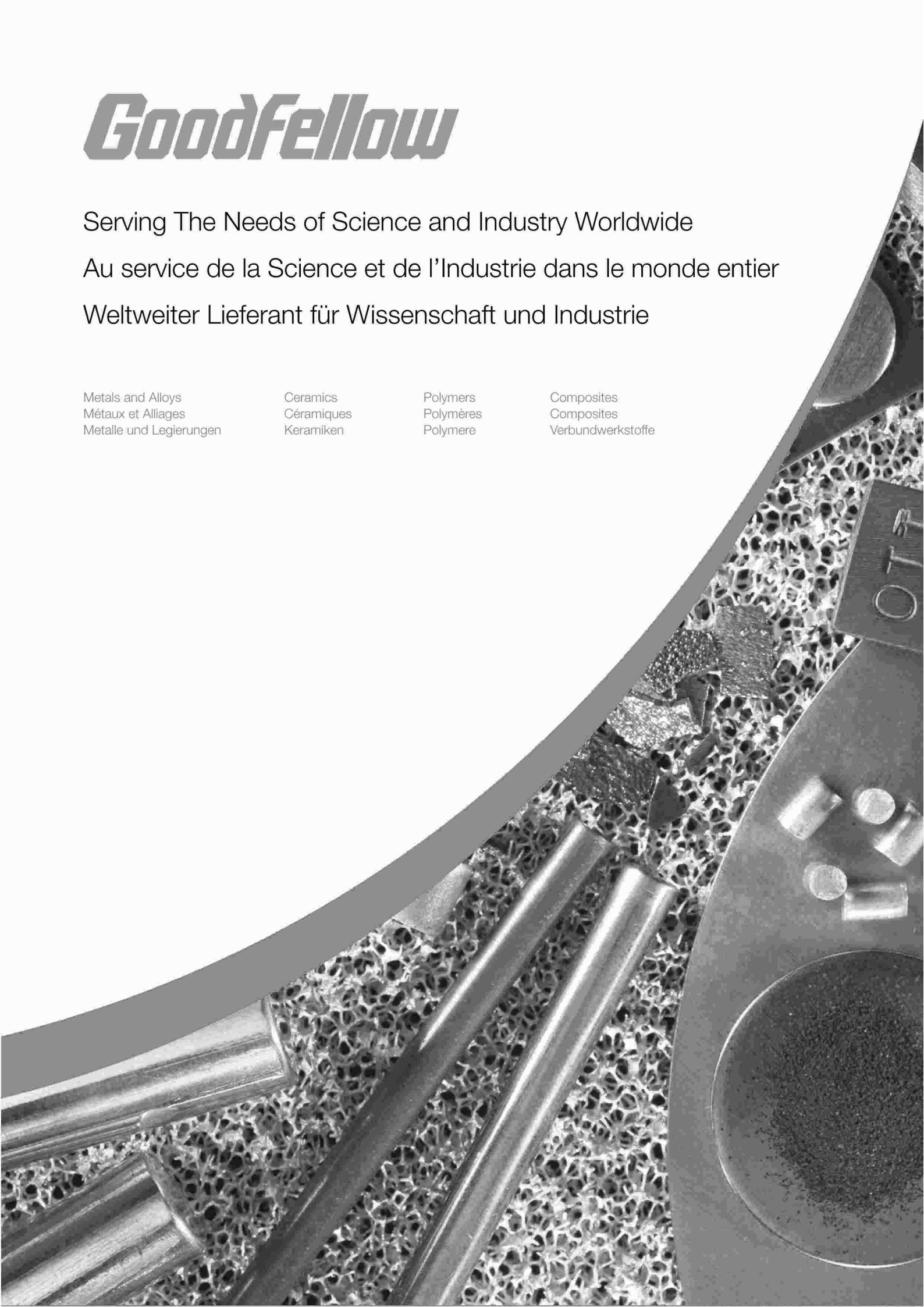
Goodfellow

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	Ceramics	Polymers	Composites
Métaux et Alliages	Céramiques	Polymères	Composites
Metalle und Legierungen	Keramiken	Polymere	Verbundwerkstoffe



Goodfellow

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Standard Price List for Polymethyl-pentene

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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 Catalog 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 Catalog at www.goodfellowusa.com.

