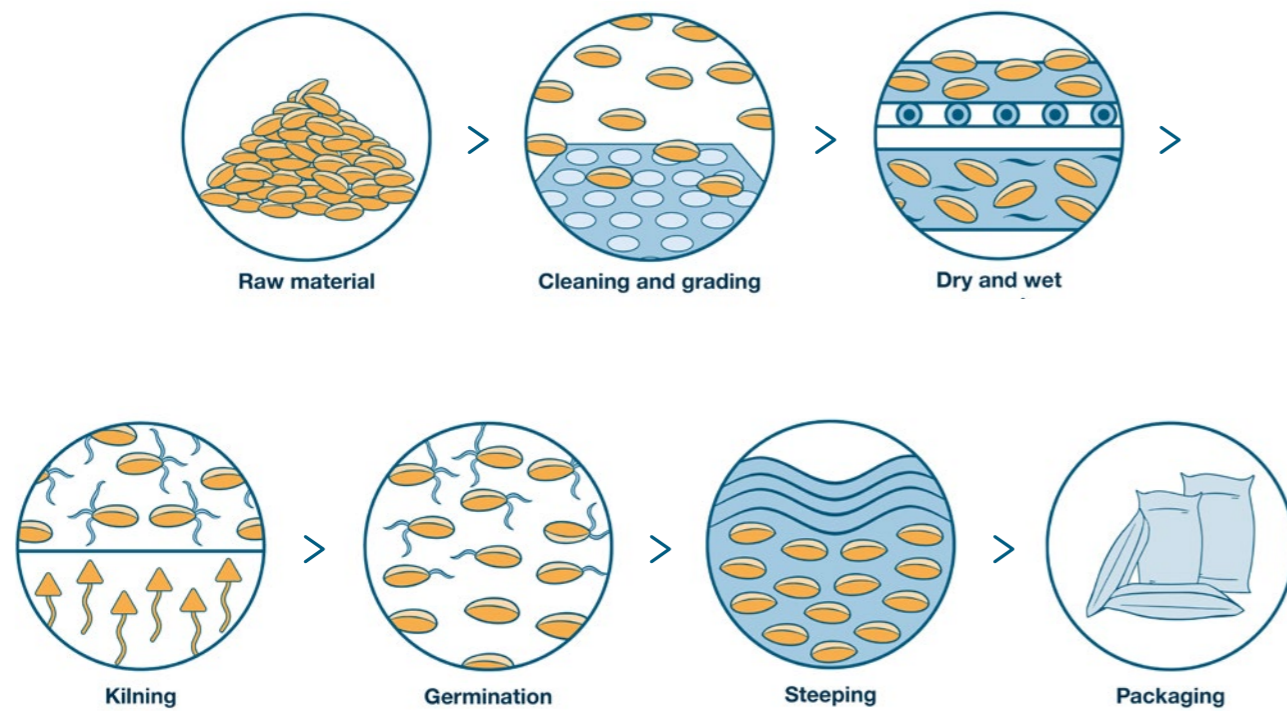


Your All-in-one
malting solution.
RimoMalt.

Bühler malting systems. Your perfect partner for the best malt.

Globally, the industrial production of beer and malt surpasses 2 billion hectoliters and 25 million tons respectively each year. Our extensive range of solutions enables us to assist you throughout the entire process, from raw materials to the finest malt.



All-in-one malting solution. RimoMalt.

RimoMalt is the perfect solution for **small-scale malting with large-scale output**. By incorporating all three process steps - **steeping, germination, and kilning** - into **a single solution**, it can produce up to 17,000 metric tons of malt annually.

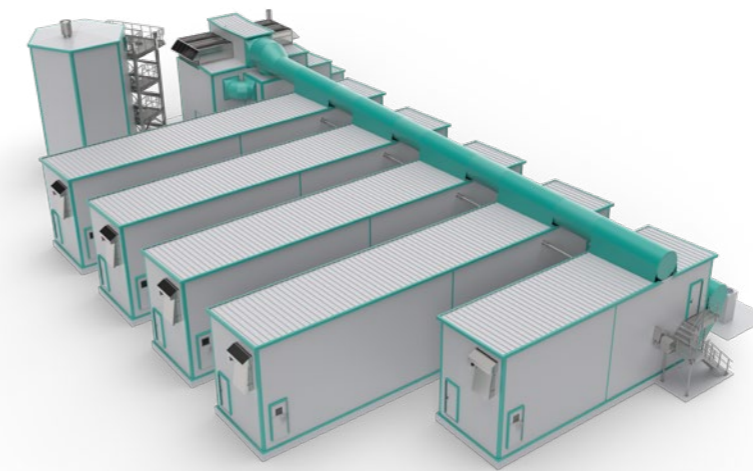


Figure 1: RimoMalt 4x32 / 1x16

RimoMalt offers a unique modular structure that can **grow with your demands**.

