



Shaping a better future



**INNOVATIVE LARGE
MILLING MACHINES**

www.dufieux.com

DUFIEUX manufactures large 5-axis milling machines.

Innovations and the integration of the latest technological advances enable DUFIEUX to provide its customers cutting-edge solutions for aluminum, titanium, and composite applications in the aerospace industry.

With numerous worldwide installations, DUFIEUX has established itself as a proven partner for its customers. The company develops long-term relationships, resulting in a mutual learning process and successful turnkey projects.

Using its Grenoble (FR) facilities, DUFIEUX, through the Aries Manufacturing branch, also specializes in the manufacturing of fuselage panels to assist clients in meeting their production targets.



Innovative large milling machines

4

MIRROR MILLING
SYSTEM (MMS®)

11

PERFORM-A

6

MANTIS

12

PANEL MANUFACTURING

7

PERFORM FIBER

13

MANUFACTURING
ENGINEERING

8

CORTIS

14

TURNKEY SOLUTIONS

9

C-WALL A

15

CUSTOMER SUPPORT

10

PERFORM-TI

MIRROR MILLING SYSTEM (MMS®)

As a replacement to the chemical milling process, DUFIEUX partnered with AIRBUS and designed the outperforming Mirror Milling System - a patented aluminum fuselage panel production process. The MMS® technology enables the high-speed milling, drilling and routing of doubled-sided 3D aluminum panels in a single setup within a single machining cycle.



Features :

- High-speed panel horizontal milling center
- Patented face-to-face numerical axes (2x 6 axes) with ultra-precise positioning
- Dynamic machine with linear motors
- Universal & stress-free loading/unloading system for a large variety of panel shapes
- Fully automated MMS® cell or stand-alone MMS® configurations
- Palletization system - off-cycle panel handling and clamping

Key factors :

- Up to 10x faster than chemical milling
- Outstanding part milling success rate for all panel types
- Optimized cycle time without the need for operator interventions
- Proven process – more than 100,000 panels produced on more than 400 references
- Profit from resale of recycled chips
- Eco-friendly, EUROLIFE award recipient



MACHINE RANGE :

- MMS Small : Y stroke - 2500 mm , X stroke - 4800 mm to 8800 mm
- MMS Medium : Y stroke - 3000 mm , X stroke - 6800 mm to 12800 mm
- MMS Large : Y stroke - 4150 mm, X stroke - 8800 mm to 14800 mm

GREENER, FASTER, CHEAPER !



MANTiS

Combining two 5-axis machines into one, a laser machine and a mechanical milling machine, the MANTiS is dedicated to the trimming and drilling of 3D titanium panels. Coupling these two processes together results in a fully efficient, integrated and flexible solution.



PERFORM FIBER

High precision 5-axis gantry for the trimming & drilling of large dimension composite parts in dry or wet processes.



Features :

- Dual-technology vertical trimming center
- 5-axis high-speed milling cell
- 5-axis high-speed 3kW fiber laser cell
- Dynamic & precise trimming center
- Easy-to-use equipment minimizing operator errors (1 machine, 1 program)
- Palletized pendular mode & synchronizable tables
- Simultaneous operations on two parts

Key factors :

Reduced operating costs and improved part quality
Faster cycle times
Two trimming operations in one setup
Easy and immediate setup for production changes
Space-saving solution

Features :

- Vertical milling gantry
- Innovative machine design for the full containment and management of composite dust
- Machine environment designed for dry composite cutting or a high-flow coolant system
- Multiple pendular configurations

Key factors :

Clean workshop protected from the pollution of composite dust
Milling of long and wide parts
Fully integrated dust vacuum system for dry applications
Corrosion resistant in wet applications
Possible combination of both dry and wet processes



PART SIZE RANGE :

- MANTiS 4400 : 1800 mm x 1600 mm
(synchronized table mode : 4400 mm x 1600 mm)



PART SIZE RANGE :

- Portal : up to 25000 mm x 7000 mm
- High Crossrail : up to 25000 mm x 5000 mm

CORTiS

Through a combination of innovative concepts, DUFIEUX's compact and patent-pending 5-axis horizontal spindle milling center is the future solution for the high-end machining of complex 3D titanium parts.



