

Groupe **BMP**



**Bodet
Aero**

Socitec Products

Boarding for extreme

- > Sensing
- > Operate
- > Control

Groupe *Bmp*



**Bodet
Aero**

- > **Mechanic**
- > **Electro mechanic**
- > **Hydraulic**

Your equipment design

Customers are calling more and more on the expertise of specialists to find complete solutions to their needs and requirements.

Our design team is specialised in the design of on-board mechanical and electro mechanical equipment for harsh environments.

Their in depth knowledge of rotating machines, whether for sensing, operating or controlling, makes them a partner you can count on for developing your equipment .

Efficient project management

BODET AERO has a thorough experience of project development having made equipment for large customers, especially aeronautical ones. The project managers can become involved from the very start of the design process and can continue to be at your side all through the different phases of development using their well known and well tried rigorous methods, until industrialisation and manufacturing.

Well known expertise

BODET AERO can bring you its 25 years of experience to help in your new developments, especially with electromagnetic sensors. More than 25 000 units are currently in use by more

The extreme



than 100 airline companies. BODET AERO position itself on being a complete service provider and will be your partner throughout the lifetime of your products.

A complete service

BODET AERO, a real development partner for your projects, offers you under one roof, a whole palette of skills for the design, implementation, testing and manufacturing of your equipment.

Through its integrated structure, BODET AERO can look after all the different stages of product development from feasibility studies to large scale production. The direct links between the different departments guarantees a rapid optimisation in products and services meaning that the equipment has been fully tested from the moment they enter into service.

Quality control

BODET AERO's quality control has been officially recognised and holds ISO 9001 v2000 and EN 9100 : 2003 certificates.

As well its different homologations the company is regularly audited by their large clients for quality control as well as for manufacturing procedures.





is our domain

The strength of a group

BODET AERO is part of the BMP Group, which includes as well Socitex Vibrations (Protection against shocks and vibrations, Design and manufacturing of special shock absorbers) and Atlas productions (Aeronautical equipment assembly and manufacturing, winding, in Morocco). Using the internal synergies of the Group we can suggest the best solutions whether from using the engineering expertise of one or from using the low production costs of another.

Main clients :

- A.B.S.C - (USA)
- AIRCELLE
- DASSAULT
- EUROCOPTER
- GOODRICH
- H.A.L - (India)
- LIEBHERR
- MESSIER BUGATTI
- MOOG - (GB)
- SCHLUMBERGER
- SIEMENS
- SOPRA
- THALES

From Development to testing

In our business, harsh environments, it is very important to have an in depth knowledge of the types of environments likely to be encountered as well as a complete understanding of the technologies and materials involved.

It's for these reasons that BODET AERO is equipped with test facilities so it can guarantee the correct performance of the designed equipment. We can carry out internal tests for, climatic effects, vibration, endurance and debugging of equipment on specially designed test benches.

Its experience in the "on board" sector allows it to take charge of all the necessary rating tests according to current standards (DO 160, for example) and, if needed, it can call upon the expertise of outside certified laboratories.



Sensing

speed

BODET AERO, through its SOCITEC® tachometers, are the European leaders in the measurement of aircraft wheel speed. Wheel speed measurement is essential for aircraft braking system efficiency. This equipment installed in aircraft landing gear close to the brakes, undergoes extreme climatic and vibration conditions during take off and landing. Temperature can change from -40°C to +150°C during landing and vibration levels can reach 400 m/s². Obviously this equipment needs to be extremely reliable given its safety implications (MTBF > 50 000h).

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1 2 3 4 5

Brake system tachometers
AIRBUS A320, A340, A380,
Dassault Falcon 2000, F7X, Rafale.

position

BODET AERO manufactures Pedal Transmitters : this equipment converts the pilots foot position into a proportional electrical signal which enables the braking calculator to apply the amount of braking to the aircraft chosen by the pilot. Here also safety is paramount and more than 500 000 hours in service normal.

BODET AERO also manufactures hardened optical encoders measuring speed and position under extreme temperatures (oil rigs of -40°C to $+80^{\circ}\text{C}$) or under shocks and vibrations (railway wheels undergoing shocks of 1000 m/s^2 during 6ms), whilst at the same time remaining very accurate (better than $\pm 0.01\%$).

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- 6 Brake pedal transmitter
- 7 Oil rig encoder
- 8 High resolution wide temperature range encoder
- 9 Railway wheel speed transmitter



service and efficiency

Operate

In applications using motors or sensors, it is often necessary to change gear ratios. BODET AERO, through its historical expertise in small size gear manufacturing, has developed reduction gears specially adapted for on board applications, with ratios that can go from 3 to 500 and more. For example in a harsh aeronautical environment, the performance one of our reduction gears is such that play is limited (3' angle) during its life (30 million cycles).

BODET AERO's electro mechanical know-how means it can also design electrical motors on specification. Several examples of which are : a bus steering motor, which forms part of an automatic steering system or even a brushless motor the key part of a linear actuator for flight control. In addition to harsh environments, high performance characteristics are also required in these situations, such as very low residual torque (1% of useable torque) or an excellent power to weight ratio (more than 200 W/Kg).

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11



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- 10 Reduction gears for an aeronautical Horizontal Stabilisation System
- 11 Brushless motor for a linear actuator
- 12 Steering motor for public transport

Control

Solid experience of fluid control coming from the TECHNIFLOW® products, means that BODET AERO can develop special equipment for safety applications. The Check valves, relief valves and shuttle valves developed by BODET AERO are tested under very severe conditions and are very reliable.

Another example of harsh conditions can be illustrated by the pressure regulator which works under permanent conditions of 8 bars at 200°C.

13



14



Ø 9,5 mm

15



Ø 7 mm

Ø 9,5 mm



13 High Pressure Regulator

14 Pilot valve

15 Relief Valve

Bodet Aero is located

- 350 Km south-west of Paris
- 1h30 from Paris by high speed train (TGV)
- 2h30 from Paris on the A11 motorway
- 1h from the international airport at Nantes

- to obtain a map please consult our web site :
www.bodet-aero.com



		
<p>Design and manufacturing of individual parts and complete mechanical assemblies</p>	<p>Design and manufacturing of shock absorbers</p>	<p>Manufacturing of parts, mechanical assemblies and electrical windings</p>
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