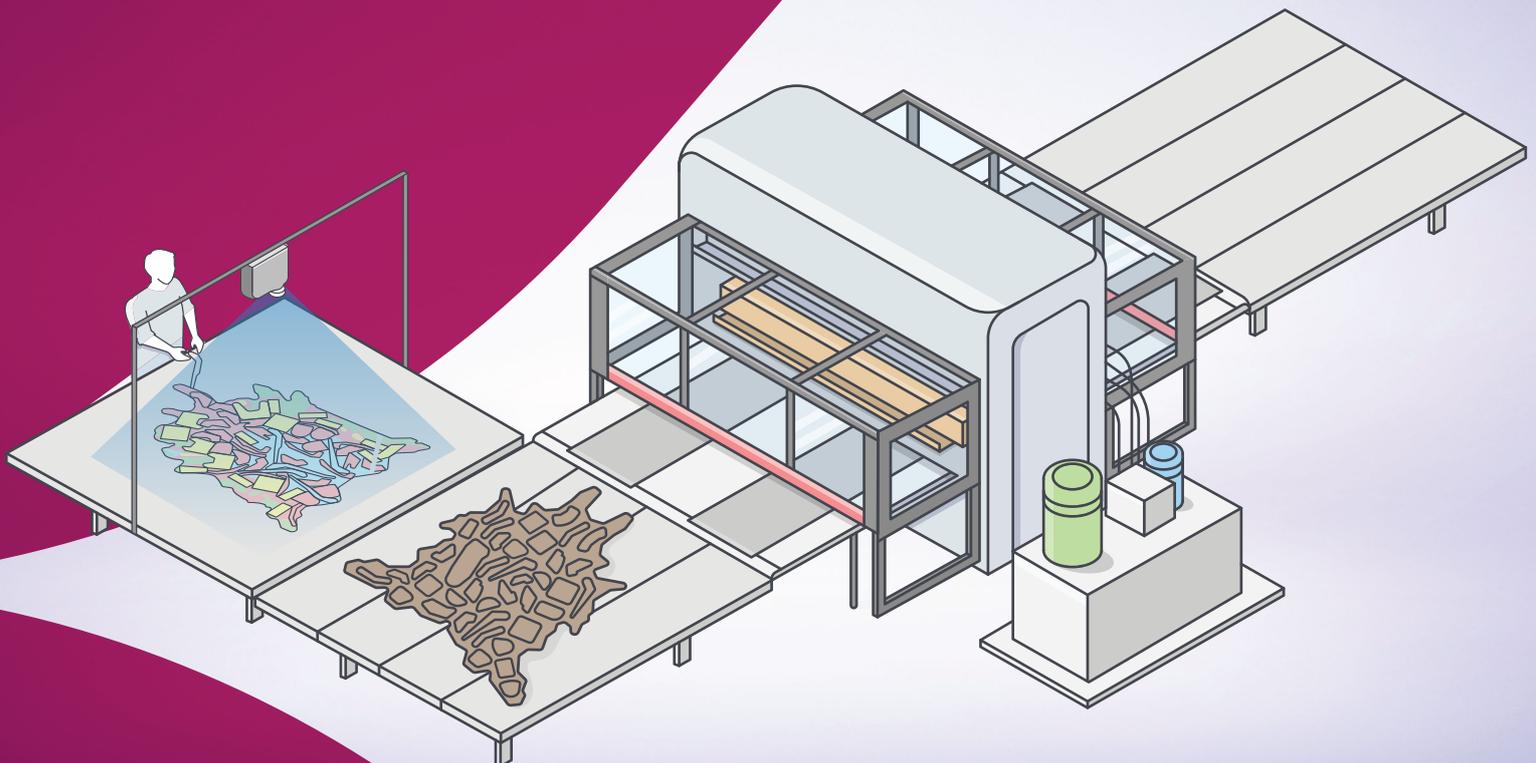


Thagora

Technology to Increase the Efficiency
of the Leather Die Cutting Process

Automotive Industry



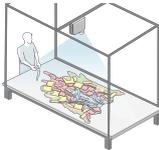
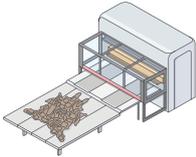
Die cutting - the workhorse of the leather cutting room