Materials

Metals and Alloys

Goodfellow supplies virtually all of the pure metals from Aluminum 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 informatiion.

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 Catalog details those glassy metals which are available from stock; please contact us if you are unable to find the item you specifically require.

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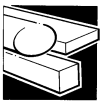
Product Descriptions



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

Ceramics: ANSI B18.6.7M-1985

Chopped Fiber

Fibers cut into short lengths called cut, staple or chopped fiber.

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:	±5%
Wall Thickness:	±5%
Outside Dimensions:	±5%

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%

Fiber

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

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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%
	0.010 - 0.050mm	± 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

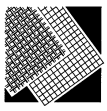
Thickness:	± 10%	
Size (linear dimension):	⩽ 100mm	± 1mm
	> 100mm	+ 2% / -1%

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.

Tolerances

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

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Product Descriptions

Metallized 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:	±10%	
Size (linear dimension):	< 100mm	±1mm
	⩾100mm	+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:	±30%
Size:	±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:	±30%
Size:	±20%

Monofilament

A single strand of a non-metallic material.

Tolerances

Diameter:	±20%
Length:	+5% / -1%

Non-Woven Fabric

Non-woven fabrics are made by methods other than weaving or knitting, the yarns and fibers 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.

Tolerances

Size (linear dimension):	< 100mm	±5mm
	> 100mm	±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

Ceramics: ANSI B18.2.4.1M-1979 (R1995)

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

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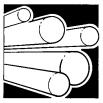
Product Descriptions



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

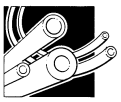
Diameter (standard):	± 5%
Diameter(precision):	see item

Sputtering Target

A high purity material used as a source for sputtering, a cold vaporization 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

Ceramics: ANSI B18.22M-1981, R1990 (Regular)

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Wire

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

Tolerances

Wire diameter:	±10%
Length:	+5% / -1%

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Hazards Information

HAZARDS

All materials listed in this catalog, 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 catalog, 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 catalog 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.

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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 in the catalog 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-cm^3.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.

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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 shown are in US$ and include free delivery by our standard 48 hour service except for those items marked as "special offer" or dangerous goods with transport restriction. Prices are subject to change without notice and orders will be invoiced at prices ruling on the date of despatch.

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

Delivery by UPS or Federal Express is included in the prices, although alternative methods may be used depending on the materials ordered.

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

Please inform us if you need to have your goods shipped urgently. An administrative charge will be made for this service, details can be found on our website.

Shipment

We aim to have all items listed in this catalog in stock in the quantities and sizes listed. We can only undertake to ship 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 shipped within 48 hours of receipt.

Non-delivery

If we have notified you of the shipment of goods and you have not received delivery within 5 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

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Order information

invoice with their first order. In order to establish a credit account we will require details of your bankers, along with two trade references.

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 and American Express.

VAT

VAT number for Goodfellow Cambridge: 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

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Order information

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

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.

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Company Details

Company Structure

The Goodfellow Group consists of four 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 North American customers.

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.

COMPANY DETAILS

Goodfellow Cambridge Limited

Ermine Business Park
HUNTINGDON
PE29 6WR
England
Registered in England and Wales no. 1188162
VAT registration GB 212 8527 79

Goodfellow SARL

229, rue Solférino
F-59000 Lille
France
Registered in Lille : RCS : B 381 486 836
Siren : 381486836
Numéro de TVA Intracommunitaire :
FR 06 381 486 836

Goodfellow GmbH

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Registered in Friedberg (Hessen) No. HRB 1309
Import VAT number DE112610478

Goodfellow Corporation

125 Hookstown Grade Road
Coraopolis, PA 15108-9302
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USA
A Pennsylvania corporation
EIN 23-2557381

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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 idemnified 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

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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 withold 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,

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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

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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

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Polymethylpentene
TPX®

Common Brand Names : TPX®

General Description : A linear isotactic polyolefin more properly called poly 4-methyl pentene-1 which is made by Ziegler-Natta type catalysis (see also General Information under Polyethylene - Low Density). Commercially available grades are copolymers. It is semi-crystalline, transparent and usually colorless (one common grade is slightly yellow), very light and - for a polyolefin - expensive. [Its density of 0.83g.cm^{-3} is very close to the theoretical minimum for thermoplastics].

