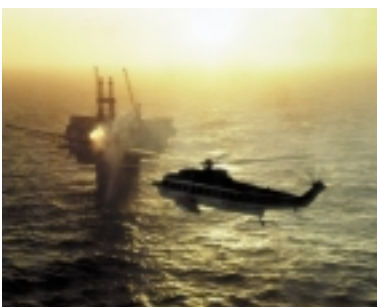


# CROSS

## Engineering seals for reliability in the extreme



# A Company at the forefront of technology

## Experience

Since the 1920's the Company has specialised in the design and manufacture of heat resisting wrought alloy sealing rings and associated products, combining technology with innovation to achieve world class quality and precision.

Cross engineers have pioneered and developed techniques and equipment designed to form wire and rod materials into rings with sections and gap configurations that could not have previously been successfully achieved. Our team of enthusiastic engineers performs a continuous programme of research and development into new techniques, building on the experience of many years.

Comprehensive in-house heat treatment, surface treatment and non-destructive testing facilities enable Cross to offer a complete service with the most stringent quality control at all stages. Consistently high standards are guaranteed by the use of statistical process control techniques from the raw material stage through to finished product.



## Research and Development

Cross pursues a policy of continuous research and development to meet the ever-increasing demands of modern international industry.

Substantial test facilities and laboratories enable Cross engineers to constantly achieve improvements in product performance. Cross research facilities also support customer development programmes to ensure that competitive technological advantages are maintained.

In addition to product and materials research, Cross technicians also design and develop special-purpose plant and processes for the manufacture of emerging new technologies.



The Company owns two modern factories at Bath and Devizes in the west of England. Currently there is a total working area of over 150,000 sq.ft. and the Company owns land at both sites to increase this considerably if needed. Well over 200 people are employed and there is an immense pool of specialist skill at all levels in the workforce.

## Environment

It is the Company's policy to continually improve the environmental awareness of its processes and procedures and to work towards accreditation to the appropriate standards.

# Advanced engineering, sealing solutions

For more than seventy years the Cross Manufacturing Company has been developing and manufacturing high quality products for applications demanding accuracy and integrity.

The Company was established by the late Roland Cross, a Chartered Engineer, who evolved a process for the manufacture of high performance piston rings from wire for his rotary valve engine. This process has been constantly developed and refined to provide a wide range of quality products.

The process has proved particularly suitable for the manufacture of components made from cobalt and nickel based alloys.

These alloys are used in high temperature conditions that are also corrosive. The sort of conditions encountered in aircraft gas turbines, power generation and other advanced technologies.



## Piston sealing rings



Designed and manufactured to consistently high standards in a wide variety of alloys to meet the most demanding service conditions.

## Large diameter metal seals

Designed for use in hot and difficult environments, diameters up to 1900mm (75") are in regular production, with larger sizes also possible.



