

# Compression Bladders

For molding  
complex **Composite** parts





COMPRESSION **BLADDER**



**COMPOSITE PART**

Bicycle fork in composite material manufactured by molding with a compression bladder

## Unique Performance

Piercan specializes in manufacturing high temperature natural rubber latex bladders used for molding by compressing composite material. These bladders are also used in the molding process by infusing fabrics with liquid resins.



**Complex Shapes**  
customized



**Reduction in the**  
manufacturing cost



**Perfect Control**  
of the finished part



**Rapid**  
implementation



**Optimized Weight**  
of the finished  
composite part

## Areas of Application



### CYCLING

**Competition | Recreation** | seats, forks, handlebars, wheels, frames, etc.



### SPORTS

baseball, hockey, golf, tennis, biking, paddling, rowing, etc.



### AUTOMOBILE

**General public | F1** | spoilers, rear-view mirrors, air inlets, oil tanks, etc.

### PRECISION IS YOUR PRIORITY

*With Piercan bladders, manufacture parts with complex shapes whose internal volume will be perfectly controlled by your process.*

### YOUR SEARCH FOR AN EFFECTIVE RATE ENDS HERE

*Piercan helps you to optimise costs.*



### AVIATION

cushions, undercarriages, propellers, etc.



### OTHERS

violin bows, tubes and all types of hollow articles, etc.



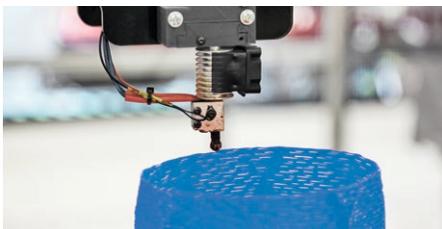
Let your imagination run wild: moulding composites with a bladder is adapted to prototypes, small and large series (within a short period of time and at competitive rates).

# Bladder Manufacturing

The bladders are manufactured by immersing a dip mould in a latex bath and then it is vulcanized.



## DIP MOLD DESIGN



Using a file, a 3D scan (photogram-metry) of the male mold or of the composite part, the mould is manufactured by 3D printing.

## DIPPING TECHNIQUE



The mold is dipped in a coagulant bath then in a high temperature natural latex bath. The thickness of the layer depends on the dipping time. After vulcanization, the bladder is removed from the dip mold.

## PIERCAN'S STRENGTHS

- *Innovative complex shapes*
- *Reduced manufacturing cost*
- *Reusable bladders*  
Even if their low cost makes them "disposable", the bladders are generally reused over multiple cycles (3 to 5), when the curing temperatures do not exceed 140°C approximately.
- *Reduction in the finishing costs*
- *Perfect thickness control of the composite layer*
- *Precise control of the inner shape, smooth*  
Due to high compression pressures (from 7 to 250 bars), the finished composite parts show no folds and a smooth interior finish.
- *No welding seam mark*
- *Rapid implementation*  
The moulds can be pre-heated which allows them to be used in successive cycles.
- *Optimised weight of the finished composite part*  
Bladder extracted after curing.

# Obtaining a Composite Part with Bladder

To mold a composite part, an inflatable device is used (bladder) in a female cavity (female mould) to ensure compression during the curing of the composite.



**1 • Dipping:** to the left, the aluminium male mandrel and to the right, high temperature natural rubber bladder manufactured by dipping.



**2 • Drape forming:** Carbon fabric layers (prepare) are placed around the bladder, inside the aluminium female mould.



**3 • Curing:** after the mold is closed, the bladder is inflated to plate the prep-reg in the mold (up to 6 or 8 bars), then we proceed to the curing.



**4 • Removal from the mould:** once the curing is complete, the bladder is deflated and the mould is opened; the bladder removed and the part is sent for finishing.

## ADVANTAGES OF HIGH TEMPERATURE NATURAL RUBBER



- *Cheapest amongst the usable elastomers*  
Natural rubber is clearly more cost effective than silicones.
- *Easiest material to process*  
Good mechanical and elastic properties (elongation at break > 800%).
- *Good resistance*  
Resistance to high temperatures (1H00 at 175 °C / 20H00 at 120 °C).  
Resistance to pressure (up to 14 bars).
- *Complex shapes*

# Piercan helps you in your projects

Piercan manufactures all types of elastomer parts. From designing to manufacturing, including the inspection of the parts or just technical advice, Piercan is capable of supporting you at every stage of your project by mastering the certified processes.

