBP 205.00	GBP 245.00	GBP 326.00
25 mm	GBP 242.00	GBP 297.00	GBP 409.00
50 mm	GBP 336.00	GBP 429.00	

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	GBP 105.00	GBP 118.00	GBP 144.00	GBP 176.00
50 x 50 mm	GBP 132.00	GBP 155.00	GBP 204.00	

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	GBP 165.00	GBP 187.00	GBP 234.00
6 mm	GBP 172.00	GBP 197.00	GBP 251.00
8 mm	GBP 179.00	GBP 208.00	GBP 267.00
10 mm	GBP 187.00	GBP 219.00	GBP 284.00
15 mm	GBP 205.00	GBP 245.00	
25 mm	GBP 242.00		

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	GBP 105.00	GBP 119.00	GBP 149.00	GBP 184.00	GBP 239.00
50 x 50 mm	GBP 136.00	GBP 162.00	GBP 217.00	GBP 281.00	
100 x 100 mm	GBP 197.00	GBP 249.00	GBP 354.00		
150 x 150 mm	GBP 258.00	GBP 335.00			

Coil

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

Width 150mm	Quantity
	1 Reel
Length 0.2 m	GBP 306.00
0.5 m	GBP 429.00
1 m	GBP 636.00

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	GBP 162.00	GBP 185.00	GBP 234.00
6 mm	GBP 171.00	GBP 198.00	GBP 254.00
8 mm	GBP 179.00	GBP 210.00	GBP 273.00
10 mm	GBP 188.00	GBP 222.00	GBP 292.00
15 mm	GBP 209.00	GBP 252.00	GBP 340.00
25 mm	GBP 252.00	GBP 312.00	GBP 435.00
50 mm	GBP 359.00	GBP 464.00	

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	GBP 102.00	GBP 115.00	GBP 143.00	GBP 176.00
50 x 50 mm	GBP 130.00	GBP 155.00	GBP 205.00	GBP 264.00
100 x 100 mm	GBP 186.00	GBP 234.00	GBP 330.00	GBP 440.00
150 x 150 mm	GBP 242.00	GBP 312.00	GBP 454.00	
300 x 300 mm	GBP 409.00	GBP 617.00		

Coil

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

Width 305mm	Quantity
	1 Reel
Length 0.2 m	GBP 370.00
0.5 m	GBP 553.00

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	GBP 161.00	GBP 183.00	GBP 231.00	GBP 304.00
6 mm	GBP 168.00	GBP 194.00	GBP 249.00	GBP 328.00
8 mm	GBP 176.00	GBP 205.00	GBP 266.00	GBP 353.00
10 mm	GBP 184.00	GBP 216.00	GBP 283.00	GBP 378.00
15 mm	GBP 203.00	GBP 244.00	GBP 327.00	GBP 440.00
25 mm	GBP 242.00	GBP 299.00	GBP 414.00	GBP 563.00
50 mm	GBP 340.00	GBP 438.00		

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

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	GBP 105.00	GBP 119.00	GBP 149.00	GBP 184.00	GBP 239.00
50 x 50 mm	GBP 136.00	GBP 162.00	GBP 217.00	GBP 281.00	GBP 376.00
100 x 100 mm	GBP 197.00	GBP 249.00	GBP 354.00	GBP 474.00	
150 x 150 mm	GBP 258.00	GBP 335.00	GBP 490.00		

Coil

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

Width 152mm	Length	Quantity
		1 Reel
	0.2 m	GBP 307.00
	0.5 m	GBP 431.00

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	GBP 162.00	GBP 185.00	GBP 234.00	GBP 308.00
6 mm	GBP 171.00	GBP 198.00	GBP 254.00	GBP 336.00
8 mm	GBP 179.00	GBP 210.00	GBP 273.00	GBP 363.00
10 mm	GBP 188.00	GBP 222.00	GBP 292.00	GBP 390.00
15 mm	GBP 209.00	GBP 252.00	GBP 340.00	GBP 458.00
25 mm	GBP 252.00	GBP 312.00	GBP 435.00	
50 mm	GBP 359.00	GBP 464.00		

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	GBP 92.00	GBP 104.00	GBP 130.00	GBP 161.00
50 x 50 mm	GBP 118.00	GBP 141.00	GBP 187.00	GBP 243.00
100 x 100 mm	GBP 169.00	GBP 213.00	GBP 303.00	GBP 406.00
150 x 150 mm	GBP 221.00	GBP 286.00	GBP 418.00	
300 x 300 mm	GBP 376.00	GBP 590.00		

