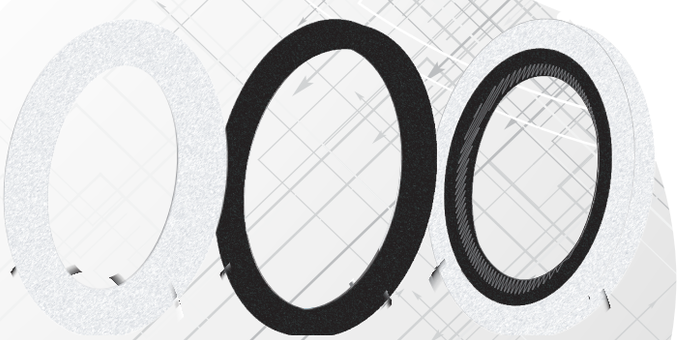
HUTCHINSON®

PRECISION SEALING

O-RINGS, X-RINGS, BONDED SEALS



We make it ***possible***

In-house Manufacturing, Safe Sealing

Hutchinson, O-Ring Division designs and manufactures precision sealing solutions such as O-Rings, X-Rings and Bonded Seals.

Our manufacturing process guarantees the origin and quality of our products and allows us to offer safe and reliable sealing solutions.

Full control of the process: from development to production, our technical expertise in industrial markets and our “zero defect” quality approach avoid any risk of leakage and ensure customers peace of mind.

The commitment of our teams to quality, safety, ethics and respect for the environment has contributed to making Hutchinson, O-Ring Division a leader in the supply of high-tech seals that meet the highest requirements, and this for more than 70 years.

Our sites have received following quality and environmental certifications:

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HUTCHINSON®

INTRODUCTION

We make it ***possible***

1 – HUTCHINSON GROUP

To meet the needs of its global customers on land, in the air and at sea, Hutchinson has been designing, developing and manufacturing high-performance solutions for over 160 years.

Our innovations cover a wide variety of demanding markets: automotive, aerospace, defence, energy, rail and industry in general.

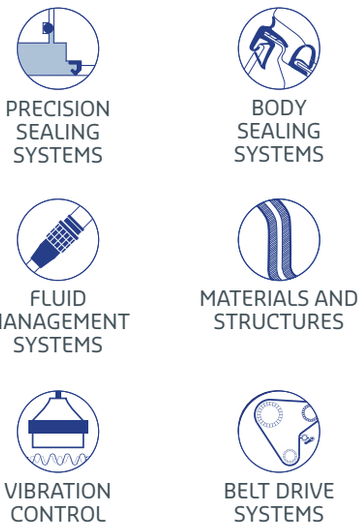
Hutchinson is a global leader in anti-vibration systems, fluid management and sealing solutions, our group stands out for its multi-market and multi-expertise approach, a source of synergies and added value.

A wide spectrum of resources

A corporate Research & Innovation Centre brings together more than 200 engineers and technicians conducting fundamental and applied research. Innovative solutions are developed by combining our key technologies and skills:

- Chemistry and Materials Science
- Mechanical engineering
- Composite Materials
- Transformation processes
- Vibration and Acoustics
- Thermal insulation
- Mechatronics

Our teams in our technical centres around the world develop high added value solutions. They dedicate their resources in applied engineering to our customers.



"Our ambition: participate in the mobility of the future that is safer, more comfortable, and more responsible."

> 44,000 employees

25 countries

100 sites

€211 million R&D

> €4,314 million turnover

www.hutchinson.com

oring.hutchinson.fr/en

2 – O-RING DIVISION

Leading manufacturer of precision solutions since 1907, Le Joint Français introduced the O-Ring in Europe in 1948 and has always kept control of all processes, from design to production, in its plants.

Le Joint Français joined Hutchinson in 1987, becoming the O-Rings & Bonded Seals Division (OR&BS) of the Precision Sealing Systems (PSS) activity.

Complete control of the production chain

We design, develop and manufacture sealing solutions such as O-Rings, X-Rings, special shaped seals, bonded seals, flange seals and tailormade seals.

Development of materials, design of optimal solutions, production of tools and parts, we are committed to the entire process to meet the most demanding requirements and guarantee the peace of mind and safety of our customers and users.

Global presence

The O-Ring Division has a global footprint with manufacturing plants in Europe (France, Portugal, Great Britain and Malta), Asia (China) and America (Mexico and Brazil). Our plants are ISO 9001 and IATF 16949 certified. Thanks to the one plant concept, our processes are the same in all the countries we work in, to ensure the same level of quality while keeping production close to our customers.

