

SOLUTIONS FOR

CONCRETE ROOF TILE PRODUCTION



ABECE

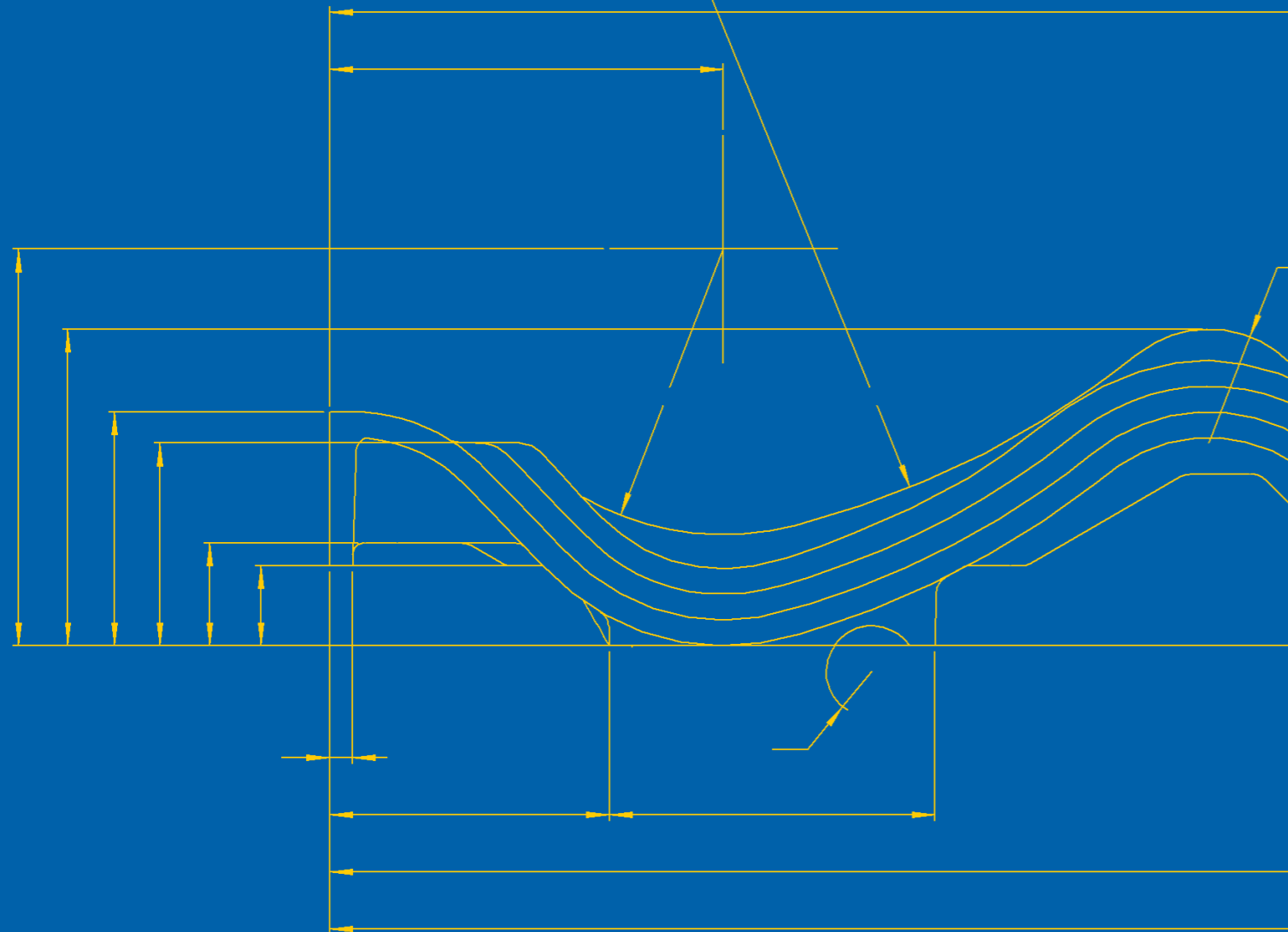
SWEDISH ARCHIPELAGO



SWEDISH RAPESEED FIELD



ABECE AB IN SWEDEN IS THE WORLD'S LEADING SUPPLIER OF MACHINERY AND TECHNOLOGY EXCLUSIVELY FOR THE CONCRETE ROOF TILE INDUSTRY.



PROFILE: ST21

CONTENT

THE PARTNER TO TRUST	1	RAW MATERIALS	5	SPL LARGE SYSTEMS	12
THE ORIGINAL	2	PLANT CONCEPTS	6	PROFILES	14
QUALITY FROM SWEDEN	3	SPS START-UP SYSTEMS	8	PACKAGING PLANTS	16
MANUFACTURING PROCESS	4	SPM MEDIUM RANGE SYSTEMS	10		

THE PARTNER TO TRUST



ABECE has more than half a century of experience in the development and supply of high quality machinery to the roof tile industry – we have the knowledge and experience to find the best solutions for every business situation.

We have longstanding relationships with our customers and they are successful. From this experience we know how to support our customers – throughout a project and beyond. As the premier supplier in the business we will look after your needs all the way from first start-up through support, service and spare parts.

Trust and professionalism are the core values for every activity performed and in every relationship with ABECE. We can incorporate these values because our sole focus is being a complete supplier to the roof tile industry.

In recent years we have made great progress, especially in the fields of safety, productivity levels and after sales service. At ABECE we never compromise on the safety and productivity of our machinery. They are easy to use and to maintain, and require few operators. They are simply the most productive!

