



Shaping a better future

**METAL FORMING
SOLUTIONS FOR THE
AEROSPACE INDUSTRY**

www.acb-ps.com

ACB has a long experience in the field of metal forming through which it has acquired invaluable know-how.

ACB clients include worldwide companies involved in aeronautical structures, engines and aircrafts manufacturing. The company offers a complete package of products and services to its customers:

- Process simulation, construction and installation of machines for titanium forming (sheet stretch forming, profile stretch forming, elastoforming, hot forming, superplastic forming, linear friction welding) and turnkey workshops.
- A full and global customer support.

Certifications



EN 9100

ISO 9100

ISO 14001

AEO



4

SHEET STRETCH FORMING

5

PROFILE STRETCH FORMING

6

ELASTOFORMING

7

HOT FORMING (HF)

8

SUPERPLASTIC FORMING (SPF)

9

LINEAR FRICTION WELDING (LFW)

10

PROCESS AUTOMATION
TURNKEY WORKSHOP

11

CUSTOMER SUPPORT

SHEET STRETCH FORMING

Sheet Stretch Forming is a fast, economical and accurate way to form a large panel from a metal sheet. The process consists in stretching the sheet in its plastic area and wrap it on a tool. Process simulation gives the expected kinematic and optimizes springback.



Transversal Stretch Forming Press (FET/T)

- 8 independent servo-controlled axes well adapted to complex shapes
- Smart design, safe operations, accuracy for repeatable production
- CNC control and CAM package
- Easy integration of automated tool handling system
- Can be equipped with a fixed or moving tablet



Leading edge

Longitudinal Stretch Forming Press (FEL/L)

- 8 servo-controlled forming axes well adapted to complex shapes
- Smart design, safe operations, accuracy for repeatable production
- CNC control and CAM package
- Easy integration of automated tool handling system
- Can be equipped with a fixed or moving table



Aluminum and stainless steel parts

MACHINE RANGE:
FROM 200T TO 2500T

PARTS:
Fuselage parts with counter-forming, leading edges...

MACHINE RANGE:
FROM 2x150T TO 2x800T

PARTS:
Fuselage parts with counter-forming, leading edges...

PROFILE STRETCH FORMING

Profile Stretch Forming is a very accurate and repeatable process for profile forming in 2D or 3D. It allows the forming of complex shapes and reduces the number of assembly operations.



Swing Arm Profile Stretch Forming Press (FEV/V)

- Independently controlled 4 to 8 axes swing arm
- High forming torque
- Direct acting or taper locked jaws
- CNC control with force and position mode
- Simulation software package for part program definition and spring back compensated tool design
- Automated quick tool and jaw changing system

Structural parts



MACHINE RANGE:
FROM 5T TO 300T

PARTS:

Allows the forming of large parts: fuselage frames, stringers

ELASTO-FORMING

Elastoforming is a drawing technique which only involves a half tool and a flexible matrix matching the contour of the tool under the effect of high pressure of the elastomer.



Elastomer Matrix Forming Press (EMC)

- High productivity multi reference forming
- Quick and easy tool change
- Equipped with standard elastomer pads
- Low cost and easy/quick maintenance
- Easy integration of automated tool handling system

Structural and joining parts



MACHINE RANGE:
FROM 200BAR TO 800BAR (FORMING PRESSURE)

PARTS:
Supports, gussets, frames, leading edge reinforcing pieces

HOT FORMING (HF)

Hot Forming is a drawing technique dedicated to any material where high temperature is used to increase the formability of the formed material.



Hot Forming Press (FCC)

- T° homogeneity at 800°C/1500F
- High accuracy of ram position
- High repeatability
- Short cycle time
- Low thickness dispersion
- Easy integration of automated tool and part handling system

Titanium parts



MACHINE RANGE:
FROM 100T TO 500T

PARTS:

Pylon parts, nacelle parts, engine parts, blades

SUPER-PLASTIC FORMING (SPF)

Superplastic Forming uses a high temperature and gas pressure to form the material under suitable stress and deformation rate to take advantage of the formability of superplastic materials.



