



HUTCHINSON®

PRECISION SEALING SYSTEMS
E-MOBILITY

OUR COMMITMENT FOR EXCELLENCE



Material Expertise:
Formulation & Transformation



Engineering Support:
In-depth understanding
of customer challenges



Custom Design for
specific requirements



In-house Manufacturing



Global Footprint:
close to our customers



CONTRIBUTE TO FUTURE MOBILITY

Since 1853, Hutchinson has been supporting the automotive industry in its development and evolutions. Our expertise in materials, customized product design, and in-house manufacturing has made us a global leader in sealing technologies.

Today, we develop solutions to address the challenges of OEMs and Tier 1/2 equipment manufacturers linked to the electrification of vehicles.

- > **Safety:** We develop solutions ensuring the safety of electrical systems and batteries, addressing challenges related to high voltage and thermal events.
- > **Weight Reduction and Energy Efficiency:** Light weight electric vehicles are crucial for optimizing energy consumption. Hutchinson innovates with high-performance materials and components.
- > **Smart Thermal Management:** Our advanced

technologies contribute to maintaining optimal temperatures in batteries and electrical components.

- > **Acoustic Performance:** Reducing noise and vibrations in electric vehicles is a challenge we tackle with specific materials and components.
- > **Reducing CO₂ Emissions:** Hutchinson is committed to improving overall efficiency in electric vehicles, contributing to a cleaner future.

At Hutchinson, we design tailor-made sealing solutions for battery applications, thermal management, and E-powertrain. Our expertise allows us to anticipate technical challenges and offer sustainable innovations, for the future of mobility.



HIGH PERFORMANCE SEALING SOLUTIONS

BATTERY PACK



THERMAL MANAGEMENT



E-POWERTRAIN



FULLY INTEGRATED IN-HOUSE CAPABILITIES

With in-depth expertise in our customers applications, our teams provide complete support: from material formulation and design of customized solutions to in-house manufacturing. By managing every step of the process internally, we ensure superior quality, consistency, and faster turnaround times.

This integrated approach allows us to meet the diverse needs of small, medium, and large-scale production, offering our customers - big OEMs and Tier 1/2 suppliers - the reliability and innovation required to tackle the challenges of electrification in the automotive industry.

MATERIAL EXPERTISE

For 170 years, Hutchinson has been a leader and expert in rubber formulation and transformation, enabling us to give our products unique properties.

Today, we develop and transform tailored materials including a wide range of rubber compounds, foams, composites, bi-material and reinforced solutions to fully meet market specifications.

Development Capabilities

- > **Material laboratories**
 - Compounds formulations
 - Validation and certification
- > **Bonding & Surface treatment laboratories**
 - Defining the best combination of elastomer bonded to high-performance rigid metal or thermoplastic substrate
 - Reducing friction forces and seal wear
 - Enabling easy assembly
- > **Tribology laboratories**
 - Analyzing and reducing friction to extend material lifetime, improve assembly, and master acoustic signature



Our teams develop materials for customized sealing solutions that address the E-Mobility challenges such as dielectric fluids, innovative coolants, compliance with material regulations, and protection against thermal runaway.

Sustainable materials **revea**[®]

revea[®] materials are designed by Hutchinson to combine high performances and reduced environmental impact. The **revea**[®] materials contain recycled and/or bio-based ingredients while having at least the same performances as our traditional materials.



Rubber Family	Compound	Battery Pack	Thermal Management	Electrical Powertrain	Benefits	Parts Examples
ACM ACM HT AEM					PFAS free materials High temperature resistance up to 165°C	Shaft seals
AEM ACM FKM HNBR					Compatibility with dielectric fluids Sealing performance in aggressive fluids Formulation of materials adapted to the fluid (immersion cooling loop and oil-cooled electric motor)	Casing seals Flange seals Tube seals Pads
EPDM	7EP3328				Fire resistance (UL94-V0) Halogen free Color detection (blue)	Casing seals
EPDM	7EP3494				Fire resistance (UL94-V0) Halogen free Color detection (blue)	O-Rings
EPDM	15549				High runner compound (UL94-HB) Affordable high-performance compound Known and validated by many OEMs	Casing seals Flange seals
EPDM	revea [®] 6EP3330				Recycled & bio-sourced materials Limited CO ₂ footprint	Casing seals Flange seals
EPDM	5EP2397				Very low hardness Reduced assembly effort Self-lubricated	O-Rings
EPDM	6EP3413				Color detection Low hardness Reduced assembly effort Improved compression set in coolant	O-Rings Y-Rings
EPDM	7EP3417				Battery electrolyte resistance Acid resistance Low electrical conductivity	O-Rings Y-Rings
HNBR	7DT2364				Strong chemical resistance to aggressive immersive cooling fluids / dielectric oils Low temperature flexibility	O-Rings
Silicone Foam					Fire and high temperature resistance (UL94-V0) Advanced mechanical properties (shape memory)	Battery Spacers
Terflame	BT32 complexing with Mica				Fire resistance & electric protection	Blast shields
VMQ	6SL3331				Fire & temperature resistance (UL94-V0)	Casing seals

