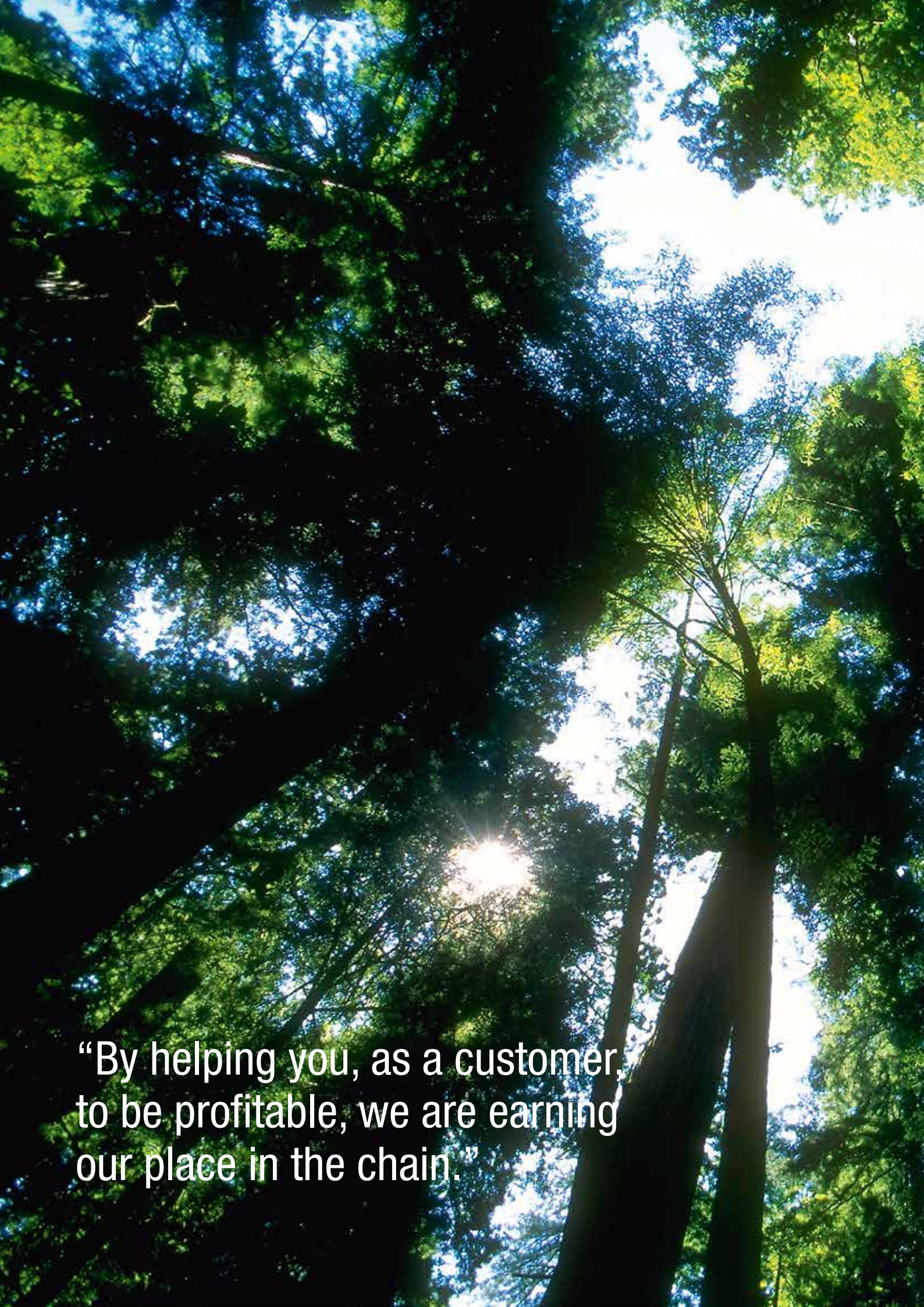
Continuous kilns

Continuous drying kilns that combine
high capacity and economy of operation
with the right drying quality.

valutec®
Good for Wood


“By helping you, as a customer,
to be profitable, we are earning
our place in the chain.”