Features :

- Hard material horizontal milling center
- High rigidity & damping structure
- Constant overhang ram
- High pressure coolant (120 L/min, 80 bar)
- High power & torque spindle (70 kW, 1400 N.m)
- 600 cm³/min material removal rate per spindle
- Mono- or dual-spindle configuration
- Hydrostatic axes
- High-capacity tool changer
- Fully automated palletization system – no downtime
- Cell or stand-alone configuration

Key factors :

Designed for optimal cost per part
Superior productivity to vertical multi-spindle profilers
Constant rigidity across the entire working area
4 times longer tool life
Improved part finishing quality
Easy chip evacuation and great machine ergonomics
Automatic head changer with 2800 N.m 3-axis accessory



PART SIZE RANGE :

- CORTiS 1000 : up to 6000 mm x 1000 mm (dual-spindle : up to 3000 mm x 1000 mm)
- CORTiS 1500 : up to 6000 mm x 1500 mm (dual-spindle : up to 3000 mm x 1500 mm)
- CORTiS 2000 : up to 6000 mm x 2000 mm (dual-spindle : up to 3000 mm x 2000 mm)

C-WALL A

DUFIEUX's high-speed 5-axis horizontal milling center, based on the MMS's architecture, brings a proven expertise to the machining of complex 3D aluminum parts.

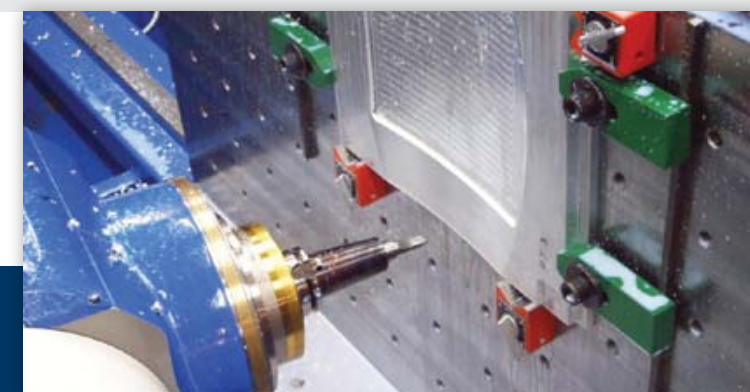


Features :

- High-power horizontal milling center
- Stiff & dynamic machine with linear motors
- Fully automated palletization system – no downtime
- Extremely high accuracy
- Cell or stand-alone configuration
- Shared structure for back-to-back setup

Key factors :

Productivity focused
Fast removal of large volumes of material
Flexible configuration – acceptance of a wide variety of raw part dimensions
Optimal dimensional & surface quality, even for thin walls
Ultra-compact solution
Safe & ergonomic machine with full enclosure
Easy chip evacuation



PART SIZE RANGE :

- C-Wall A 2000 : up to 14000 mm x 2000 mm
- C-Wall A 2500 : up to 14000 mm x 2500 mm
- C-Wall A 3000 : up to 14000 mm x 3000 mm

PERFORM-Ti

As one of DUFIEUX’s most proven machines, this 5-axis multi-spindle gantry is designed to achieve outstanding results in the milling of complex titanium parts, also referred to as “Titanium smooth cutting”.



Features :

- Hard material multi-spindle vertical milling machine
- Configuration range up to 5 spindles
- High damping capacity & rigidity
- Direct Drive spindle system
- High torque & high power spindles (up to 70 kW, 1400 N.m)
- Large section guides

Key factors :

- Simultaneous multi-part machining
- No special foundation needed
- Proven process



PART SIZE RANGE :

- PERFORM-Ti : up to 23000 mm x 5000 mm

PERFORM-A

As one of DUFIEUX’s most proven machines, this 5-axis multi-spindle high-speed milling gantry is designed to achieve outstanding results in the mass production of aluminum structural parts.



Features :

- Aluminum multi-spindle vertical milling machine
- Configuration range up to 5 spindles
- High dynamic & rigidity
- High power electrospindles (up to 80 kW, 30000 rpm)
- Suited for all applications from roughing to high accuracy finishing
- Vacuum chip evacuation
- Precise linear motion guides
- Integration of a large variety of electro-spindles
- Enclosure of the milling area

Key factors :

- 24L/min material removal rate for the 3-spindle configuration
- Simultaneous multi-part machining
- Safe operator access to the working area during the milling cycle
- Proven process



PART SIZE RANGE :

- PERFORM-A 4500 : up to 23000mm x 4000 mm
- PERFORM-A 6500 : up to 23000mm x 6000 mm

PANEL MANUFACTURING

DUFIEUX manufactures pocket milled, drilled, and trimmed fuselage panels in its facilities in Grenoble (FR) thanks to its 2 MMS machines.