Its properties are reasonably similar to those of other polyolefins, compared to which it is more brittle and more gas permeable. It has a higher melting point (240C) than most polyolefins and retains form stability up to temperatures close to this i.e. it softens more slowly with increasing temperature than is normal for thermoplastics. It has good release characteristics and good high frequency electrical and valuable acoustic/ultrasonic properties.

Applications include medical and laboratory apparatus, microwave components and cookware and electronic components.

Grades of TPX®

TPX® is available in a range of grades with different melt flow rates (MFR) covering injection molding, extrusion, blow moulding and coating. The list shown below gives details of the main processing methods and the MFR for each grade:

DX845 - MFR of 9 g/10 min - highly recommended for film extrusion, possible use for injection molding, fiber extrusion and blow moulding.

RT31 & RT31XB - MFR of 21 g/10 min - highly recommended for injection molding, possible use for film and fiber extrusion.

MX002 - MFR of 21 g/10 min - highly recommended for injection molding, film and mandrel extrusion, possible use for fiber extrusion and blow moulding.

MX002O - MFR of 21 g/10 min - highly recommended for injection molding and film extrusion, possible use for mandrel and fiber extrusion, and blow moulding.

MX004 & MX004XB - MFR of 25 g/10 min - highly recommended for injection molding, film and mandrel extrusion, possible use for fiber extrusion and blow moulding.

RT18 & RT18XB - MFR of 26 g/10 min - highly recommended for injection moulding, possible use for film and fibre extrusion.

DX231 & DX310 - MFR of 100 g/10 min - highly recommended for paper coating and possible use for fibre extrusion.

DX350 - MFR of 110 g/10 min - highly recommended for paper coating and possible use for fibre extrusion.

DX820 - MFR of 180 g/10 min - highly recommended for paper coating and fibre extrusion.

RT31 & RT31XB: low odor grades RT18XB, RT31XB & MX004XB: blue tint grades

Physical Properties	
Density	0.835 g cm^{-3}
Flammability	HB
Limiting oxygen index	17 %
Refractive index	1.463
Resistance to Ultra-violet	Poor
Water absorption - over 24 hours	0.01 %
Electrical Properties	
Dielectric constant @1MHz	2.12
Dissipation factor @ 1kHz	0.0002
Volume resistivity	> 10^{16} Ohmcm
Thermal Properties	
Coefficient of thermal expansion	117 x10^{-6} K^{-1}
Heat-deflection temperature - 0.45MPa	100 C
Heat-deflection temperature - 1.8MPa	40 C
Lower working temperature	-20 to -40 C
Specific heat	2000 J K^{-1} kg^{-1}
Thermal conductivity @23C	0.17 W m^{-1} K^{-1}
Upper working temperature	75-115 C

Mechanical Properties	
Elongation at break	15 %
Hardness - Rockwell	R85
Izod impact strength	49 J m^{-1}
Tensile modulus	1.5 GPa
Tensile strength	25.5 MPa
Chemical Resistance	
Acids - concentrated	Good-Fair
Acids - dilute	Good
Alcohols	Good
Alkalis	Good
Aromatic hydrocarbons	Fair-Poor
Greases and Oils	Good-Fair
Halogenated Hydrocarbons	Fair-Poor
Halogens	Fair-Poor
Ketones	Good-Fair

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Polymethylpentene
TPX®

Film

Permeability to Carbon Dioxide @25C	**$x10^{-13}$ cm^3. cm cm^{-2} s^{-1} Pa^{-1}**	**70**
Permeability to Nitrogen @25C	$x10^{-13}$ cm^3. cm cm^{-2} s^{-1} Pa^{-1}	5
Permeability to Oxygen @25C	$x10^{-13}$ cm^3. cm cm^{-2} s^{-1} Pa^{-1}	20
Permeability to Water @38C	$x10^{-13}$ cm^3. cm cm^{-2} s^{-1} Pa^{-1}	700

ME311050

Thickness . . . . . **0.05mm** Colour . . . . . .

