ADR

ALCEN

High Precision Ball Bearings & Electromechanical Systems for Specific Environments

AEROSPACE

technology in motion

AERONAUTICS

ADR offers many technical solutions for the aerospace industry.

Thanks to specific products (**integrated, thin-section** or **hybrid** bearings), it is possible to solve problems related to severe environments such as speed, extreme temperatures or mass.

Today we are present in various applications:

Engine - Auxiliary Power Unit

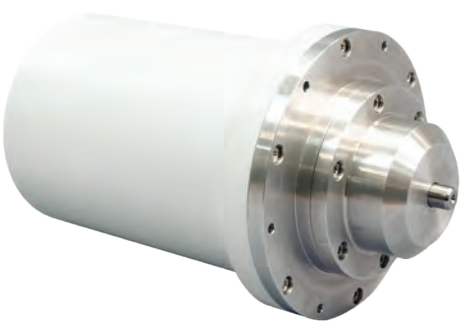
- Gear Boxes
- Fuel Control Systems
- Air Circuit Valves
- Turbochargers

Cockpit & Cabin

- Air Conditioning Units
- Pumps
- Instruments
- Flight Control Systems

Landing Gear

- ADR manufactures special ball bearings and electromechanical actuators (EMA) that are used in the uplock assemblies and braking systems.



SPACE

ADR is now a key driving force behind the success of all the major space programmes around the world.

Our technical solutions make it possible to take into account the specificities of this environment, such as reduction of weight and size, service life, extreme temperatures, high vacuum or high speed, while achieving exceptional levels of performance.

We offer you specific products such as ball bearings (Integrated, Thin Section, Miniature, Super Duplex) or actuators adapted to your needs.

Pointing Control

- Antenna Pointing Mechanisms (APM)
- Reaction Wheels
- Momentum Wheels
- Positioning Mechanisms

Rotating Instruments

- Filter Wheels
- Automated Arms
- Mirror Mechanisms

Power supply

- Integrated bearings and rotating actuators are used for Solar Array Drive Mechanisms (SADM).

Propulsion

- Precision mechanical components and super duplex bearings are used in rocket engine pumps (cryogenic LOX and NOX valves) and in the fairing actuators.

ADR TECHNICAL OVERVIEW

Materials & lubrications

Conventional and **specific** materials are used depending on your application or environment and **adapted to your specifications.**

RINGS	Stainless steel X105CrMo17, High Nitrogen Stainless Steel, X40CrMoVN16.2, High-speed steel Titanium, Surface hardened steel, etc
BALLS	Steels, Stainless steel, Ceramic Si_3N_4, Zirconium Oxide ZrO_2, etc.
SEALS	Reinforced PTFE with bespoke design requirements, Polymer, etc.
CAGES	Phenolic resin, PTFE, Peek, Self-lubricating cages (PGM-HT, VESPEL SP3), Steel and alloys, etc.

LUBRICATION	Fluid : Oil or Grease with high stability. Solid : MoS2, WS2, Silver, WC/C, etc.

LUBRICATION WITH LOW DEGASSING.

ANTI-FRICTION AND ANTI-CORROSION COATING.

CRYOGENIC, EXTREME TEMPERATURES AND VACUUM COMPATIBLE MATERIALS.

Integrated design & Electromechanical Actuators

ADR has the ability, to offer solutions with an **integrated design**.

These integrated bearings bring many benefits such as the improvement in **stiffness** depending on the chosen design, the excellent **mass/dimensions/capacity ratio** or even the increase in the **rotational accuracy**, the **guiding and in the stability.**

Thanks to its knowhow in integrated systems, ADR is able to design and to develop **linear and rotating electro-mechanical actuators.**

These solutions are custom-made and meet the aeronautical and space requirements.

Controlled environments

Each ADR product is assembled in clean rooms **categorised Class 100/ ISO 5 to Class 100 000/ISO 8.** This allows to obtain a very low and stable friction torque.

As quality is the priority of ADR, we also are **ISO 9001** and **EN 9100** certified.

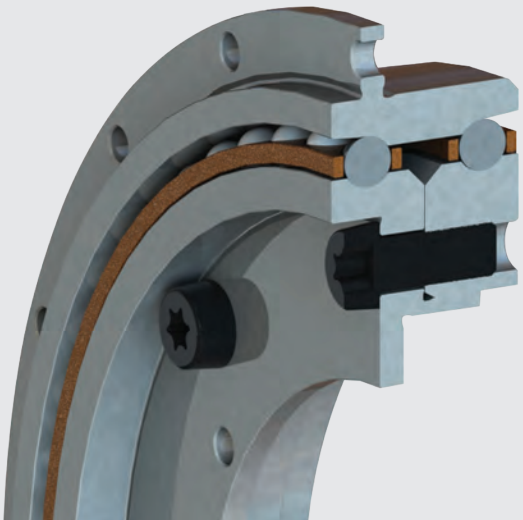
afaq ISO 9001 Qualité AFNOR CERTIFICATION

afaq EN/AS/JISQ 9100 Aerospace AFNOR CERTIFICATION

A perfect mastery of the preload

One of the key competences of ADR is its ability to undertake fully-measured and fully-controlled **preloads.**

This operation will make it possible to increase the **precision of rotation** as well as the **overall stiffness** of the bearing while keeping a perfect control of the friction torque.



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