Valutec is Europe's leading supplier of timber kilns. Why?

There are, of course, many different explanations for Valutec's market successes. Factors such as our offering high quality timber kilns and control systems tailored to our customers' needs may be one reason. Another may be that we have both the expertise and the desire to drive development forwards. However, I feel that the most important reason for our success is really something more basic.

We believe in our continuous improvement and optimisation of the drying process. We are also absolutely convinced that it enables us to contribute to better timber products and the increased competitiveness of wood. In turn, this leads to increased use of wood. This is the foundation of our long-term right to exist. By helping you, as a customer, to be profitable, we are earning our place in the chain. It also constantly inspires us to develop new, innovative concepts.

With the above attitude as our base and with a mind that is open to customer processes and challenges, we jointly continue to take the technology to new levels. Examples of this include our timber kilns and our industry-unique control systems. They enable you to work from the factors that are most important for each individual end product and control the drying process to achieve the desired properties. In other words, they enable you to optimise quality, capacity and energy consumption – all at the same time. This was long the ultimate goal of our development department. It is now one of the basic functions in our control systems.

In the following pages, you can read about our continuous kilns and the various possibilities they offer. We hope that this brief brochure can serve as a basic aid when you are choosing a timber kiln. Nonetheless, I would still recommend getting directly in touch with us at Valutec. Together, we can find the drying solution that is exactly right for your operations.

Robert Larsson, MD

CONTENTS

1-zone Continuous kiln

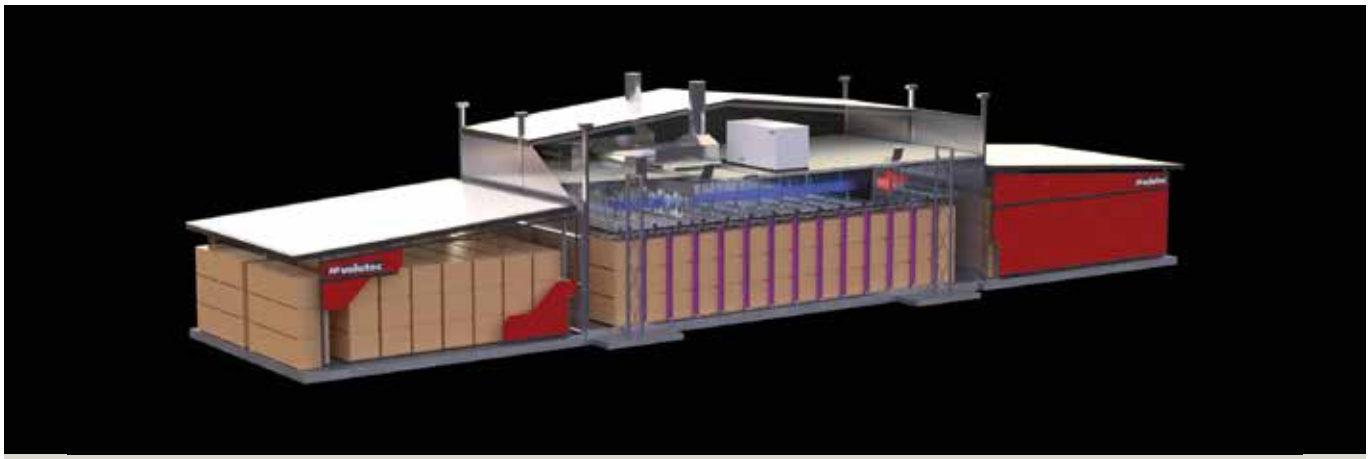
ÅSLJUNGAPALLEN	
Start-up:	2006
Control system:	S9000
Capacity:	Approx. 25,000 m³/year 10 MMBF/year

The first continuous kilns were developed to improve drying capacity for small sizes of timber that were subject to standard requirements as regards target moisture content and moisture content variation. In principle, the use remains the same today. However, standard requirements are constantly being raised.

New, advanced components. Today's 1-zone continuous kilns have only the basic principle in common with the first models from the beginning of the 1900s. As regards facility construction, machine equipment, components and control system, we use the same advanced solutions as in our new generation of continuous kilns (see pages 14 – 15).