With our technology leadership and Swedish engineering tradition we focus on increasing productivity and lowering costs such as energy and raw material quantities – we always develop solutions to maximize your return on investment. In the business of concrete roof tiles – we are the partner to trust!

Erik Lindeberg
Managing Director

THE ORIGINAL



ABECE has, through the decades, delivered hundreds of concrete roof tile solutions all over the world. Back in 1955, we launched “The Original” ABECE roof tile machine “Skandia” which had a capacity of 12 concrete roof tiles per minute. Since then many markets have discovered the advantages of ABECE production solutions.

We follow a strong and successful Swedish engineering tradition. Our plants are known to be the most productive in the world, and we are the most experienced supplier of high-speed machines. For six decades we have been gaining the necessary experience, and

together with our highly skilled co-workers and partners, we have developed and built the biggest and most advanced roof tile plants in the world.

We develop solutions for concrete roof tile equipment, extrusion machines, clay or ceramic tile packaging equipment, machinery and services – always focusing on the customer’s budget and return on investment.

Our philosophy is always to be close to our customers throughout the entire process, from the start of the project to its commissioning, and we also provide continuous upgrades, service and support.

QUALITY FROM SWEDEN



UV-RESISTANT COATING
The UV-resistant outer layer makes the tile less sensitive to ultraviolet rays.

DURABILITY
The tiles have a life span of up to 50 years.

EXTREMELY HARD SURFACE
Prevents algae, fungus, lichens and moss growth.

DESIGN
The tile has a good aesthetic

HYDROPHOBIC SURFACE
The tile surface is hydrophobic, which means that the water runs off easily.

COLOURED RIGHT THROUGH
Because the roof tile is coloured right through, it resists long-term wear and doesn't fade in the sun.

After centuries of production, concrete roof tiles are still undergoing development and the market is constantly expanding. This is mainly due to the technical properties of the material, but it is also a result of the fact that architects and builders all over the world realise that concrete roof tiles make very attractive roofs, thanks to their aesthetic and appealing design and their rich patterns of light and shade.

There are no real geographical boundaries to limit the future. Different climate conditions have no adverse effects on the successful use of concrete roof tiles in comparison with other roofing material. Concrete roof tiles are used

to a considerable extent even in countries with extremely high air humidity as they absorb very little moisture. And they also provide excellent resistance to freezing temperatures.

The energy-efficient production process and long product life cycle mean that concrete tiles have a comparatively low environmental footprint. Concrete is excellent in terms of its embodied carbon, embodied energy and numerous other environmental performance indicators.

As a result, concrete tiles represent a roofing solution which is highly functional, has a long lifetime (up to 50 years), is ecologically sound and provides excellent value for money.

MANUFACTURING PROCESS

Concrete roof tiles are produced by machine, using the principle of extrusion.

Moulds (also called pallets) which form the underneath profile of the roof tile, are coated with a release agent prior to being fed into the extrusion machine.

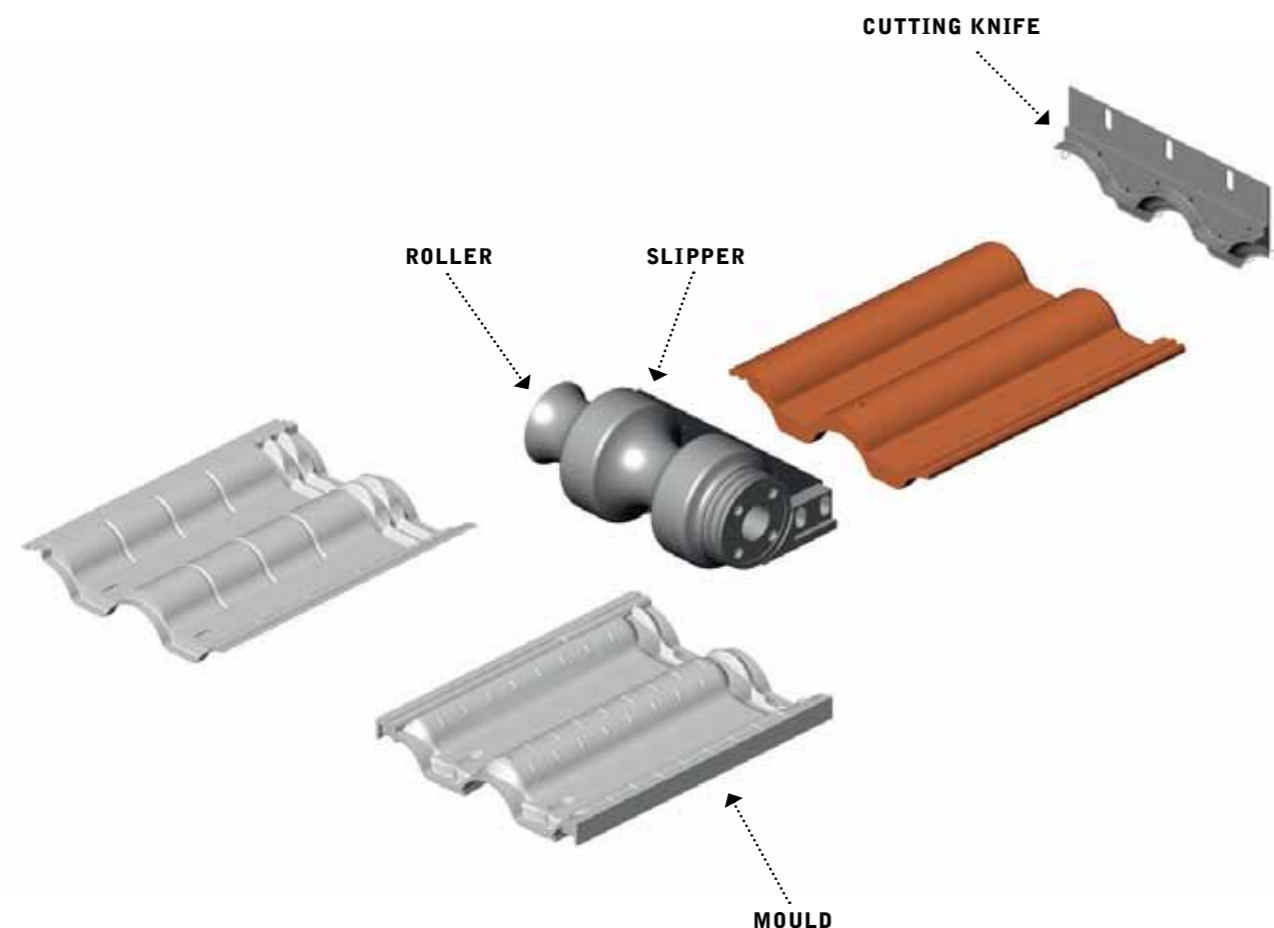
A mortar mix is delivered from a mixing system to the extrusion head of the machine. This mix is extruded between the pallets and a roller.