Die cutting is the golden standard in the automotive industry for good reasons. Whether it is a beam-press or a roller-press, this is a reliable technology, with excellent productivity and high uptime. It is perfectly adapted for mass production, a true asset when you must cut programs in large series, again and again. But although it is a reliable and productive technology, it has not been improved significantly in the past 30 years. In addition, it has a few important shortcomings which become more and more pressing on the market today:

- Low nesting efficiency (the nesting is done manually, so it is time-consuming and inaccurate)
- Dependency on operators that often are difficult to hire, train and keep at the factory
- Complicated and slow process of calculating nesting efficiency for current jobs

The die cutting process becomes more efficient

By preserving all the advantages of the die cutting process, Thagora Die Cutting Solution addresses its shortcomings by adding the latest technology in software, scanning and automatic nesting. Thus, an old technology is brought to the 21st century and becomes once again highly competitive. You can keep the trusted, rugged and efficient die cutting equipment, while benefiting from the automation brought by the latest leather cutting room technology.

<p>Leather inspection & scanning</p>		<p>The leather inspection process is performed on a separated station. Several solutions are available starting with the more affordable static table and photo camera up to the conveyORIZED leather scanning machine with InfraRed marking technology.</p>
<p>Nesting</p>		<p>The nesting becomes an automated, multi-hide operation. The introduction of GPU technology, that speeds up this process, increases even further the leather consumption efficiency.</p>
<p>Dies placement</p>		<p>The dies are placed on each hide, with video projection assistance, according to nesting.</p>
<p>Cutting</p>		<p>Each hide, with the dies already placed with video projection is sent, on its board, to the die-press.</p>
<p>Parts collecting</p>		<p>The parts collecting process is assisted by video-projection, to achieve an increased productivity.</p>



Thagora die cutting solution advantages

Thagora addresses the constraints of keeping low costs, due to high competition in the automotive industry, and the pressure to deliver high volumes in a short time, while meeting restrictive quality standards through a combination of software and advanced equipment.



Leather nesting efficiency

On the competitive market of the automotive leather interiors, a critical part of the cost is represented by the leather consumption. Thus, a high nesting efficiency represents a key point in the process. The deployment of the automatic, multi-hide nesting solution, based on GPU technology, is a crucial advantage for leather savings:

- **The nesting solution is adapted for die cutting**

In the die cutting process, the total number of dies available for each unique part gives certain limitations for nesting. GeminiCAD's nesting algorithm respects the following constraint: on each hide, for each unique part, the maximum number of dies will not be exceeded.

- **Reduces the dependence on highly skilled operators**

This solution reduces your dependency on the skills of your operators, who no longer do the manual nesting.

- **Allows nesting simulations for a more controlled process**

The off-line nesting allows the evaluation of efficiency before starting the cutting process. Therefore, the production orders can be modified to increase the efficiency of the entire process.



Increases the speed of process on die cutting station

All the operations on the cutting boards are done faster, because the nesting is no longer done manually, and the collecting process is assisted by video-projector.



A more accurate scanning process

By using Thagora Leather Scanning Machine, the scanning process is faster and more accurate. This has a positive impact on nesting efficiency and reduces the number of recuts.



Process tracking

Thagora offers the possibility to supervise the whole leather cutting process:

- **Process assessment**

The technology allows you to instantly know the current efficiency, the frequency of recuts and to forecast the future efficiency for your production.

- **Control the operators' efficiency**

It allows you to oversee the operators' activity.

- **Supplier control**

Thagora Leather Scanning Machine allows the control of the quantity and the quality of the leather supplied by the tanneries (if you are buying leather from independent tanneries)



ERP integration

Thagora software system is compatible with your ERP, which automates the system communication both ways:

- Imports the production orders from ERP to Thagora

- It offers complete live production reports, which allows you to oversee each step of the process.



