DRY PASTA PROCESSING
Cutting edge technology developed by pioneers
WE KNOW
We know how to handle every type of ingredient. Even flours with low gluten contents can be made into excellent products.

PIONEERING RESEARCH
By travelling our own path and imagining the future, we got there before the others. We have developed futuristic technologies and continue to refine them.

TOTAL VACUUM
Vacuum technology has been used on Pavan lines for over 60 years. A pioneering choice that has stood the test of time, developed and perfected to create the current solutions.

TAS TECHNOLOGY
The Thermo Active System has revolutionised the way pasta is dried. An avant-garde system yielding higher quality pasta in less time.

ADVANCED RESEARCH
We have our own area dedicated to R&D, with pilot plants, flexible production lines and analysis laboratories equipped with all the instruments required to carry out chemical, rheological and nutritional tests.

EXCELLENT PASTA FROM ANY TYPE OF RAW MATERIAL
The technology developed by Pavan facilitates the use of any type of ingredient. The percentage of protein present is fundamental to the quality of the pasta as it gives strength to its texture. By applying technologies such as TAS, climatic zones and vacuum, it is possible to make excellent end products even from flours with low protein contents. High temperatures are excellent for processing products made from weak flours and bread wheat flours with low protein contents because they facilitate coagulation and improve the quality of the pasta.

— WE KNOW —
The gluten matrix, fundamental to the quality of the pasta, is formed when the dough is mixed under ideal temperature and humidity conditions, avoiding all mechanical stress.
DOUGH

The total vacuum affects the organoleptic properties of the pasta, also providing for brighter colours and a higher quality end product.

WATER, FLOUR AND VACUUM: THE THREE INGREDIENTS

Pavan was the first company to extensively apply vacuum technology during the shaping stage, from pre-mixing to the exit of the extruded product.

EACH STAGE UNDER VACUUM

This extensive application of vacuum technology provides many advantages for the finished product. The hydration of the semolina is more homogeneous and this reduces defects and white specs. The vacuum allows for the addition of a greater quantity of water during the mixing stage, which improves the formation of gluten. The evaporation effect caused by the vacuum lowers the temperature of the semolina during the mixing and extrusion stages; this prevents thermal stress and results in a pasta with better cooking performance.

THE FOUNDATIONS OF QUALITY

The gentle shaping stage results in pasta with brighter colours. The complete vacuum blocks the enzyme Polyphenol Oxidase, responsible for the oxidation of the semolina pigments, thus preserving the amber yellow colours given by the carotenoids and flavonoids. The vacuum also deactivates the enzyme Lipoxygenase, responsible for turning colours grey and the development of unpleasant odours caused by the oxidation of the lipids. The partial deactivation of alpha and beta amylase leads to a reduced occurrence of the Maillard reaction, i.e. the pasta turning brown during drying.

WE KNOW

The vacuum process minimises the development of reducing sugars. This means less starch release during cooking and less stickiness.

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The press is the head of the line: the dough is formed here and the product is extruded and sent to the drying process.
OPTIMUM DRYING
The drying stages are the most delicate and important phases in the production process, critical to achieving an excellent product.

TAS - THERMO ACTIVE SYSTEM AND HIGH TEMPERATURES
TAS technology includes drying and stabilisation stages. It maintains the product in a plastic and porous state throughout the process and keeps the development of the Maillard reaction under control. The rapid reduction in the water content of the pasta and the progressive temperature increase block the expansion of the starches and activate proteinic coagulation. The result is a product with improved colour and cooking performance.

HIGH PERFORMANCE TECHNOLOGY
Thanks to the integrated software that controls the duration of each individual stage according to the drying diagram settings, it is possible to keep the temperature and humidity conditions constant by transferring excess humidity from one zone to another. Without the need for external machinery, the integrated technology keeps the production process uniform, manages the humidity and temperature values and reduces power consumption, with drying times of less than two hours for short-cut pasta and less than five hours for long-cut pasta. Another added value of the high temperature process is that it eliminates the risk of contamination, for a hygienically safe product.

DRYERS
These are made from stainless steel and anti-corrosion materials to provide decades of service.
**THERMO ACTIVE SYSTEM**

The process that changed the way pasta is dried

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**Status 0**

Freshly extruded pasta contains approximately 30% water

**Drying area**

The first drying stage dries the outer layers.

**Stabilisation area**

The moisture is concentrated in the heart of pasta. The water is able to distribute itself uniformly in this zone with a lower temperature and higher humidity level.

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**A1**

**S1**

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**A2**

Drying area

The following drying stages reduce the moisture levels to the desired concentration.

