

İZNİK FOUNDATION

İZNİK QUARTZ TILES

TECHNICAL FILE

IZNIK FOUNDATION

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A. The Characteristics of Iznik Quartz Tiles Produced by Iznik Foundation.

- Iznik tiles have not been produced for the last 300 years and there were no documents whatsoever providing clues to the technologies used in the process until Iznik Foundation started the revival of the traditional technique.
- The extant tiles give evidence of extremely difficult production methods that; result in very hard glaze and under-glaze decorations.
- The colors used in the tiles, especially the coral red include very complex mixtures and are difficult to obtain and apply. Both domestic and international researchers have spent years investigating this subject, and only Iznik Foundation has achieved the successful result.
- Because the clay, undercoating and glaze have 85% ratio of quartz, these tiles are documented in ceramic literature as being very difficult to achieve; made even more difficult by the fact that the composition of these materials at temperatures exceeding 930° C. is distributed across a wide thermal spectrum.
- The ceramic tiles contain a network of pores which, while they are in opposition to their compactness, act to protect the tiles against the effect of extreme temperature changes by allowing the tiles both to expand and dilate, and to breathe with the walls to which they are attached.
- The light matte quality of the glaze is **non-glaring to the eye** and has a low light reflection quality.
- The quartz in the basic material of the tiles is radiation absorbent; collect static electricity and are used in surroundings where electromagnetic waves are effective.

B.The Sizes of Iznik Foundation Tiles.

Contemporary research and technical developments undertaken by the Iznik Foundation in the production of Iznik tiles have enabled the manufacture of tiles of the same finish and quality as their predecessors. The tiles in Ottoman architecture are traditionally triangular, square, hexagonal, six pointed star or in the form of a cross.

Iznik tiles employ principally the square form; its module corresponding to the dimensions of an opened hand palm. This can be seen as a clear relationship established with human morphology and scale, where the repetitive module and geometry with their subsequent patterns reinforce this variety of scale.

The Iznik Foundation has ongoing efforts to apply contemporary designs into traditional production sizes. To achieve this; mainly the sizes mentioned below are used.

The dimensions can vary +/- 2 mm as the production is hand made. Border tiles are produced according to the project and design.

<u>Dimensions</u>	<u>Thickness</u>	<u>Weight</u>
23.3 cm x 23.3 cm - 7.5 fingers (Ottoman) 1200 gr	12 mm	
29.3 cm x 29.3 cm - 9 fingers (Ottoman) 1400 gr	14 mm	

C.The Production Process in Iznik Foundation Ateliers.

For a **square tile, which consists of 4 layers**; the custom manufacturing process is briefly outlined to emphasize on “hard to achieve” production phases.

Dimensions: 233 x 233 mm (+/- 2 mm) or 293 x 293 mm (+/- 2 mm)

Thickness: 12-13 mm (+/- 1 mm)

Weight: 1200-1400 gr

Strength: 6.5 Mosh

Layer 1. Biscuit

1. Blocks of quartz are selected and manually broken into pieces.
2. Clay is laid in water for a day, then boiled and filtered through a cloth sieve.
3. Adding % 85 quartz on the filtered clay makes a paste.
4. The homogeneous paste is left to rest for one day.
5. Drying for 7-10 days in a shady place, on wooden shelves.
6. The edges of the plates are manually sandpapered to obtain the standard size.

Layer 2 .Undercoating

1. A thick liquid paste is prepared with very fine powdered clean quartz and clay.
2. Mixture flown equally over the plate to obtain a flawless surface.
3. The tile is air dried in natural surroundings min. 10 days.
4. It is then kilned at 930 C°.
5. They are left to cool off before sending to the design ateliers.
6. Biscuits are dusted off with air compression pistols.

Layer 3. Design

1. Designs are prepared on sketching paper, which are pin holed and transferred on to the biscuit tiles with charcoal powder.
2. The tiny dots which form the design or motif; visible on the biscuit tiles are contoured in dark blue or black colours.
3. The parts in between are painted with colours.

Layer 4. Glaze

1. The glaze is obtained by the mixture of quartz, metal oxides and soda
2. This glassy bulk is broken into small pieces, washed, sifted and dried.
3. The glazing mixture is prepared with the use of a water based organic blender and flown equally over the designed and painted tiles.
4. Glazed firing is made within the same period as the biscuit firing.

D. The Accredited Standards of Iznik Foundation.

Iznik Foundation, Research and Development Centre and the workshop group has been collaborating with the “The Scientific and Research Council of Turkey, TUBITAK”, the state owned Government Establishment., since 1993. TUBITAK’s appointed laboratories are internationally accredited, issuing ISO standard tests and relevant reports.

As per the standards of the ceramic literature, ceramics are divided into two as, pressed and un-pressed products. Pressed ceramics referring to the mass productions in the factories, un-pressed ceramics referring to the custom manufacturing process.

Iznik Foundation has put all its effort into setting the Unique Standards for Un-pressed Ceramics, to be named, as it has been traditionally, “CHINI” or “IZNIK CHINI” in world ceramic literature. The studies of the Ceramic Research Centre of the Iznik Foundation with the laboratories of MAM, Marmara Research Centre of TUBITAK have accredited results.