DESIGN & QUALIFICATION

Our development experts work closely with local laboratories and Hutchinson's Research and Innovation Centers on three continents. Thanks to their characterization resources, they carry out simulations, calculations and real tests to design the optimal solutions meeting customer specifications.



Product Design

Tailor-made solutions

- > Co-design / Simultaneous engineering
- > CAD design
- > Numerical simulation | F.E.A. 2D-3D

Technical Support

Applications Engineering

- > 16 technical centers around the world
- > 5 Research and Innovation Centers

Qualification & Validation

State-of-the-art testing for materials and products

- > Materials development: in-house testing equipment and mixing facilities to develop best-in-class materials
- > Functional test benches and measurement assessing the product performance: dynamic sealing for shaft seals up to high speed, static sealing, friction losses, assembly-disassembly efforts measurement, NVH benches, VTMS bench, ...
- > Expertise laboratories with state-of-the-art testing equipment dedicated to tribology, NVH, EMC, fire, chemistry
- > Final quality inspection: cleanliness measurement, Automate Visual Inspection, ...

IN-HOUSE MANUFACTURING

Our in-house manufacturing capabilities are the foundation of our commitment to quality and reliability. With an extensive global industrial footprint, including our own mixing facilities, we ensure that every step of our production process meets the highest standards.

By managing the process, from development to production:

- > We guarantee the origin and quality of our products, allowing us to offer safe and reliable sealing solutions. Our rigorous "zero-defect" quality approach ensures peace of mind for our customers.
- > We can implement modifications and introduce new products without relying on external suppliers. This agility ensures that we can meet our customers requirements promptly and efficiently.
- > We offer wide range of finishing options: surface treatments, cleanliness, flashless, die cutting, adhesives...



Optimal Quality

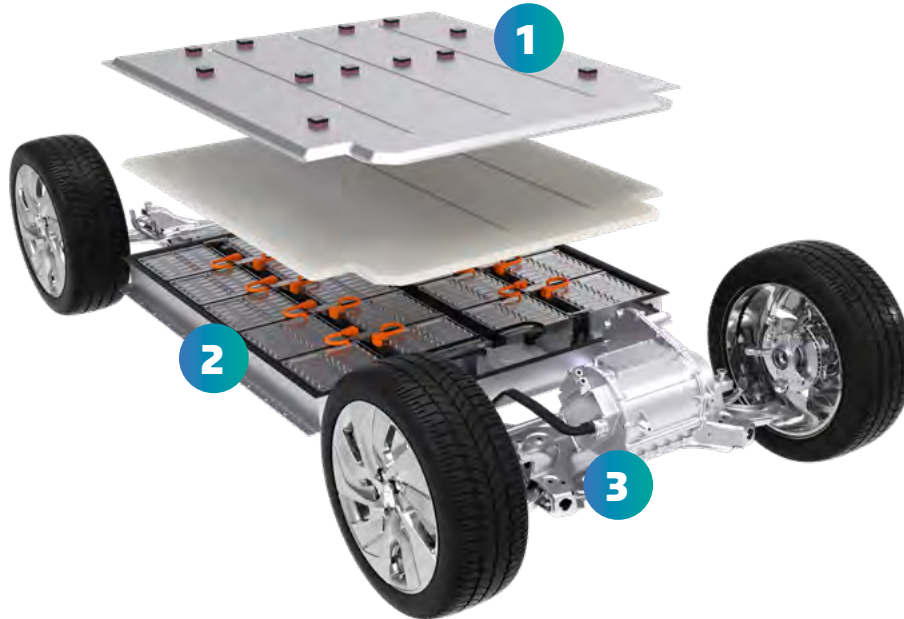


Full Product Personalization

BATTERY PACK



With **engineered materials**, we deliver innovative technologies to contribute to **higher energy efficiency, performance, extended autonomy, and safety** for batteries.



1 BATTERY COVER

Battery Spacers



Composite spacers protect the top cover from transportation and vibrations. They ensure the air gap between the battery pack cover and the car body in case of thermal runaway.