Size

Web Code	Size	Quantity 1pc	2pcs	5pcs	10pcs	20pcs
882-713-874	150 x 150 mm	USD 150.00	USD 168.00	USD 208.00	USD 258.00	USD 322.00
339-226-050	300 x 300 mm	USD 185.00	USD 218.00	USD 286.00	USD 369.00	

Coil

Web Code	Width 600mm Length	Quantity 1 Reel
403-260-720	0.5 m	USD 279.00
407-597-350	1 m	USD 335.00
949-671-737	2 m	USD 418.00
708-968-973	5 m	USD 588.00

ME311070

Thickness **0.09mm**

Size

Web Code	Size	Quantity 1pc	2pcs	5pcs	10pcs	20pcs
621-114-054	150 x 150 mm	USD 162.00	USD 185.00	USD 235.00	USD 296.00	USD 375.00
639-257-574	300 x 300 mm	USD 209.00	USD 252.00	USD 340.00	USD 445.00	

Coil

Web Code	Width 610mm Length	Quantity 1 Reel
907-199-166	0.5 m	USD 324.00
399-894-466	1 m	USD 399.00
986-803-591	2 m	USD 508.00
350-441-638	5 m	USD 730.00

Disks

Web Code	Diameter	Quantity 10 disks	20 disks	50 disks
805-206-562	4 mm	USD 260.00	USD 281.00	USD 344.00
650-820-010	8 mm	USD 264.00	USD 288.00	USD 354.00
352-507-352	10 mm	USD 267.00	USD 291.00	USD 358.00
063-413-850	12.7 mm	USD 270.00	USD 295.00	USD 365.00
926-731-312	25 mm	USD 283.00	USD 314.00	USD 395.00
841-419-524	50 mm	USD 310.00	USD 352.00	USD 456.00
177-449-578	100 mm	USD 365.00	USD 430.00	USD 579.00

ME311100

Thickness **0.125mm**

Size

Web Code	Size	Quantity 1pc	2pcs	5pcs	10pcs	20pcs
692-976-872	150 x 150 mm	USD 171.00	USD 197.00	USD 253.00	USD 323.00	USD 413.00
239-547-995	300 x 300 mm	USD 226.00	USD 276.00	USD 377.00	USD 498.00	

Coil

Web Code	Width 670mm Length	Quantity 1 Reel
428-021-291	0.5 m	USD 365.00
152-253-319	1 m	USD 457.00
111-673-769	2 m	USD 589.00
577-310-252	5 m	USD 859.00

ME311150

Thickness **0.25mm**

Size

Web Code	Size	Quantity 1pc	2pcs	5pcs	10pcs	20pcs
134-763-154	150 x 150 mm	USD 194.00	USD 230.00	USD 305.00	USD 395.00	USD 516.00
810-141-728	300 x 300 mm	USD 272.00	USD 341.00	USD 480.00	USD 643.00	

Coil

Web Code	Width 660mm Length	Quantity 1 Reel
115-993-751	0.5 m	USD 451.00
266-892-145	1 m	USD 579.00
383-757-704	2 m	USD 762.00
526-227-042	5 m	USD 1132.00

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Film

ME311250 Thickness **0.5mm**

Size

Web Code	Size	Quantity 1pc	2pcs	5pcs	10pcs
181-195-388	150 x 150 mm	USD 226.00	USD 275.00	USD 376.00	USD 496.00
649-419-585	300 x 300 mm	USD 336.00	USD 431.00	USD 623.00	

Coil — Width 420mm

Web Code	Length	Quantity 1 Reel
177-448-452	0.5 m	USD 488.00
181-061-290	1 m	USD 631.00
632-655-741	2 m	USD 836.00

