

MAESTRO

MAESTRO is the new range of SACMI kilns equipped with an innovative heat and air control system, ensuring perfect firing of slabs and tiles.

MAESTRO是萨克米新型窑炉系列,配备了创新的热能和空气控制系统,确保大板和瓷砖的完美烧成。

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SACMI

ENDLESS INNOVATION SINCE 1919

MAESTRO



MORE PRODUCTIVE

Less waste and improved outgoing product quality thanks to optimal firing control and effective management of production gaps. User-friendly.

更有成效

由于最优的烧成控制和对空窑的有效管理,减少了浪费,提高了出窑产品的质量。操作方便。

COOLING / 冷却

Cooling zone burners allow accurate quality and planarity control and a higher percentage of 1st class products

冷却区烧嘴允许精确的控制质量和平面度,一等品率更高



MORE CONNECTED

Digital management of recipes and digitized adjustment parameters. Native connection to HERE, the 4.0 Digital Manufacturing platform.

更多连接

配方数字化管理,参数数字化调整。自带的连接萨克米HERE工厂管理程序——数字化制造4.0平台。



MORE SUSTAINABLE

Minimum consumption and optimized heat exchange thanks to burners with high-speed flame internal combustion. Lower CO₂ and NO_x emissions.

更可持续

由于采用高速火焰内燃烧嘴,最大限度减少了能耗,优化了热交换。降低了二氧化碳和氮氧化物的排放。

LINING / 炉衬

Improved lining insulation and a redesigned roller housing zone reduce heat dispersion and fuel consumption. Greater machine durability

改进的炉衬隔热和重新设计的孔砖区域减少了热量耗散和燃料消耗。机器更加耐用



FIRING AREA / 烧成区

Automated temperature/pressure recipe control system during both firing and cooling, resulting in products of consistent size and color tone whatever the manufacturing conditions

温度/压力配方自动控制系统在烧成和冷却过程中,无论操作条件如何,都能生产出尺寸和色调稳定的产品



AIR CONTROL / 空气控制

Greater energy savings thanks to use of pre-heated combustion air

由于使用预热的助燃风,更加节能

M△ESTRO



The perfection of firing

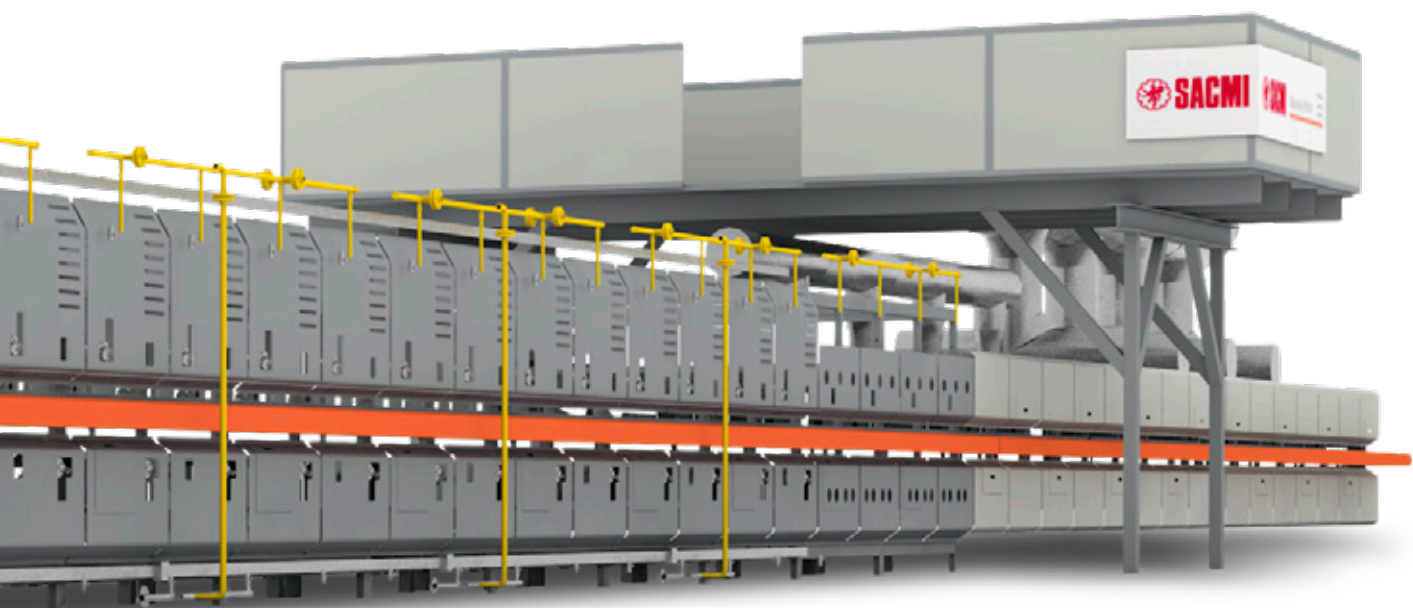
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SACMI's new MAESTRO kiln range has been designed to maximize product quality and minimize resource/energy consumption. Built to make manufacturing flexible and easily incorporated into digital manufacturing systems, the MAESTRO range creates the firing conditions that allow ceramic factories to meet the challenges of the future.