The roller forms the top surface of the roof tile. A slipper is mounted behind the roller and this serves to further compact the tile and produce a smooth and level surface finish. The

final operation of the tile machine is to cut the tiles to length and shape using a vertical cutting knife.

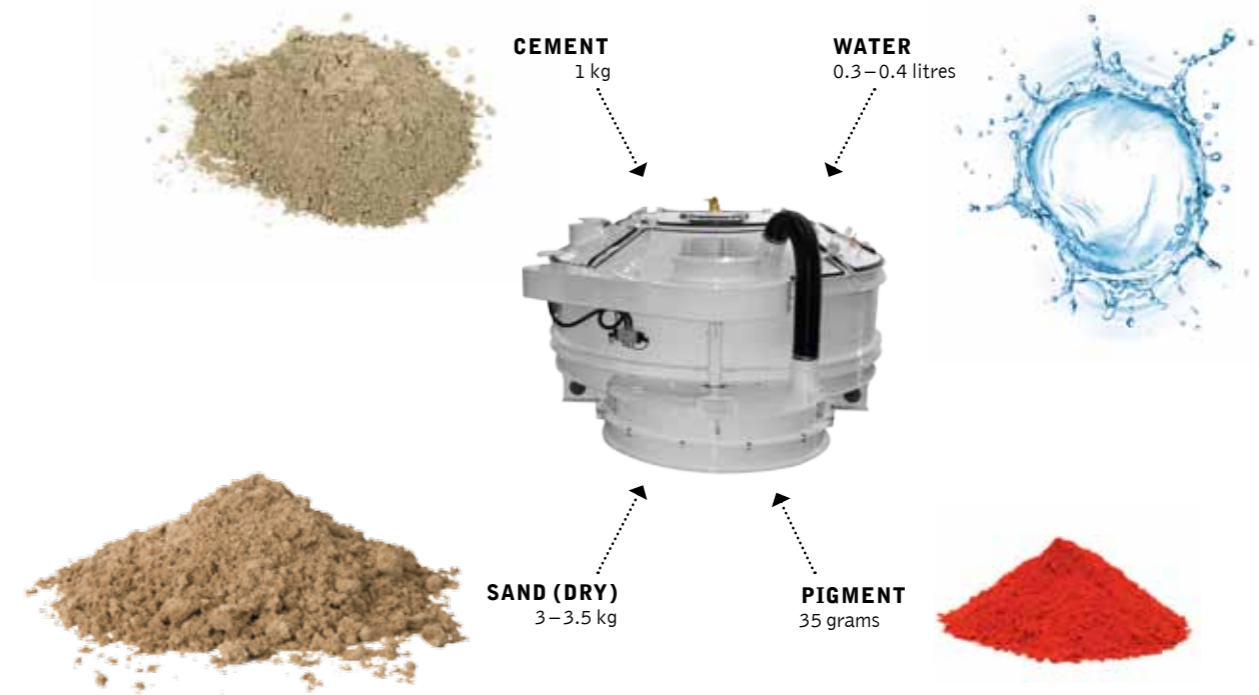
The freshly extruded tiles, still on their own individual pallets, are loaded into racks and placed in chambers for curing. The conditions inside the curing chambers are controlled in terms of temperature and humidity. Curing over a 24 hour period normally requires no added heat and results in temperature inside the curing chambers of 30–35°C and a relative humidity of 95%. A shorter curing time can be achieved by adding heat and/or using a rapid hardening cement.

THE PRINCIPLE OF EXTRUSION:



RAW MATERIALS

TYPICAL MATERIAL QUANTITIES FOR AN AVERAGE THROUGH-COLOURED CONCRETE ROOF TILE:



The basic raw materials used in the manufacture of coloured concrete roof tiles are sand (quarried or river), cement, colour pigment and water. The production of concrete roof tiles adds considerable value to these economic and readily available materials and as a result, the popularity of the product continues to grow in both established and developing countries alike.