- > High temperature resistance: 550°C for 10 min
- > Fire resistance UL94-V0
- > Lightweight

2 BATTERY HOUSING

Battery Casing Seal



Molded rubber seal or die-cutted foam seal for battery pack top cover ensure water/dust tightness during battery lifetime.

- > Fire resistance: from UL94-HB to UL94-V0
- > High temperature resistance: up to 150°C for EPDM
- > Serviceability

3 BATTERY CONNECTIONS

Precision Seals for Quick Connectors



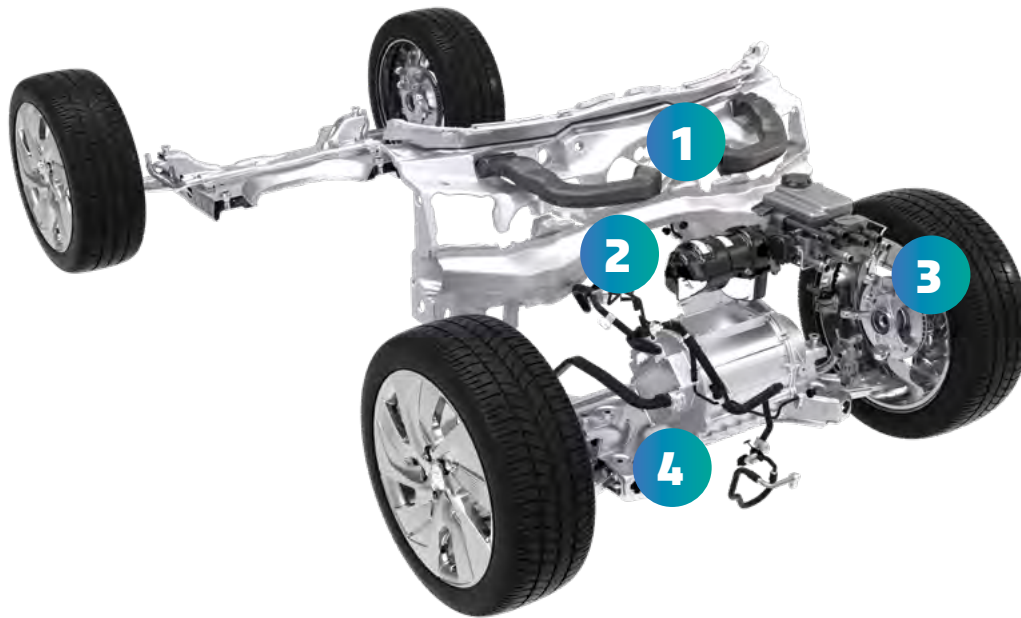
O-Rings and Y-Rings for static sealing

- > Interchangeable solutions: O-Ring / Y-Ring
- > Approved compounds by all major OEMs
- > Dimension complying with QC standards
- > Surface treatments for easy assembly

THERMAL MANAGEMENT



Our innovative systems provide **optimized thermal management** for BEV's, ensuring energy **efficiency, comfort, and safety** in harsh conditions.



1 HVAC

AAA Air Ducts



Acoustic Attenuated Air Duct for HVAC applications & battery thermal management

- > Up to 85% weight reduction
- > Up to 11dB acoustic attenuation
- > Flexible duct for easy assembly

2 E-COMPRESSOR

NVH Encapsulation



Acoustic Cover for BEV and PHEV

- > Enhanced passengers comfort
- > Acoustic and thermal insulation for E-compressors and E-motors
- > Lightweight and limited thickness
- > Tailormade design for quick integration



3 MULTIWAY VALVE

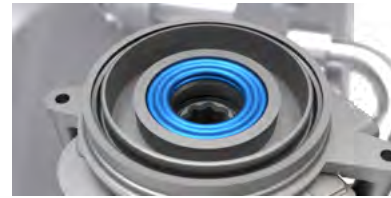
Low friction sealing pads for Valves & Modules



Thermal management multiway valve component - internal valve sealing system designed for high requirements

- > High sealing performance on a wide temperature and pressure range
- > Low torque-to-rotate even at low temperature
- > Low wear over complete lifetime
- > In-house torque and endurance testing

Y-Rings / X-Rings for Multiway Valves



Lip seals for dynamic rotative shafts

- > Low assembly forces
- > Surface treatment for torque reduction
- > Increased resistance to wear

4 CONNECTIONS

Slimline Sealing Washers



Slimline sealing washers for HVAC connectors

- > Easy and safe assembly
- > Resistance to very high pressure
- > Reliable tightness
- > Dimensions complying with standards

Flange Seals



High-pressure flange seals or PIP seals are complementary to O-Rings. I and H shapes are common designs.

