

DURIT Granitec HL - Special Effect Linie



Our design model with very good scratch resistance

Noble granite look with smooth, hard surface. Excellent scratch resistance and very good abrasion resistance.

Developed for top level cookware.

Consumers can find out what DURIT Granitec HL is all about.

This product is also available in a "Maximizing Green" variant.

Here you can see what that means for you as a consumer.

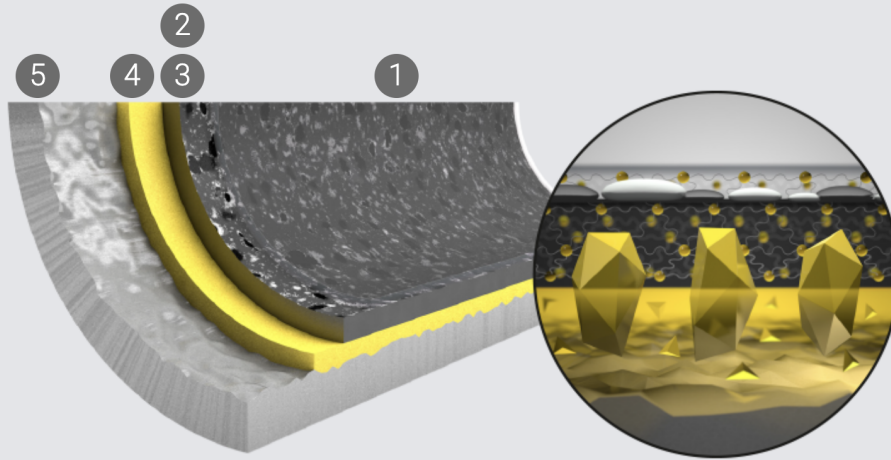
- Unique granite look with smooth surface
- Very good scratch and abrasion resistance
- Exceedingly exceptional non-stick properties
- Very good cleanability

Characteristic

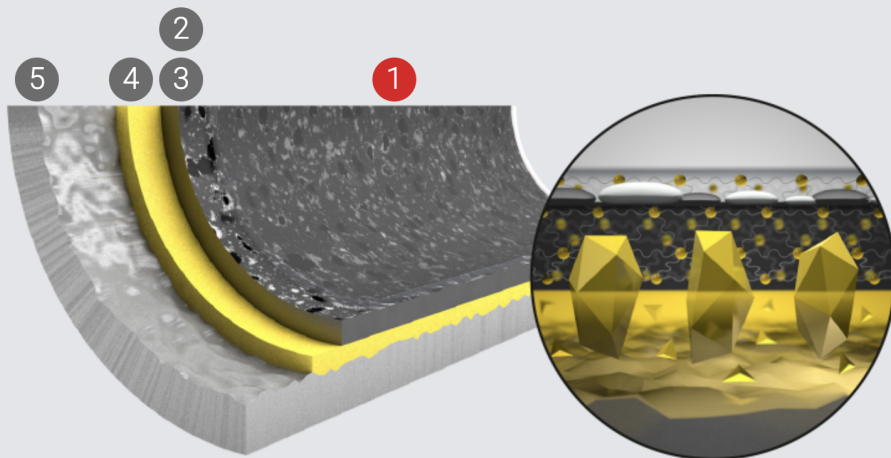
Number of Layer	4
Coating Thickness μm	40-45
Curing Temperature $^{\circ}\text{C}$	435
Service Temperature $^{\circ}\text{C}$	250
Scratch resistance	★★★★★
Abrasion (BS)	★★★★☆
Non-stick (LGA)	★★★★★
Non-stick (LGA & milk)	★★★★★S
Corrosion resistance	★★★★☆

DURIT Granitec HL (GRANITEC HL)

is a unique, four-layer non-stick coating based on DURIT High Level technology. Gentle roasting and easy cleaning, a very good scratch resistance and an excellent abrasion resistance make this product unique. The noble granite look with its smooth and hard surface sets a strong quality signal.