Most countries are fortunate in that they have ample natural deposits of sand that is suitable for producing concrete tiles.

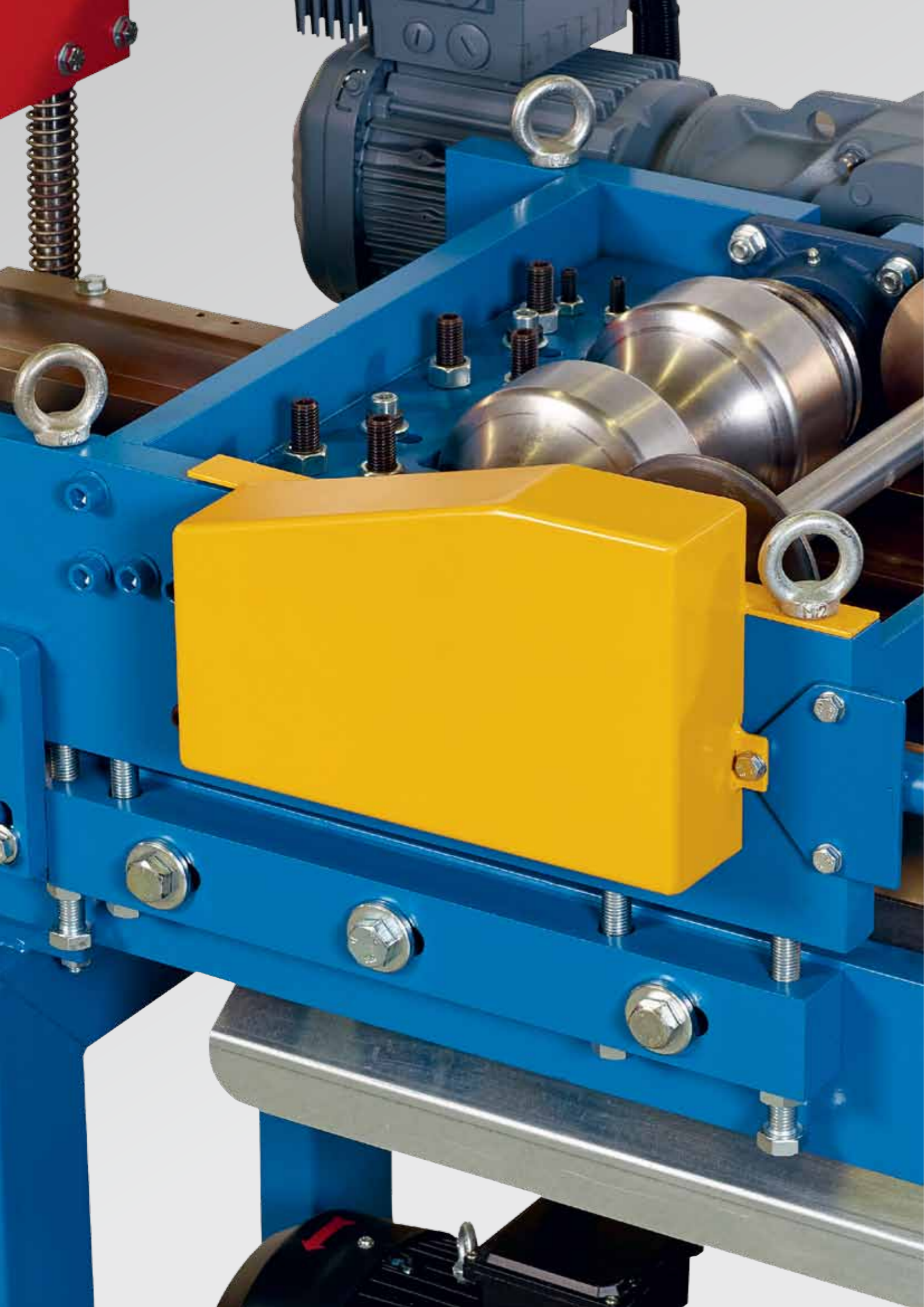
These sands will contain a balanced distribution of coarse and fine particles ranging from 4 mm downwards. The coarse particles provide strength and the fine particles a close-textured surface finish.

Where natural sand deposits are rare, crushed aggregates will provide a suitable substitute and make an equally good tile. The grain sizes of sand can be checked by

separating a sample through a series of vibrating sieves and comparing the results with a classification chart showing the ideal particle grading.

Ordinary Portland Cement (surface area 350 sqm/kg) is most widely available and recommended for general use in the roof tile industry. When a reduced curing period is required, the use of a rapid hardening cement (with an increased surface of 450 sqm/kg) is advisable.

In order to simulate the vibrant colours of ceramics or naturally occurring stone, the grey of concrete is artificially altered by the addition of coloured pigments (synthetic iron oxides). As these pigments colour only the cement, the level of addition is normally calculated on the cement weight. The pigment is added as a dry powder or as a liquid and, depending on the required colour, 2.5–5% is the generally accepted proportion.