- > Shock and vibration resistance
- > Easy installation
- > Sealing performance

Tube Seals



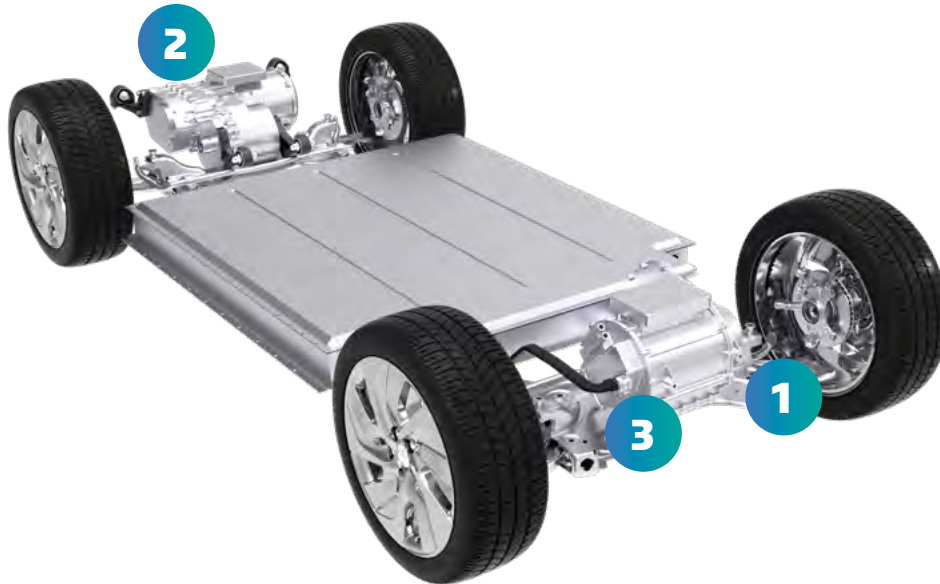
Connecting tube for quick and easy hand-assembly of subsystem on battery or E-powertrain, featuring rubber bonding to thermoplastic.

- > Easy assembly
- > Low assembly force even with high positioning tolerances

E-POWERTRAIN



Our **multiple expertises** enable us to design **high-performance** solutions for E-powertrain. They **extend service life, reduce size & weight, and improve passenger comfort.**



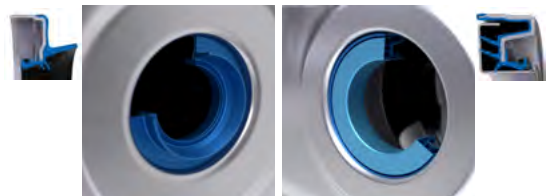
1 TRANSMISSION

Y-Rings for Quick Connectors



- O-Rings and Y-Rings for static sealing
- > *Interchangeable solutions: O-Ring / Y-Ring*
- > *Approved compounds for all major OEMs*
- > *Dimensions complying with standards*
- > *Reduced insertion forces with surface treatments*

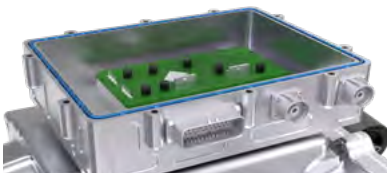
Output Shaft Seal & Cassette



- Shaft seals designed for output shaft
- > *Adapted to the application*
- > *Optimal efficiency*
- > *Protection against pollution*
- > *Safe assembly integrated design*

2 INVERTER

Inverter Casing Seal

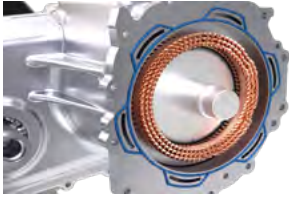


- Casing seal for power electronics housing covers
- > *Fire resistance: from UL94-HB to UL94-V0*
- > *High temperature resistance: up to 150°C for EPDM*
- > *Lightweight: low density EPDM*
- > *Wide range of design/material combinations*



3 E-MOTOR

Housing Seal



Housing seal for air, water or oil cooling E-motors, protecting the inner components

- > High-performance sealing
- > Easy assembly
- > Fire safe material
- > Serviceability

Oil Spray Ring



Multimaterial part made of a plastic ring and rubber seals

- > Retaining oil to rise its pressure
- > Continuous oil spray pattern on stator windings
- > Windings cooling