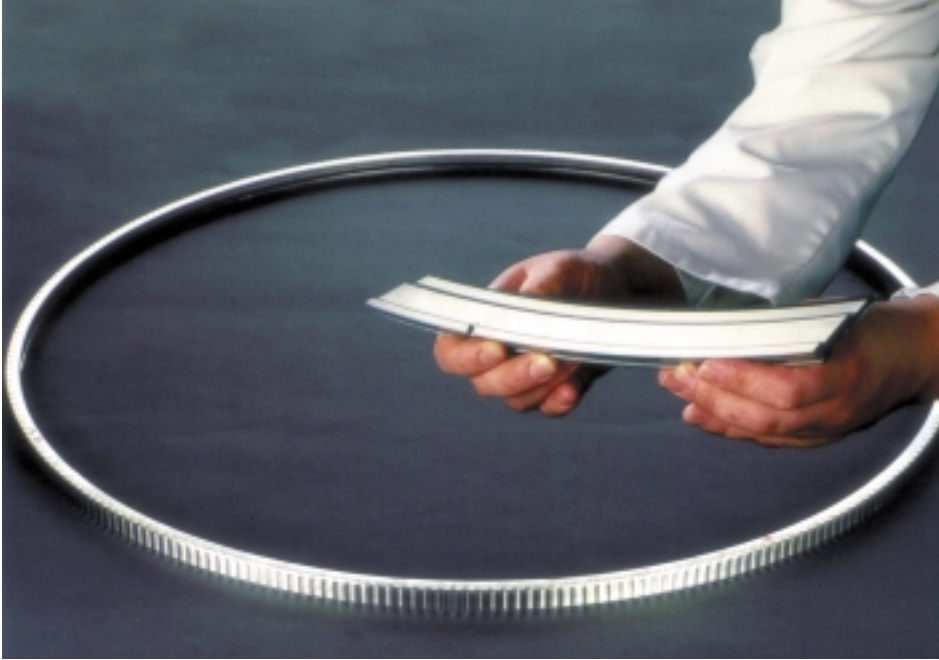
## Special lock washers

Cross single coil spring washers are manufactured by a special process to satisfy the standards of quality and performance demanded by high technology industries including aerospace and defence equipment.



# CROSS

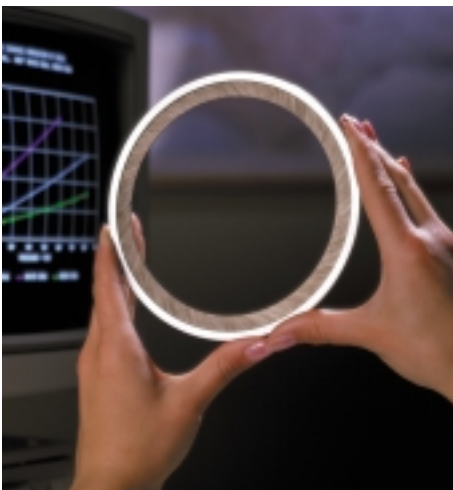
## Brush seals



Cross brush seals advance the efficiency of turbine machinery in many diverse applications.

Offering a marked improvement over conventional labyrinth seals, brush seals are proven to offer much reduced leakage and longer service life, particularly in high temperature applications.

The brush seal consists of a ring containing many thousands of heat resisting fine wires, which touch the rotor, thus forming an effective barrier against flow. The wires are arranged in such a way to be readily deflected radially while supporting the gas pressure in an axial direction. They are used in aerospace and large ground running turbines with shaft diameters up to 2000mm (80").



## High performance liquid filters



Cross filters are designed to filter solid particles from liquids automatically, efficiently and continually with minimal loss of liquid. The filter is made from a coil which offers a precise filtration gap and can open evenly along its length to allow 100% cleaning during every backwash. The system is particularly good at removing solid particles from water pipelines. It is being used with great success on the cooling pipework of the Channel Tunnel.

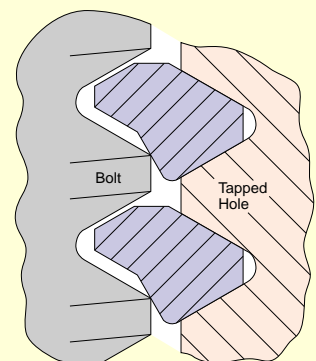
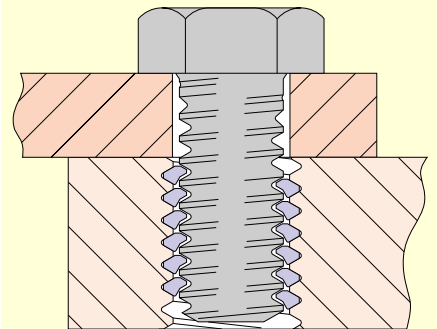
## Turbocharger sealing rings

Precision miniature rings provide turbine shaft sealing in car and commercial turbochargers. Millions of these rings are made at our Devizes factory every year.



## Spiralock® wire thread inserts

The Spirallock self-locking insert features a unique thread form that maintains bolt tension under severe vibration conditions and is used in applications where maximum integrity is essential such as helicopter gearboxes and aluminium gearbox casings on underground trains.



# Reliability cannot be a compromise

Cross products are found in industrial and defence industry applications wherever the ultimate in reliability and performance is essential.

Applications range from miniature high-precision seal rings in automotive turbochargers to complex large seals for the aerospace and nuclear power industries.

The choice of materials is complex and we offer advice based on our own experience and test results for the use of different alloys in a variety of conditions.