After steeping the barley in a single cylindro-conical vessel, it is fed to the combined germination and kilning units, which are available in various sizes ranging from 16 to 56 metric tons. **The height of the steep can be adjusted by adding rings**, which increases the batch size.

The same principle applies to the germination and kilning units, which can be expanded using intermediate modules.

One of the unique features of RimoMalt is its ability to be **installed outdoors**, eliminating the need for additional buildings for operation.

Advantages at a glance:

- No building needed - designed for outdoor installation
- Batch increases possible
- Modularly expandable- up to 24h batch cycle
- Individual / combined heating systems (gas/hot water/steam)
- Highly and quickly adaptable to changing requirements
- Product access anytime, anywhere
- Space-saving and standardized solution
- Quick installation thanks to pre-assembled modules
- Independent aeration and cooling system
- The most advanced malting automation system
- Efficient waste and fresh water reservoir design
- Combinable with roaster for caramel and roasted malt production



Are you're looking for an all-in-one malting solution? RimoMalt is the perfect choice! It will elevate your business to new heights. Check out our brief video to find out more.



Your customized malting solution. What is RimoMalt?

RimoMalt is a **fully modular, all-in-one, and standardized malting plant**, making it the first of its kind. It provides complete flexibility to customers producing between 1,000 and 17,000 metric tons of malt annually. The system allows for **four or five germination days** at the following capacities:

Example 1						
RimoMalt example: 4 germination days	16	24	32	40	48	56
1st GKU with steeping unit	969	1,454	1,939	2,424	2,908	3,393
2nd GKU	1,939	2,908	3,878	4,847	5,817	6,786
3rd GKU	2,908	4,362	5,817	7,271	8,725	10,179
4th GKU	3,878	5,817	7,756	9,694	11,633	13,572
5th GKU	4,847	7,271	9,694	12,118	14,542	16,965

Example 2						
RimoMalt example: 5 germination days	16	24	32	40	48	56
1st GKU with steeping unit	810	1,215	1,620	2,025	2,430	2,835
2nd GKU	1,620	2,430	3,240	4,050	4,860	5,671
3rd GKU	2,430	3,645	4,860	6,076	7,291	8,506
4th GKU	3,240	4,860	6,481	8,101	9,721	11,341
5th GKU	4,050	6,076	8,101	10,126	12,151	14,176
6th GKU	4,860	7,291	9,721	12,151	14,581	17,012

