

You Build, We Protect!

NEWSLETTER HEGGEL[®] UltraTile R10

April 2025

INSIDE THIS ISSUE:

Tested for Performance,Trusted for Applications

- Chemical & Slip Resistance, Strength and Abrasion Tested
- Engineered for Extreme Conditions
- Superior Mechanical, Chemical & Physical Performance



From Specification to Validation, Confidence in Every Tile

> The Critical Role of Acid-Resistant Tiles in Industrial Protection

In today's industrial environments, flooring and lining systems do far more than support foot traffic, they serve as the first line of defense against aggressive operating conditions. These surfaces must endure continuous exposure to corrosive chemicals, thermal shocks, abrasive wear, frequent cleaning, and hygiene-critical protocols, all while maintaining structural integrity and safety.

A failure in these systems can lead to serious operational consequences: contamination of products, non-compliance with safety standards, unplanned shutdowns, or even permanent structural degradation.



This is where acid-resistant tiles come into play, not as a decorative finish, but as a technical barrier solution. Designed for function, their dense ceramic structure, low porosity, and exceptional resistance to acids, alkalis, and oxidizing agents make them indispensable in harsh service environments such as:

- Chemical & petrochemical plants
- Metal refining & pulp processing units
- Power & fertilizer production facilities
- Pharmaceutical & food-grade environments
- Laboratories, cleanrooms & battery rooms
- Wastewater treatment & containment zones

However, not all ceramic tiles are created equal. In critical applications, reliance on claims is not enough. Performance must be proven, not promised. That is why certified third-party testing is essential: it delivers the data-driven confidence that the material will withstand the real-world conditions it is designed to face.



HEGGEL UltraTile R10

> Industrial Grade Ceramic Engineering

HEGGEL UltraTile R10 is a high-performance unglazed stoneware tile, manufactured according to EN 14411 (Group AI_b). Developed specifically for corrosive, load-bearing, and process-intense environments, it offers:

- Dimensional stability and mechanical strength
- High resistance to concentrated acids, alkalis, and cleaning agents
- Compatibility with acid-resistant mortars and membrane systems
- Non-glazed surface with controlled slip properties (R10)

It is available in standard formats of 240 x 115 mm ranging from 10 to 40 mm in thickness, adaptable to various structural and loading requirements.





Engineering Confidence Through Certified Testing

As mentioned before, in industrial cases, performance must be proven. For this reason, **HEGGEL** submitted **HEGGEL UltraTile R10** for comprehensive third-party evaluation at accredited laboratories, verifying its alignment with key international standards.

Certified testing provides traceable, documented results for regulatory review, confirms that measured performance matches declared specifications, and validates the tile's characteristics. Most importantly, it ensures that the material is technically fit for use in demanding, safety-critical environments.

Technical Validation: Scope of Testing

The tests were designed to assess the tile's performance under mechanical, thermal, chemical, and safety-critical conditions, in accordance with the latest European Norm (EN) and ISO standards as mentioned in the table below:

Test Category	Standard Applied	
Water Absorption, Porosity, Bulk Density	EN ISO 10545-3	
Modulus Of Rupture, Breaking Strength	EN ISO 10545-4	
Abrasion Resistance	EN ISO 10545-6	
Chemical Resistance	EN ISO 10545-13	
Slip Resistance	EN 16165: 2023 ANNEX B & A	

Each of these tests plays a critical role in evaluating the quality and performance of tiles. These tests are important to ensure that we can fully trust the quality and reliability of the tiles in demanding industrial environments. By passing these evaluations, **HEGGEL UltraTile R10** can prove its suitability for high-performance, safety-critical applications.