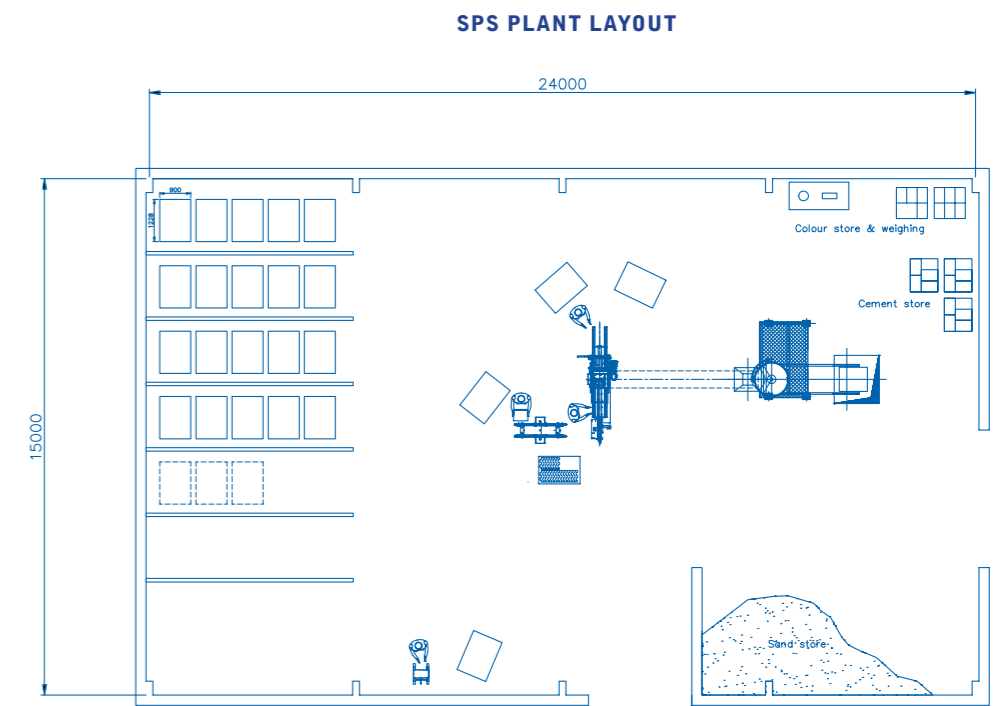
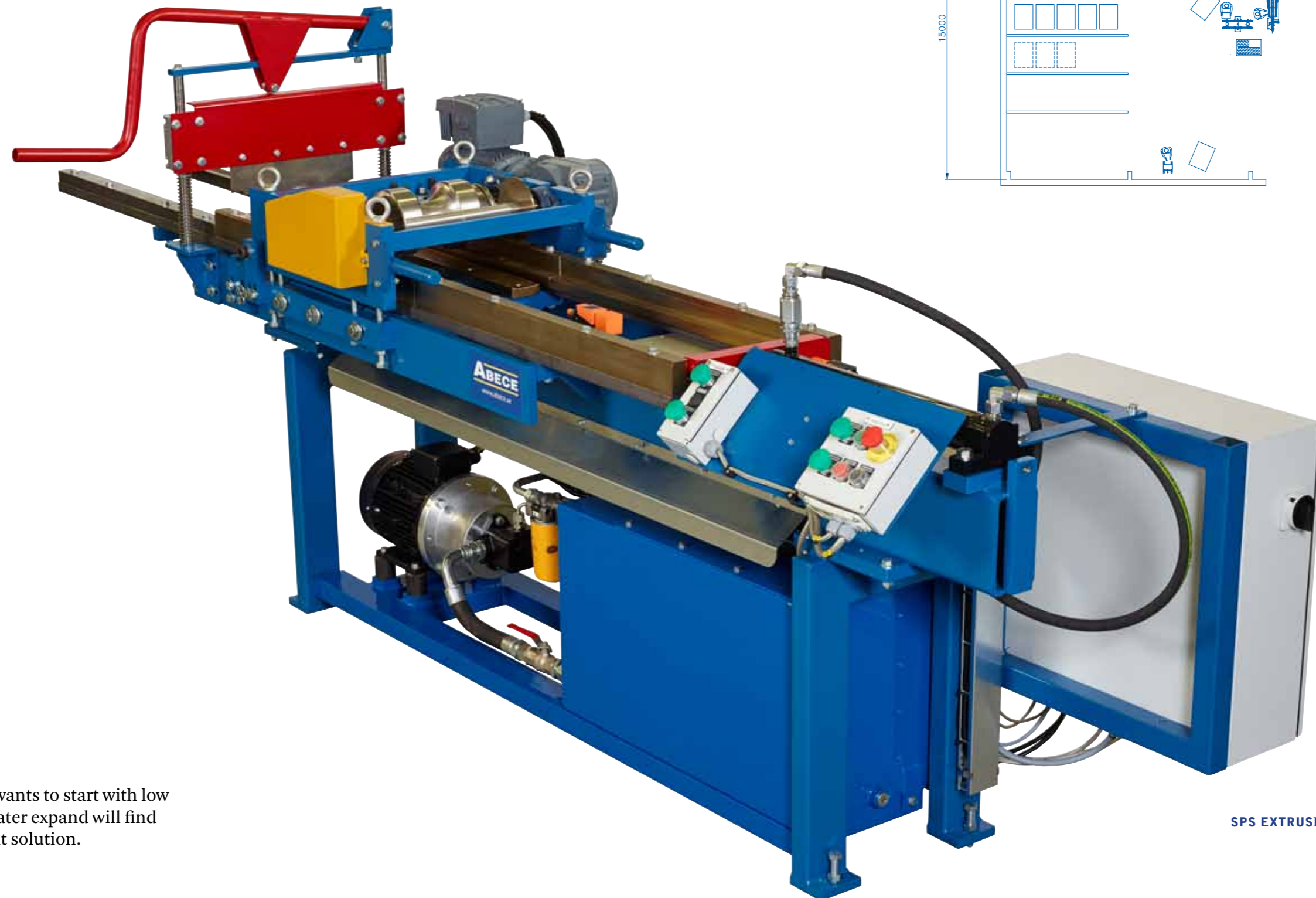
PLANT CONCEPTS

“With our wide range of multi-profile machinery and step-by-step solutions, we can meet any of your needs.

