Batch kilns

valutec®
WOOD DRYERS INC
Good for Wood


“Enabling increased use
of wood is the very reason
for our existence.”

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.

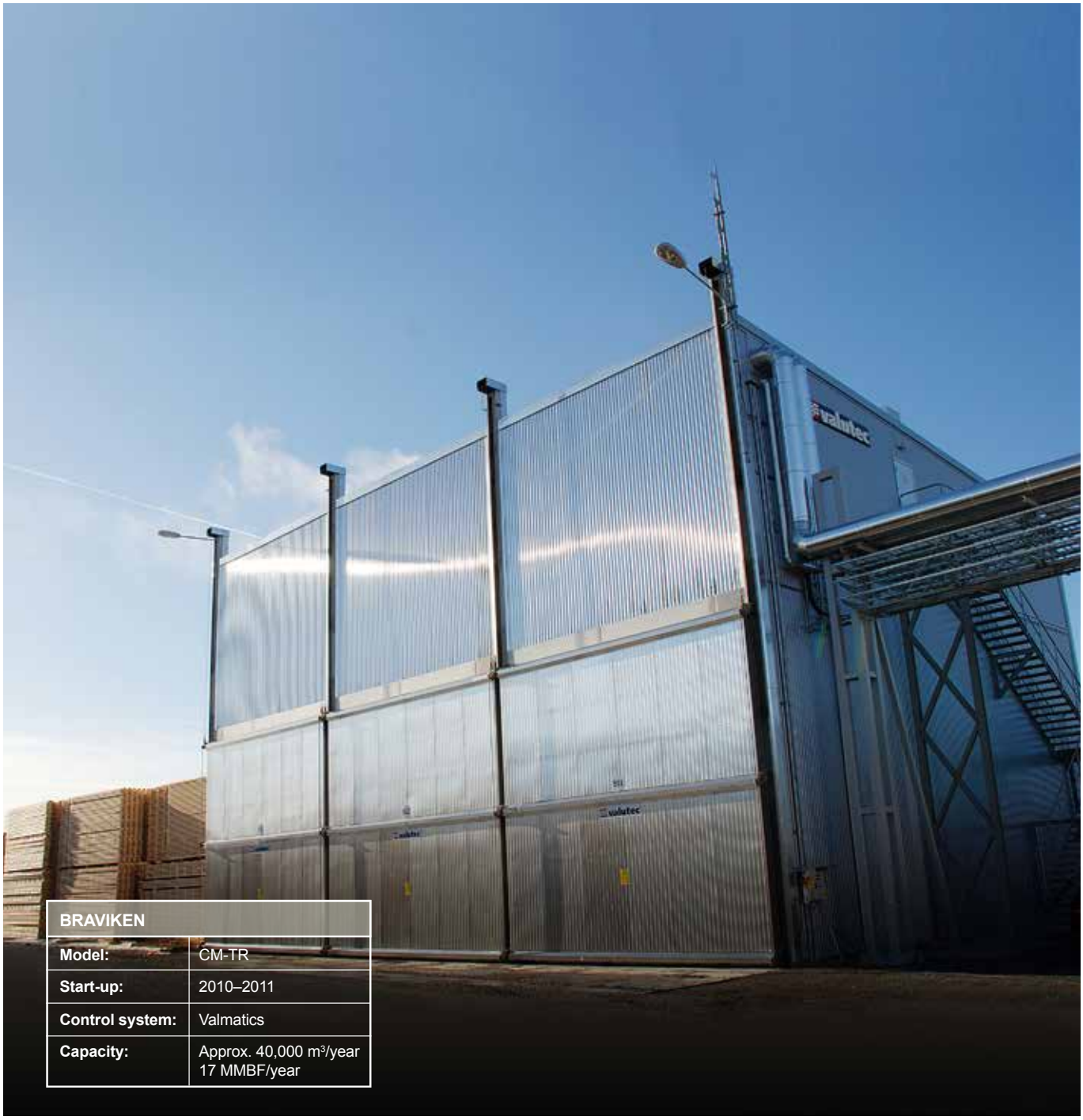
We believe in our continuous improvement and optimisation of the drying process. We are also absolutely convinced that it enables us to contribute to better timber products and the increased competitiveness of wood. In turn, this leads to increased use of wood. This is the foundation of our long-term 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 batch 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