Consumption data per produced metric ton of malt

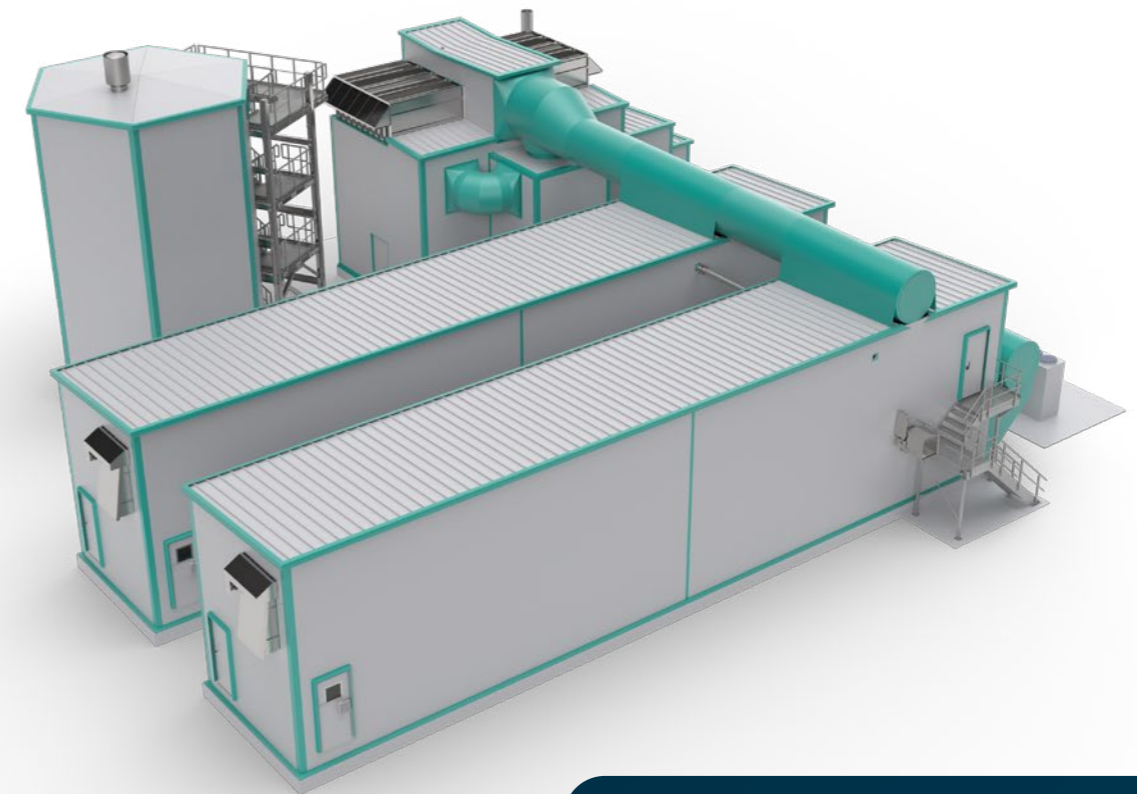
- Heat demand per mt of malt: 600-650 kWh
 - Electrical demand per mt of malt: 130 kWh
 - Fresh water consumption per mt: 3-4 m³
 - Waste water consumption per mt: 2.5 m³
- For effluent water treatment plant (customer supply):
- COD-value: 500-900 mg/l waste water
 - BOD5-value: 400-800 mg/l waste water

Scope:

- Bühler supplies everything above ground (steeping unit, heating unit, germinating-kilning unit)
- Bühler provides design for fresh water reservoir below steeping unit
- Bühler provides design for waste water reservoir below germinating-kilning unit
- Bühler will send an installation team to install Bühler's scope
- Delivery time 6-8 months

Products

- Barley
- Wheat
- Rye
- Others on request

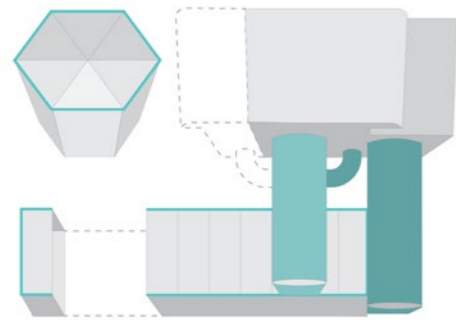
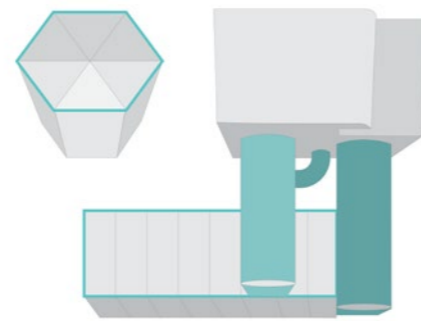


Footprint:

- RimoMalt 16 - 1,000 mt/a:
15m x 24m (height max. 9.5 m)
- RimoMalt 56 - 17,000 mt/a:
45m x 45m (height max. 13 m)

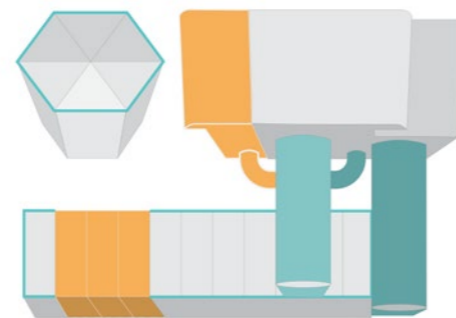
Modularity and flexibility Growing with your demands.

The **smallest version** of each RimoMalt unit has a **batch size of 16 mt**. However, evolving needs and requirements may necessitate the expansion of the existing plant, and this is where the **unique modularity of RimoMalt** comes into play.