Affordable investment

Thagora brings a significant improvement to the leather cutting process while keeping the trusted die-press machines. This means a good return on investment, with a reasonable initial financial commitment.



Quick integration with your production process

Thagora is completely compatible with your existing cutting process. The deployment of this technology is straightforward, without disrupting your current production. Also, the system and the equipment are easy to understand and to operate by your employees.





Higher leather savings with automatic multi-hide nesting

Nesting efficiency is critical for leather saving. Despite this, your people are doing the operation manually, by placing the dies on each hide in the best way possible. Thus, the nesting is done only by human intervention. And its efficiency depends only on how experienced the operators are. If you have problems with training and keeping these operators in your factory, the problem gets more complicated. You lose a lot of money due to a higher leather consumption, you cannot estimate your current efficiency and also, you cannot forecast the efficiency for the next months.

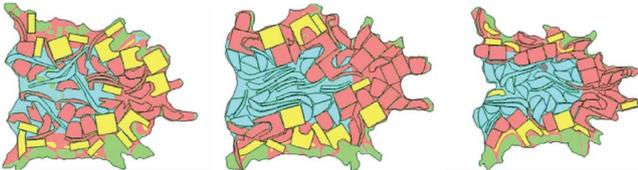


Introducing automatic multi-hide nesting

Gemini CAD Systems is one of the leading companies that develop leather nesting dedicated to the automotive industry. We offer a new generation of automatic multi-hide nesting solution that makes nesting more efficient than ever.

How does multi-hide nesting works?

This technology is implemented with the Off-Line workflow, managed by Thagora. This means that the hides needed for one job are scanned in advance and their digital data are introduced in the system. Thus, the nesting server can automatically perform the nesting on several hides. The process is done with extreme high speed, to achieve the best result without impeding the production workflow.



Key advantages

- **Multi-hide nesting**

The Off-Line workflow allows simultaneous nesting of several hides - a key factor for high efficiency and less reusable waste.

- **Eliminates the workforce dependency when nesting**

Your operators don't have to do manual nesting anymore. The introduction of automatic nesting means you don't need experienced people, skillful in efficiently placing the dies on the hides. They just have to match the placement of the dies with the shapes projected by the video-projector on the cutting board.

- **24/7 nesting**

The separation between nesting and cutting allows a longer time allocation to the nesting process. This represents a key factor for multi-hide nesting and therefore higher efficiency.

- **Adaptive strategies**

The nesting algorithm automatically adapts itself to the characteristics of all hides and models, obtaining high quality and stable results regardless of the production diversity.

- **GPU nesting technology**

After an extensive R&D program, Gemini CAD Systems has launched the next generation of multi-hide nesting technology, powered by the latest developments of GPU (General-Purpose computing on Graphics Processing Units). The introduction of GPU's massively increases the nesting speed. Thus, the nesting algorithm can run many more nesting trials on each set of hides, which leads to better efficiency.





Digitize your hides with the latest scanning technology

The introduction of automatic multi-hide nesting requires the digitization of the hides. Gemini CAD Systems has an extensive experience in this area, by developing two scanning solutions to cover various production characteristics. Thagora Leather Scanning Machine is an advanced conveyerized equipment with the latest technology in this field. Thagora Static table with photo camera is a basic solution for hides digitization. According to the specifics of your production, you may choose one or another.



Thagora Static Table with photo camera

Digitizing the hides with a photo camera on a static table is the best solution for you if the labor cost is still reasonable. Furthermore, it may better suit your needs if you are using leather that is less sensitive to chalk or ink marks.



Thagora Leather Scanning Machine

This technology is better for you if you want an equipment dedicated for mass production, for a fast and accurate inspection process. Moreover, it is recommendable if you are manufacturing car interiors of high quality leather, because the marking is done with an IR pen, which doesn't leave traces of chalk or ink on the hides.

