

Quality Standards 1

Approvals

All Dennis Ruabon quarry tiles are manufactured under an approved quality system to BS EN ISO 9001:2000 which governs the production and supply of ceramic tiles and ancillary fittings from raw material to after sales service.

In addition to compliance with the above standard the company also holds membership of Ceram Research, a UKAS and government accredited test organisation for ceramic products. Through this membership Dennis Ruabon commissions regular independent inspection and testing of all its products to the requirements of the applicable British, European, and International standards.

These audit tests are carried out at the laboratories of British Ceramic Research (copies of approval certification and product audit test reports are freely available on request).

Product performance standards:

The technical properties of ceramic tiles intended for use on floors and walls have been very well defined for a number of years by the comprehensive British Standard BS 6431: and more recently by BS EN 14411. This is also the European standard (EN).

BS EN 14411:2006 is currently structured as follows:

There are three definitions pertaining to the method of shaping:

Group A – Extruded

Group B – Dry Pressed

Group C – Made by other processes

Further group divisions are made according to level of water absorption and strength:

I – Water Absorption $\leq 3\%$. and Breaking Strength $> 1100N$

IIa - Water Absorption $\leq 6\%$ and Breaking Strength $> 950N$

IIb - Water Absorption $\leq 10\%$ and Breaking Strength $> 900N$

III - Water Absorption $> 10\%$ and Breaking Strength $> 600N$

With certain exceptions all Ruabon Quarry Tiles are categorized as **Group AI** and are governed by Annex A of the standard as prescribed for **Natural Extruded Tiles of Low Water Absorption.**

Each of the aforementioned groups is governed by specific parts of **BS EN ISO 10545** which specifies the minimum physical properties for the tiles in that sub-group and comes in 16 parts. The parts which relate to Ruabon Quarry Tiles are listed below:-

BS EN ISO 10545 Part 1 : Sampling and basis for acceptance.

BS EN ISO 10545 Part 2 : Determination of dimensions and surface quality.

BS EN ISO 10545 Part 3: Method for determination of water absorption.

BS EN ISO 10545 Part 4: Determination of modulus of rupture and breaking strength.

BS EN ISO 10545 Part 6: Determination of resistance to deep abrasion for unglazed tiles.

BS EN ISO 10545 Part 8: Determination of linear thermal expansion.

BS EN ISO 10545 Part 9: Determination of resistance to thermal shock.

BS EN ISO 10545 Part 12: Determination of frost resistance.

BS EN ISO 10545 Part 13: Determination of chemical resistance.

BS EN ISO 10545 Part 14: Determination of resistance to stains.

Technical Properties

Detailed information on technical properties which are not prescribed under BS EN ISO 10545 can be found on Technical Data Sheets No. 4 and No. 6 which relate to Slip Resistance, Chemical and Stain Resistance and Frost Resistance.



Process Inspections

Detailed quality control procedures ensure products are manufactured to exacting standards throughout all aspects of production.

All staff are fully experienced and thorough, ongoing training ensures they are fully competent in all aspects of relevant product standards and quality expectations.

Final Inspection

All products are visually inspected prior to packaging and each batch is required to undergo full prescribed laboratory testing prior to release.

Quality Standards 2

Dimensional Tolerances:

Comparison of British/European/International Standards related to Ruabon Values.

Technical property	Product group A1 – Annex A Natural extruded ceramic tiles requirement	Ruabon Tiles Typical value
Dimensional tolerances BS EN ISO 10545: Part 2	Quarry tiles	Quarry tiles
Length & Width		
(a) Permissible deviation in % of the average size of an individual tile (2 or 4 sides) from the work size (w).	± 2%	± 1%
(b) Permissible deviation in % of the average size of an individual tile (2 or 4 sides) from the average of the 10 test specimens	± 1.5%	± 1%
Thickness		
Permissible deviation in % of the average size of an individual tile from the work size	± 10%	± 6%
Straightness of sides		
The maximum deviation from straightness, in % related to the corresponding work size	± 0.6%	± 0.4%
Rectangularity		
The maximum deviation from rectangularity, in % related to the corresponding work size	± 1.0%	± 0.7%
Surface flatness		
(a) Centre curvature in % related to the diagonal calculated from the work size	± 1.5%	± 0.4%
(b) Edge curvature in % related to the corresponding work size	± 1.5%	± 0.4%
(c) Warpage in % related to the diagonal calculated from the work size	± 1.5%	± 0.45%

Quality assurance

All dimensional tests are conducted by fully trained technicians, utilising the latest calibrated measuring instruments and gauges.

All equipment used for quality inspection is fully traceable to NAMAS standards.



Extensive process checks are carried out throughout all stages of manufacture to stringent in-house standards which are normally far more demanding than prescribed by the relevant product standards.