Typical materials held in stock include:

## Nickel Alloys

Nimonic 75, 80A, 90, C.263  
Inco 600, 625, 718, X.750, 901  
Waspaloy

## Cobalt Alloys

L.605 Haynes 25

## Carbon Steels

BS. S.201, S.203, S.204, S.205, S.135

## Stainless Steels

DTD.734 and 189, Type 304, 316, 321, 347, Nitronic 60, BS 420.S.45, DTD.326, Jethete

## High Speed Steels

2%, 14% and 18% Tungsten H.S.S.  
MI, M2

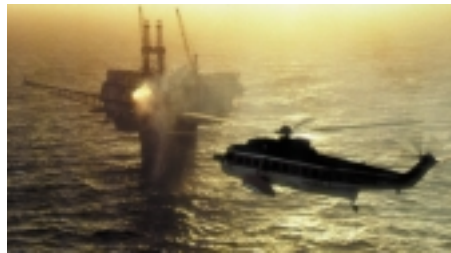
## Bronze

Phosphor Bronze,  
Aluminium Bronze

## Aluminium

3103, 6063

Material is held in our Quality Controlled Bonded Stores, each batch with appropriate aerospace and/or proprietary certificate.





## Cross Manufacturing Company (1938) Ltd.

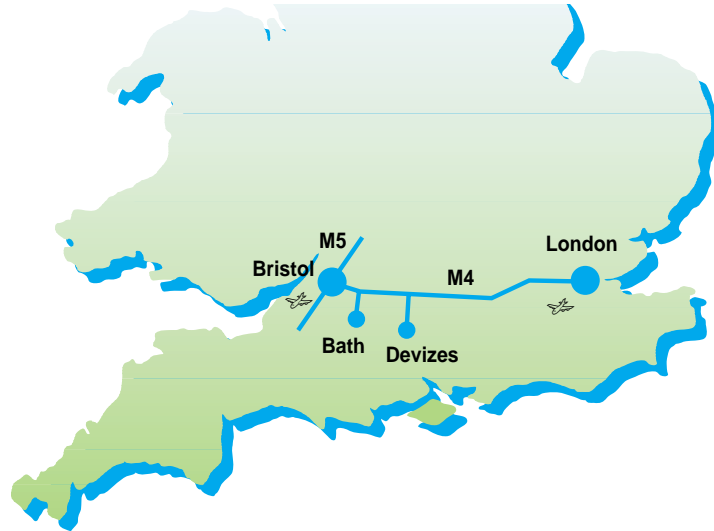
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Fax: +44 (0)1380 722405  
mail@cross-devizes.com



## World-wide recognition

Over 90% of output is exported directly or indirectly. Organisations which regularly use our products include:

ABB Kent Introl

Aermacchi

Alstom – Automation

Alstom – Energy Steam Turbines

Alstom – Energy Gas Turbines

Alstom – France

BMW – RR

BNFL

Bombardier Aerospace – Short Bros plc

Borg Warner Associates 3.K Warner

Borg Warner Associates Europe

Borg Warner Associates USA

British Aerospace – Airbus

British Aerospace – Military Aircraft

British Aerospace – Space

Cosworth Racing

Cummins Engine

Daimler-Chrysler Aerospace-MTU

Delphi Automotive

Dowty Group

Eaton S.A.

Eurotunnel

Fiat Aviazione

Flight Refuelling

GE Aircraft Engines

GE Energy Products - Europe

GE Power Systems

GE Engine Services

GKN Westland Aerospace

GKN Westland Helicopters

Hitachi

Holset Engineering

Honeywell (Allied Signal)

(13 aerospace and vehicle factories worldwide)

HS Marston Aerospace

IHI

IHI Turbo Italy

IHI Turbo USA

ITP

Kimberley Clark

Lentern

Microturbo

MHI Equipment (Europe)

MHI Automotive (Japan)

MHI Power

Rolls Royce

Rolls Royce Corporation (Allison)

Siemens Westinghouse

Siemens Power

Siemens Canada

Severn Trent

Sundstrand Aerospace

Senior Flexonics

Thames Water

TRW Lucas Aerospace

Turbomeca

Vickers Aerospace

Volvo Aero

Weir Pumps



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