Disks

Web Code	Diameter	Quantity 10 disks	20 disks	50 disks
081-972-969	4 mm	USD 266.00	USD 290.00	USD 357.00
246-618-303	8 mm	USD 276.00	USD 304.00	USD 380.00
827-295-036	10 mm	USD 281.00	USD 312.00	USD 391.00
411-885-639	12.7 mm	USD 288.00	USD 321.00	USD 407.00
485-711-173	25 mm	USD 320.00	USD 366.00	USD 477.00
713-894-807	50 mm	USD 384.00	USD 457.00	USD 621.00
236-859-705	100 mm	USD 512.00	USD 638.00	

Sheet

ME313370 Thickness . . . . . **4.8mm** Condition. . . . . **Compression moulded**
Condition. . . . . **Mottled surface**

Size

Web Code	Size	Quantity 1pc	2pcs
866-885-126	70 x 70 mm	USD 375.00	USD 513.00
914-950-539	145 x 145 mm	USD 929.00	

ME313410 Thickness . . . . . **10mm** Condition. . . . . **Extruded**

Size

Web Code	Size	Quantity 1pc	2pcs	5pcs
423-247-575	100 x 100 mm	USD 364.00	USD 482.00	USD 705.00
313-353-974	150 x 150 mm	USD 477.00	USD 642.00	
677-487-760	300 x 300 mm	USD 992.00		

ME313415 Thickness . . . . . **12.7mm** Condition. . . . . **Extruded**

Size

Web Code	Size	Quantity 1pc	2pcs	5pcs
744-875-832	100 x 100 mm	USD 392.00	USD 522.00	USD 801.00
212-739-374	150 x 150 mm	USD 520.00	USD 704.00	
386-433-965	300 x 300 mm	USD 1223.00		

ME313435 Thickness . . . . . **22.5mm** Condition. . . . . **Extruded**

Size

Web Code	Size	Quantity 1pc	2pcs	5pcs
755-200-098	100 x 100 mm	USD 458.00	USD 615.00	USD 1053.00
431-951-474	150 x 150 mm	USD 618.00	USD 931.00	
934-996-558	150 x 300 mm	USD 907.00		

ME313470 Thickness . . . . . **30mm** Condition. . . . . **Extruded**

Size

Web Code	Size	Quantity 1pc	2pcs	5pcs
967-745-204	100 x 100 mm	USD 507.00	USD 685.00	USD 1338.00
018-097-160	150 x 150 mm	USD 693.00	USD 1188.00	
287-569-526	150 x 300 mm	USD 1163.00		

ME313200 Thickness . . . . . **2.0mm** Condition. . . . . **Injection moulded**

Size

Web Code	Size	Quantity 1pc	2pcs	5pcs	10pcs
346-795-601	60 x 104 mm	USD 246.00	USD 313.00	USD 461.00	USD 632.00
740-571-046	104 x 120 mm	USD 299.00	USD 388.00	USD 579.00	
639-104-818	104 x 180 mm	USD 339.00	USD 445.00		
910-134-201	104 x 370 mm	USD 435.00	USD 580.00		

Rod

ME317910 Diameter **6.35mm**

Size

Web Code	Length	Quantity 1pc	2pcs	5pcs	10pcs	20pcs
355-470-606	100 mm	USD 203.00	USD 254.00	USD 355.00	USD 483.00	USD 777.00
433-826-846	200 mm	USD 241.00	USD 309.00	USD 442.00	USD 696.00	
228-358-972	500 mm	USD 319.00	USD 418.00	USD 783.00		
544-869-511	1000 mm	USD 406.00	USD 631.00			

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Rod

ME317915 Diameter **9.5mm**

Web Code	Length	Quantity 1pc	2pcs	5pcs	10pcs
108-699-581	100 mm	USD 241.00	USD 309.00	USD 442.00	USD 696.00
587-443-455	200 mm	USD 297.00	USD 387.00	USD 656.00	
387-888-464	400 mm	USD 374.00	USD 529.00		
803-139-482	1000 mm	USD 619.00			

ME317920 Diameter **20mm**

Web Code	Length	Quantity 1pc	2pcs	5pcs
392-433-933	100 mm	USD 392.00	USD 576.00	USD 1271.00
054-244-211	200 mm	USD 556.00	USD 1015.00	
780-534-184	500 mm	USD 1214.00		