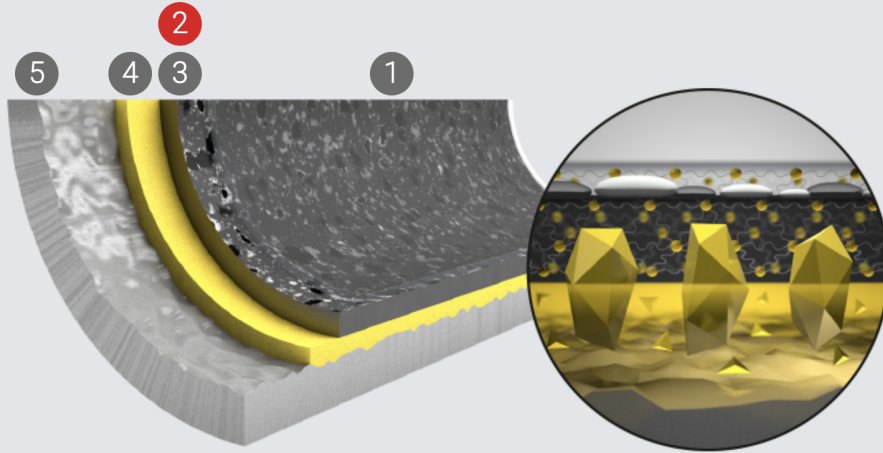


1. Surface sealing applied wet-in-wet to achieve good cleanability



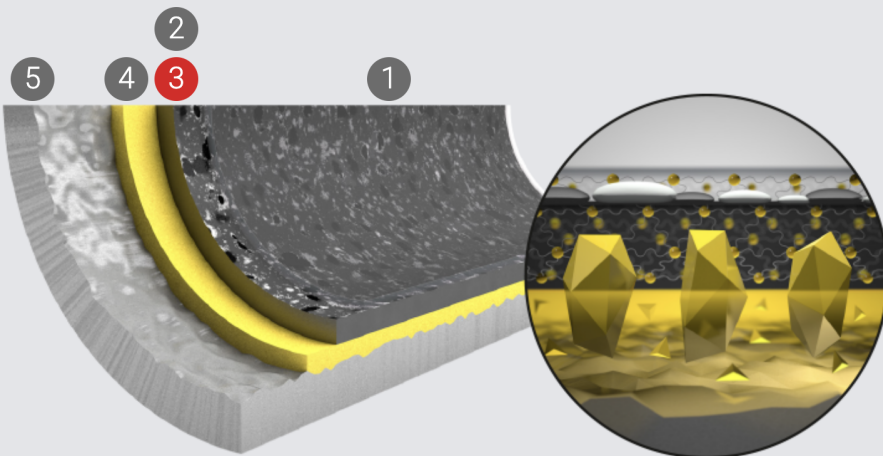
2. Granite effect coating with polymer matrix technology is applied wet-in-wet

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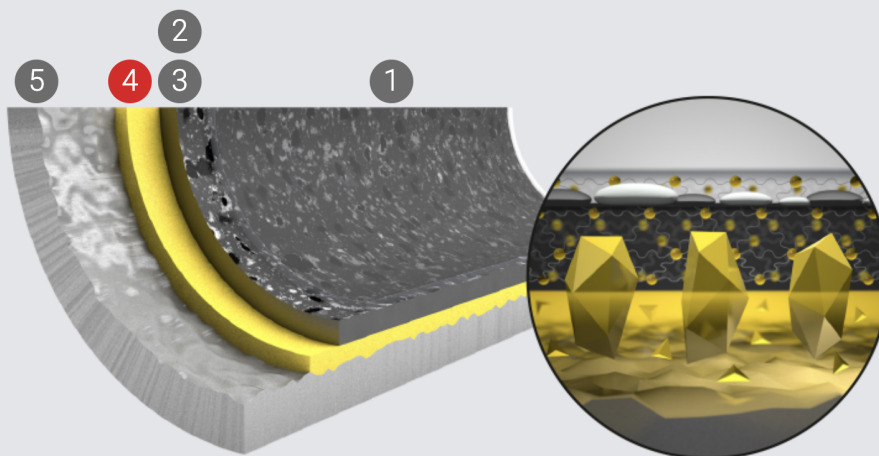
3. Mid coat with innovative polymer matrix enables best scratch resistance

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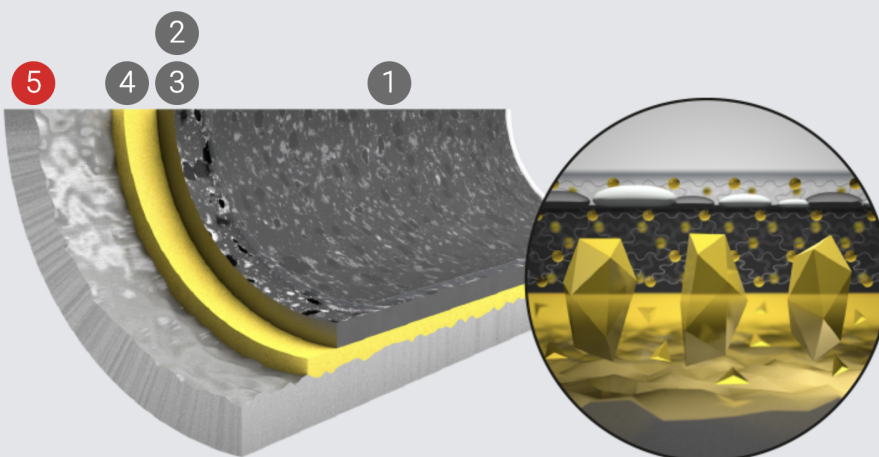
4. Primer with strong ceramic reinforcement

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5. Specially prepared substrate for an optimum adhesion of the coating to the cookware product

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Substrates

Substrate	Pretreatment	Suitability
pressed/forged alu	sandblasting with corundum	✓✓
Alu cast	sandblasting with corundum	✓✓
Stainless steel	n.a.	✗

Testing Methods

Basic Properties

Food contact

Every non-stick coating, once applied, must be tested by an independent institute in order to control its suitability for food contact. A food approval certificate is mandatory.