完美的烧成

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萨克米新型MAESTRO窑炉系列设计用于最大限度地提高产品质量和减少资源/能源消耗。MAESTRO系列旨在使生产更加灵活、易于融入数字制造系统,为陶瓷工厂创造出满足未来挑战的烧成条件。



MAESTRO ON THE MARKET

Designed to respond to - and anticipate - market trends in terms of new sizes, new decorations, material-like texturing, graphics and aesthetics

市场上的MAESTRO窑炉

设计用于回应和预测在新尺寸、新装饰、仿真纹理、图形和美学效果方面的市场趋势



Product quality

产品质量

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To achieve perfection, tiles and slabs must have

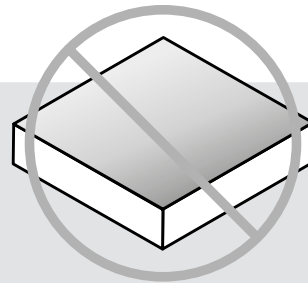
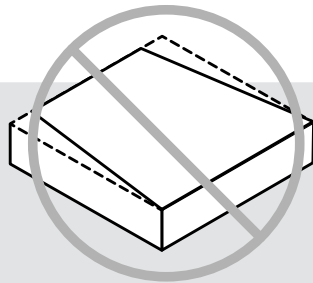
- consistent color tone
- one consistent size
- consistent planarity
- no tension
- no dunting

MAESTRO ensures all this.

为了达到完美, 瓷砖和大板必须

- 色调一致
- 尺寸一致
- 平整度一致
- 没有应力
- 没有冷裂

MAESTRO 确保了这一切。



PERFECT SIZE, CONSISTENT COLOR

By using PL7-NNG burners to maximize efficiency in the firing zone and specific control systems that stabilize in-channel pressure, MAESTRO ensures uniformity of both size and color.

Minimizing the risk of any imperfections means:

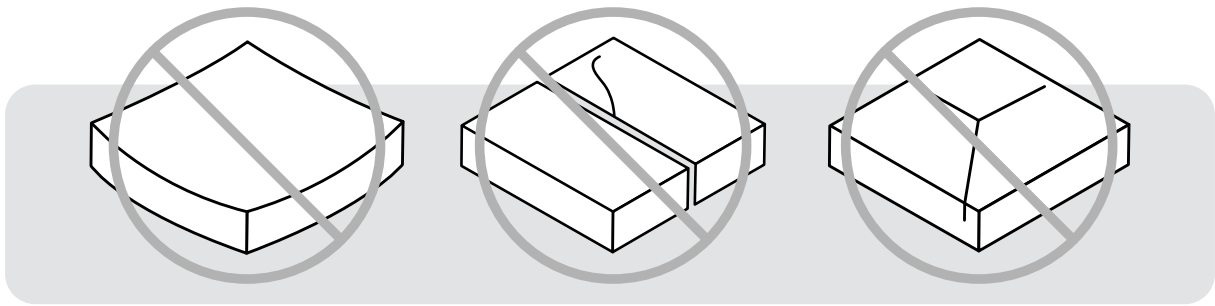
- a higher percentage of 1st class products
- lower unburnt fuel/residue emissions
- lower consumption