Thanks to standardized intermediate modules, **germination-kilning-unit (GKU) can be expanded** in 8 mt increments, starting from 16 mt up to a maximum batch size of 56 mt per unit. The **steeping unit can be expanded** in two stages according to the main size of 16 mt, 32 mt or 56 mt.

Inserting **new modules between the start and end module** facilitates the expansion of the already installed GKU. The GKU is opened at **pre-determined expansion points** to enable the intermediate module to be installed. Like all other modules, the intermediate module is **pre-assembled** on-site to **reduce plant downtime** and ensure fast installation.



Your malting process starts. Steeping unit.

The **cylindro-conical-steps unit (CCS)** is **fully enclosed, insulated, and lined**. The grain elevator is situated at the opening, allowing for easy transportation of grain to the **top of the steeping unit**. From there, the grain is transferred into the CCS through a pipe, and the steeping process can begin.

Installed stairs permit access to the roof of the CCS via a mounted door, and there is another door at the ground level for simple access to the bottom of the CSS.

Our steeping unit is **incredibly versatile and can be effortlessly expanded** by installing height-extension rings. With a three-step process, you can opt for 16 mt, 32 mt, or 56 mt steeping units.



Figure 2: CCS for RimoMalt 16



Figure 3: CCS for RimoMalt 32

Continuing your malting process. Germinating-kilning unit.

Combined process solution

RimoMalt includes of a **combined germinating-kilning unit**, which means that no additional-product conveying is needed. This also **improves malt quality**.

Standardized equipment

Each unit comes equipped with a turning, loading, and unloading machine that guarantees an **even product layer** for the germination and kilning stages, as well as speedy unloading. Additionally, every unit has its own germination fan to provide **optimal flexibility** during the malting process. Even when you decide to extend your RimoMalt, standardized germination

fans are available for all extension stages – 16mt, 32mt and 56mt.

Easy expansion

By adding an **intermediate module** between the starting and end modules, each unit can be extended in 8 metric ton steps – **completely independent from the other units**.

Specific deck load: approx. 425 kg/m² barley as steeped barley

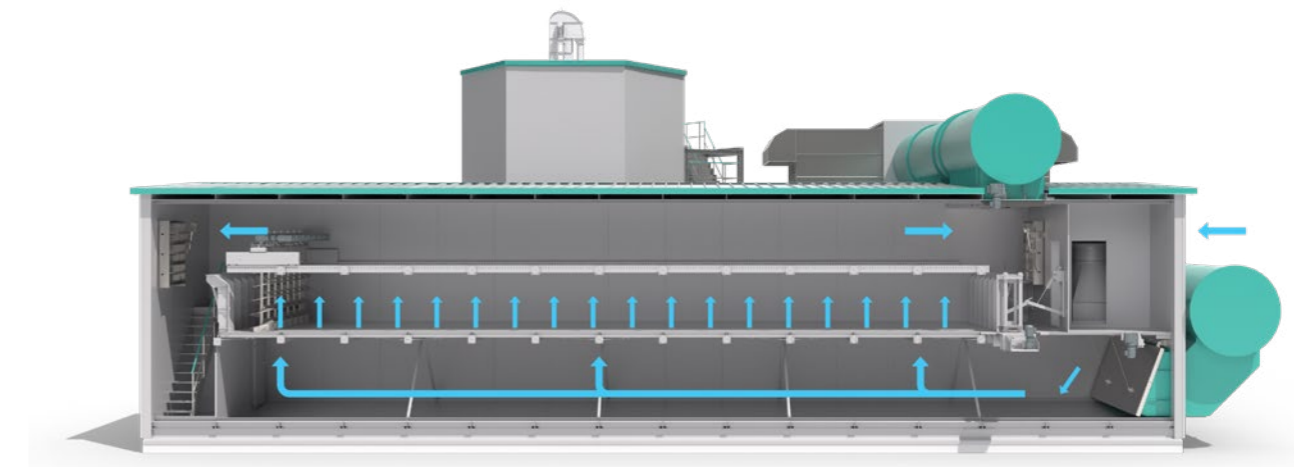
Aeration airflow rate during germination: approx. 600 m³/h and mt

Aeration airflow rate during kilning: approx. 3,000 m³/h and mt



Figure 4: Turning-, Loading and Unloading machine

Process details. Germination.