Dimensions and capacity. Valutec's 1-zone continuous kilns have been developed for producing small boards at an annual capacity of up to 35,000 m3 (15 MMBF) and a target moisture content down to 15 – 18%.

Good total economy. Within the framework of this type of kiln's limitations, 1-zone models are often the most economical solution – as regards both investment and energy consumption. 1-zone continuous kilns can advantageously be fitted with heat recovery systems.



PRINCIPLE

The timber is dried during transport through the various climates in a drying channel.
Once loaded on trolleys, the timber is fed into the channel from a buffer track at the kiln's input end.

A fully automatic feed system carries the wood through the kiln and out through its output end.

Via heat coils, axial fans blow circulation air through the timber (in the opposite direction to timber travel).

2-zone (FB) Continuous kiln

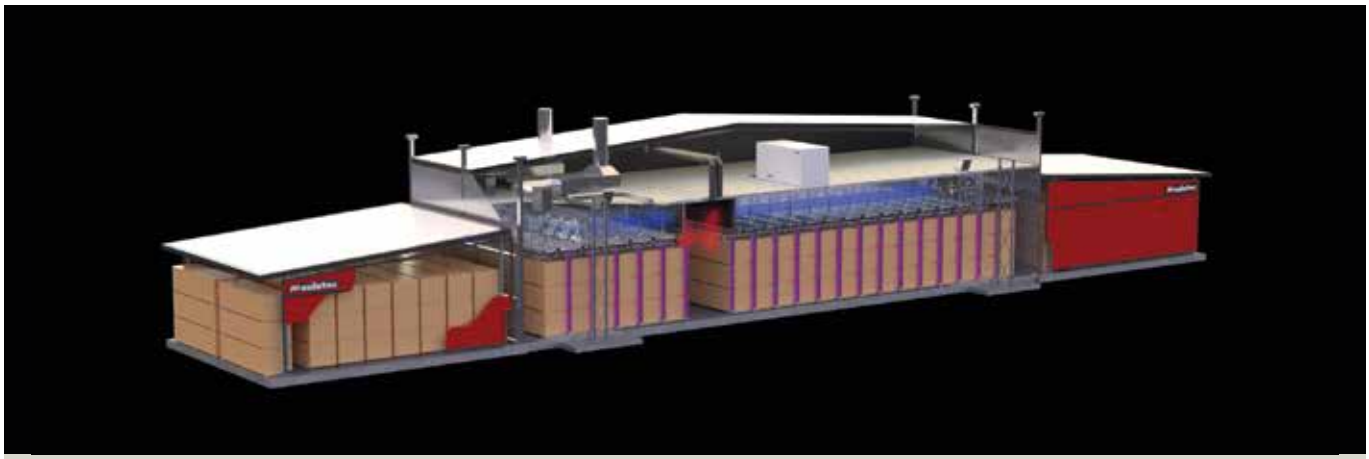
PÖLKKY	
Start-up:	2014
Control system:	Valmatics
Capacity:	Approx. 40,000 m^3/year 17 MMBF/year

Distinguishing them from 1-zone continuous kilns, 2-zone continuous kilns are divided into two separate zones. This type of kiln is also known as a feedback (FB) kiln because the climate in zone 2 is “fed back” to zone 1, where the channel is ventilated.

Advantages of this kiln type. 2-zone models offer both better quality and increased capacity. In principle, the first zone functions as a short 1-zone continuous kiln. Consequently, the air is humidified more quickly. This reduces surface drying and, thereby, the risk of checks arising through drying at the input end. The second zone functions as an equalisation zone. This reduces the moisture spread.

Capacity and drying economy. Through close collaborations with researchers and customers alike, we have developed 2-zone models that ensure optimum use of capacity and the best possible drying economy. Additionally, the kilns can advantageously be fitted with heat recovery systems. From facility design to technical solutions and control systems, all Valutec offerings are built on a combination of expertise, experience and international cutting-edge research (see Technical solutions, pages 14 – 15).

Timber types and capacity. Valutec’s 2-zone models have been specially developed for producing small dimension and centre timber at an annual capacity of up to 90,000 m^3 (40 MMBF) and a target moisture content down to around 8 – 18%.