HEGGEL[®] UltraTile R10

Technical Comparison: What the Values Say

To validate the chemical formulation and structural consistency of **HEGGEL UltraTile R10**, an X-Ray Fluorescence (XRF) analysis was conducted on calcined material. The full oxide composition, shown in the table below, confirms a dense and stable structure ideal for harsh industrial environments:

Chemical Composition	Test Results	
Al ₂ O ₃	22.2%	
TiO ₂	1.26%	
Fe ₂ O ₃	1.48%	

Each of these oxides plays an important role in the performance of **HEGGEL UltraTile R10**. Al_2O_3 (Aluminum Oxide) increases the tile's strength and helps it resist chemicals and acids. TiO₂ (Titanium Dioxide) improves the density of the tile, making it less porous and better at blocking liquid penetration. Fe_2O_3 (Iron Oxide) is kept at low levels to keep the color stable and prevent negative reactions in acidic environments. These ingredients work together to give the tile its strong, durable, and acid-resistant properties.

The table below provides the results confirmed through certified testing:

Property	Test Result		
Bulk Density	2.33 g/cm³		
Water Absorption	0.2%		
Apparent Porosity	0.5%		
Modulus of Rupture	50.5 MPa		
Cold Crushing Strength	> 220 MPa		
Abrasion Resistance	184 mm³		
Slip Resistance	R10		



The test results highlight **HEGGEL UltraTile R10**'s excellent performance across key technical properties, placing it among the top-performing acid-resistant tiles in terms of density, low porosity, strength, and durability. Below is a summary of its 3 main advantages compared to typical acid-resistant tile standards:

• Water Absorption: 0.2%

Much lower than typical acid-resistant tiles (up to 0.5%), ensuring outstanding moisture and chemical resistance.

• Apparent Porosity: 0.5%

Lower than the usual 0.7–1.5%, providing a denser surface ideal for harsh chemical environments.

Cold Crushing Strength: > 220 MPa

HEGGEL[®] UltraTile R10

Within the high-performance range (industry standard often > 200 MPa), capable of withstanding heavy industrial loads.

Verified Under Chemical Stress

To evaluate **HEGGEL UltraTile R10**'s durability in chemically active environments, the tile was subjected to chemical resistance testing according to EN ISO 10545-13. The test involved exposure to a variety of commonly encountered industrial chemicals, including acids, alkalis, and oxidizers at both low and high concentrations.

Test Solution	Concentration	Class
Hydrochloric Acid (HCl)	3% (Low)	А
	18% (High)	A
Lactic Acid	5%	А
Ammonium Chloride (NH ₄ Cl)	100 g/L	А
Sodium Hypochlorite (NaOCI)	20 mg/L	А
Citric Acid	100 g/L	А



Test Interpretation:

- Class A: No visible effect
- Class B: Noticeable change in appearance
- Class C: Partial or complete loss of appearance

HEGGEL UltraTile R10 achieved **Class A** performance demonstrating complete resistance to visual and surface degradation, even in high-concentration chemical conditions. These results validate the tile's use in areas with routine exposure to:

- Strong acids
- Cleaning agents and disinfectants
- Process effluents and aggressive byproducts



HEGGEL[®] UltraTile R10

Technically Verified and Field-Ready

Tests confirm that **HEGGEL UltraTile R10** is classified among high-quality acid-resistant tiles in the market, offering proven reliability in environments where chemical exposure, thermal cycling, load-bearing, and hygiene are critical. With traceable standards compliance, an optimized ceramic formulation, and reliable test results, **HEGGEL UltraTile R10** delivers:

- Proven chemical and mechanical resistance
- Measurable thermal and dimensional stability
- Fully certified materials, ready for regulated applications

These results position **HEGGEL UltraTile R10** in the upper tier of acid-resistant solutions, ensuring dependable long-term performance.

Discover how **HEGGEL UltraTile R10** can bring lasting value to your next project. Whether you are specifying materials for a new facility or upgrading critical infrastructure, **HEGGEL** is here to support you at every stage. Our commitment extends beyond delivering a certified, high-performance product; we offer complete technical support, from early design consultation to on-site application guidance, ensuring your project is not only compliant, but built to last.

Let us Build It Right, Together

Let us build long-lasting protection with tested performance, technical support, and trusted results. Connect directly with our technical engineering team today!

HEGGEL GmbH You Build, We Protect! www.heggel.de info@heggel.de +49 201 17003 270