## MANUFACTURING A **UNIQUE PART**

Piercan helps you throughout the entire process of development and manufacturing of bladders. Our engineering office is at your disposal for analysing and developing your projects.

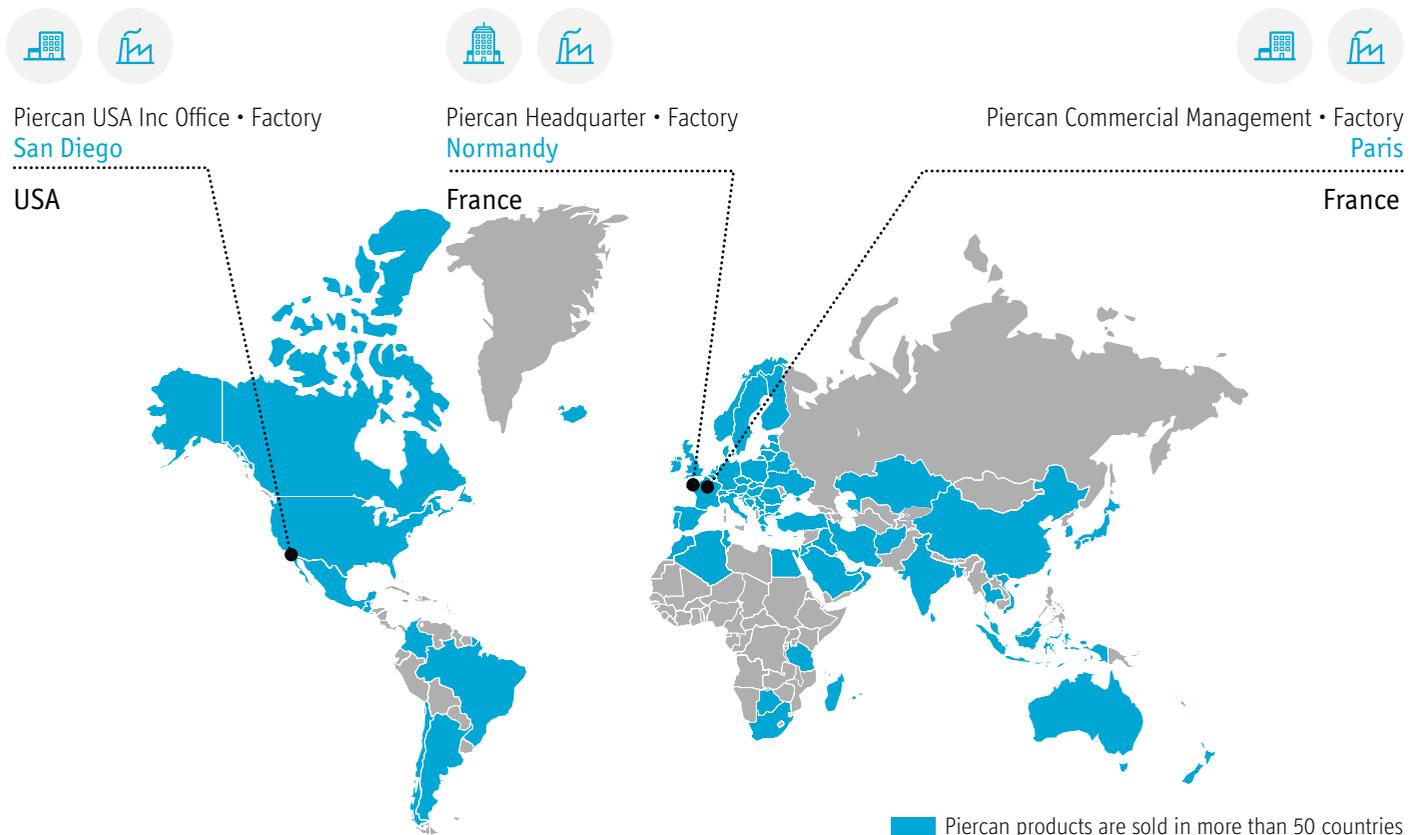
## CONSULTING

Piercan can also assist you during audits or in the setting up of production lines integrating elastomeric transformation or can advise you about the physicochemical properties of the materials.



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## Piercan around the world



### A QUESTION OR IN NEED OF INFORMATION?

Please do not hesitate to contact our sales team by phone or email. Piercan's services and products are only one call away:

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