Alongside constructors and manufacturers around the world, our teams pursue the same objective: zero defects for safe sealing.

Designer and manufacturer of your future sealing solutions

3 - MARKETS

Aerospace

Food

Automotive

Heating

Chemicals

Cosmetics

Drinking water

Energy

Railway

Hydraulics

Off-Road

Oil & Gas

Pharmaceutical / Medical

Industrial pneumatics

Trucks

Power transmission

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4 – OUR COMMITMENT TO EXCELLENCE

In-house manufacturing

Compound development
Tooling conception
Parts manufacturing

Reliability

Trusted partner
70 years of experience
World leader in sealing solutions

Wide product range

Wide range of dimensions
All elastomer families
From unit to mass production

Presence

Exclusive contact person
Global presence, local production
Distributors' network

Expertise

Rubber formulation experts
Technical engineering support
Conception of tailormade solutions

Reactivity

5,000 references in stock
3 days express
10 days express

Quality

0 ppm approach
100% inspection
Approvals & certifications

Services

Assembly aid app
E-commerce website
Unit micro-engraving

5 – TOOLS, RESOURCES & DEVELOPMENTS

5.1 – Division website

Our website allows you to download the catalogue, brochures, data sheets, watch our videos, access mobile applications and use the *O-Ring* fitting tool.

In addition, you will find the latest news, upcoming trade fairs, as well as information on our products and markets.

www.oring.hutchinson.fr/en/

5.2 – E-commerce for distributors

An e-commerce website is available for our distributors and access can be given on request by your sales contact.

It offers following features:

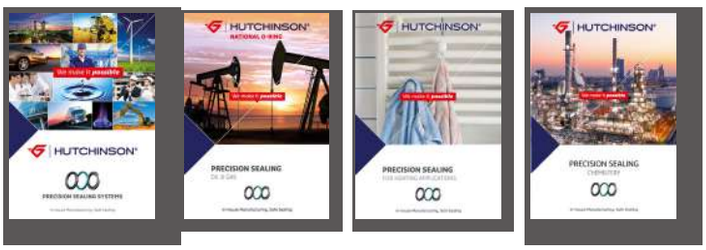
- Reference search
- Stock queries
- Price queries
- Determination of delivery time
- Placing orders
- Quick code entry
- Delivery management
- Order template management

www.ecommerce.oring.hutchinson.fr

oring.hutchinson.fr/en

5.3 – Documentation

Our documentation is available for download on our website.



ORD catalogue and general brochure

Market brochures

- Food industry
- Cosmetics
- Pharmaceutical
- Heating
- Oil & Gas
- Off-road
- Chemicals
- Medical

Product brochures

- Bonded seals
- PFS Flange seals
- Slimline sealing washers
- Surface treatments
- Stainless-steel bonded seals

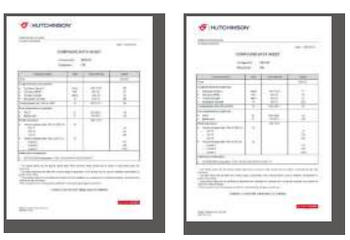
Specific compound flyers

- Drinking water, natural gas, oil & gas, etc.

Services flyers

- Assembly Aid Smartphone App
- Micro-engraving
- E-commerce
- 10 days express

Compound sheets



5.4 – O-Ring assembly aid tool

The O-Ring fitting assistance application allows you to define the groove geometry and select the correct O-Ring. Get it on your smartphone or on our website.

Groove geometry
Determine the machining dimensions according to the type of assembly (shaft, bore, cover, internal or external pressure)

Catalogue Dimensions
Consult the list of standard codes

Measure a seal
Determine the dimensions of an O-Ring using the camera on your smartphone and a coin

Fluid compatibility
Select the elastomer family suited to your fluid

Available on the App Store

GET IT ON Google Play

5.5 – Computer Aided Design (CAD)

The PARTcommunity CAD service is included on our website under the Services tab. It offers the possibility of configuring standard sealing solutions and exporting models in 2D and 3D formats (AutoCAD, Catia, Inventor, SolidWorks, Solid Edge, Creo, NX, etc.).