Grounding Ring



Conductive ring to divert bearing electric currents, avoid electronic disturbances & extend bearing service life

- > High conductivity: electrical resistance < 10 Ω
- > High linear speed up to 58 m/s
- > Compatible with oil
- > Low Friction
- > Robustness & Compactness

High Speed Shaft Seal



Shaft seal designed for high rotation speed applications

- > Low friction
- > High linear speed up to 58 m/s
- > Stands reverse gear

XL O-Ring



Sealing solution for E-motor cooling

- > Chemical resistance: coolant, transmission oil or dielectric fluid
- > Reduced insertion forces with surface treatment, self-lubricated compounds
- > Matching E-motor large diameters

Plate Seal



Housing seal over-molded on metal carrier

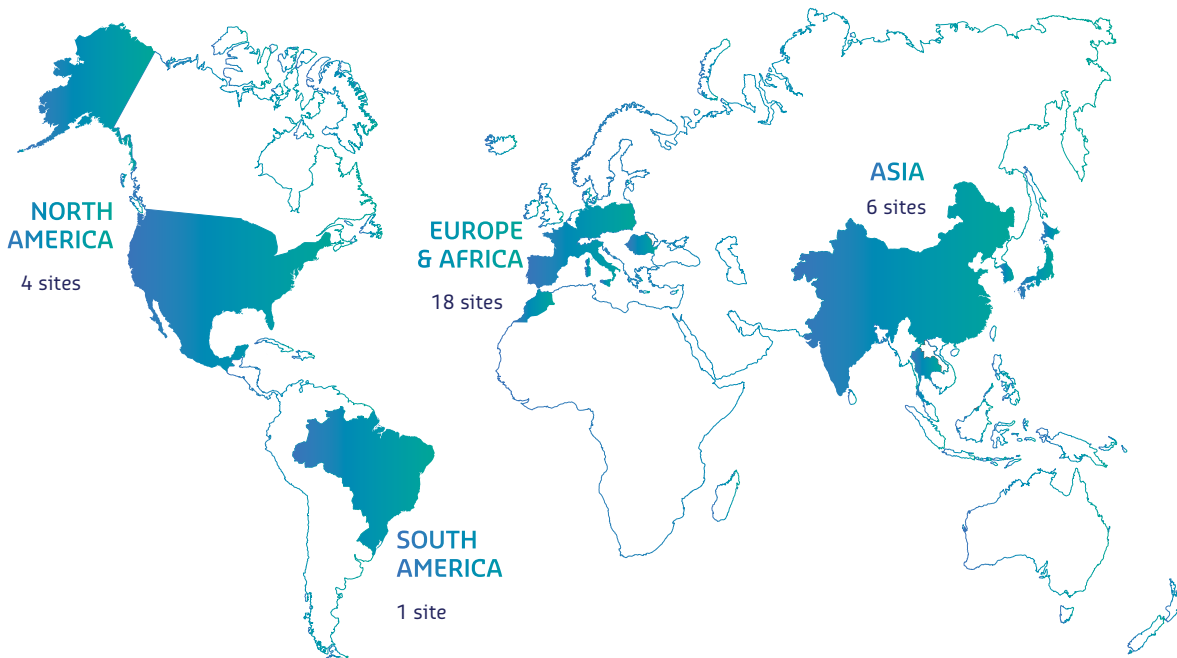
- > Easy assembly (automation allowed)
- > Robustness
- > Thin layer possible: down to 0.6 mm
- > No spacers needed to control compression
- > Design on demand

HUTCHINSON - PRECISION SEALING SYSTEMS

French leading manufacturer of sealing technologies, with a legacy spanning 170 years, Hutchinson Precision Sealing Systems specializes in providing O-Rings, static and dynamic seals, magnet rings, foams, and composites. Our expertise enables us to design customized solutions that ensure optimal performance, even for the most demanding customer requirements.

Our deep understanding of material science and customer challenges allows us to work hand-in-hand with the major players of the automotive, aerospace, defense, energy, and railway industries. This collaborative approach ensures that we deliver solutions that fully meet customers expectations.

Quality and reliability are the cornerstones of our operations. By fully integrating the development and manufacturing processes, we maintain the highest standards across all our products. Our global presence, with 28 sites in 15 countries and a dedicated team of over 6,650 employees, ensures that we are always close to our customers, ready to provide the support and expertise they need.



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KEY FIGURES ABOUT HUTCHINSON



40,000
Employees



25
Countries



100
Sites



€4.8 Billions
Revenue in 2023



5% of our revenue
invested in R&D

HUTCHINSON - Precision Sealing Systems
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