Coil

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

Width 300mm	Length	Quantity
		1 Reel
	0.2 m	GBP 338.00
	0.5 m	GBP 521.00

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	GBP 150.00	GBP 172.00	GBP 219.00
6 mm	GBP 157.00	GBP 183.00	GBP 235.00
8 mm	GBP 165.00	GBP 193.00	GBP 252.00
10 mm	GBP 172.00	GBP 203.00	GBP 268.00
15 mm	GBP 190.00	GBP 229.00	GBP 308.00
25 mm	GBP 226.00	GBP 280.00	GBP 389.00
50 mm	GBP 317.00	GBP 409.00	

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	GBP 93.00	GBP 106.00	GBP 133.00	GBP 165.00
50 x 50 mm	GBP 120.00	GBP 144.00	GBP 193.00	GBP 250.00
100 x 100 mm	GBP 174.00	GBP 221.00	GBP 314.00	GBP 422.00
150 x 150 mm	GBP 228.00	GBP 297.00	GBP 435.00	
300 x 300 mm	GBP 391.00	GBP 642.00		

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	GBP 151.00	GBP 173.00	GBP 221.00
6 mm	GBP 158.00	GBP 184.00	GBP 238.00
8 mm	GBP 166.00	GBP 195.00	GBP 255.00
10 mm	GBP 174.00	GBP 206.00	GBP 272.00
15 mm	GBP 192.00	GBP 232.00	GBP 314.00
25 mm	GBP 230.00	GBP 286.00	GBP 399.00
50 mm	GBP 326.00	GBP 421.00	

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

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	GBP 93.50	GBP 107.00	GBP 134.00	GBP 167.00
50 x 50 mm	GBP 121.00	GBP 146.00	GBP 195.00	GBP 254.00
100 x 100 mm	GBP 176.00	GBP 224.00	GBP 319.00	GBP 428.00
150 x 150 mm	GBP 232.00	GBP 302.00	GBP 446.00	
300 x 300 mm	GBP 397.00	GBP 665.00		

Coil

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

Length	Quantity
	1 Reel
0.2 m	GBP 358.00
0.5 m	GBP 592.00

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	GBP 151.00	GBP 174.00	GBP 221.00
6 mm	GBP 159.00	GBP 185.00	GBP 239.00
8 mm	GBP 167.00	GBP 196.00	GBP 256.00
10 mm	GBP 174.00	GBP 207.00	GBP 274.00
15 mm	GBP 194.00	GBP 234.00	GBP 317.00
25 mm	GBP 232.00	GBP 289.00	GBP 404.00
50 mm	GBP 329.00	GBP 427.00	

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	GBP 100.00	GBP 116.00	GBP 149.00	GBP 188.00
50 x 50 mm	GBP 135.00	GBP 165.00	GBP 226.00	GBP 297.00
100 x 100 mm	GBP 204.00	GBP 262.00	GBP 380.00	
150 x 150 mm	GBP 272.00	GBP 359.00		

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	GBP 155.00	GBP 179.00	GBP 230.00
6 mm	GBP 165.00	GBP 193.00	GBP 252.00
8 mm	GBP 174.00	GBP 207.00	GBP 273.00
10 mm	GBP 184.00	GBP 220.00	GBP 295.00
15 mm	GBP 208.00	GBP 254.00	GBP 349.00
25 mm	GBP 256.00	GBP 322.00	
50 mm	GBP 377.00		

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	GBP 105.00	GBP 123.00	GBP 160.00	GBP 204.00
50 x 50 mm	GBP 145.00	GBP 179.00	GBP 248.00	
100 x 100 mm	GBP 224.00	GBP 290.00		
150 x 150 mm	GBP 302.00			

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	GBP 112.00	GBP 132.00	GBP 174.00	GBP 223.00
50 x 50 mm	GBP 157.00	GBP 196.00	GBP 275.00	GBP 367.00
100 x 100 mm	GBP 248.00	GBP 325.00	GBP 580.00	
150 x 150 mm	GBP 339.00	GBP 525.00		

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	GBP 123.00	GBP 148.00	GBP 200.00	GBP 260.00
50 x 50 mm	GBP 180.00	GBP 229.00	GBP 327.00	
100 x 100 mm	GBP 294.00	GBP 390.00		
150 x 150 mm	GBP 425.00			

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

25 x 25 mm
 50 x 50 mm
 100 x 100 mm

Quantity

1pc

GBP 130.00
 GBP 195.00
 GBP 323.00

2pcs

GBP 159.00
 GBP 249.00

5pcs

GBP 216.00

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

150 x 150 mm
 300 x 300 mm

Quantity

1pc

POA
 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

150 x 150 mm
 300 x 300 mm

Quantity

1pc

POA
 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.

50.8 mm

Quantity

1disc

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.

25.4 mm
 50 mm
 75 mm

Quantity

1disc

POA
 POA
 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.