尺寸完美, 色调一致

通过使用PL7-NNG烧嘴, 使烧成区效率最大化, 并使用特定的控制系统来稳定窑内压力, MAESTRO确保了尺寸和色调的一致性。

减少任何不完美的风险意味着:

- 一等品的比例更高
- 减少未燃烧燃料/残留物的排放
- 降低能耗



PERFECT PLANARITY, DE-TENSIONING AND NO DUNTING

Proper cooling control is essential for the manufacture of perfectly flat tiles without any tension or dunting problems. To distribute heat evenly over the tile surface, MAESTRO applies solutions such as:

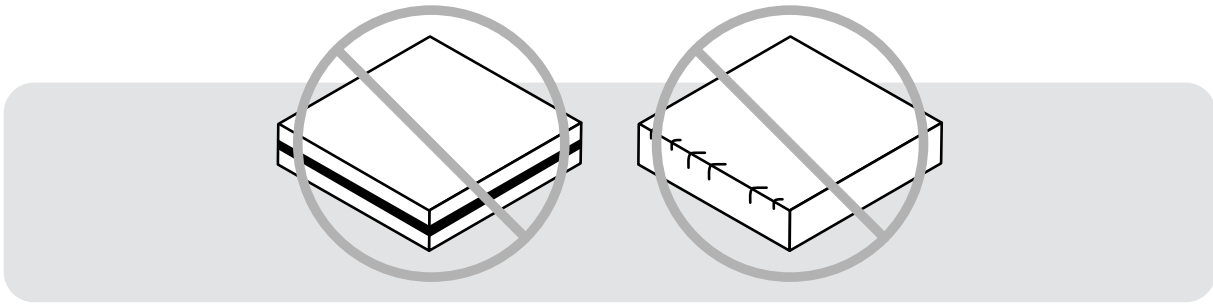
- split cooling
- burners below the roller plane
- ceramic air blowers
- piped burners

完美的平整度, 消除应力 也没有冷裂

正确的冷却控制对于制造完美的平面瓷砖而没有任何应力或冷裂问题来说是至关重要的。为了使热量均匀分布在瓷砖表面, MAESTRO采用了以下解决方案:

- 分区冷却
- 在辊道面下方布置烧嘴
- 陶瓷吹风管
- 辐射管式烧嘴





NO BLACK CORE OR CRACKING

Accurate control of the pre-heat zone is a must for the prevention of defects such as black core, cracking or bursting. To this end, the MAESTRO range implements the **Pump Jet**, a single-piece burner placed inside the kiln that:

- optimizes firing homogeneity over the kiln cross-section thanks to improved fume recirculation
- reduces cycle times
- increases wall and kiln interior temperatures
- lets manufacturers raise output rates
- reduces consumption (by up to 7% compared to average ceramic kiln consumption)
- helps lower NO_x emissions (up to 35% lower than average ceramic kiln emissions)
- recirculates 70% of inflow air

无黑心或裂纹

对预热区进行精确控制是防止黑心、开裂或爆裂等缺陷的必要条件。为此，MAESTRO 系列实现了泵喷射 (**Pump Jet**) 烧嘴，一种放置在窑内的单体烧嘴：

- 通过改善烟气再循环，优化窑炉横截面上的燃烧均匀性
- 缩短烧成周期时间
- 提高窑壁和窑内温度
- 允许生产厂家提高产量
- 降低能耗（与陶瓷窑炉的平均能耗相比，最多可减少7%）
- 有助于降低氮氧化物排放（与陶瓷窑炉的平均排放相比，最高降低35%）
- 进入窑炉的空气70%可再循环

Lower consumption, optimized resources

低能耗, 优化资源

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KILN EFFICIENCY AND SUSTAINABILITY

窑炉的效率和可持续性

In ceramics, finished product quality is intrinsically dependent on kiln efficiency. Accurate heat control is essential for the prevention of defects and raw material wastage; it also lowers costs and environmental impact.