**S2**

Stabilisation area

The moisture is allowed to distribute itself uniformly through the product during the stabilisation and conditioning stage.

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**Final status**

After successive drying and stabilisation stages the ideal moisture concentration level is achieved, usually around 12.5%.

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**THREE HOURS**

We know how precious energy is, this is why our lines take less than 2 hours to dry short-cut pasta and less than 5 hours for long-cut pasta. Lower energy consumption and more compact systems

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**GREAT FLEXIBILITY, MAXIMUM SCOPE FOR CUSTOMISATION**

The climatic zones are areas in the dryer that are physically separated from one another, they can be managed and configured independently but are also intelligently interconnected.

The drying diagram is completely customisable. This simplifies the changeover between pasta shapes with different drying requirements or different ingredients.
IMPROVED DRYING WITH CLIMATIC ZONES
The climatic zones are the technological core of the TAS drying process. They are comprised of physically-isolated independent sections in which the temperature and humidity are controlled in order to optimise the process and provide an excellent finished product. Hot and moist air masses are used to accelerate or stabilise the drying process, using an intelligent ventilation system that provides ideal control over the conditions in each zone.

DRYING SOLUTIONS
A system that is able to adapt to and react to all conditions

STRATEGIC AIR FLOWS
The air flows inside the dryer are managed so that the masses of hot and moist air are moved where required. The automated system recognises the temperature and humidity conditions and reacts strategically, using them as operating tools.

HIGH PRODUCTIVITY, GREAT RESULTS
The TAS technology involves accelerated drying and stabilisation stages that take place in physically separate zones inside the dryer. These areas provide temperature and humidity variations that allow for optimal drying of pasta, preserving the product’s properties and reducing process times. Excellent quality and maximum efficiency.
MAXIMUM THERMAL INSULATION

High performance insulation, a shield against energy waste

**STRATOS**
Increased energy savings

The high levels of insulation are achieved using multi-layer panels made from insulating materials such as polyurethane foam and rock wool.

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**CROSS SECTION OF PANEL**

<table>
<thead>
<tr>
<th>1 mm</th>
<th>30 mm</th>
<th>70 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless steel sheet</td>
<td>Horizontal fibre rock wool</td>
<td>Polyurethane foam</td>
</tr>
</tbody>
</table>

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**CLOSURES**
Every single detail has been made with great care, using durable materials such as stainless steel.

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**COMPLETE ACCESSIBILITY**
Pavan dryers are designed and built to be easily accessible for maintenance and cleaning operations.
The innovative concepts used in the mechanics of the moving parts, based on the high precision manufacture of the individual parts, ensures that the systems are fully mechanically reliable.

With the aim of minimising maintenance times and increasing efficiency, unique applications were designed such as heat exchangers in the main reducers to lengthen the life of the oils, the use of new generation lubricants and high service factors in the mechanical parts.

The chains are generously oversized with respect to the imposed standards and the Niploy surface treatment provides excellent resistance to corrosion.

Every mechanism is also equipped with electronic monitoring and redundant safety systems.
INFLATABLE SEALS

Protection against heat dispersion

Made from a special VMQ compound which following a vulcanisation process at 200°C acquires excellent resistance to high temperatures, humidity and tearing. The internal chamber is pressurised with air at 0.8 bar, ensuring adhesion to the contact surface even in the event of complex geometries. This feature is essential from a technological point of view, as it allows the relative humidity of the air to be kept to maximum levels.

Protection against heat dispersion

0.8 bar

INTERNAL PRESSURE

To guarantee complete isolation between the outside and inside environments

32 N/mm

TEAR RESISTANCE

The seals are resistant to wear and stress
The production systems are able to recognise problems and react by implementing the necessary measures.

- Full automation
- Real time control
- Recipe management
- Power consumption analysis
- Historical data analysis
- Compatibility

**ADAPTIVE SYSTEMS**

**IMPROVED SUPERVISION**

The entire plant is monitored in real time and the software system records every piece of data in order to measure efficiency and compare power consumption against historical data.

- High speed data archiving and retrieval
- Power consumption analysis
- Easy recipe management

**REMOTE ASSISTANCE**

Pavan’s technological and software support service is available 24/7; it is also able to solve issues remotely.

