

# The importance of the application process in large-size ceramic tile treatment and finishing

## 大规格瓷砖处理和精加工应用工艺的重要性

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Surfaces Group was set up with the aim at offering the market a complete range of technologies, tools and expertise for ceramic surface finishing operations.

The three highly specialised companies in the group – Surfaces Technological Abrasives (abrasives and fickert blocks for honing), ADI (diamond tools for cutting and squaring) and A.S. Tools (tools and plants for protective treatment) – have rapidly established an international leadership position in the industry thanks to their unflagging research efforts focused on innovative hi-tech products.

One of the most important steps in the production of large-size ceramic tiles and slabs is **pre-grinding** of the short side to eliminate sharp and curved edges that are liable to break and cause surface scratching when one tile pushes against another. This process does not affect the tool cost per square metre as any material removed at this stage does not have to be removed in the **final squaring** stage. To remove all scratching particles during honing, it is advisable to chamfer any sharp corners of the tile using specific tools. Pre-grinding and final squaring of large panels and slabs requires a larger quantity of product to be removed from the edges than in the case of traditional tiles.

For this purpose, ADI has developed a line of **dry grinding wheels** that guarantee productivity of the line and finished product quality.

For **honing** of large-size tiles and slabs, Surfaces offers a wide range of tools, abrasive brushes and fickert grinding blocks suitable for any kind of finishing. **Five®**, for example, is a new Surfaces project that is capable of eliminating as much of the post-firing undulation effect as possible to protect the aesthetic quality of the surface.

It achieves the same final aesthetic effect as traditional polishing while maintaining the productivity typical of surface honing.

**Full** on the other hand is a product that simplifies the polishing phase by eliminating the pickling process. It guarantees a perfect aesthetic result with extremely clean, smooth and glossy surfaces (up to 90 gloss) using fewer polishing heads. Moreover, without pickling it reduces machine wear and considerably improves the quality of the working environment.

There are three surface finishes with different gloss levels:

- **Campo Pieno 80-90 Gloss**, for extremely glossy full-field mirror surfaces.
- **In Cresta 30-60 Gloss**, for polishing the outermost portion of the texture.

Surfaces集团成立的目的是为陶瓷表面精加工操作提供全面的技术、工具和专业技能。该集团中三家高度专业化的公司组成，分别是：Surfaces Technological Abrasives（用于哑抛的磨料和磨块）、ADI（用于切割和磨边的加工工具）以及A.S.Tools（用于防护处理的工具和工厂）。由于其对创新高科技产品的不懈研究，该集团在行业中迅速建立起国际领导地位。生产大规格**瓷砖和板材**，最重要的步骤之一就是对短的一边预先进行磨边，消除瓷砖边沿上锋利和变形的部分，因为当瓷砖相互推挤时就会容易产生破裂并在瓷砖表面留下刮痕。这个过程不会影响每平方米的工具成本，因为在这个阶段去除的任何材料都不必再在最终的磨边阶段去除。为了在哑抛过程中去除所有能够造成划痕颗粒，建议使用专用工具对瓷砖的所有尖角进行倒角。对大板进行预先磨边和最后磨边需要比传统瓷砖（每面多达几厘米）去除更多的边缘材料。为此，ADI开发了一系列干法研磨轮，确保生产线的生产力及成品质量。

对大规格瓷砖和大板进行哑抛，Surfaces提供了一系列工具，适用于任何后期加工，如具有珩磨作用的刷子和磨





- **Satinato 20-40 Gloss**, for silky touch surfaces with an anti-reflective effect. This new **Soft Touch** finish produces smooth, satin-effect tiles on a par with the most sophisticated natural stone without compromising the non-slip characteristics of the surfaces. It can be applied to any kind of porcelain tile thanks to a mechanical operation performed on the finished product after firing. It is ideal for creating marble and natural stone effect surfaces and is equally valid for concrete- or resin-inspired finishes.