在陶瓷中, 成品质量本质上取决于窑炉的效率。精确的热控制对于防止缺陷和原材料浪费是必不可少的; 它还降低了成本和对环境的影响。

To optimize consumption, the MAESTRO range features a fixed-air combustion plant with independent zone control, with burners that apply the fume recirculation principle.

为了优化能耗, MAESTRO系列配备了一个带有独立区域控制的定量空气燃烧装置, 烧嘴应用烟气再循环原理。

- The system sub-divides combustion into different zones.
- Each zone has its own internal oxygen analyzer.
- For each zone it's possible to adjust the quantity of air being fed to achieve the exact quantity of CO₂ requested.
- In large-scale manufacturing solutions an air-air exchanger is placed above the roller plane in the rapid cooling zone. This allows for partial recovery of the heat subtracted from the product and its reutilization to pre-heat combustion air.

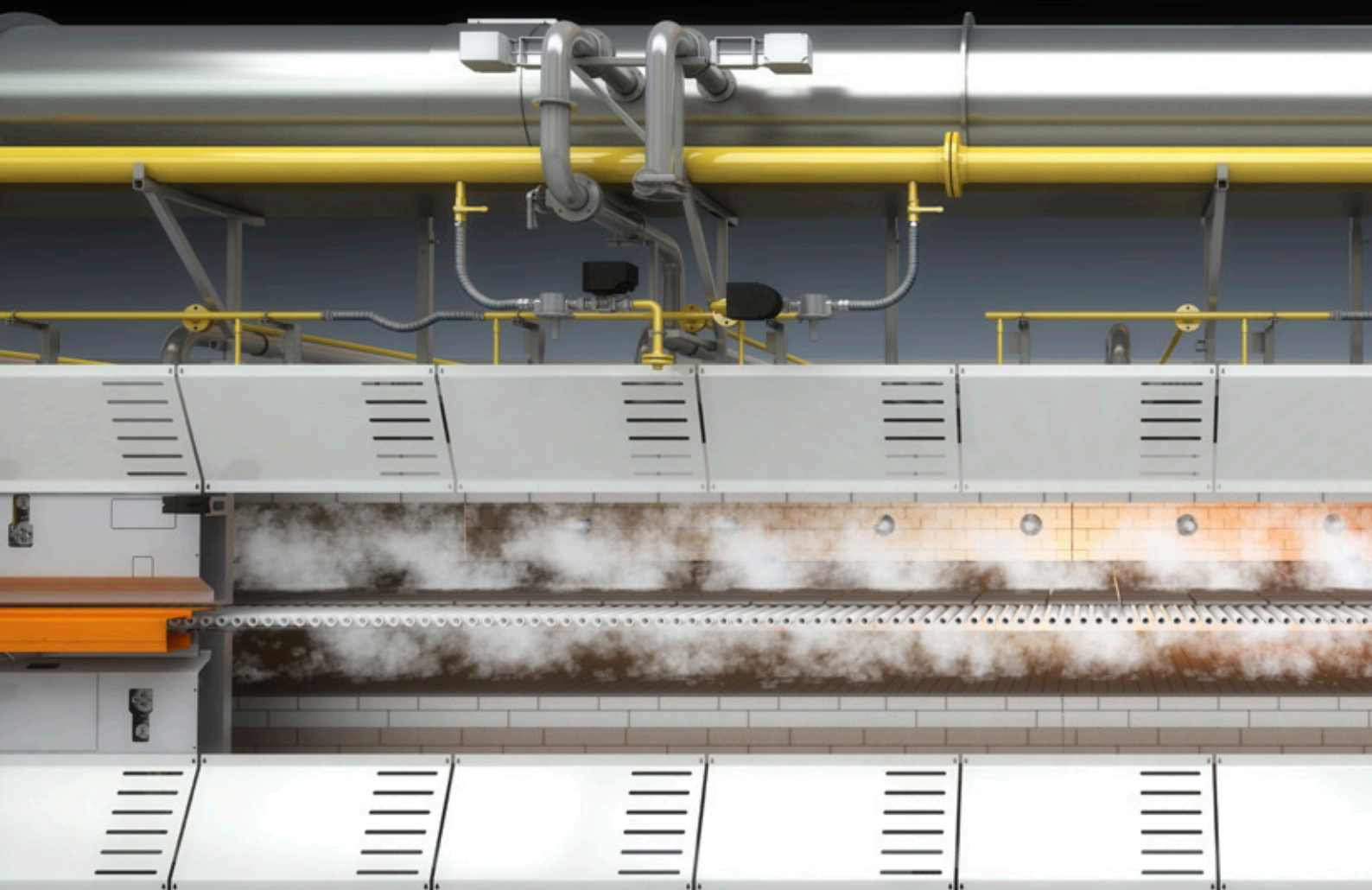
- 该系统将燃烧细分为不同的区域。
- 每个区域都有自己的内部氧气分析仪。
- 对于每个区域, 可以调整空气的供应量, 以达到要求的二氧化碳的确切数量。
- 在大规模生产解决方案中, 空气-空气交换器被放置在急冷区辊道面上方。这允许部分回收从产品中抽出的热量, 并将其重新利用来预热助燃空气。

