

# Pack&Strat®

Fast Packaging by Stratoconception®

*Original patented process*



[www.packnstrat.com](http://www.packnstrat.com)

Innovation through research and development

**CIRTES**  
research & development

# The original patented concept



The research team, headed by Professor Claude Barlier, has been working in France since the late 80s, to develop the internationally patented Stratoconception® process. Stratoconception® is the Additive Manufacturing process that enables an object designed in CAD to be manufactured, layer by layer, without any break in the digital chain.


The latest major innovation patented by the CIRTES R&D team consists in optimizing the original Stratoconception® process for the design and direct production of by-layer-made packaging to protect and transport a product.

Starting from a CAD model or a point cloud generated by product scanning, the Pack&Strat® software enables :

- the automatic design of the virtual counter-form that will house or support the product,
- the slicing of this counter-form,
- the automatic generation of 2D or 3D cutting paths for each of these slices in the chosen material.

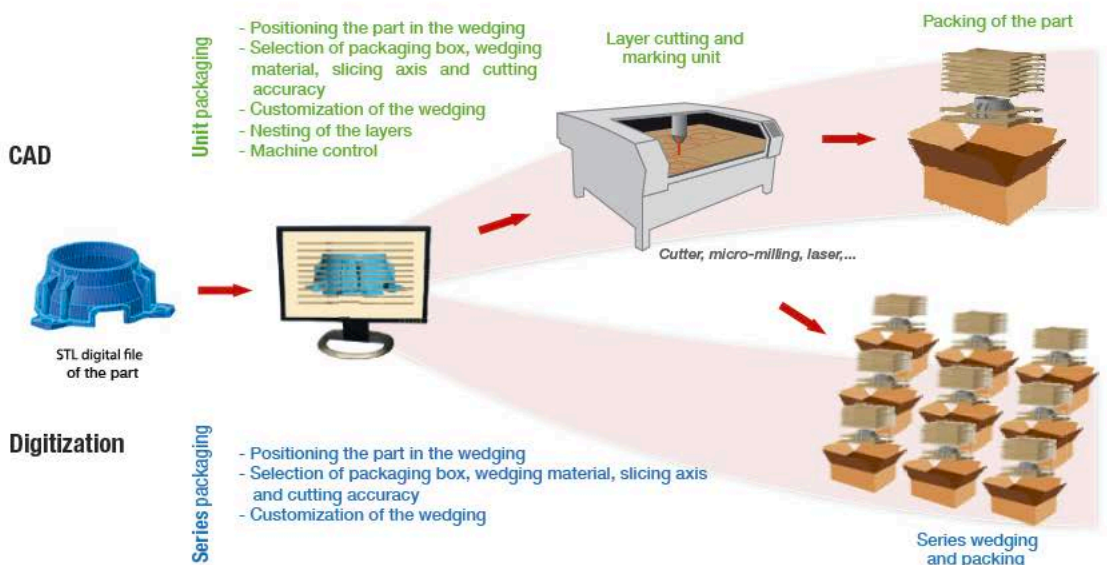
These layers are then positioned and assembled together using inserts, or directly by using an outer box.

The process is particularly well-suited to the packaging of high value-added products, whether unique or produced in small quantities as, for example, in the automotive, aerospace, medical, artwork and crystal glass sectors. Pack&Strat® offers a cost-effective solution to the problem of custom packaging, with exceptional responsiveness.

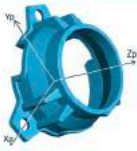
Stratoconception® process - patents and trademarks C. Barlier, CIRTES - Saint-Dié-des-Vosges - France   
Stratoconception®, Stratoconcept®, Strat®, Orthostrato®, VirtuREEL®, VirtuReal®, Strat'Emball®, Pack & Strat®  
are trademarks, registered by CIRTES.

Software development for the Stratoconception® process is entirely controlled and carried out by CIRTES, which owns the source code. This has led to the development of various products and business applications.

## The process



# Pack&Strat®: Steps of the patented process



1  
Import of digital files obtained from CAD software or digitization



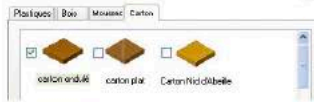
2  
Definition of the minimum packaging volume required to protect the part



3  
Positioning the part in the wedging (minimizing box volume, ...)



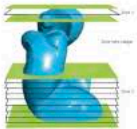
4  
Selection of box material and opening direction and type



5  
Selection of wedging material from a wide selection in the database



6  
Selection of slicing axis



7  
Selection of the wedging zone (single or multiple zones for complex parts)



8  
Software analysis of part unpackability, according to three types of part typology



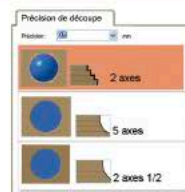
9  
Adding handles to the wedging



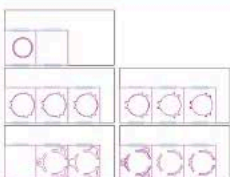
10  
Marking the wedging: import text and 2D images, numbering layers, ...