Our machinery is the most productive available and with full operator accessibility and the highest possible safety standards.”

SPS START-UP SYSTEMS

- Up to 5000 tiles per shift
- Several upgrade options available



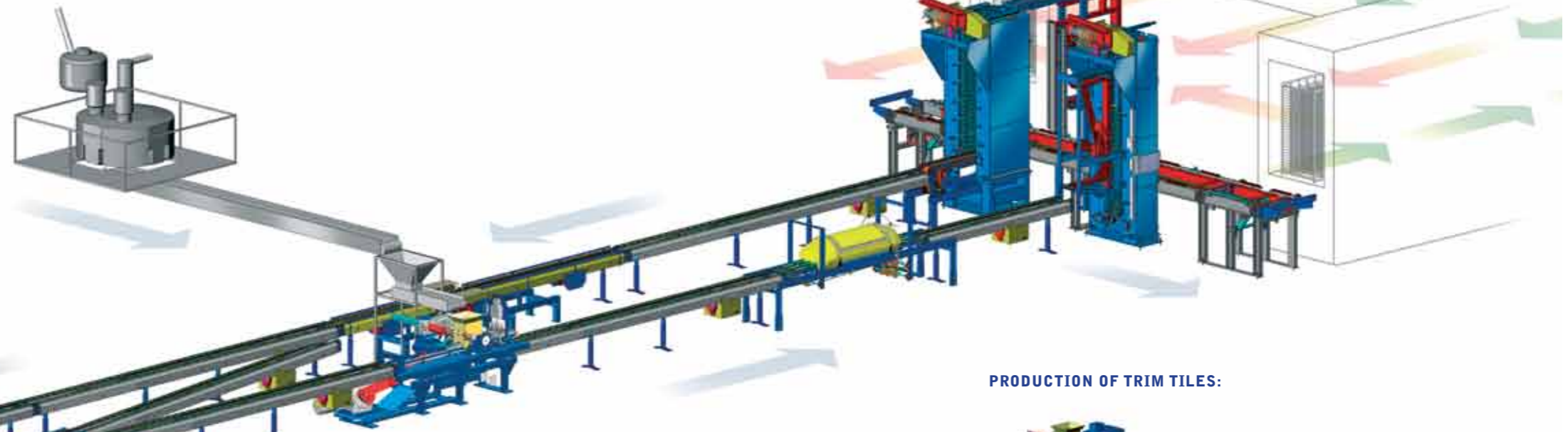
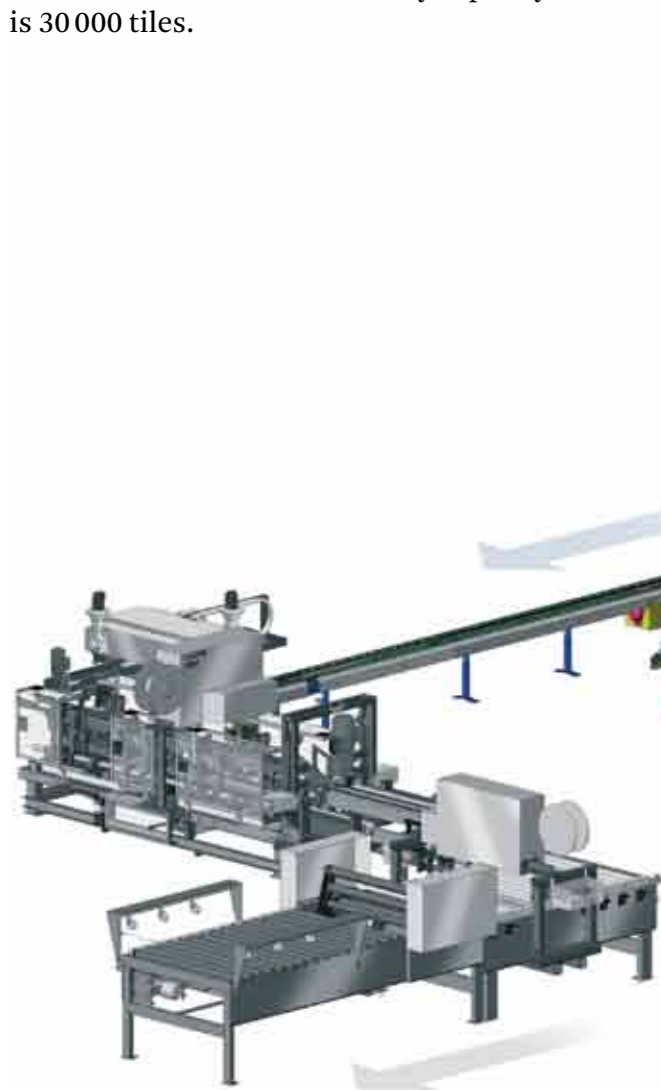
The tile producer who wants to start with low production levels and later expand will find this to be the ideal plant solution.

SPS EXTRUSION MACHINE

SPM MEDIUM RANGE SYSTEMS

- 5000 – 30 000 tiles per shift
- Expand with growth in five steps

Our well proven and robust Medium Range plants are delivered to many customers worldwide. The maximum daily capacity is 30 000 tiles.