- Smart Alert System
- Flexible planning
- Compatible with mobile systems

**QUALITY**

Quality ensured in the end product

**REPEATABILITY**

Standardised execution of best practices

**EFFICIENCY**

Increased system efficiency

**SIMPLICITY**

Simple to use, implement and configure

**COMPATIBILITY**

The system integrates with all the main operating systems

PASS® has been developed to be accessible from all mobile devices
A COMPLETE RANGE OF ADVANCED SOLUTIONS
SHORT-CUT PASTA LINE

01 Dosage and Press
In the mixing tank the slowly rotating paddles mix the ingredients until optimal hydration is achieved, allowing the gluten matrix to form. The whole process from dosing to extrusion takes place under vacuum at a temperature of 60-65°C.

02 Cutting units
This machine cuts all short-cut pasta shapes and is suitable for the installation of the PENNAUT device for cutting "penne" pasta shapes; this is equipped with an automatic centring/positioning system for the cutting discs.

03 Shaker pre-dryer
The pasta is surface-dried with hot, dry air in order to prevent sticking. The temperature of the pasta is raised to 78°C.

04 TAS HP dryer
This machine is enhanced by TAS technology, and by a ventilation system designed to allow air to flow through the product layer. The dryer is completely isolated from the outside environment and all air inflow and outflow is strategically managed to improve the production process. The maximum temperature reached is 115°C with stabilisation zones at 77°C and an average residence time of 120-145 minutes.

05 Cooler
This machine is equipped with automatic air cooling units that lower the temperature of the pasta to 20-25°C and prepare it for the packaging stage.

DRY PASTA | Pavan cutting edge technology

DRYER
This machine is divided into technologically independent areas for drying and stabilising the product. The entire structure is made of stainless steel. Each process zone is separated by panels and equipped with automatic heating and ventilation stations, heat exchangers and independent air extraction units in order to ensure accurate temperature and humidity control.

EXTREMELY HIGH TEMPERATURES
Efficiency and extremely high temperatures for the shortest possible drying times and superior quality pasta
Pavan has chosen PEEK as the material for its dryer belts, a technical polymer with high levels of thermal and mechanical performance. The belt is not subject to any mechanical stress as it is never fully under tension. Resistant to high temperatures, humidity and wear, it is not subject to structural modifications or alterations. The geometry of the belt allows the air to permeate perfectly through the layers of pasta. The hot and humid air masses pass over the product in a controlled way without the obstacles typical of other systems.
MULTI TIER LONG-CUT PASTA LINE
The solution for producing high quantities of long-cut pasta in the smallest possible space
LONG-CUT PASTA LINE
MULTI-TIER

01
Dosage and Press
Low-shear stainless steel compression screw. The variable pitch and broad diameter of the screw, combined with an ideal rotation speed, allow for gradual compression and a more homogeneous dough.

02
Multiple spreader
Spreader with sticks up to 2500mm in length, with a device for collecting the trimming scraps, mincing them and returning them to the press.

03
Pre-dryer
The pasta is surface-dried with very hot air flows before entering the final dryer.

04
TAS HP dryer
The drying process is enhanced by thermo-active climatic zones. The structure is made up of physically separate process tiers for maximum humidity and temperature control at every point.

05
Cooler
This machine is equipped with automatic ventilation units with cold water heat exchangers that bring the pasta to an ideal temperature before the packaging stage.

06
Stripper saw unit
Removes the pasta from the sticks and cuts it to the desired length.

After the pre-drying stage the pasta enters the dryer, which has either three or five tiers. These tiers are physically separated from one another and house the technological core of the Thermo Active System. The pasta passes through accelerated drying and stabilisation zones in which the temperature and humidity parameters are programmed in order to achieve perfect drying.
CONVEYOR STICKS
A simple and effective system

The product conveyor sticks have an oval cross-section and offer excellent resistance to mechanical stress. They are made from AISI 304 stainless steel, which guarantees optimum process hygiene with respect to conventional aluminium sticks, which due to surface micro-porosity can capture particles of the product.

Made from high-strength extruded stainless steel rods, the ends of the rods are attached to conveyor chains.

Stainless steel sticks have a deformation trend of 1/3 that of conventional aluminium sticks with the same cross section; this translates into increased solidity.

DEFORMATION INDEX
With equal loads and cylinder cross-sections, the deformation index of AISI 304 steel sticks is 1/3 that of AL6060 aluminium sticks.
SINGLE TIER
LONG-CUT
PASTA LINE
Effective technology for optimum results.
The single tier solution
LONG-CUT PASTA LINE

SINGLE TIER

The production line is characterised by a single-tier dryer, expressing the full potential of TAS technology. After extrusion the pasta is pre-dried and then sent to the dryer. Following successive accelerated drying and stabilisation stages in the dryer, the product then arrives at the cooler with the correct humidity percentage and excellent organoleptic properties.