Upon completion of the on-going studies about setting the unique standards for custom manufactured processing of murals, Iznik Foundation’s effort will continue to set up the minimums of traditionally manufactured products of art in cross cultural production environments.

The results of the *related standards* fitting the criteria of un-pressed, custom manufactured ceramic tiles are given below;

TS EN ISO, 10545-4, Determination of Breaking Strength and Modulus of Rupture

Breaking Load, 914 Newton

Breaking Strength, 708 newton/mm²

Modulus of Rupture, MOR, 86.55 kg/cm² = 8.4 N/mm²

TS EN ISO, 10545-9, Determination of resistance to Thermal Shock, is Successful.

TS EN ISO, 10545-11, Determination of Craze Resistance for Glazed Tiles, is No Crazeing.

TS EN ISO, 10545-3, Determination of Water Absorption in apparent porosity and relative density, is un-absorbency ratio of %79, 23.

TS EN ISO, 10545-12, Determination of Frost Resistance, is Successful in 32 turns.

TS EN ISO, 10545-13, **Determination of Chemical Resistance**, is Successful with rating A.

ISO, Mosh, The Determination of Hardness of the Glaze, is 6.5 Mosh. The hardest inorganic substance, the diamond is 8 Mosh.

E. The Installation of Iznik Foundation Tiles.

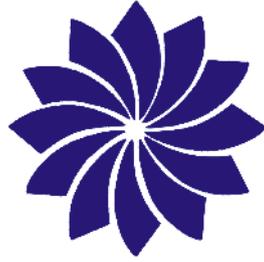
Iznik Foundation recommends the installations of murals by Foundations' in-house experts who are specially trained technicians.

The application of the tiles on the finished surfaces can be considered simple but the handling of the tiles by experts is essential for the precise installation of artwork.

For the finished surfaces, the type of adhesive for Iznik Tiles is like all other adhesives used for smooth surfaces, such as; marble, polished timber etc.. It should be a cream textured material; highly chemical; late setting-must dry out at least in 48 hours. "Policol" is an example of this type of adhesive. The remaining adhesives are not re-usable

For the unfinished surfaces, Iznik tiles would be applied on, smoothed, undercoat plaster or gypsum board surfaces with a powder type of mortar adhesive that is mixed with water. The adhesive is chosen from slow setting, high resistant type of commercial brands. The supply of the adhesive can be made from commercial brands such as Fleximörtel/German, Ardurit/British or Vitrafix, Epoxy/Turkey. On gypsum board surfaces it is advisable to proceed by applying a coating before installation.

For both finished and unfinished surface applications, it is essential that in both cases the adhesive must be flexible types. The types of the adhesives are determined accordingly to the surrounding conditions such as location, weather, and humidity.



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METHOD STATEMENT for the INSTALLATION of İZNIK TILES

Iznik Quartz Tiles are pieces of artwork, totally handmade; of %85 quartz. Therefore the handling during application on walls requires special training and delicate conduct. The most important point is that the designs need excellent knowledge of assembly and reading method of given data sheets. As there is no visible grouting; the technicians adjust the tiles with minimal spacing between joints. The application procedure should not be evaluated by standard tile laying methods.

1. Preparation of ground / platform:

To lay-out the quartz tiles as full panels; a clean surface on the floor is prepared. A platform or clean flooring where treading is not allowed is reserved. The technicians carefully lay out the tiles in the correct succession to view the full panel.

All tools & materials required for the installation process are prepared within the location. Preferably a caution-band is put up to surround the location to avoid any passing.

2. Preparation of the surface:

- i. “Levelling” the surface of the location where installation of quartz tiles is being done – a smooth surface is required for an even finish.
- ii. Surface is to be cleaned of any extra layer of coating and to ensure that the surface to be tiled is free from dust, oil or other form of contamination. Rendering should be applied as an intermediate substrate to provide the necessary measure of suction and accuracy.

3. Preparation prior to the installation:

- i. Covering of the flooring/ground with layers of plastic sheets to avoid any spilling or dropping of adhesive material that can harden in a short period of time.
- ii. Preparation of the centrelines for application.
- iii. A timber bearer / support guideline for the lowest line of tiles to be fixed where application begins.
- iv. Due to the nature of the hand made tiles; **bevelling** on all four edges may be necessary to fit successive tiles to each other. The technicians who “read” designs carry out this process during the laying out of the tiles as well as during the installation phase.

4. Installation, application:

- i. Preparation of the adhesive material (mixing). Tiles should be fixed in position before surface drying of the adhesive occurs. After spreading the adhesive on the surface the open time will vary according to atmospheric conditions but is usually about 30 minutes.
- ii. Application to start from the lowest line from centre point.
- iii. Levelling from the first line of installed tiles and continuing upwards.
- iv. Bevelling wherever necessary to match the design to the surrounding tiles.
- v. Minimal grouting is left; main grouting is on the backside of the tile edges and is not visible. Adjusting can be made within drying period to obtain the correct overall design.