Superplastic Forming Press (FSP)

- T° homogeneity at 1000°C/1800F
- High accuracy of gas management system with multiple lines
- High repeatability
- Option of dual capacity of SPF/HF for optimized quality and cycle time
- Easy integration of automated tool and part handling system



Titanium parts

MACHINE RANGE:
FROM 60T TO 3000T

PARTS:
Pylon panels, nacelle panels, engine parts, fan and OGV blades

LINEAR FRICTION WELDING (LFW)

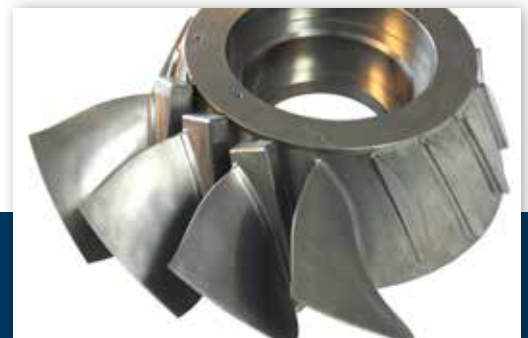
Linear Friction Welding is a solid state joining process done at forging temperature. The heat is generated by the linear friction. Near net shape manufacturing improves buy-to-fly ratio and reduces machining costs.



Linear Friction Welding Machine

- Extreme accuracy and repeatability
- High frequency dynamic CNC control system
- Robust and safe clamping system
- High productivity through fully automatized robotic production cell

Blisk



MACHINE RANGE:
FROM 10T TO 100T

PARTS:

Bladed disks (Blisks) Integrally Bladed Rotors (IBR) Integrally Bladed Fans (IBF) for jet engines, thick joints, aircraft structural parts...

PROCESS AUTOMATION

Based upon the customer's expectations, ACB can supply full automated cells to significantly increase productivity and reduce the costs by the benefits they induce, among which:

- High regularity of cycles
- Reduced cycle times
- Easier management
- Higher availability of the production machines

ACB expertise

- Loading and unloading of raw and finished parts
- Loading and unloading of tools
- Preparation of tools
- Configuration of the machine during product changeovers
- Preparation or finishing tasks on parts

TURNKEY WORKSHOP

ACB can help you develop your projects of modernization, extension or creation of production workshops.

The scope of action goes from the focus on one specific area to be improved to the creation of a complete plant from a green field.

The projects are conducted around 3 stages:

- **The preliminary study:** supports the industrial strategy by providing an overview of the project as well as guidelines for its development
- **The detailed study:** defines the accurate features of the workshop and its equipment, according to the guidelines decided at the preliminary study
- **The implementation stage:** includes staff training, delivery, installation, commissioning of the production equipment and the assistance during ramp-up

ACB expertise

ACB is specialized in the following projects:

- Elementary metal formed parts workshops
- Pre-assembly and assembly workshops

With a particular focus on:

- Industrial efficiency improvement
- Production processes reorganization
- Handling, transfer and storage of material, parts and tooling optimization
- Production time and cost improvement (lean manufacturing)
- Supply chain management



CUSTOMER SUPPORT

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

Manufacturing engineering

A turnkey solution to perform stretching, superplastic forming or hot forming part industrialization, from part definition to production, in 4 steps:

- **Part forming feasibility** through CAM (Computer Aided Manufacturing) for cold and hot forming
- **Process simulation definition and optimization** of all process parameters as blank size, number of run, heat treatment
- **Tool design and manufacturing**
- Part program definition, optimization and **industrialization** up to **production**

Training

ACB offers basic or continuous training programs. The aim is to provide the users the necessary tools and knowledge for an optimized machinery use and a process optimization.

Maintenance

Spare Part Management

- ACB can assist and provide with original quality controlled spare parts to keep your ACB machine up and running