PRINCIPLE

The timber is dried during transport through the various climates in a drying channel that has 2 separate zones. Once loaded on trolleys, the timber is fed into the channel from a buffer track at the kiln’s input end.

A fully automatic feed system carries the wood through the kiln and out through its output end. Via heat coils, axial fans in each zone blow circulation air through the timber.

In the first zone, the air is blown in the opposite direction to timber travel. In the second zone, it is blown in the same direction as timber travel.

OTC Continuous kiln

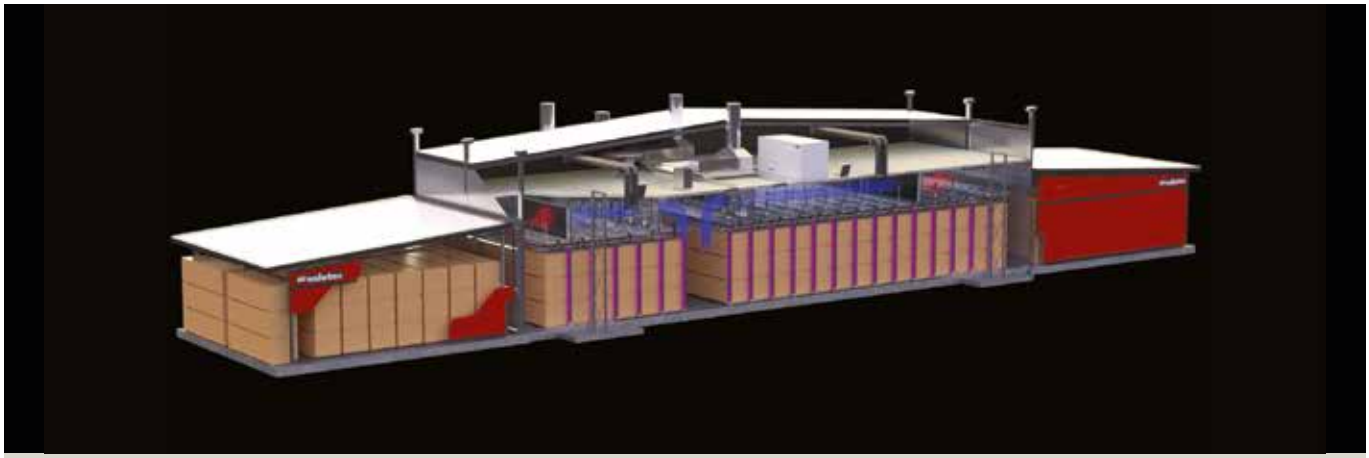
HASSLACHER	
Start-up:	2016
Control system:	Valmatics
Capacity:	Approx. 40,000 m³/year 33 MMBF/year

OTC stands for optimised two-stage continuous and refers to the new generation of continuous kilns. The OTC model has been developed to create a “climate profile” along the length of the drying channel. This “profile” imitates the drying schedule of a chamber kiln, but with a blowing direction opposite to that in a 2-zone continuous kiln.

Larger dimensions. Our OTC solution, which is patented, has enabled the development of a continuous kiln that minimises the risk of checking in larger dimensions. Combining the continuous kiln’s high capacity and the batch kiln’s high quality, our OTC model even manages rapid drying to a low final moisture content. The kilns can advantageously be fitted with heat recovery systems.

Unique on the market. The Valutec development work that has led to today’s OTC models is a good example of our ambition to capitalise on innovation and the possibilities thrown up by cutting-edge research. Today Valutec is the only supplier on the market to offer this type of kiln model. In combination with the latest technological solutions in respect of kiln components (see Technical solutions, pages 14 – 15), the OTC principle has resulted in a product concept that satisfies all the stringent requirements we impose on our products.

Timber types and capacity. Valutec’s OTC models have been specially developed to be able to produce boards and planks at an annual capacity of up to 100,000 m3 (43 MMBF) and a target moisture content down to around 8 – 18%.



PRINCIP

The timber is dried during transport through the various climates in a drying channel that has 2 separate zones.
Once loaded on trolleys, the timber is fed into the channel from a buffer track at the kiln’s input end.