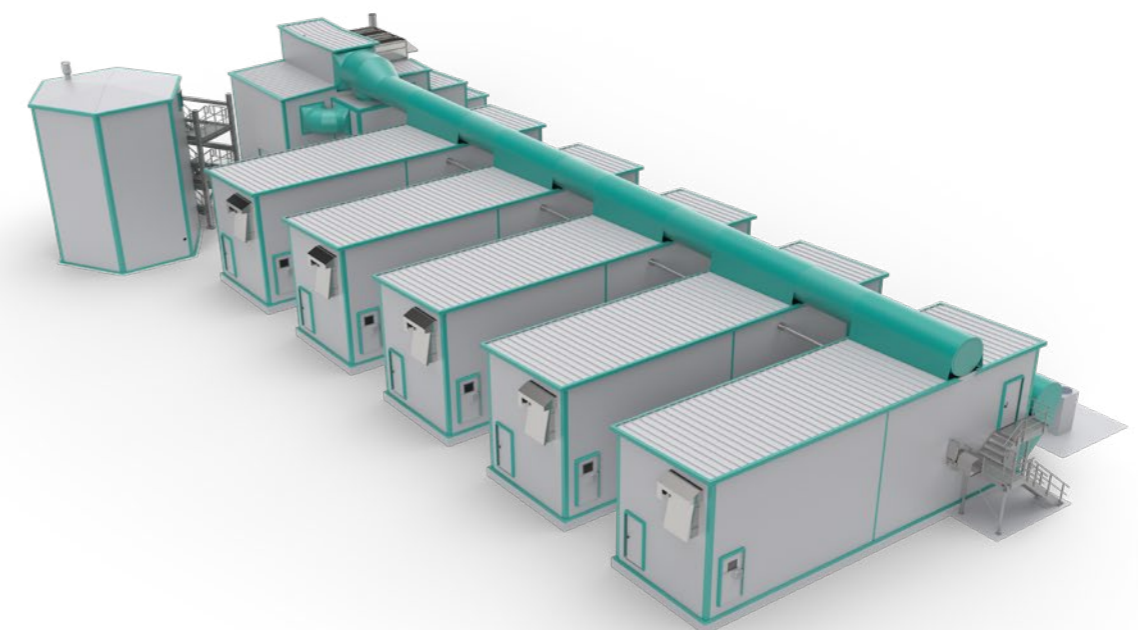


Decentralized germination fan

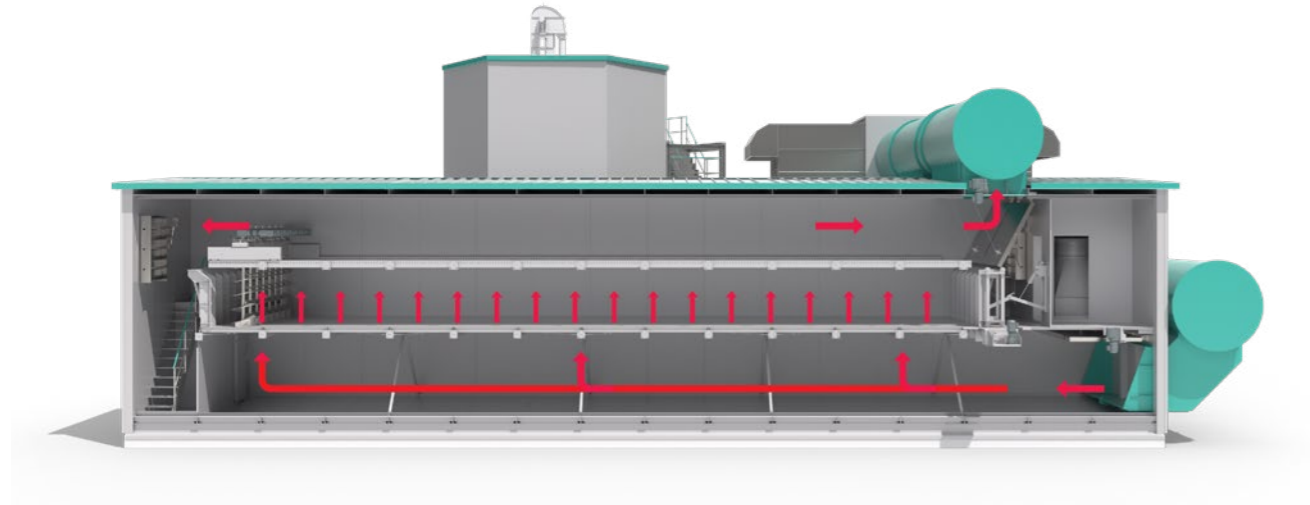
At the start module of each germination-kilning-unit, there is an **axial fan** that pulls in fresh air via a **set of flaps**. The fan then blows the air into the intermediate modules, where it circulates through the **perforated floor deck** and the product. This unique design enables **each unit to operate independently**.