25.4 mm
 50 mm
 75 mm

Quantity

1disc

POA
 POA
 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

1 m GBP 104.00
 2 m GBP 118.00
 5 m GBP 151.00
 10 m GBP 199.00
 20 m GBP 299.00

Quantity

1 Reel

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	GBP 104.00

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	GBP 133.00
10 m	GBP 167.00
25 m	GBP 218.00
50 m	GBP 317.00

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	GBP 84.00
1 m	GBP 94.50
5 m	GBP 140.00
25 m	GBP 241.00
100 m	GBP 431.00

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	GBP 75.50
1 m	GBP 83.00
5 m	GBP 113.00
25 m	GBP 182.00
100 m	GBP 309.00
200 m	GBP 415.00

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	GBP 86.50
1 m	GBP 98.50
5 m	GBP 148.00
25 m	GBP 259.00
50 m	GBP 343.00
100 m	GBP 509.00

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	GBP 97.50
1 m	GBP 114.00
5 m	GBP 183.00
10 m	GBP 234.00
20 m	GBP 308.00

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	GBP 106.00
1 m	GBP 126.00
5 m	GBP 210.00
10 m	GBP 274.00
20 m	GBP 363.00

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	GBP 115.00
1 m	GBP 139.00
2 m	GBP 172.00
5 m	GBP 239.00
10 m	GBP 314.00
20 m	GBP 444.00

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	GBP 105.00
2 m	GBP 120.00
5 m	GBP 153.00
10 m	GBP 208.00
20 m	GBP 316.00

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	GBP 115.00
2 m	GBP 139.00
5 m	GBP 227.00
10 m	GBP 373.00

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	GBP 105.00
2 m	GBP 120.00
5 m	GBP 153.00
10 m	GBP 208.00
20 m	GBP 316.00

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	GBP 105.00
2 m	GBP 120.00
5 m	GBP 153.00
10 m	GBP 208.00
20 m	GBP 316.00

NB005865

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

Insulation thickness **0.04mm**

Length

Web Code
 354-286-536

Quantity	
Length	1 Reel
1 m	GBP 105.00

Typical Analysis : Not applicable

Niobium

Nb



Rod

NB007905	Diameter 1.5mm	Purity 99.9%
	Temper Annealed	
	Size	Quantity
	Web Code	Length 1pc
	765-978-807	300 mm GBP 146.00
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	Purity 99.9%
	Temper Annealed	Condition Centreless ground
	Size	Quantity
	Web Code	Length 1pc 2pcs
	237-876-470	150 mm GBP 116.00 GBP 140.00
	953-826-141	300 mm GBP 134.00 GBP 164.00
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	Purity 99.9%
	Temper Annealed	
	Size	Quantity
	Web Code	Length 1pc 2pcs 5pcs 10pcs 20pcs
	235-934-284	100 mm GBP 106.00 GBP 126.00 GBP 172.00 GBP 225.00 GBP 313.00
	491-778-626	200 mm GBP 120.00 GBP 147.00 GBP 204.00 GBP 270.00 GBP 425.00
	472-334-032	500 mm GBP 149.00 GBP 187.00 GBP 268.00 GBP 449.00
	041-761-214	1000 mm GBP 181.00 GBP 232.00 GBP 428.00
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	Purity 99.9%
	Temper Annealed	
	Size	Quantity
	Web Code	Length 1pc
	893-040-159	93 mm GBP 122.00
	027-368-287	935 mm GBP 231.00
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	Purity 99.9%
	Temper Annealed	Condition Centreless ground
	Size	Quantity
	Web Code	Length 1pc
	783-412-051	83 mm GBP 140.00
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	Purity 99.9%
	Temper Annealed	
	Size	Quantity
	Web Code	Length 1pc 2pcs 5pcs 10pcs
	220-159-215	100 mm GBP 146.00 GBP 185.00 GBP 273.00 GBP 419.00
	519-908-243	200 mm GBP 173.00 GBP 224.00 GBP 373.00 GBP 670.00
	988-530-815	500 mm GBP 229.00 GBP 340.00
	566-359-484	1000 mm GBP 329.00 GBP 591.00
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	Purity 99.9%
	Temper Annealed	
	Size	Quantity
	Web Code	Length 1pc 2pcs 5pcs 10pcs
	249-047-844	100 mm GBP 144.00 GBP 183.00 GBP 269.00 GBP 407.00
	197-898-795	200 mm GBP 171.00 GBP 221.00 GBP 360.00 GBP 645.00
	409-508-398	500 mm GBP 225.00 GBP 328.00
	618-639-149	1000 mm GBP 316.00 GBP 566.00
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	GBP 189.00	GBP 246.00	GBP 472.00	GBP 867.00
200 mm	GBP 234.00	GBP 369.00	GBP 818.00	
500 mm	GBP 426.00	GBP 784.00		
1000 mm	GBP 772.00			