A fully automatic feed system carries the wood through the kiln and out through its output end.
Via heat coils, axial fans in each zone blow circulation air through the timber.

In the first zone, the air is blown in the direction of timber travel. In the second zone, it is blown in the opposite direction to timber travel.

TC Continuous kiln

EGGER	
Start-up:	2016
Control system:	Valmatics
Capacity:	Approx. 80,000 m^3/year 66 MMBF/year

Along with our OTC model, TC is one of the new generation of continuous kilns. TC is the abbreviation of the Swedish expression for “cross circulation”. The principle is based on the timber package being fed lengthways through zones in which the air circulates across (i.e. laterally to) the drying channel’s longitudinal direction. This enables the separate regulation of the climate in different zones. The result is a “profile” that is extremely close to the ideal schedule for a batch kiln.

Flexibility and high capacity. The TC principle has created the right conditions for the development of a very flexible continuous kiln that offers high capacity. TC kilns give virtually limitless freedom to mix dimensions. Minimum moisture content variation and reduced risk of checking are amongst the other advantages. This kiln type is also extremely suitable for efficient heat recovery.

Many unique solutions. The latest models in Valutec’s TC programme have been developed to take full advantage of the TC principle’s possibilities. All designs, constituent components and control systems are based on cutting-edge technology and, in many cases, unique timber drying solutions (see Technical solutions, pages 14 – 15).

Timber types and capacity. Valutec’s TC models have been specially developed to produce boards and planks at an annual capacity of up to 170,000 m3 (75 MMBF) and a target moisture content down to around 12 – 18%.

PRINCIP

The timber is dried during transport through a number of zones that have separate climates.
Once loaded lengthways on trolleys, the timber is fed into the channel from a buffer track at the kiln’s input end.

A fully automatic feed system carries the wood through the kiln and out through its output end.

Via heat coils, laterally located axial fans blow circulation air across the channel’s longitudinal direction and through the wood.

3-zone Continuous kiln

RUNDVIK	
Start-up:	2014
Control system:	Valmatics
Capacity:	Approx. 85,000 m^3/year 36 MMBF/year

Our 3-zone continuous kilns add a further zone to the two found in our FB and OTC models. This zone has its own climate and is operated purely as a conditioning zone. This makes it possible to achieve better quality, even at really high capacities.

Advantages of this kiln type. A third zone opens the possibility of using continuous kilns for drying to low moisture contents. Previously, this was something usually reserved for batch kilns. The conditioning zone is equipped with fans, heat coils, pressure frames, spraying/steaming equipment and its own ventilation. A door is installed between the conditioning zone and zone 2. Consequently, the conditioning zone's climate can be regulated separately from that in the rest of the kiln. Normally, the zone has two stations. Depending on loading intervals, this gives a conditioning time of 4 – 8 hours (see Technical solutions, pages 14 – 15).

Timber types and capacity. As both FB and OTC models can be equipped with a conditioning zone, capacity can be up to 90,000 m^3 (43 MMBF). All dimensions can suitably be handled and target moisture content can be down to around 8 – 18%.

PRINCIPLE

After standard drying, the timber arrives at a conditioning zone. Here, the climate is set to reduce the stresses in the timber. Via heat coils, axial fans blow circulation air through the timber. To achieve the best equalisation of moisture content, the air direction is reversed.

Valutec has a long list of high-class references.
Scan the QR code to take a closer look!

You can also visit www.valutec.ca.

Solutions at the forefront of technology – In every detail

Valmatics 4.0 is our latest control system, developed for industry 4.0, which allows sawmills around the world to automate and optimize drying in all types of lumber kilns. A modern, intuitive user interface based on the latest technology in wood drying.High process quality is guaranteed by simulators programmed with data from hundreds of thousands of measurements that enable the calculation of drying processes with unbeatable accuracy from beginning to end.

Valmatics 4.0 is the only control system on the market that combines simulator technology with adaptive control, and enables optimization based on capacity, quality and energy consumption. Simultaneous.