Gentle product transport and handling

After steeping, the product is **gently pumped** into the germinating-kilning unit. The machine provides an even layer of product for **optimal-aeration** during germination.



Process details. Kilning.



High operating temperature

In order to **increase the variety of malt production**, RimoMalt is designed for kilning temperatures of **up to 120° C (248 °F)**, thanks to its centralized heating unit.

Smart air supply system

Each germinating-kilning unit is directly connected to the heating unit and can be **supplied independently with hot air**. The return air

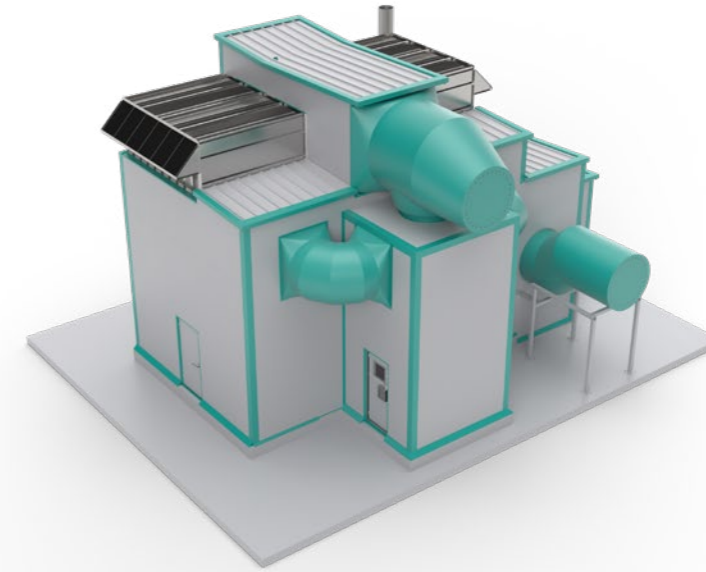
channel ensures energy-efficient use of the glass-tube heat exchanger located on top of the heating unit.

High energy efficiency

Use of **state-of-the-art technology** in this system results in lower energy consumption and higher efficiency. It also offers **flexibility with various heating systems**, and the cross-flow heat exchanger further enhances **energy efficiency**.

Process details. Heating unit.

During the kilning process, hot air is directed through the **hot air channel from the heating unit** to the germinating-kilning units via a **central kilning fan**, and returned to the heating unit via a **return air channel**. Aeration takes place by the same central kilning fan. The heating unit is connected to the start modules of the germinating-kilning units.



During the kilning process, **the central kilning fan** from the heating unit introduces tempered air from the gas burner and heating coil (hot water or steam) into the intermediate modules. In addition to the heating unit, at least one **glass tube heat exchanger** can also be integrated – RimoMalt 16 has one glass tube heat exchanger, while RimoMalt 32 and 56 have

two tube heat exchangers. There is also a **control center** in the heating unit that serves to control and monitor the RimoMalt.

The maximum heating capacity of the RimoMalt 16 is 800 kW, the RimoMalt 32 is 1,600 kW and the RimoMalt 56 is 2,400 kW.

Business case. Brewing plant.

Brewery in Germany with an annual throughput of 250,000 hl of beer

Amount of malt required: $250,000 \text{ hl} * 0,015 \text{ mt/hl malt} = 3,750 \text{ mt malt}$

Since the brewhouse and bottling plant are typically inactive on weekends, the heating system is similarly deactivated and reactivated for the Sunday night shift.

The RimoMalt 40, equipped with two germinating-kilning-units, enables the brewery to utilize their current heat plant to warm up the hot water/steam coil or gas register within the RimoMalt heating unit.

The kilning process is limited to weekends, while steeping and germinating take place on weekdays. This optimizes the brewery's heating plant usage for maximum efficiency.