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	GBP 149.00	GBP 188.00	GBP 324.00
100 mm	GBP 180.00	GBP 261.00	GBP 551.00
200 mm	GBP 254.00	GBP 442.00	
500 mm	GBP 526.00		

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	GBP 167.00	GBP 216.00	GBP 422.00
50 mm	GBP 205.00	GBP 331.00	GBP 728.00
100 mm	GBP 320.00	GBP 576.00	
200 mm	GBP 566.00		

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	GBP 364.00

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	GBP 206.00	GBP 313.00
50 mm	GBP 289.00	GBP 501.00
100 mm	GBP 477.00	

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	GBP 428.00	GBP 780.00
100 mm	GBP 755.00	

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

Length	Quantity		
	1pc	2pcs	5pcs
100 mm	GBP 195.00	GBP 249.00	GBP 444.00
200 mm	GBP 240.00	GBP 355.00	GBP 772.00
500 mm	GBP 412.00	GBP 748.00	
1000 mm	GBP 740.00		

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

Length	Quantity		
	1pc	2pcs	5pcs
100 mm	GBP 189.00	GBP 240.00	GBP 410.00
200 mm	GBP 232.00	GBP 327.00	GBP 703.00
500 mm	GBP 377.00	GBP 679.00	
1000 mm	GBP 671.00		

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

Length	Quantity		
	1pc	2pcs	5pcs
100 mm	GBP 182.00	GBP 231.00	GBP 376.00
200 mm	GBP 223.00	GBP 299.00	GBP 634.00
500 mm	GBP 343.00	GBP 610.00	
1000 mm	GBP 602.00		

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.

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	GBP 203.00	GBP 260.00	GBP 496.00
200 mm	GBP 252.00	GBP 396.00	GBP 876.00
500 mm	GBP 464.00	GBP 851.00	
1000 mm	GBP 843.00		

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	GBP 220.00	GBP 290.00	GBP 611.00
200 mm	GBP 282.00	GBP 487.00	
500 mm	GBP 578.00		

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	GBP 151.00
50 g	GBP 202.00
100 g	GBP 260.00
200 g	GBP 418.00

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	GBP 153.00
100 g	GBP 241.00
200 g	GBP 417.00

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	GBP 144.00
100 g	GBP 216.00
200 g	GBP 368.00

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 GBP 163.00

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
 GBP POA

Typical Analysis : Not applicable

NB002139

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

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

Web Code
 308-730-679

Quantity
1pc
 GBP 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
 GBP POA

Typical Analysis : Not applicable

NB002110

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

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

Web Code
 382-028-253

Quantity
1pc
 GBP POA

Typical Analysis : Not applicable

NB002059

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

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

Web Code
 069-925-129

Quantity
1pc
 GBP POA

Typical Analysis : Not applicable

NB002119

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

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

Web Code
 470-131-959

Quantity
1pc
 GBP 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
 GBP POA

Typical Analysis : Not applicable

Metal – Niobium

Niobium

Nb



Single Crystal

NB002112	Oriented (110) Diameter 12mm Condition Unpolished	Thickness 2mm Purity 99.999%	Quantity	1pc GBP POA
	Web Code 021-460-814			
	Typical Analysis : Not applicable			
NB002060	Oriented (110) Length 25mm	Diameter 6mm Purity 99.999%	Quantity	1pc GBP POA
	Web Code 202-067-528			
	Typical Analysis : Not applicable			
NB002120	Oriented (110) Length 25mm	Diameter 12mm Purity 99.999%	Quantity	1pc GBP POA
	Web Code 258-448-673			
	Typical Analysis : Not applicable			
NB002061	Oriented (110) Length 50mm	Diameter 6mm Purity 99.999%	Quantity	1pc GBP POA
	Web Code 740-647-538			
	Typical Analysis : Not applicable			
NB002121	Oriented (110) Length 50mm	Diameter 12mm Purity 99.999%	Quantity	1pc GBP POA
	Web Code 681-660-859			
	Typical Analysis : Not applicable			
NB002129	Oriented (111) Length 10mm	Diameter 12mm Purity 99.999%	Quantity	1pc GBP POA
	Web Code 120-214-448			
	Typical Analysis : Not applicable			
NB002115	Oriented (111) Diameter 12mm Condition Polished on 1 side to 1 micron	Thickness 2mm Purity 99.999%	Quantity	1pc GBP POA
	Web Code 560-750-707			
	Typical Analysis : Not applicable			
NB002114	Oriented (111) Diameter 12mm Condition Unpolished	Thickness 2mm Purity 99.999%	Quantity	1pc GBP POA
	Web Code 126-458-179			
	Typical Analysis : Not applicable			
NB002130	Oriented (111) Length 25mm	Diameter 12mm Purity 99.999%	Quantity	1pc GBP POA
	Web Code 708-598-188			
	Typical Analysis : Not applicable			

Metal – Niobium

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