A PARTcommunity account is required to download the CAD model and can be opened directly from our website.

https://www.oring.hutchinson.fr/en/services/cao_services/

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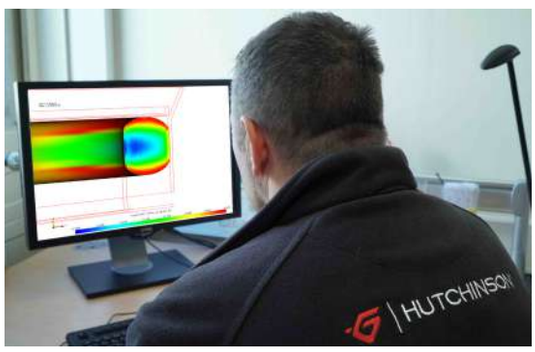
5.6 – Technical support

Our application engineers support our customers in the design and development of reliable and optimised sealing solutions:

- Help in the choice of compound
- Dimensional definition of groove and O-Ring
- Definition of seals and shaped parts
- Assembly analysis
- Surface roughness recommendations
- Proposal for surface treatments and cleanliness level
- Packaging adapted for assembly lines
- Development of customised solutions
- Finite Element Method calculations (FEM)
- Study of laboratory analyses
- Analysis after functional trials



Functional validation remains the responsibility of the customer.

Documentation available on request

- Parts drawings
- Material Specification Sheets
- Certificates of Compliance
- Certificates of Approval

Our teams of experts are able to respond to specific requests with recommendations tailored to your environment, application and fluids in contact.

6 – QUALITY

6.1 – Quality controls

Our production process is designed to meet the highest quality requirements with rigorous process parameters.

To move ever closer to 0 ppm, all seals are subject to both visual and automatic inspection.

6.2 – Material characteristics

Each step of the manufacturing process contributes to the quality and final performance of the seal. The final inspection in production ensures that parts comply with customer requirements and allows traceability information to be recorded.

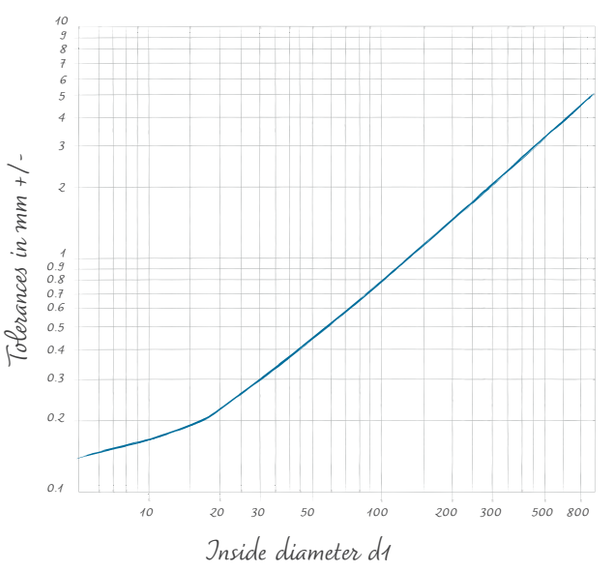
The material characteristics like hardness, density and compression set are measured according to the standards in force.

6.3 – Dimensional tolerances

The dimensional tolerance intervals are in accordance with ISO 3601-1:2012 class B for standard seals.

We can respond to requests for more stringent dimensions and tolerances.

Cross section Ø (mm)		Tolerances (mm)
from	to	
0.80	2.25	± 0.08
2.26	3.15	± 0.09
3.16	4.50	± 0.10
4.51	6.30	± 0.13
≥ 6.30		± 0.15



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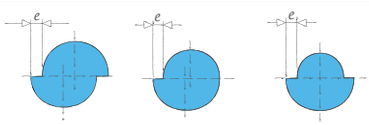
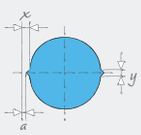
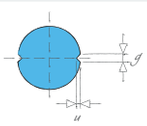
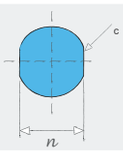
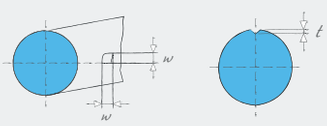
6.4 – Surface imperfections

The table below shows the maximum permissible limits for surface imperfections in standard O-Rings as defined in ISO 3601- 3:2005, N Grade.

These standards define maximum defect limits which do not impact usual industrial applications. Our standard O-Rings meet this standard.

We are also able to meet higher levels of requirements in case of specific needs (technical specifications, special applications, etc.) with S Grade.