For all machining of pocketed panels, DUFIEUX controls the entire process from simulation and programming up to the delivery of finished parts.

DUFIEUX offers pocket milling, drilling and trimming services in its Grenoble (FR) facilities.

Panel Dimensions :

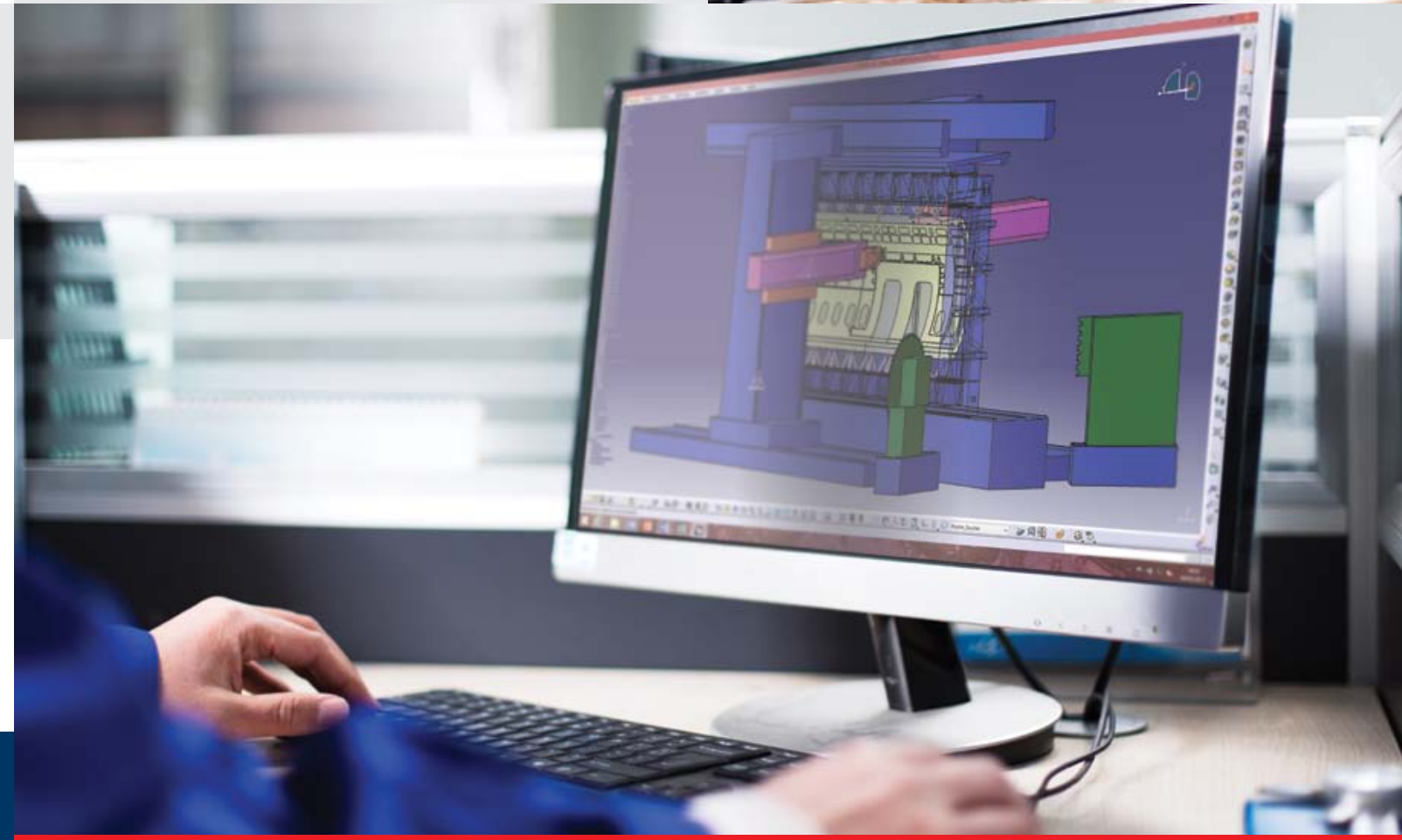
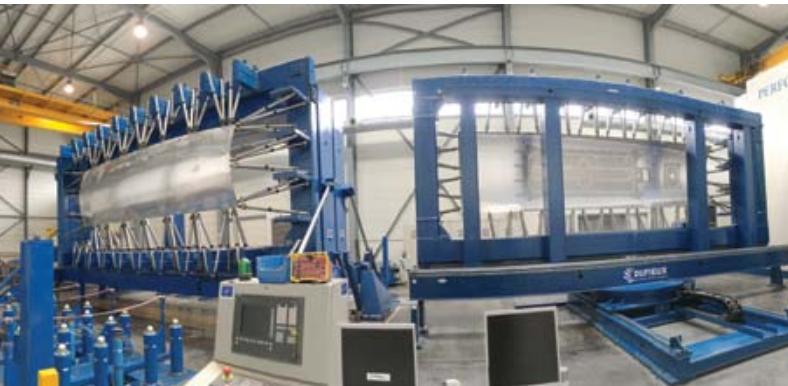
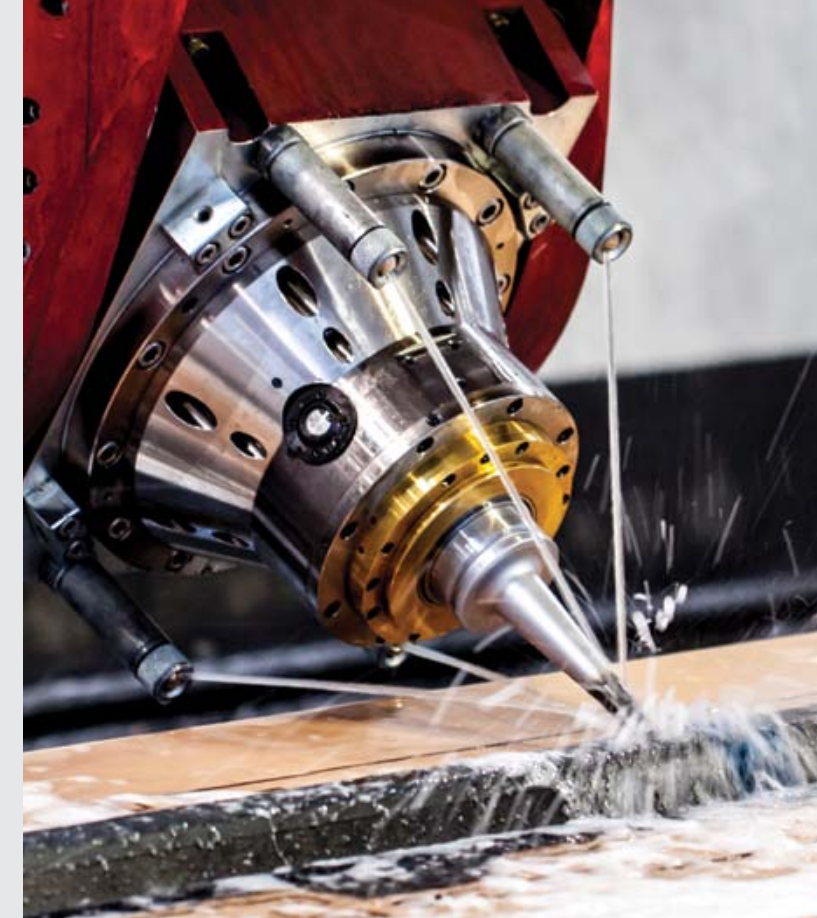
MMS Small: up to 4000 mm x 1500 mm