MAESTRO IN PRODUCTION

Optimized to reduce costs, consumption and defects, re-utilize energy waste and prevent raw material waste

生产中的MAESTRO窑炉

经过优化以降低成本、减少能耗和缺陷、重新利用余热和防止原材料浪费





-7%

energy consumption*
能耗*

70%

inflow**
入窑空气**

up to / 最多

-35%

NO_x emissions
氮氧化物排放

* compared to a traditional kiln

** in pre-heat

* 与传统窑炉相比

** 在预热

- Outstanding insulation performance and in-kiln pressure control reduce consumption further and extend the working life of the machine.
- 优异的绝热性能和窑内压力控制,进一步降低了能耗,延长了机器的使用寿命。

EFFICIENCY AND SUSTAINABILITY FOR THE ENTIRE PLANT

To contain energy consumption successfully it's important to consider the production plant as a whole. SACMI focuses on optimizing the entire plant to significantly reduce both costs and environmental impact. Interconnecting all the machines that use heat energy multiplies the opportunities to make savings.

For example, it's possible to use the heat waste from the MAESTRO in spray dryers/dryers or to heat the building.

The MAESTRO kiln can also be equipped with fume treatment systems to reduce organic and inorganic pollutant levels (see p. 18).

整个工厂的效率和可持续性

为了成功地控制能耗,重要的是要把生产工厂作为一个整体来考虑。萨克米专注优化整个工厂,以显著降低成本和环境影响。把所有使用热能的机器连在一起可以增加节约能源的机会。

例如,可以把MAESTRO的余热用于喷雾干燥塔/干燥器或环境加热。

MAESTRO窑炉还可配备烟气处理系统,以减少有机和无机污染物水平(见第18页)。

Production flexibility

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A ONE-STOP SOLUTION TO MANAGE A VAST RANGE OF THICKNESSES AND SIZES

The MAESTRO range offers solutions that enhance production flexibility, letting manufacturers handle very different thicknesses and sizes.

- The modulated air/gas combustion system lets users set different combustion ratios from zone to zone and between burner units.
- This minimizes heat consumption, through chimney volumes and CO₂ emissions.
- The system adapts the air to gas consumption to maintain the set ratio.
- Configured in this way, the machine is highly versatile, perfect for both traditional sizes and large slabs made with Continua+.
- The machine can cope with products as thin as 3 mm and as thick as 30 mm.