Type of surface imperfection	Diagrammatic representation	Limiting dimensions	Maximum defect limits Class N O-Rings cross section diameter d2				
			> 0.8[b] ≤ 2.25	> 2.25 ≤ 3.15	> 3.15 ≤ 4.50	> 4.50 ≤ 6.30	> 6.30 ≤ 8.40[b]
Offset off-register, mismatch		e	0.08	0.10	0.13	0.15	0.15
Combined flash, offset and parting line projection		x	0.10	0.12	0.14	0.16	0.18
		y	0.10	0.12	0.14	0.16	0.18
		a	If the flash can be distinguished it must not exceed 0.07 mm.				
Backrind		g	0.18	0.27	0.36	0.53	0.70
		u	0.08	0.08	0.10	0.10	0.13
Excessive trimming Radial machining marks are not permissible		n	Departure from a circular cross section due to trimming is allowed provided that the resulting surfaces are smoothly blended and are within the size tolerance limits for d².				
Flow marks (radial orientation of flow marks is not permissible)		v	1.5[a]	1.5[a]	6.5[a]	6.5[a]	6.5[a]
		k	0.08	0.08	0.08	0.08	0.08
Non-fills and indentations Including parting line indentations		w	0.6	0.8	1.0	1.3	1.7
		t	0.08	0.08	0.10	0.10	0.10

[a] Or 0.05 times the O-Ring's inside diameter (d1), by using the highest.
[b] Limits of imperfections for cross sections < 0.8 mm or > 8.40 mm shall be agreed upon between manufacturer and customer.
[c] Rounded angles

7 – PACKAGING

As standard, our seals are packaged in bags or translucent microperforated polyethylene sheets.

Depending on customers requirements, we offer different types of bags: UV protective, microperforated, non-microperforated, zipped, translucent, opaque or in different colours.

We also offer packaging that meets severe cleanliness requirements according to ISO 16232-2018, such as double-bagging under laminar flow.

The quantity per bag is optimised as standard, but can be adapted to the customer's needs (unit bagging, for example). Our bags of parts are delivered in Galia boxes (A or C). We will consider requests for specific packaging (plastic tray or other).

Hutchinson has also developed specific packaging to ensure the flatness needed for seals in automatic assembly: inflated bag, tube, plastic shell, etc.

For distributors ordering standard catalogue parts, the quantity of O-Rings per bag is determined by the inner diameter.

8 – STORAGE

8.1 – Storage conditions

We recommend to store the seals in their original packaging until they are used.

Light

Avoid direct exposure to sunlight or intense artificial light.

Temperature

Maintain storage areas at a temperature between 5 and 35°C.

Avoid storing parts next to a heat source (radiator, lamp, etc.).

Atmosphere

Ensure relative humidity between 45 and 70%. The air should not contain aggressive vapours (solvents, acids, etc.). Because ionising radiation and ozone are particularly harmful, the vicinity of any device that is likely to produce ozone is to be avoided (mercury vapour lamps, high-voltage electrical equipment, spark-generating devices, etc.). Any mechanical constraint favours the action of ozone.

Deformation

Avoid stacking and folding bags.

8.2 – Storage time

The international standard ISO 2230-2002 recommends storage periods for elastomer-based products.

The families of materials are classified according to their sensitivity to ageing.