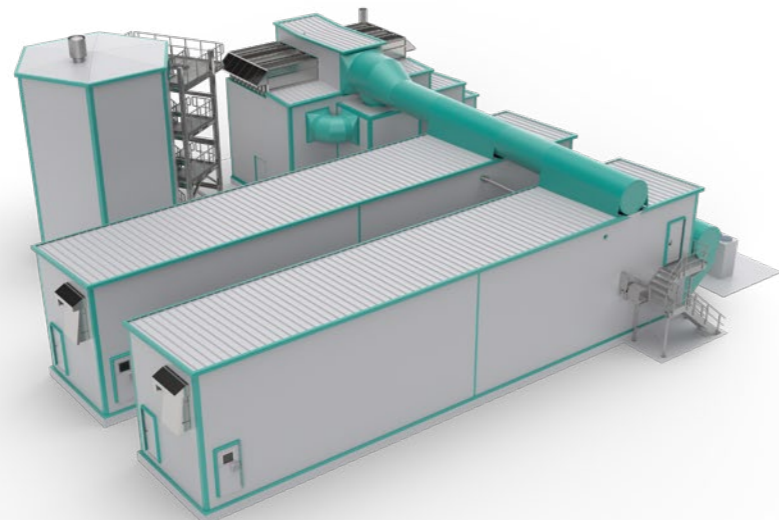
Solution:

RimoMalt 40 with two germinating-kilning units:

Annual malt production: approx. 4,050 mt/a

If demand changes, the brewery can expand the RimoMalt 40 by adding intermediate modules to the existing germinating-kilning units to increase the batch size up to 56 mt.

Two germinating-kilning units of 56 mt mean that an annual capacity of 5,671 mt is possible, and if that's still not enough additional germinating kilning units up to a 24h batch cycle can be



Business case. Distillery plant.

Distillery in Scotland with an annual throughput of 3,000,000 liters of whisky

Amount of malt required: $3,000,000 \text{ l} / 644 \text{ l/mt} = 4,658 \text{ mt malt}$

Instead of malt intake, the distillery can procure locally grown barley directly from farmers. Bühler offers suitable cleaning machines for barley intake as well as sorting and classifying machines, ensuring the barley's quality before it is stored in silos. The storage is then connected to the RimoMalt for further processing.

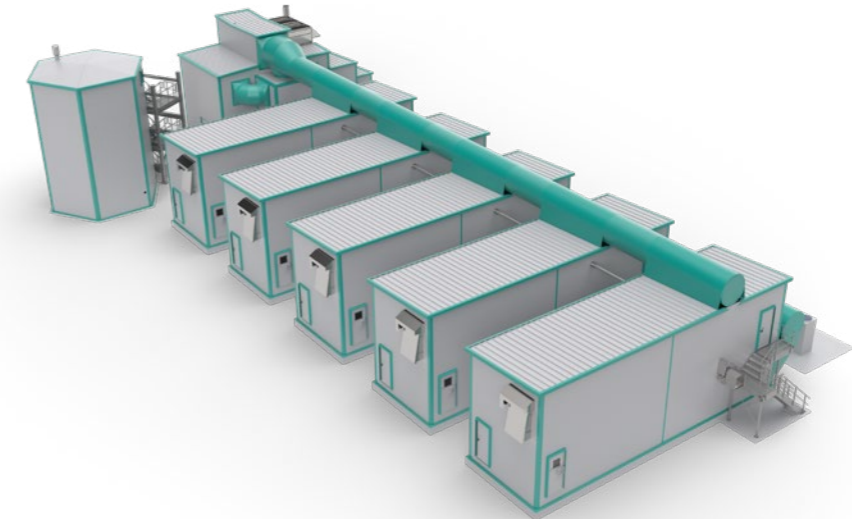
Solution:

RimoMalt 16 with five germinating-kilning units:

Annual malt production: approximately 4,847 mt/a With four days of germination and one day for kilning, the RimoMalt 16 with five germinating kilning-units supplies the distillery with one batch of distilling malt per day.

If the demand for distilling malt increases, the RimoMalt system can be expanded to increase the batch size. The steeping unit can be enlarged by adding an extra ring to the cylindrical section, while the GKU can be extended by installing an intermediate module. The heating unit can also be expanded by incorporating a larger hot water/steam coil or gas burner and an additional glass tube heat exchanger.

One of the GKUs can be designated to exclusively produce peated or smoked malt, in which case it will only be connected to the fresh air channel from the heating unit, and there will be no return air channel to the heating unit to prevent contamination of the surrounding area. channel coming from the heating unit. There is no revert air channel to the heating unit to protect the periphery from contamination.





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