生产的灵活性

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一站式解决方案, 以管理各种厚度和规格

MAESTRO系列提供了提高生产灵活性的解决方案, 让瓷砖生产厂家能够处理相差很大的厚度和尺寸。

- 可调节的空气/燃气燃烧系统, 使得用户可以设置从区域到区域和烧嘴组之间的不同的燃烧比。
- 这最大限度地降低热耗、减少通过烟囱排放的烟气和二氧化碳。
- 系统根据燃气的消耗来调节空气, 以保持设定的比值。
- 以这种方式配置, 机器是高度灵活的, 对使用 Continua+生产的传统规格瓷砖和大板来说都是完美的。
- 本机可处理薄至3毫米和厚至30毫米的产品。



 **SACMI**

MAESTRO IN EFFICIENCY

Designed to guarantee a high percentage of 1st class products, outstanding quality and constant efficiency

MAESTRO窑炉的效率

设计保证了产品的高一等品率、卓越的质量和恒定的效率



here



● COMPLETED ● IN PROGRESS ● ON STANDBY



PRODUCTION TIMES



PRODUCTIVITY

Digital control

数字控制

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EVERYTHING AT THE TOUCH OF A TABLET

轻轻触摸平板电脑,一切都在掌控之中

Digital control/management of every stage of the firing process is a key MAESTRO feature.

对烧制过程的每个阶段进行数字化控制/管理是 MAESTRO 系列的一个关键特点。

The plant supervisor can set air/gas ratios and firing recipes for each product or size; this makes the kiln even more flexible, suitable for frequent product changeovers or products that differ greatly from each other.

工厂主管可以为每个产品或规格设置空气/燃气比和烧成配方;这使得窑炉更加灵活,适合频繁的产品更换或相互差异较大的产品。

Digital control allows:

数字控制允许:

- full repeatability of production conditions for all parameters
- consistent outcome quality
- optimized consumption for every recipe