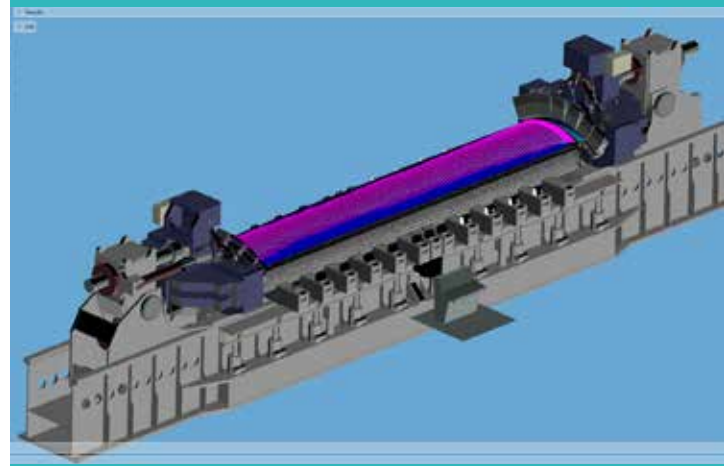
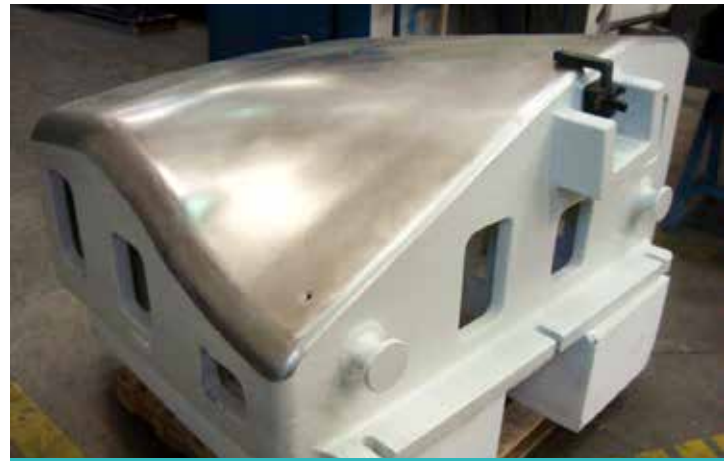
Maintenance contracts

- ACB proposes a range of **preventive maintenance contracts** to meet the needs of each machine user. Maintenance is performed by ACB specialists in collaboration with local ACB personnel

Retrofit and Upgrading

What we can do:

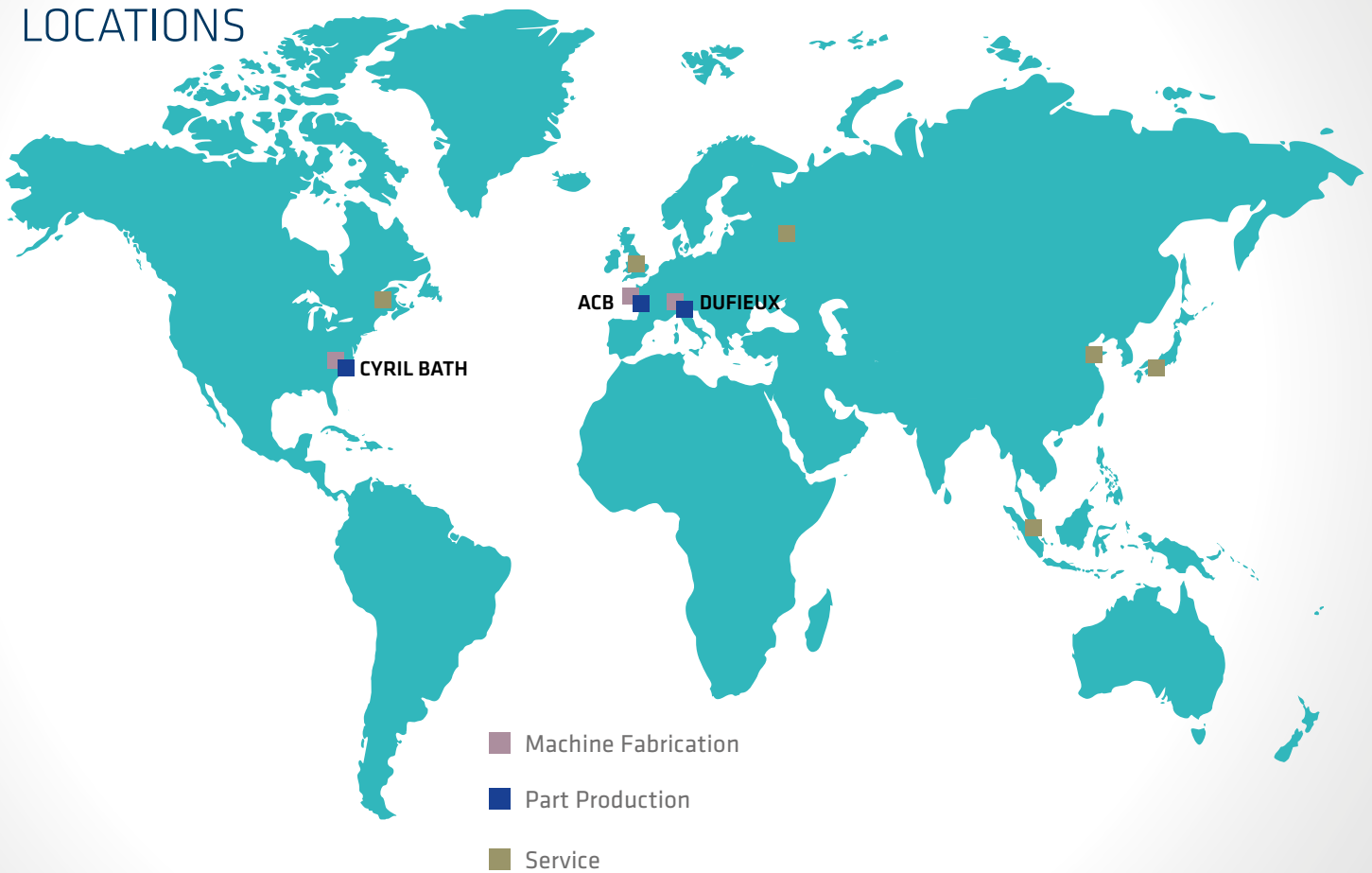
- Retrofit with the latest technology
- Modernize equipment to meet your customer's needs whilst cost effectively extending the lifespan of your current investment
- Benefit from the latest developments: maintenance tracking, standardized components..
- Machine re-location
- Restore your machine to its original operational state