Forklift-fed Batch kiln



BRAVIKEN	
Model:	CM-TR
Start-up:	2010–2011
Control system:	Valmatics
Capacity:	Approx. 40,000 m³/year 17 MMBF/year

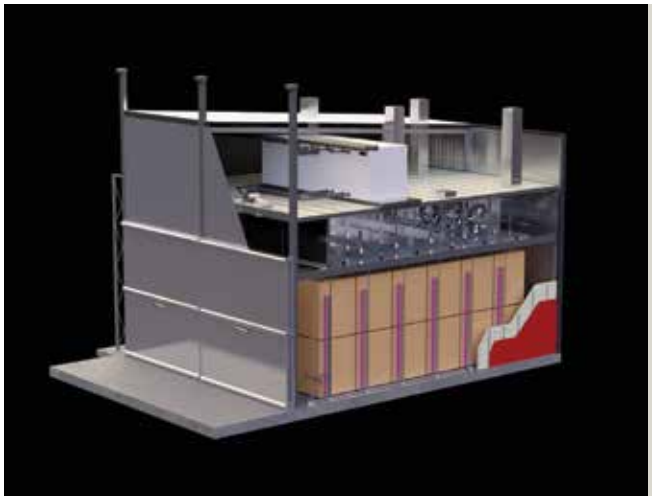
Just as all our other batch kilns, the forklift-fed batch kiln ensures precise control of the climate throughout the entire drying process. This opens the possibility of drying that, with minimum risk of checking, takes the timber all the way to exactly the desired target moisture content.

Flexibility and quality. This type of kiln gives great flexibility as regards type of wood and dimensions. A forklift-fed batch kiln requires relatively little space and is a good choice where achieving the desired quality at the lowest investment cost is a major requirement. Combined with our market-leading control systems, our batch kilns provide the right conditions for satisfying ever stricter requirements in respect of processing quality and customisation.

Control with great choice. With drying requirement as the starting point, we offer the following choices: schedule control, model control, power control, adaptive simulator control and adaptive temperature drop control. To these can be added Valutec's leading simulator technology. This has in-built intelligence that, in a simple and user-friendly way, radically shortens the time necessary for optimising a drying process.

Based on industry-leading R & D. The drying facility is built in stainless steel and air circulation is controlled by axial fans. All sensitive equipment is located in the building's ventilated "cold attic". Leading research and development, both Nordic and international, is the basis of all our design solutions (see Technical solutions, pages 12 – 13). Kilns can advantageously be fitted with heat recovery systems.

Volume and target moisture content. Valutec's forklift-fed batch kilns are particularly adapted for planks, but can also be used for boards. Batch volume can vary from 50 to 450 m^3 (21–190 MBF) and target moisture content from 5 – 20%.



PRINCIPLE

Forklift trucks load and unload the kiln from a single side. Axial fans located on a deck above the timber load blow circulation air between the piles (in the timber's longitudinal direction).

Lamella-type heat coils give maximum heat transfer. After initial equalisation of moisture content, the heating level is adapted to how the moisture content is changing.

Making use of the pressure difference, the moist air is evacuated via two ducts on either side of the load.

E-trolley fed Batch kiln

HÅLLANDERS	
Model:	CM-CE
Start-up:	2005
Control system:	S9000
Capacity:	Approx. 10,000 –20,000 m³/kiln 4–8 MMBF/kiln

E-trolley feeding is a good choice if large batch volume and high productivity are a major priority. Because loading and unloading are in the kiln's longitudinal direction, a large number of kilns can be placed side by side. Loading the timber outside the kiln minimises pulling time.

Flexibility and exact control. Batch kilns give great flexibility as regards type of wood and dimensions. Exact control of the climate throughout the drying process provides optimum conditions for satisfying all requirements in respect of high processing quality and customisation. This type of kiln delivers drying right down to the target moisture content and minimises the risk of checking.

Building system and fans. The drying facility is normally built in stainless steel and air circulation is controlled by axial fans. All sensitive equipment is located in the building's ventilated "cold attic". Leading research and development, both Nordic and international, is the basis of all our design solutions (see Technical solutions, pages 12 – 13). Kilns can advantageously be fitted with heat recovery systems.