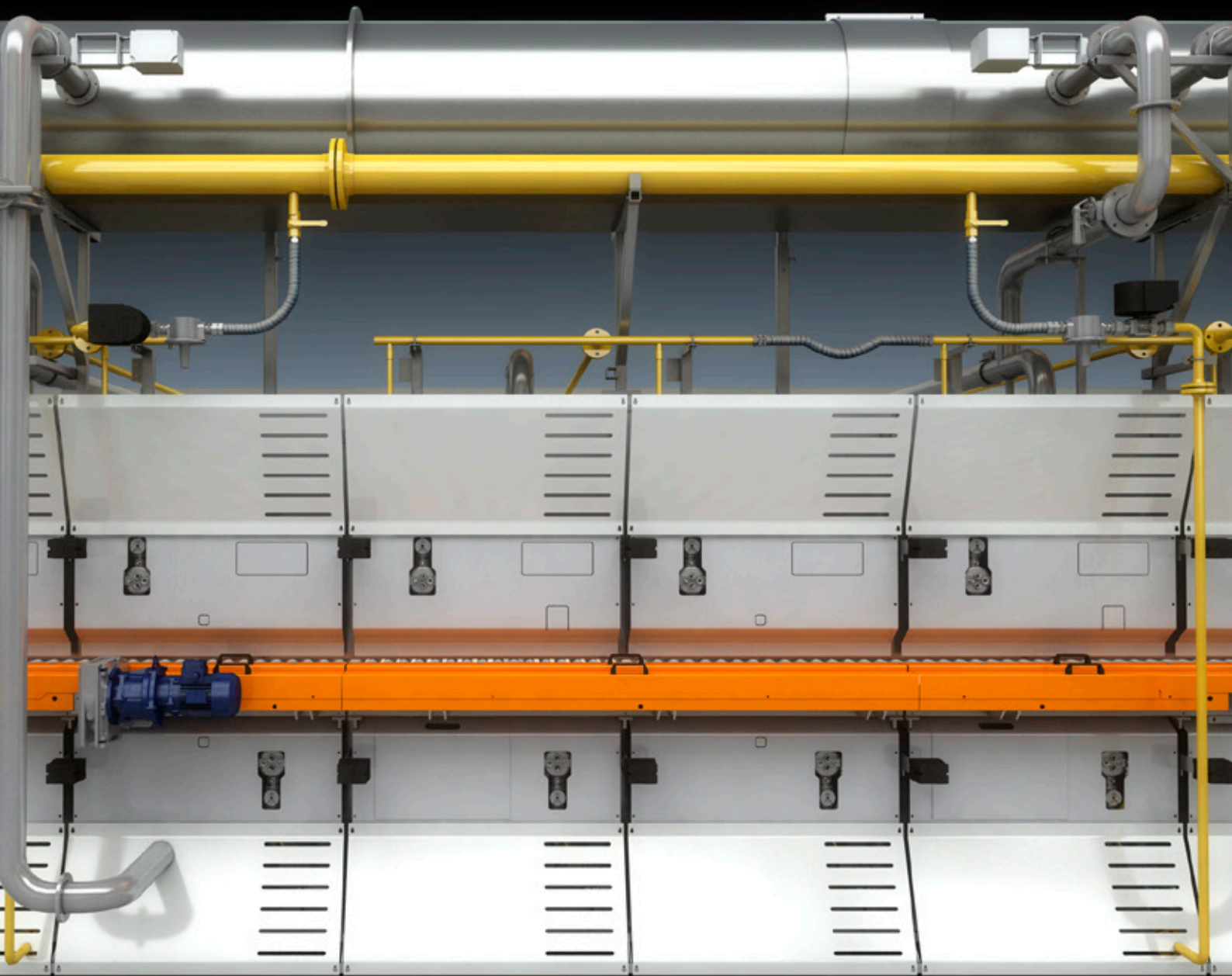
- 生产条件在所有参数下完全可重复
- 结果质量一致
- 优化每个配方的消耗量

HERE

HERE

Perfect compatibility with the HERE plant supervision system.

与HERE工厂监督系统完美兼容。



Technical features

技术特点

INLET (mm) 入口宽度(mm)	EXAMPLE OF SIZE AND N. OF PIECES* 尺寸举例和每排片数 *	EXAMPLE OF SIZE AND N. OF PIECES* 尺寸举例和每排片数 *
1650	12 pieces 100x100 mm	6 pieces 200x200 mm
2170	1 piece 1600x3200 mm	2 pieces 800x800 mm
2400	1 piece 1800x3600 mm	2 pieces 900x900mm
2950	2 pieces 1200x2400 mm	3 pieces 800x800 mm
3250	3 pieces 900x900 mm	6 pieces 450x450 mm
3550	5 pieces 600x600 mm	3 pieces 1000x1000 mm
3850	2 pieces 1600x3200 mm	4 pieces 800x800

* Pieces have been calculated assuming 8% shrinkage

* 计算每排片数时考虑的收缩率为8%

SACMI sustainable innovation

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In the 1987 Brundtland report the United Nations Commission on Environment and Development (WCED) defines sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own”.

In industry, a global, integrated approach to production plants and pollutant filtration/treatment systems is essential to:

- safeguard the workplace, the area surrounding the factory and the wider environment
- ensure correct operation of the machines and plants involved in the production process
- safeguard final product quality.

SACMI, as an all-round plant engineer, ensures full integration-interaction between the factory's machines and its filtration systems, providing interconnected HMIs and cutting-edge controls.

Thanks to Eurofilter, the Group company that specializes in environmental protection processes, SACMI has merged the MAESTRO kiln range with systems that ensure effective treatment of pollutants contained in firing fumes.

These include, for example, **bag filters for the capture of inorganic pollutants (so-called acid gases) and regenerative thermal oxidizers**

萨克米： 可持续的创新

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在1987年的布伦特兰报告中，联合国环境与发展委员会(WCED)将可持续发展定义为“既满足当代人的需要，又不损害子孙后代满足其需求的发展”。

在工业方面，对生产工厂和污染物过滤/处理系统采取全球性的综合办法是：

- 保护工作场所、工厂周围区域和更广泛的环境
- 确保生产过程中机器和工厂的正确操作
- 确保最终产品质量。

萨克米作为一名全方位的工厂工程师，确保工厂机器与其过滤系统之间的充分集成交互，提供互联的人机界面和尖端控制。

感谢欧洲过滤器公司(Eurofilter)，一个专门从事环境保护工艺的集团子公司，萨克米在MAESTRO窑炉系列上采用了可确保有效处理燃烧烟气中污染物的系统。

这些措施包括，例如，用于捕获无机污染物(所谓的酸性气体)的袋式过滤器和再生式热氧化器(RTO)，以减少来自有机溶剂的挥发性有机物



(RTO) to abate the VOCs that come from organic solvents (and are responsible for bad odors).