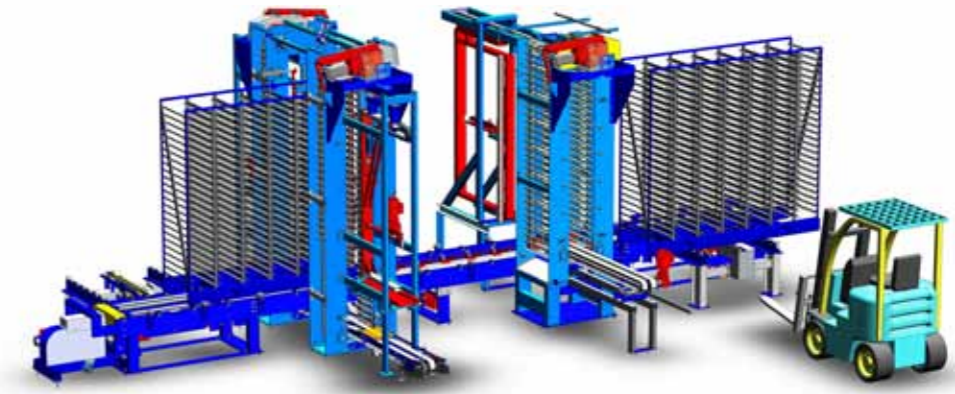


LAYOUT FOR AN SPM MEDIUM RANGE STEP 5:

PRODUCTION OF TRIM TILES:



RACKING SYSTEM FOR AN SPM MEDIUM RANGE STEP 3 PLANT:

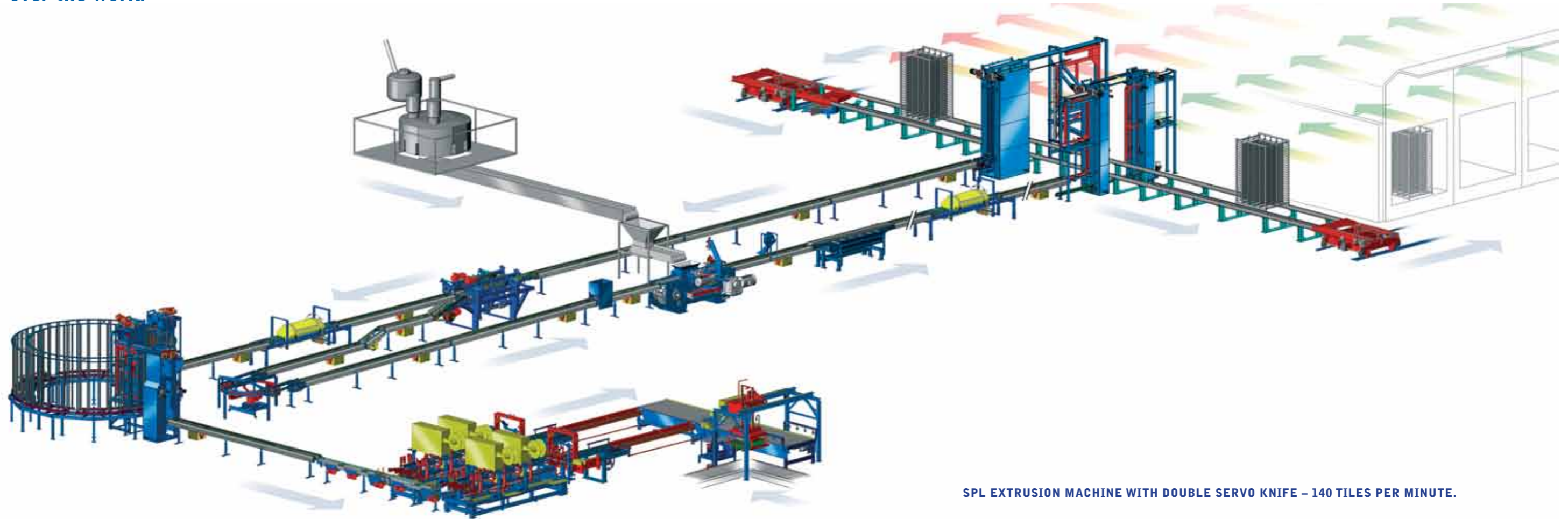


Start with low investment and expand with automation, lower staffing and higher capacity – just add equipment.

SPL LARGE SYSTEMS

- 30 000 – 60 000 tiles per shift
- ABECE plants are the most advanced and widely used high speed systems all over the world

SPL PLANT LAYOUT:
DOUBLE TOP COATING, ON WET AND DRY SIDE (WITH A DRYING CAROUSEL)-,
AND SMALL-PACK STRAPPING AS WELL AS LARGE-PACK STRAPPING



Our top-of-the-range plant solution developed for producers with the highest demands. This is a very sophisticated plant system with a capacity up to 60 000 tiles per shift.

SPL EXTRUSION MACHINE WITH DOUBLE SERVO KNIFE – 140 TILES PER MINUTE.



PROFILES

We have solutions for both standard and customised design tile profiles which we have successfully delivered to a large number of customers worldwide. Besides standard profiles, we are often asked to design special tile profiles to meet specific market and customer demands.

The choice of profiles is dependent on climate, culture and local market trends. Below you can see examples of our most popular roof tile profiles. The standard dimensions are 420x330 mm unless stated otherwise.