The protection of honed surfaces entails filling the porosity by means of **protective chemical treatments**. These involve batching and applying the treatment, drying it and then removing any excess by friction using special tools. At the end of the treatment, the surface is generally slightly more glossy but above all it is protected from dirt, staining (wine, coffee, etc.) and chemical attack from acids (e.g. lemon juice).

The plant proposed by Surfaces Group for filling porosity on the surface of large ceramic panels and slabs is called **FILL IT**. Compact in size (with a width of around 50 cm), it is able to treat slabs up to 170 cm wide by adjusting the quantity of treatment to be applied according to the needs of the product. By controlling the speed of rotation of the tools it is possible to adjust the friction applied to the surface.

Complete success of the protective treatment application and removal of excess is guaranteed by the materials used, namely Scotch-Brite pads and polishing fabrics for the tools that distribute and fix the product inside the pores, while filament planetary brushing machines are used to dry the treatment and remove any excess. These surface treatments are suitable for both glossy and matt surfaces.

Surfaces Group provides customised solutions and support in developing prototypes thanks to the expertise of **Surfaces LAB**, a pilot plant equipped with the most advanced technologies that works in close contact with ceramic companies, providing them with assistance through to the start-up of industrial production and performing staining and chemical resistance tests in accordance with standard UNI EN ISO 10545.

The presence of branches in the main markets outside Italy allows the group to provide technical support to its international clientele. X

块。例如，**Five®**是一个新的Surfaces项目，能够尽可能地消除瓷砖烧制后的不平整，以保护瓷砖表面的美观性。它达到了与传统抛光同样的最终美学效果，同时保持了哑光面特有的生产力。另一方面，**Full**是一个通过去除酸洗工艺来简化抛光工序的产品。它使用更少的抛光头，但获得了非常干净、光滑、亮光的表面（光泽度高达90），保证了完美的美学效果。此外，不进行酸洗可以减少机器磨损，并显著改善工作环境的质量。

这款设备可创造三种不同光泽度的表面效果：

- **Campo Pieno 80-90亮度**，有着极高的光泽度并呈现出立体镜面效果。
- **Cresta 30-60 亮度**，对纹理的最外层进行抛光。
- **Satinato 20-40 亮度**，这是没有反光效果的柔滑表面。这种新的“**柔和触感**”表面能够生产与最精致的天然石材相媲美的光滑的，具有缎光效果的瓷砖，而不会影响表面的防滑特性。由于是在烧制后对成品进行机械操作，因此它应用于任何类型的瓷质砖。这是创造大理石和天然石材表面效果的理想选择，同样适用于水泥或树脂表面效果的瓷砖。

哑抛表面的保护需要通过保护性化学处理来填充气孔。这包括配料、应用处理和干燥，然后用特殊工具通过摩擦去除多余材料。在处理结束时，表面亮度通常会有所增加，但最重要的是它可以防止灰尘、污渍（葡萄酒、咖啡等）和酸性物质（如柠檬汁）的化学侵蚀。Surfaces集团研发的填充大板表面气孔的设备被称为**FILL IT**。该设备体积小（宽度大约50厘米），能处理宽度达170厘米的大板，可根据产品的需求调整适量的处理数量。通过控制工具的旋转速度，可以调整施加到表面的摩擦力。所使用的材料保证了保护性处理应用和去除多余材料的完全成功，即用于设备的 不织布磨头和抛光材料修复了产品内的气孔，而长丝行星齿轮式刷子清除设备用于干燥处理以及去除多余材料。这些表面处理适用于亮光和哑光的表面处理。

得益于**Surfaces LAB**的专业知识，Surfaces集团为原型研发提供定制方案和支持。Surfaces LAB是一家拥有最先进技术的试验工厂，与陶瓷企业关系密切，帮助企业启动工业生产，进行符合UNI EN ISO 10545标准的防污和抗化学腐蚀性的测试。该集团在意大利以外的主要市场设有分支机构，从而能够为国际客户提供技术支持。 X