ME317925 Diameter **25mm**

Web Code	Length	Quantity 1pc	2pcs	5pcs
566-771-797	100 mm	USD 285.00	USD 370.00	USD 546.00
846-474-693	200 mm	USD 363.00	USD 480.00	
866-698-143	500 mm	USD 518.00		

ME317933 Diameter **33mm**

Web Code	Length	Quantity 1pc	2pcs
723-619-427	50 mm	USD 352.00	USD 469.00
610-422-611	100 mm	USD 449.00	

ME317938 Diameter **38mm**

Web Code	Length	Quantity 1pc	2pcs
991-834-717	50 mm	USD 426.00	USD 577.00
367-247-549	100 mm	USD 546.00	USD 933.00
605-248-380	200 mm	USD 903.00	

ME317950 Diameter **50mm**

Web Code	Length	Quantity 1pc	2pcs
809-333-280	50 mm	USD 518.00	USD 831.00
166-653-419	100 mm	USD 801.00	USD 1495.00
831-686-795	200 mm	USD 1464.00	

Granule

ME316300 Nominal Granule Size . . . . **3mm** Grade **RT18**

Web Code	Quantity Weight	1 Pot
383-805-181	200 g	USD 141.00
975-638-752	500 g	USD 181.00
954-843-704	1000 g	USD 225.00

ME316301 Nominal Granule Size . . . . **3mm** Grade **RT18XB**

Web Code	Quantity Weight	1 Pot
984-623-912	200 g	USD 141.00
682-118-519	500 g	USD 181.00
962-828-050	1000 g	USD 225.00

ME316302 Nominal Granule Size . . . . **3mm** Grade **DX820**

Web Code	Quantity Weight	1 Pot
840-856-900	200 g	USD 141.00
841-929-037	500 g	USD 181.00
245-200-816	1000 g	USD 225.00

ME316303 Nominal Granule Size . . . . **3mm** Grade **MX002**

Web Code	Quantity Weight	1 Pot
801-169-509	200 g	USD 141.00
334-346-923	500 g	USD 181.00
870-228-529	1000 g	USD 225.00

ME316304 Nominal Granule Size . . . . **3mm** Grade **MX004**

Web Code	Quantity Weight	1 Pot
399-637-968	200 g	USD 141.00
900-081-530	500 g	USD 181.00
683-786-755	1000 g	USD 225.00

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Granule

ME316305 Nominal Granule Size . . . . **3mm** Grade **DX845**

Web Code	Quantity Weight	1 Pot
219-462-591	200 g	USD 141.00
939-326-912	500 g	USD 181.00
705-443-819	1000 g	USD 225.00

ME316306 Nominal Granule Size . . . . **3mm** Grade **DX560M**

Web Code	Quantity Weight	1 Pot
797-480-610	200 g	USD 141.00
276-304-026	500 g	USD 181.00
316-031-153	1000 g	USD 225.00

ME316307 Nominal Granule Size . . . . **3mm** Grade **RT31**

Web Code	Quantity Weight	1 Pot
934-459-938	200 g	USD 141.00
572-533-164	500 g	USD 181.00
677-771-610	1000 g	USD 225.00

ME316309 Nominal Granule Size . . . . **3mm** Grade **DX310**

Web Code	Quantity Weight	1 Pot
272-645-172	200 g	USD 141.00
522-029-886	500 g	USD 181.00
218-997-174	1000 g	USD 225.00

ME316308 Nominal Granule Size . . . . **3mm** Grade **MBZ230**

Web Code	Quantity Weight	1 Pot
947-774-974	200 g	USD 146.00
438-254-849	500 g	USD 198.00
474-532-274	1000 g	USD 260.00

ME316310 Nominal Granule Size . . . . **3mm** Grade **MX001**

Web Code	Quantity Weight	1 Pot
567-870-369	200 g	USD 141.00
697-466-753	500 g	USD 181.00
969-912-841	1000 g	USD 225.00

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