MMS Medium: up to 6000 mm x 2000 mm

MANUFACTURING ENGINEERING

Process solution to perform part industrialization, from part definition to production, in 3 steps :

- Part machining feasibility through CAM (Computer Aided Manufacturing)
- Process simulation definition and optimization of all process parameters as blank size
- Part program definition, optimization and industrialization up to production



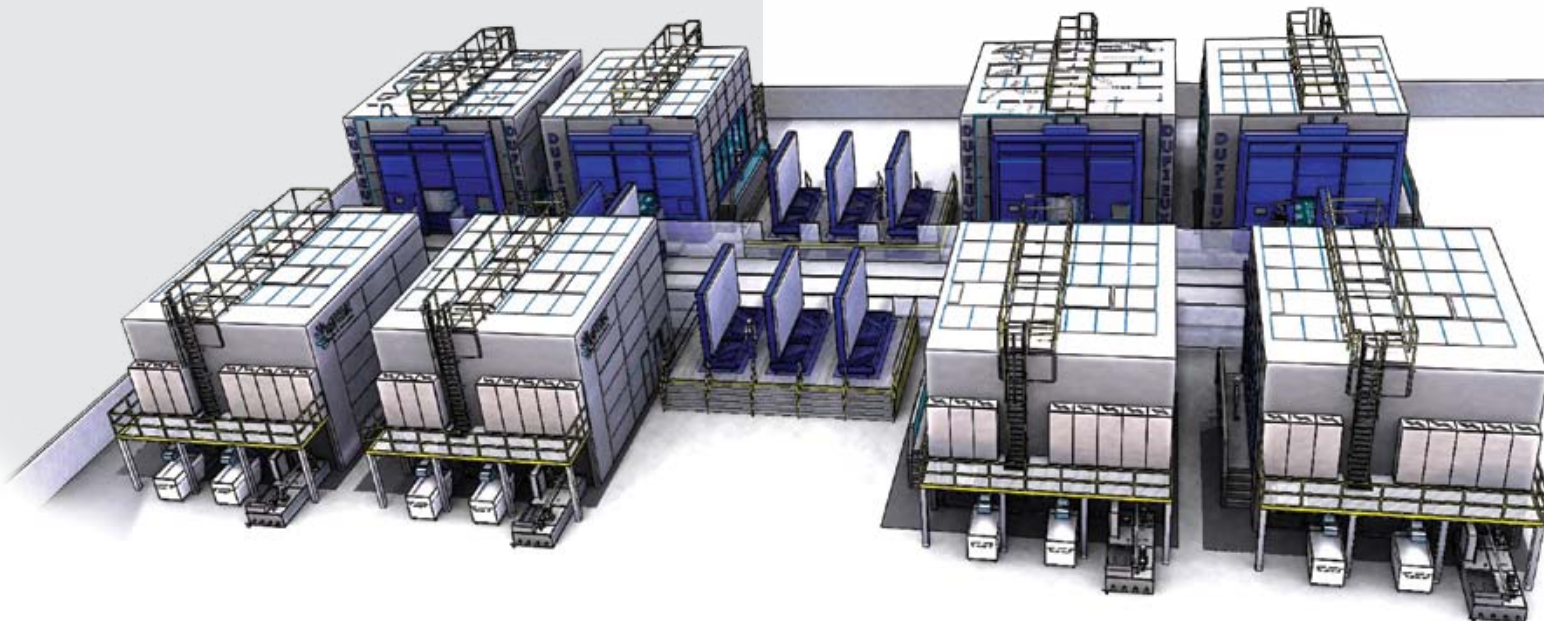
TURNKEY WORKSHOP

DUFIEUX can supply fully automated cells to significantly increase productivity and reduce costs through :

- Process automation
- High cycle reliability
- Optimal cycle times
- Supervision
- High production machine availability

DUFIEUX's expertise

- Industrial strategy and master plan assistance
- Industrial efficiency improvement
- Production unit design
- Part handling, transfer and buffer optimization
- Production time and cost improvement (lean manufacturing)
- Part programming
- Part preparation & finishing processes



CUSTOMER SUPPORT

DUFIEUX provides a full and global support to assist customers in making cost effective decisions and the correct use of DUFIEUX products.

TRAINING

DUFIEUX offers basic and continuous training programs. The aim is to provide the users with the necessary tools and knowledge for optimal machine use and process optimization.

MAINTENANCE

Spare Part

- DUFIEUX assists and provides with original quality controlled spare parts to keep your DUFIEUX machine up and running.

Maintenance contracts

- DUFIEUX proposes a range of preventive maintenance contracts to optimize the machine productivity. Maintenance is performed by our specialists in collaboration with a local DUFIEUX personnel.