Also, it requires only one operator. Thus, for companies with high production volumes, the deployment of the Thagora Leather Scanning Machine brings important savings out of total wage bill.

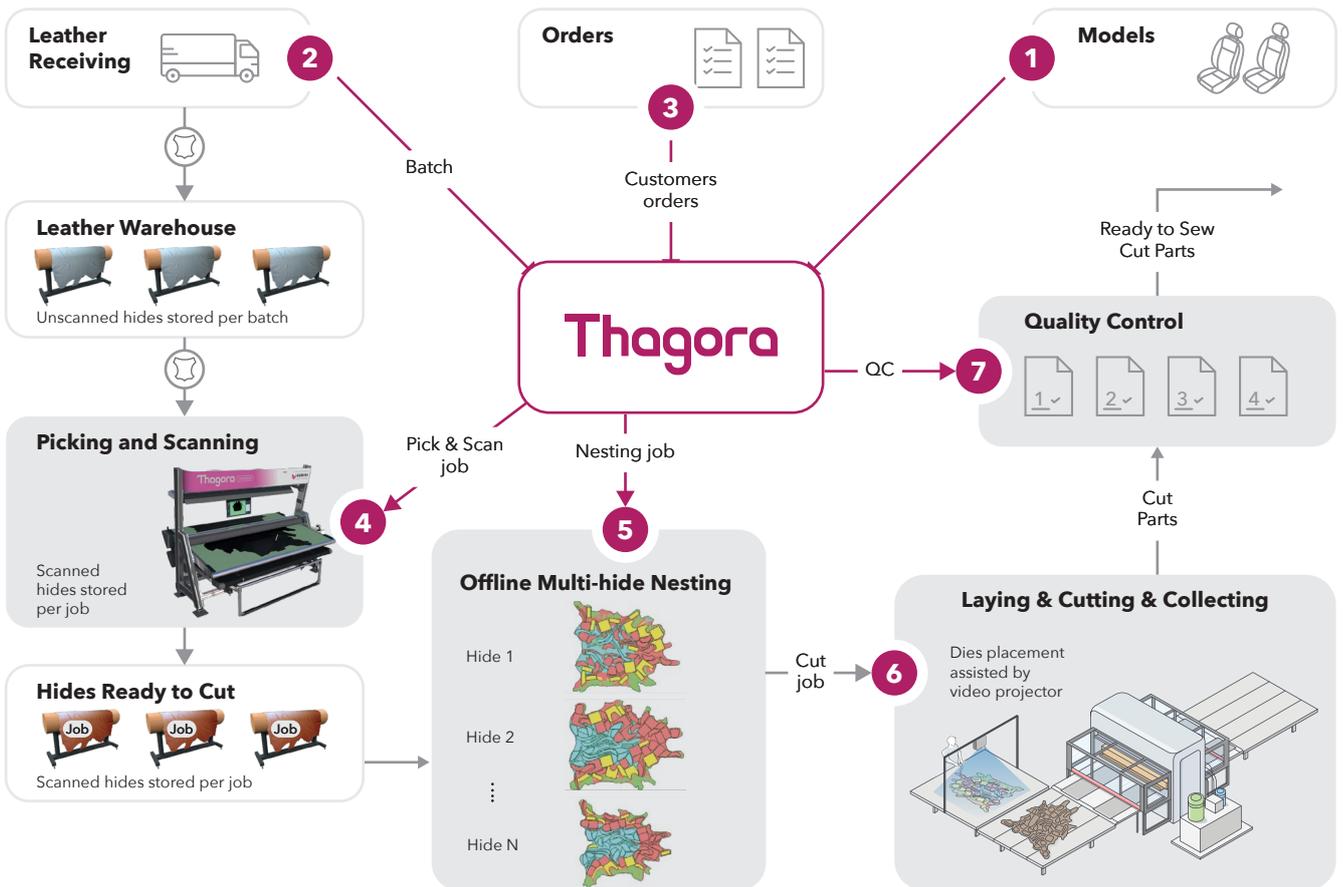
Comparative table

Feature	Scanner Static Table	Thagora Leather Scanning Machine
Need of pre-inspection	Yes	No
Fast hides' laying on the scanning surface	No	Yes
No of Quality Zones	3	Up to 7
Stability of detection	Medium	High
Low footprint	No	Yes
Need of erasing the marks	Yes	No
Problems with traces of chalk or ink on the hides	Yes	No
Adaptive lighting system for pre-inspection	No	Yes
Speed of inspection	Low	High
Requires more than one operator	Yes	No