Volume and target moisture content. Valutec's e-trolley fed batch kilns are particularly adapted for planks, but can also be used for boards. Batch volume can vary from 50 to 450 m^3 (21 – 190 MBF) and target moisture content from 5 – 20%.

PRINCIPLE

E-trolleys are brought into the kiln by feeders. The kiln is also available with equipment for automatic loading. Axial fans located on a deck above the timber load blow circulation air between the piles (in the timber's longitudinal direction).

Lamella-type heat coils give maximum heat transfer. After initial equalisation of moisture content, the heating level is adapted to how the moisture content is changing.

Making use of the pressure difference, the moist air is evacuated via two ducts on either side of the load.

High-temperature kiln

IMPREGNA	
Model:	CM-CA
Start-up:	2001
Control system:	S9000
Capacity:	Approx. 15,000 m³/kiln 6 MMBF/kiln

When requirements in respect of moisture content variation and the final quality of the timber permit, an alternative drying method that offers extremely high productivity can also be chosen. Drying in a high-temperature kiln is considerably faster than in other timber kilns. To give just one example, the drying time for 50 mm timber is around 24 hours. With drying temperatures up to 140°C (285°F), water is vaporised through boiling and thus dissipates more quickly than in ordinary drying.

Building system and fans. To withstand the high temperatures, steam pressure and evaporation rate, the drying facility is built in well-insulated steamtight stainless steel. All sensitive equipment is located in the building's ventilated "cold attic". The sturdily housed fan motors are air-cooled. Furthermore, the kiln has a loading/unloading solution for streamlined pulling – timber is loaded onto trolleys that are fed in via a rail-based system.

Control of drying. Drying is primarily controlled by regulating the heat input and selecting a drying temperature. This means that evaporation can be controlled to achieve the desired final results. In the final phase of drying, the process can also be controlled via hygrometric differences.

Moisture equalisation through conditioning. After drying in a high-temperature kiln, timber has a relatively large moisture gradient. The surfaces are dry and the centre relatively moist. There is compression stress at the surface and tensile stress in the centre. When drying has finished, these differences are equalised through conditioning. Because of the short drying time, the air-blow depth in a high-temperature kiln should not be more than 4 metres. This allows two normal-size timber packages to be dried side by side.

Volume and target moisture content. Valutec's high-temperature kilns are particularly adapted for planks and poles, but can also be used for boards. Batch volume is up to 200 m^3 (85 MBF) and target moisture content from 2 – 18%.

PRINCIPLE

The timber is dried through water vaporisation induced by boiling in an environment with temperatures of 100°C (212°F) and above.

The timber is loaded onto trolleys that are then either pushed or pulled on rails into the kiln. Via fans, air is blown through the timber in the direction that is opposite to that of transport. Spraying with saturated steam ensures rapid heating.

The moisture gradient (dry surfaces and a relatively moist centre) is equalised by conditioning.

Heat treatment
ThermoWood®

HEATWOOD	
Model:	Thermowood
Start-up:	2008
Control system:	Walpas II
Capacity:	Approx. 5,000 m³/year 2.2 MMBF/year

Valutec's heat treatment plants are based on the market-leading ThermoWood® method. Broadly speaking, ThermoWood® can be regarded as a type of wood in itself. ThermoWood® treatment makes the wood a far better option than tropical tree species and pressure impregnated timber.

Dimensional stability and aesthetics. Heat treated wood has better dimensional stability when exposed to moisture changes. It also binds less moisture than does normally dried wood. Additionally, it is more rot-resistant and acquires an aesthetically pleasing colouring of various shades of brown. Even in changing weather conditions, the treated timber retains its unique properties. By adapting temperature levels and process time, the timber's properties and colouring can be tailored to the end customer's needs.

Environment-friendly and chemical-free. The wood acquires a low equilibrium moisture content and increased resistance to biological degradation. As no chemicals are used in the process, ThermoWood® is an extremely environment-friendly option. There is no risk of chemicals leaching from the finished product. Suitable uses include outdoor panels, doors, windows, outdoor/indoor decking, saunas and furniture.