ST2 | SYMMETRIC DOUBLE S

This tile is one of the easiest to produce with good results and at the same time with a low weight. It is easy to make this tile in a weight less than 4 kg.
Markets: Europe, Africa, Asia, Australia, North and South America.



ST5 | BOLD ROLL

A Double Roman tile profile.
Markets: Asia and North America.



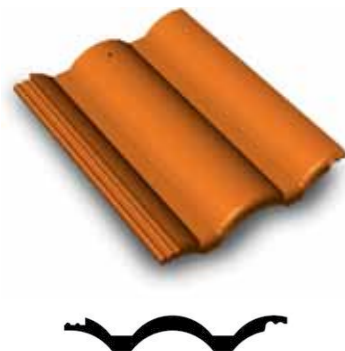
ST9 | ELLIPSE

The highest profile in our range.
Markets: Europe and South America.



ST11 | ELABANA

A low tile of Double Roman type.
Markets: Asia, Australia and North America.



ST14 | SPANISH S

Influenced by traditional Spanish tile design.
Markets: Europe, North America.



ST17 | DOUBLE ROMAN

A medium height Double Roman type tile.
Markets: Europe, Asia and Africa.



ST21 | SEA WAVE

An asymmetric type of Double Roman profile.
Markets: Europe, North and South America.



ST22 | FLAT

The Flat tiles are used on most markets. Available in two dimensions: 420x280 or 420x330 mm.
Markets: Europe, Asia, Australia and North and South America.



ST31 | MECKLENBURG

A classic Double Roman tile.
Markets: Europe.

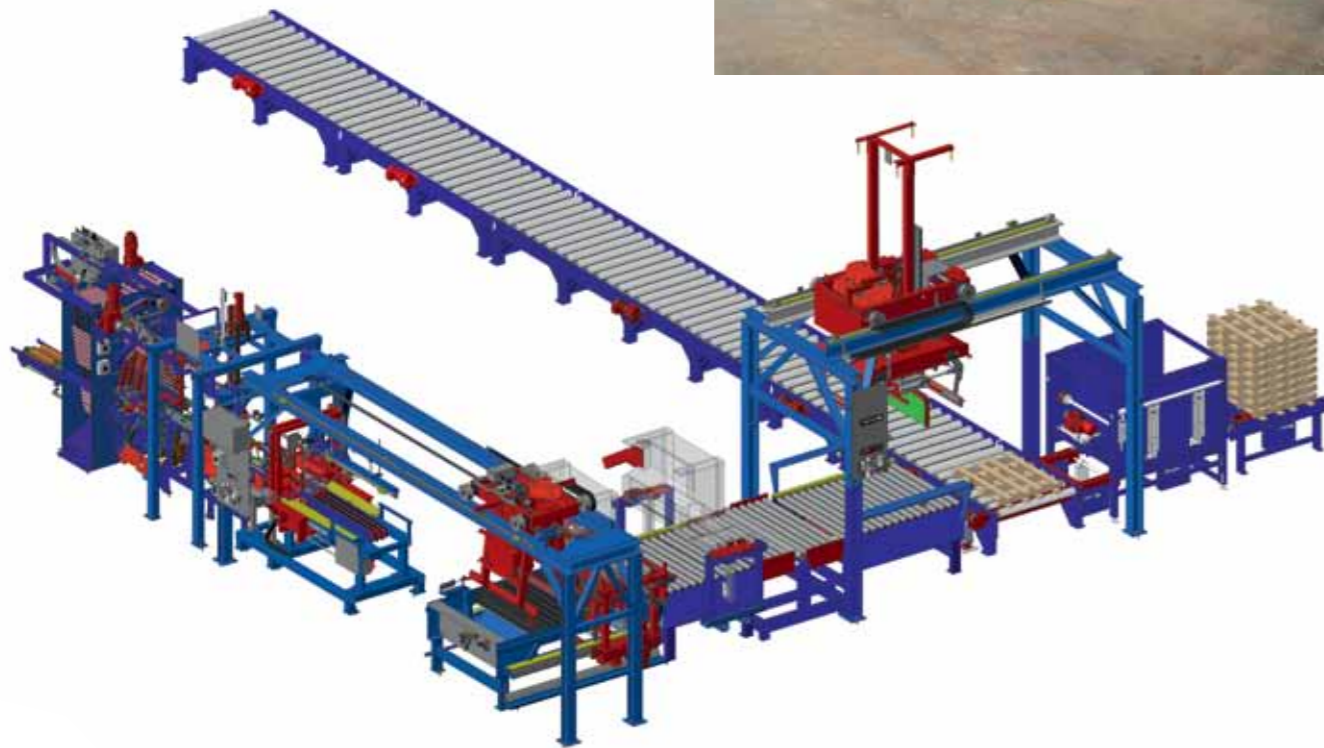


A SELECTION OF OUR TRIM PROFILES TO CORRESPOND TO OUR FIELD TILES:



PACKAGING PLANTS

Extremely productive packaging plants for all tile plant concepts from Medium Range to Large.



LARGE PLANT PACKAGING SYSTEM

The packaging system range is very extensive and adapted to various applications and production capacities. The main features for the configuration of a packer are:

- Wooden pallet or pallet-less
- Strapping of small packs (4–10) tiles
- Strapping or shrink wrapping on large packs (~ 40 tiles)
- Spin wrapping or shrink wrapping of the entire pallet load
- Large packs resting on long side or on nail hole end
- Flexible numbers of layers



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