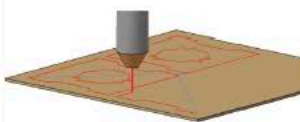
11  
Selection of machine and cutting process



12  
Selection of cutting accuracy



13  
Nesting and automatic toolpath calculation



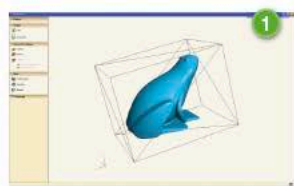
14  
Automatic control of the cutting machine



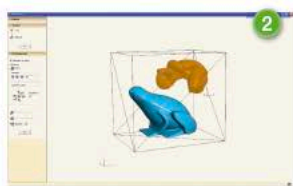
15  
Layer stacking and packing assistance



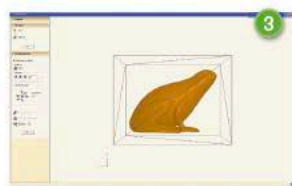
# Pack&Strat® software - stations



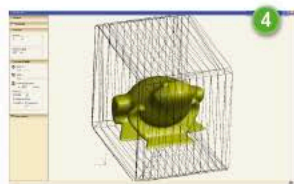
Import and viewing  
of the digital file



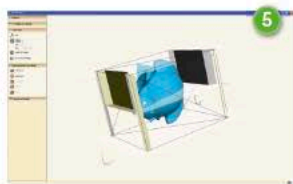
Possible combination  
of several parts in the packaging



Positioning in the packaging



Selection of material and slicing



Positioning of unpacking zones  
and handles



Nesting and machine code  
generation

## Dedicated stations or integration on cutting machines

Dedicated stations, cutter, micro-milling, hot wire.

The process has already been integrated in partnership with manufacturers, MECANUMERIC (cutter) and CROMA (hot wire).

The CIRTES teams also propose:

- Integration study for all CNC cutting machines
- Development of a custom post-processor



Cutter  
(MECANUMERIC)



Micro-milling  
(MECANUMERIC)



Hot wire  
(CROMA)

Pack&Strat® offers a new solution for eco-friendly packaging using materials such as cardboard and cork to protect the environment.



### 2D cutting materials:

Corrugated cardboard, honeycomb  
cardboard, cork, wood, foam, ...



### 3D cutting materials:

Cork, wood, PU, EPS, XPE, PTZ foams, ...

# Pack&Strat® *Innovative and original patented process of Fast Packaging*

## A French innovative process!

Pack&Strat®: process and software entirely developed and patented by a **French R&D team** at the CIRTES R&D center ideally located in Saint-Dié-des-Vosges.

## Packaging that matches your shapes!

Pack&Strat® is a 3D digital packaging system that **perfectly matches the shape of the part**, offering the **best possible protection**.

**Aesthetic** packaging with possibilities of **customization** and automatic part grouping.

This process can be used to pack products of **any size**, with **complex shapes**, ...

## Fast and customized packaging production!

Pack&Strat® designs and manufactures **customized packaging** in a few minutes, from a simple digital file. You can choose a **case with optimized dimensions** to pack the product and its wedging, using a specially configured database based on industry standards.

## Unit or series protection!

Pack&Strat® is particularly well suited to the packaging of **high value-added products**, whether one-off or mass-produced. **All product sectors** are covered by the process: automotive, aeronautics, medical, art, design, crystal, ... **High-volume packaging** is made possible by the direct series die-making.

## Low cost!

Pack&Strat® produces **low-cost** packaging, **with no tooling cost** and **high reactivity**.

The software integrates easily with your existing cutting machines.

## A sustainable development approach!

Pack&Strat® can use a variety of materials such as cardboard, wood, cork and other recyclable sheet materials based on natural fibers. It can also be applied to materials such as polystyrene and polyethylene. This process is in line with the challenge of sustainable development, offering the **possibility of producing wedges from recyclable or biodegradable materials**.

## A real industrial solution!

Pack&Strat® brings you **industrial solutions**, either as software to be integrated into existing cutting machines, or as complete stations or dedicated customized solutions. It is the direct and qualified automatic digital pilot for cutting processes: cutter, micro-milling, hot wire, laser, ...

## Pack&Strat® applications



## References

**P&S software solutions and machines:** Bugatti, Seco Tools, GE Healthcare, Nefab, CDTA (Algeria), LP Art, Lycée Loritz, Pépinière d'Entreprises de SDDV, CNAM, Freyssinet Aero, Embelco Art Shipping (Belgium), IUT Reims, ...

**P&S 3D packaging manufacturing:** Realmeca, Numalliance, Pouenat, Hydro Leduc, Atelier Thierry Dreyfus, Ventana, Disderot, Polles, Mécachrome, Iconic Retail Design, Recaéro, Beam, Quipment, Idea, Microtrac Formulaction, AggPrint, Tec3i, Cresilas, Bürkert, Dosilab, ...



### **CIRTES, in Saint-Dié-des-Vosges, France, in the heart of Europe**

CIRTES SA is an accredited contract research organisation. Located in the heart of the Saint-Dié-des-Vosges industrial estate since 1991, CIRTES also has a site in Carmaux, in South-Western France.

Based on its patented specialities: Additive Manufacturing by Stratoconception®, Pack&Strat® 3D Fast Packaging and Actarus® Machining Monitoring, CIRTES aims to develop industrial Research & Development contracts, manufacture models and tooling and market software solutions and associated machines.

### **Cirtes, Innovation through Research and Development**

CIRTES carries out R&D projects in its core areas of expertise: Stratoconception®, Pack&Strat® and Actarus®. Its R&D contracts cover various sectors of activity. CIRTES current contracts include PSA/STELLANTIS and BUGATTI for the automotive industry, Charpente HOUOT et WEISROCK for the wood industry, SAINT-GOBAIN PAM, BROUSSEVAL, FERRY CAPITAINE for the foundry industry, AIRBUS, ARIANE Group, MECACHROME et REALMECA for aerospace and defence industries, FRAMATOME and EDF for energy, TOPSOLID and MECANUMERIC for CAD/CAM and machinery, ...

*More than 800 CIRTES Stratoconception®  
solutions distributed worldwide*



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