Update your current workflow

The introduction of Thagora brings several critical benefits without disrupting your current production. Scanning, nesting and cutting are performed separately, on different workstations. Unlike processing hide by hide, several hides required for one cutting job are manually selected and scanned. After the last hide is scanned, the Nesting Server starts the automatic multi-hide nesting. When the nesting job is approved, the hides are placed one by one on the cutting boards. The dies are placed with the help of a video projector to match the automatic nesting. Then, the die cutting proceeds as usual.



1 Models

The models are imported in Thagora database. During the import procedure, the models are automatically checked for geometrical and consistency errors before using into the production. Conversion from different CAD systems and DXF formats is available.

2 Leather receiving

The leather is received and stored in the warehouse. All the information related to the received batches are stored in the Thagora database.

3 Orders

The customer orders are entered into the system. The automatic planning module optimizes the production by organizing the customer orders into the production orders. The production jobs are created and the required total area for each job is calculated.

4 Hides picking and scanning

The required hides for one job are picked from the warehouse and the scanning process starts. The scanned hides of one job are stored on a separate horse and sent to the cutting area.

5 Nesting

The Nesting Server starts the automatic, multi-hide nesting on all the hides of the job. After the nesting is finished, the results must be approved manually or automatically.

6 Laying & Cutting & Collecting

The approved jobs are ready to be cut. The hides are processed one by one. The dies are placed on each hide, with video projection assistance, according to nesting. The hide is sent, on its board, to the die-press. After cutting, the parts collecting process is assisted also by video-projection, to achieve an increased productivity. The reusable waste is automatically cut, labelled and sent back to the warehouse.

7 Quality control

The quality control is performed on a separated station. The parts to be recut are marked in the system for reprocessing and a full traceability of the entire process.



Transparent Total Cost of Ownership

One of the advantages offered by Gemini CAD Systems is that we don't just sell you a well-performing solution - we become your partner. Therefore, we will guarantee a close cooperation in every aspect regarding the upgrade of your cutting room and constant technical support.



Partnership from day one

From day one, we make a detailed assessment of your current workflow and your specific requirements. Then we ensure the deployment of a customized solution with no disruptions of your ongoing production process.



Quick response time for customer support

In case of problems that affect your production, the service contract guarantees you a quick response time from our team. Our people take care of the issues to ensure that everything works fine.



Technical support

We provide online customer support 24/7, in 5 languages.

All the technical advantages provided by Thagora bring significant profitability of investment. Each of these advantages are verifiable, controllable and predictable, so you can make a comparison with other solutions on the market. The financial advantages come from:



Short payback period

An average 12-18 months payback period allows you to cover the investment through leather savings and increase of productivity.



Reduced cost of ownership

The product's maturity, as well as the support services provided by Gemini CAD Systems lead to a competitive value of the ownership costs.



About us

Gemini CAD Systems is a leading global supplier of technology for industries working with soft flexible materials such as textile, composites or leather. Our activity includes research, development and implementation of software, hardware and workflow solutions for apparel, furniture and automotive, with focus on computer aided design (CAD) and computer aided manufacturing (CAM) applied in the cutting room.

Gemini's business is based on cross-linked fields of expertise and a collection of proprietary software algorithms and hardware equipment, built over 15 years of activity and continuous investments in R&D.

Gemini's advanced technologies automate the manufacturing process from design to cutting for more than 16.000 customers across 38 countries, providing reliable services and technical support throughout all stages.

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