Filter and RTOs can be managed together with the main plant via the main machine control panel: if the machines dialogue with each other, adjustments can also take into account conditions upstream/downstream of the process, with evident benefits. When it comes to sustainable production, the SACMI Group brings the added value of expertise, consultancy services, assistance, knowledge of standards and unmatched design skills. A complete, green, technologically advanced plant, all from one partner.

VOCs造成环境异味的罪魁祸首)。

过滤器和再生式热氧化器(RTO)可以通过主机控制面板与主设备一起管理:如果机器之间相互对话,调整也可以根据工艺过程的上游/下游条件而不同,对工艺过程具有明显的好处。谈到可持续生产,萨克米集团带来了专业知识、咨询服务、技术支持、标准知识和无与伦比的设计技能的附加价值。

一个完整的、绿色的、技术先进的工厂,都来自一个合作伙伴。



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BAG FILTER SYSTEM WITH REAGENT INJECTION

袋式过滤系统,带试剂喷射

This system treats acid fumes by bringing them into contact with a reagent that combines with polluting inorganic compounds. The fumes, into which the reagent is injected, are fed into a filter made up of fabric bags, or 'sleeves'. These let the gases through but trap dust and particulates, allowing the pollutant-reducing chemical reaction to take place.

该系统通过使酸性烟气与一种与污染的无机化合物结合的试剂接触来处理酸性烟气。注入试剂的烟气被送入一个由织物袋或“滤袋”组成的过滤器。这些滤袋可以让气体通过,但会吸附灰尘和微粒,从而能够发生减少污染物的化学反应。

By supplying both the kiln and the filtration system, SACMI ensures full compatibility and the highest level of control.

通过提供窑炉和过滤系统,萨克米确保了充分的兼容性和最高水平的控制。

ADVANTAGES

优势

- High quality, ultra-safe filtration
- Personalization and modularity thanks to SACMI know-how
- Long-lasting performance
- Suitable for high flow rates and certain types of pollutant (acid and inorganic gases)
- Established technology

- 高品质,超安全过滤
- 凭借萨克米诀窍的个性化和模块化
- 持久性能
- 适用于高流量和某些类型污染物(酸性和无机气体)
- 巩固的技术



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SELF-RECOVERING AFTERBURNER

The **self-recovering post-combustion treatment system** is used to treat fumes with polluting organic compounds that cause odors. The fumes enter (often after passing through initial sleeve filtration) a system that subjects them to a thermal oxidation process, eliminating all the organic compounds present. Meticulous constructive design allows for the recovery of internal heat, which is used to pre-heat the fumes before they reach the combustion chamber to reduce fuel consumption. **By providing both kiln and afterburner, SACMI ensures full compatibility and, therefore, total control of the system.**

自回收后燃器

自回收燃烧后处理系统用于处理造成异味的含有污染性有机化合物的烟气。烟气(通常经过最初的袋式过滤器)进入一个系统,该系统使烟气进行热氧化处理,消除所有存在的有机化合物。精心的结构设计考虑到了内热能的回收,用于在烟气到达燃烧室之前预热烟气,以减少燃料消耗。

通过提供窑炉和后燃器,萨克米确保了充分的兼容性,因此,确保了系统的全面控制。

ADVANTAGES

- Complies with emissions parameters
- Personalization thanks to SACMI know-how
- Suitable for high flow rates and certain types of pollutant (organic compounds)
- Established technology

优势

- 符合排放参数
- 萨克米诀窍的个性化和模块化
- 适用于高流量和某些类型污染物(有机化合物)
- 巩固的技术