01 Dosage and Press
Stainless steel tank with dough level sensor. The process takes place under vacuum at low temperature. Thanks to the slow rotation of the mixing paddles, the gluten matrix is not subjected to mechanical stress and the product maintains excellent elasticity.

02 Spreader
Single or multiple spreader with sticks 1500, 2000 or 2500mm in length. All versions include a device that captures the scraps and reintroduces them into the mixing tank.

03 Pre-dryer
The pre-dryer eliminates the water from the outermost layer of the pasta and prepares the product for the subsequent drying stage.

04 TAS HP dryer
Each section of this machine is equipped with ventilation units, heat exchangers and air extraction stations in order to ensure accurate temperature and humidity control at every point in the dryer.

05 Cooler
Lowers the temperature of the pasta before the packaging stage. It can be accessed from both sides to facilitate maintenance operations.

06 Stripper saw unit
This device removes the pasta from the sticks and cuts it to the desired length.

Drying takes place in segments in which climatic conditions are kept constantly under control.

SIMPLE
The line extends in length over a single production tier. Simple, with all Pavan’s technology inside.

TAS TECHNOLOGY
The drying process takes place via alternating stabilisation and accelerated drying zones.

RELIABLE
The single drying tier production line is reliable and easily accessible for maintenance.
NEST SHAPED PASTA LINE

Making pasta is an art that requires knowledge and imagination.
NEST-SHAPED PASTA LINE

CUPS & BELTS

This mixed system features a pre-drying stage in which the just-extruded nests are placed in cups where they remain until they exit the pre-dryer. They are then deposited onto belts that transport them through the entire drying process.

01 Dosage and Press
Low-shear stainless steel compression screw. The variable pitch and broad diameter of the screw, combined with an ideal rotation speed, allow for gradual compression and a more homogeneous dough.

02 Nest forming machine
Laminating roller unit positioned under the extrusion head, removable for the production of directly extruded products. Nest making device with 12 or 24 tubes installed directly under the press die. With conveyor tubes in transparent food grade material for checking the length of the pasta strips.

03 Lower pre-dryer
The nests sent to the pre-dryer in cups are subjected to strong ventilation to achieve the ideal shape and prevent sticking.

04 Upper pre-dryer and TAS dryer
This machine is comprised of two sections. During the first stage the nests are pre-dried still in their cups until they reach a suitable rigidity. During the second stage the nests enter the main dryer on a conveyor belt.

05 Storage
This area acts as a buffer with loading and unloading stages regulated by automatic sequences based on presets that can be programmed by the operator to adapt to different packaging requirements or to manage the production of different types of nests.

TAS TECHNOLOGY
The drying process takes place in alternating stabilisation and accelerated drying zones

CUPS
Made from stainless steel with a mesh bottom, these ensure breathability for improved drying.
CUPS LINE

The nests travel in cups from the beginning to the end of the process to prevent scraps.
NEST-SHAPED PASTA LINE

NIDOMATIC

The "Nidomatic" solution employs a different method for conveying the nests during the drying stage. Following extrusion, the pasta is placed into cups where it remains until the end of the process. This system reduces scraps to zero and facilitates packaging in trays.

01 Dosage and Press
In the mixing tank the slowly rotating paddles mix the ingredients until optimal hydration is achieved, allowing the gluten matrix to form.

02 Nest forming device
Laminating roller unit positioned under the extrusion head; removable for the production of directly extruded products. Nest making device with 12 or 24 tubes installed directly under the press die. With conveyor tubes in transparent alimentary material for checking the length of the pasta strips.

03 Weight check
Situated under the nest-forming machine, this device checks the weight of the nests.

04 Pre-dryer
Stainless steel structure with ventilation units specifically designed to keep the nests in their ideal shape. Equipped with independent controls for automatically regulating temperature and humidity.

05 TAS dryer
Divided into three independent sections: the pre-drying stage continues in the first zone; in the second area the main drying process takes place and the third section is used for stabilisation.

06 Unloading units
The nests are unloaded in groups of 4, 6 or 8 units for arranged packaging in trays or heat-sealed film. After unloading the empty cups are returned to the nest forming machine to repeat the cycle.

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**CONTROLLED DRYING**
The cups move through climatic zones and air passes over them in a controlled way.

**NIDOMATIC SYSTEM**
The nests remain in their cups from the beginning to the end of the process.

**NO SCRAPES**
Conveyance in cups reduces scraps and the risk of damaging the product to nil.

**PRECISE PACKAGING**
The method of conveying nests in individual cups allows for the precise management of the packaging process.
The data provided in this brochure may be subject to changes aimed at improving the solutions shown.

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