RETROFIT AND UPGRADING

- Retrofit with the latest technology
- Modernize equipment to set up new functionalities
- Benefit from the latest developments : maintenance tracking, standardized components
- Machine re-location



REFERENCES

AIRBUS

AIRBUS DEFENCE & SPACE

AIRBUS HELICOPTERS

AIRBUS SAFRAN LAUNCHER

ASCO

ASQUINI

ARIES MANUFACTURING

AUBERT&DUVAL

CONSTELLIUM

DASSAULT AVIATION

DUQUEINE

GE

KHRUNICHEV SPACE CENTER

LEONARDO

MECACHROME

PROGRESS RAIL

SABCA

SNCB

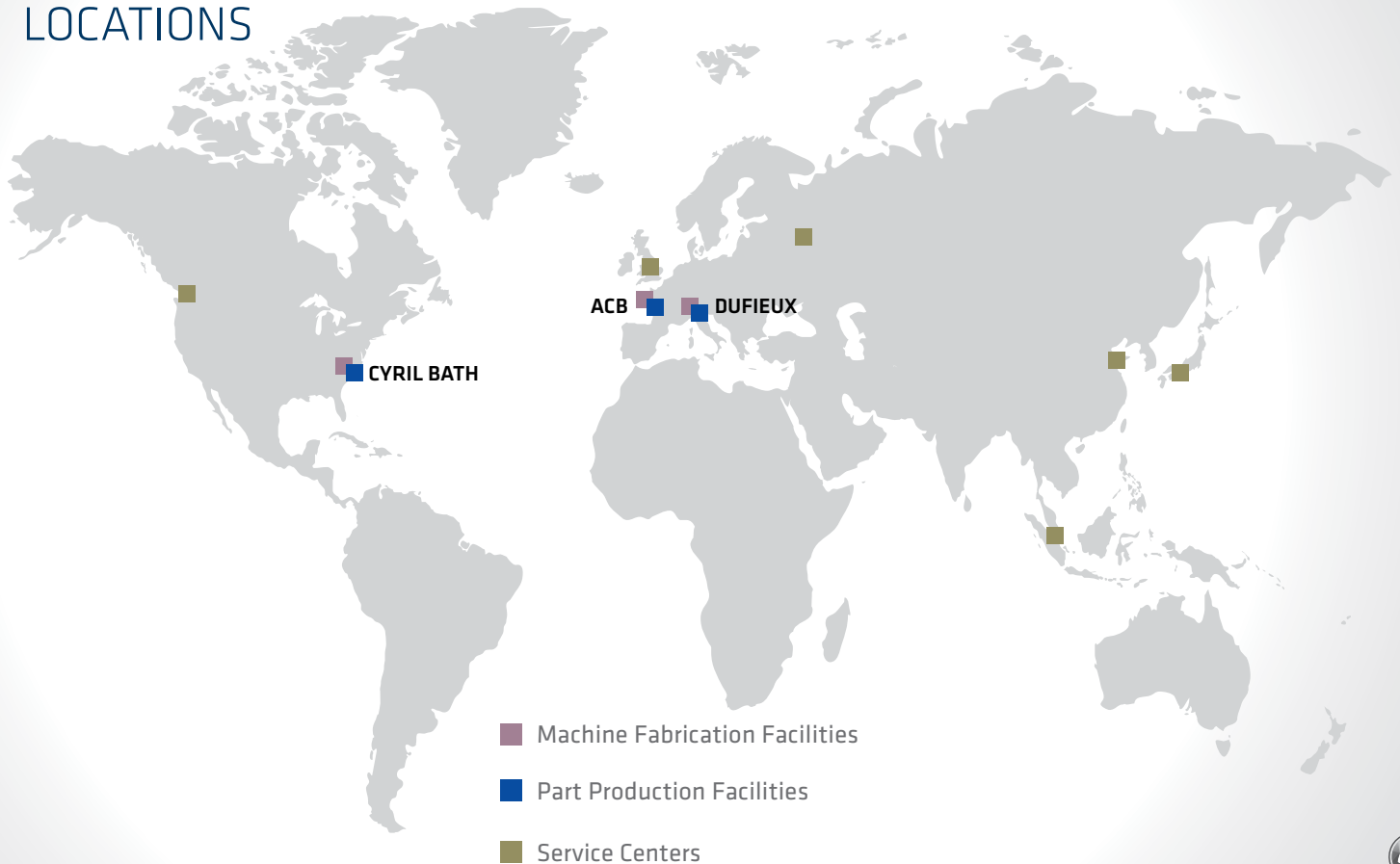
SNCF

SONACA

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