Volume and target moisture content. The underlying technology is the result of a Finnish collaboration project in the 1990s. Since then, Valutec has taken the research and development further with partners in the Nordic countries and Korea. Valutec's heat treatment plants are particularly adapted for boards, but can also be used for planks. Batch volume can vary from 10 to 150 m^3 (4 – 63 MBF) and target moisture content from 2 – 6%.

PRINCIPLE

The process starts with drying. This may be in conventional kilns with subsequent treatment in a heat treatment chamber. Alternatively, it may be the first step in an integrated process.

The heat treatment stage involves heating to between 180°C and 230°C (356°F and 446°F).
To avoid pyrolysis and fire, heating is in an oxygen-depleted atmosphere.

Would you like to see our references?
Scan the QR code or visit www.valutec.se.


Fans


Pressure frames


Heat recovery


Control systems

Solutions at the forefront of technology – In every detail.

Valmatics control system
A complete, flexible, adaptive control system that gives the operator maximum choice. The system can control most types and makes of kilns that use an air exchange system for drying. An interface that is graphical and intuitive makes the system very easy to use.

Batch kilns can be controlled using a traditional schedule or via various adaptive drying methods.

The integrated “expert system” collects data on quality parameters and, to optimise the process for each drying batch, generates proposals as to how drying should be carried out. The system has a modular construction and user-customised layout. It can be gradually supplemented by adding a number of modules. Both the simulation program and the adaptive air control technology to regulate temperature drop are patent protected.

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.

• Prefabricated 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

Apparatus rooms

Timber feeding

Flaps

Steaming

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.

Batch kilns.
Brief specifications.

○ = Possibly
● = Yes

	BATCH KILNS		HIGH-TEMP KILNS	HEAT TREATMENT
PROPERTIES	Forklift-fed	E-trolley fed	Trolley fed	ThermoWood®
Boards	●	●	○	●
Planks	●	●	●	○
Minimal space	●			
Large batch volume	●	●	○	
High availability/short pulling time		●	●	●
Minimal checking	●	●	○	○
Minimum moisture content variation	●	●	○	●

TECHNICAL DATA			
Max. kiln temperature (°C)	90 or 120°C, 194 or 248°F	140°C, 284°F	230°C, 446°F
Batch volume (m^3) Batch volume (MBF)	50–450 21–190	<200 <85	10–150 4–63
Target moisture content (%)	5–20		2–6
Construction material	Stainless steel	Stainless steel	Separate weights
Heat transmit. coeff. (W/m^2 °C)	<0,30		<0,30
Door system	Horizontal or vertical doors		Door with clamping system
Air sealing/flaps	Wire cloth or EPDM		Stainless steel plates
Superimposed loading	Pneumatic pressure frames	Separate weights	Separate weights
Fans, number	2–4	2–15	1
Air speed (m/s)	4–6		3–6
Spraying/steaming system	High pressure hot water or steam		High pressure cold water and steam
Control system	Valmatics		Walpas TPR
Heating media	Hot water or steam		Steam, or heat transfer oil


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

Throughout its almost one century in the sector, Valutec has developed drying equipment for the sawmill industry. Over the years, we have supplied more than 4,000 timber kilns to customers in the Nordic countries and the rest of Europe. Valutec is now Europe's leading supplier of timber kilns.

Every year, Valutec invests at least 5% of its turnover in research and development. Close collaborations with the industry's leading research bodies have resulted in continuous kilns and batch kilns that are now market leaders as regards both quality and total economy. Furthermore, Valutec's research into control systems and simulators has resulted in value-adding solutions that make it possible to realise the full value of the raw materials.

The Valutec Group includes Valutec Wood Dryers Inc, North America, Valutec AB, Sweden, Valutec Oy, Finland and Valutec LLC, Russia. Total sales amounted to approx. CAD 35 million.

valutec®
WOOD DRYERS INC
Good for Wood

Sweden
Valutec AB, Box 709, SE-931 27 Skellefteå
Phone + 46 (0)910 879 50, Fax + 46 (0)910 879 59
E-mail: valutec@valutec.se, www.valutec.se

Canada
Valutec Wood Dryers INC, 1000-840 Howe Street,
Vancouver BC V6Z 2M1
Phone +1 (0) 123 456 789
E-mail: valutec@valutec.ca, www.valutec.ca