There are several standards with regards to food contact, for nearly every country in the world, but the most accepted ones are the following:

EEC – Regulation (EC) No. 1935/2004

USA – FDA CFR Title 21 Food and Drugs

DE – LFGB und BfR Standards

Visual features

The coating should be looked at through a microscope (magnification 30X) and has to show no cracks and/or pores. The wholeness of the coating prevents the foodstuff to penetrate through to the substrate and the consequent risks of undermining the adhesion and damage in long-term use.

Dry film thickness (DFT)

Every coating has its own specifications set by the coating manufacturer. Cookware manufacturers have to follow these specifications and the DFT must be controlled and written down after the final application. Sometimes it is difficult to measure the DFT directly on the substrates during the production, like in case of cast aluminium, stainless steel and hard base substrates. Under these circumstances DFT measurements must be carried out on “smooth” aluminium panels in order to have a value as close as possible to the real one. As a “rule of thumb”: the higher the DFT the more durable the coating.

Adhesion (Cross hatch)

The strength of a coating's adhesion to the substrate can easily be measured with the cross hatch test. The procedure requires that a "cross" pattern of 100 squares is carved on the surface by making 11 parallel cuts, approx. 5 cm long and at a distance of 1 – 2 mm from each other, and then repeating the 11 cuts perpendicular to the previous ones. The cuts must go through the coating down to the substrate. After that, a normalised tape, wide enough to cover the pattern, is pressed on it with a force of 10 N/cm² and then sharply torn off. This operation has to be repeated 5 times in succession, every time using a new tape: no square should be peeled off. For intensification the test item can be boiled in water for 15 minutes and subsequently the tear off test can be repeated.

Non-stick Tests

Egg-/Pancake-/Milk Test

For cookware and electrical appliances the most used tests are:

Egg Test

Pancake Test

Milk Test

For some particular products (e.g. breadmaker, rice cooker, raclette grill, etc.) other non-stick specific tests may be carried out.

It is important to test the coating continuously over a certain period of time, to make sure that the non-stick property will last long enough. All non-stick tests can be combined with mechanical or chemical abuse which simulates a typical long-term household use.

Milk-Test

For cookware and electrical appliances the most used tests are:

Milk Test

For some particular products (e.g. breadmaker, rice cooker, raclette grill, etc.) other non-stick specific tests may be carried out.

It is important to test the coating continuously over a certain period of time, to make sure that the non-stick property will last long enough. All non-stick tests can be combined with mechanical or chemical abuse which simulates a typical long-term household use.

Corrosion Tests

Salt Water Test

The salt water test is used to judge the coatings in terms of resistance to blistering, undermining, and other defects. Variation of the standard are possible, but the following parameters must be defined and noted:

Concentration of salt as a percentage in weight (standard 10 %)

Number of hours and/or cycles under testing (20 hours)

In-use temperature (boiling)

Tomato Test

Since tomatoes have already a low pH-value, this test is focusing specifically on the evaluation of the resistance to acid ingredients. In addition elevated temperatures are used to make conditions more severe. This specific test is made even more aggressive by adding salt and/or acetic acid. Similar to previous tests, the tomato test also helps in evaluating the resistance to blistering, undermining, staining, etc.

Rice-Tomato Test

In the CEN-test the item is subjected to a combination of different cooking cycles based on acid ingredients (tomatoes), salt and starch (rice) at elevated temperatures. This test is used to evaluate resistance to blistering, undermining and staining (due to the presence of tomato which is, by nature, highly staining).

Abrasion Tests

LGA Abrasion Test

This test uses a special mixture of steel balls, abrasive agent (silica grits) and water, which is poured into the item.

The items are then positioned onto an orbital shaking machine, turning at a speed of 300 rpm: the mixture heavily abuses the coating.

Judgement after 15/30/45 minutes of test.

MTP Abrasion Test

The test uses a special rotating “head” to which three ballpoint pen refills are attached under a specific load. The items are positioned on a hotplate and brought up to a temperature of 200°C. The hotplate is moving forth and back. The test will be scored according to the first break through (metal contact EMK) and the caused change after a defined running time.

British Standard Abrasion Test

This test uses a specified scotch-Brite pad, which is rubbed back and forth under a specific load, on the coating, in combination with water and detergent. The test tries to simulate the cleaning and scrubbing action on cook- and bakeware. Similar to the previous test, the longer the coating withstands without being removed – the longer the expected lifetime.

Dry Abrasion Test

This test uses an abrasive pad that rotates on the coating under a certain load and a certain speed. The number of rotations carried out to expose the substrate is an indication of lifetime expectation.