Stainless steel construction system. All kilns comes with Valutec's stainless steel construction system. This is an FEM calculated design that uses 2 – 10 mm steel. • Prefabri-cated modules with minimal welding. • Static joins with screwed/bolted joints and silicon sealing. • Resistant to thermal expansion and fatigue. • No need for assembly welding. • Instability and fracturing highly unlikely.

Doors. Robust door leaves in aluminium or stainless steel. • Same elements and joins as the construction system. • Mineral wool insulation and profiled covering plates with good thermal and acoustic insulation. • The elements are held together in an outer frame that has sealing strips. • Bolts in bearings ensure secure locking to the sealing surfaces of door frames. • Door lift with electrical, vertical wire operation.

Fans. Axial fans optimised on the basis of operating conditions for highest efficiency. • Adjustable or fixed blades. • For operating temperatures above 90°C (194°F), air-cooled motors are supplied. • External cooling fans supply each motor with cooling air.

Flaps. For sealing around timber packages and thereby counteracting energy losses and the unnecessary spreading of moisture. • Fixed side and roof flaps with EPDM rubber or polyamide wire cloth. • Manually adjustable side flaps. • Roof flaps integrated with pressure frames.

Timber feeding. Package feeder system with stable timber trolleys and hook equipped bar feeder system with external motor. • Fully automatic feed system with packing function in the input and output buffers.

Pressure frames. For minimal deformation of the topmost timber layers. • Stable stainless steel loading frame with guides – the design enables the use of permanently mounted cylinders and ensures that the frame can be fully tilted with no risk of jamming. • Loads of up to 1 tonne per cylinder. • Stainless steel piston rods with Viton seals, stainless steel pipes and connections. • Also available in a scissors design for integration into existing kilns.

A complete range of continuous kilns.
Brief specifications.

○ Possibly
● Yes

PROPERTIES	1-ZONE	2-ZONE FB	OTC	TC	3-ZONE
Boards	○	●	●	●	●
Planks	○	●	●	○	●
“Online” switching of dimensions	○	○	○	●	○
Recommended dimension (mm)	16–32	16–63	16–75	16–50	16–75
Low final moisture content		●	●	●	●
Recommended target moisture content (%)	15–18	12–18	12–18	8–18	12–18
Minimal checking (planks)		●	●	●	●
Minimum moisture content variation		○	○	●	●
High capacity		○	○	●	○

TECHNICAL DATA					
Max. kiln temperature (°C)	100°C, 212 °F				
Annual capacity (m^3) Annual capacity MMBF	< 35 000 15	25 000–90 000 10–40	25 000–100 000 10–43	25 000–170 000 10–75	25 000–100 000 10–43
Construction material	Stainless stee				
Heat transmit. coeff. (W/m^2 °C)	< 0,30				
Door system	Vertical doors				
Air sealing/flaps	Fixed/foldable wire-cloth flaps				
Feed system	Fully automatic, electrically operated				
Fans	2 – 4 axial fans				
Air speed (m/s)	3–5	3–6	3–6	2–4	3–6
Air handling	Mechanical evacuation				
Exhaust flow (m3/h)	10 000–50 000				
Heat recovery	Air/air or air/fluid				
Control system	Valmatics 4.0				
Heat coils	Lamella-type coils, Valutec special				
Spraying/steaming system	High pressure hot water or steam				

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valutec®
Good for Wood

With nearly 100 years in the industry Valutec has developed drying equipment for the sawmill industry. Over the years we have delivered more than 4 000 wood dryers to customers in both Scandinavia and the rest of Europe. Valutec is Europe's largest supplier of wood dryers.

Valutec reinvests at least 5% of its annual turnover into research and development. Close collaboration with leading researchers has resulted in continuous kiln dryers and batch kiln dryers which today are market leaders in terms of both quality and total economy. Additionally, Valutec's development work in control systems and simulators has resulted in value-adding solutions, making it possible to seize the full value of the raw material.

The Valutec Group AB includes Valutec AB, Skellefteå, Valutec Oy in Riihimäki, Finland, Valutec LLC in St. Petersburg, Russia and Valutec Wood Dryers Inc in Vancouver, Canada. Collectively, the Group has a complete range of products based on Swedish and Finnish expertise in wood drying. Total sales amount to approximately SEK 450 million.