REFERENCES

AEROFABRICATION	BOMBARDIER	GSE	KHI	OAK MOSCOW	SLICOM
AGUSTA	CAPITAL SPACE	HAL AIRCRAFT	KHRUNICHEV AEROSPACE	ODK	SMEA
AIRCELLE	CHARRITON	HAL LPSC	KVZ KAZAN	PAC KAMRA	SNECMA
AIDC	CESSNA	HARBIN AIRCRAFT	LATECOERE	POTEZ	SOGERMA
AIRBUS	CHENGDU AIRCRAFT	HELLENIC AEROSPACE	LAUAK	PREMIUM AEROTEC	SONACA
AIRBUS HELICOPTERS	CSIST	IAI	LETOV	ROLLS ROYCE UK	SPIRIT AEROSYSTEMS
AIRBUS DEFENSE AND SPACE	DAHER SOCATA	IAZ IRKUTSK	LEARJET	ROLLS ROYCE SINGAPORE	STELIA AEROSPACE
ALCAN	DASSAULT AVIATION	INDRAERO SIREN	LEONARDO	ROMAERO	TAI
ALCOA	DEMA	IRT JULES VERNE	LIMING AEROENGINE	ROSTVERTOL	TURBOMECA
ANTONOV	DENEL	ISRO	LIYANG AEROENGINE	RUAG AG	UMPO UFA
AOI EGYPT	DMRL DUCOMMUN	ITP	LOCKHEED	SAAB AEROSTRUCTURES	UUJAZ ULAN UDE
AUVERGNE AERONAUTIQUE	EADS	KAZ KAZAN	MAZ'AIR	SAFRAN	VASO
AVIASTAR-SP	EMBRAER	KNAAZ KOMSOMOLSK	MBDA	SAMARA AEROSPACE	VOUGHT
BAMTRI	ENAER	KHI	MECAHERS	SHAANXI	XIAN AIRCRAFT
BAE SYSTEMS	EUROCOPTER	KHRUNICHEV AEROSPACE	NANCHANG-HONGDU	SHANGHAI AIRCRAFT	
BEML	FAMAT-GENERAL ELECTRIC	KVZ KAZAN	NAZ NOVOSIBIRSK	SHENYANG AIRCRAFT	
BOEING	FOKKER AEROSTRUCTURES	KNAAZ KOMSOMOLSK	NORTHROP GRUMMAN	SIMAIR	

LOCATIONS



ACB

27 rue du Ranzai
 BP 31908
 44319 NANTES Cedex 3
 FRANCE
 Tel. : +33 (0)2 51 13 84 00
 info@acb-ps.com

www.acb-ps.com