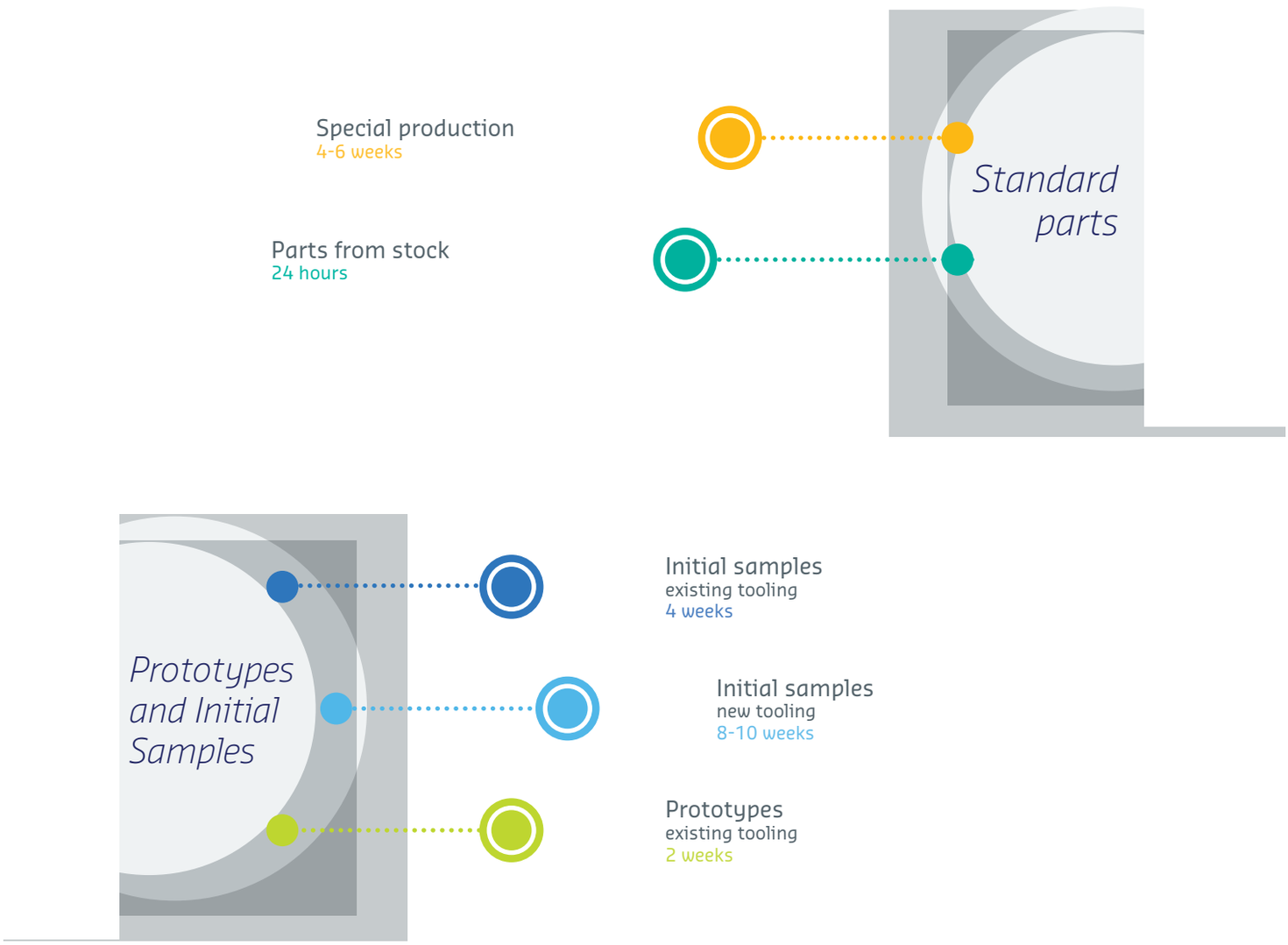
Longevity group	B	C
Storage characteristics	low sensitivity	very low sensitivity
Families of elastomer	NBR, HNBR, NBR/ PVC, CR, ACM, AEM, IIR	EPDM, FKM, FVMQ, Q, FFKM
Initial storage period	7 years	10 years
Extended storage period	3 years	5 years

The extension corresponds to the period for which a rubber product, appropriately packaged, may be stored after the initial storage period, before further inspection and re-testing is necessary.

9 – DELIVERY

To meet all needs, we offer a variety of fast production and delivery services.

We ship daily and regular grouped shipments are possible (weekly / monthly).



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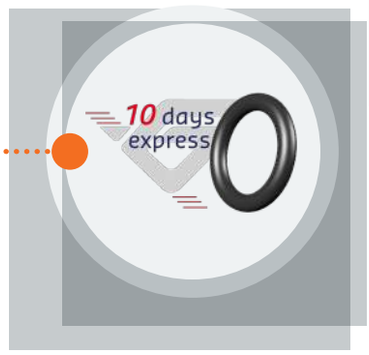
The 10 Days Express service allows delivery in under 10 days, including production and delivery, while maintaining our standard level of service: control, certificate of conformity, etc.

This concerns:

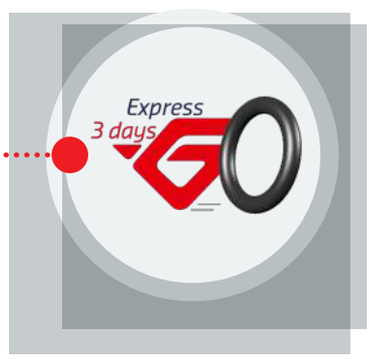
- All our compounds
- All dimensions
- All processes
- Order quantity up to 7,000 parts per reference, depending on the compound and dimensions
- Other possible specifications (cleanliness, packaging, etc.)

10 Days express
10 days



Our 3 Days Express service allows you to cope with urgent requirements, as we ship your parts within 72 hours for usually ordered parts, and one week for specific dimensions with mould creation.

3 Days Express
72 hours



With our 10 DAYS EXPRESS and 3 DAYS EXPRESS services, your O-Rings will be manufactured and delivered in just a few days!