

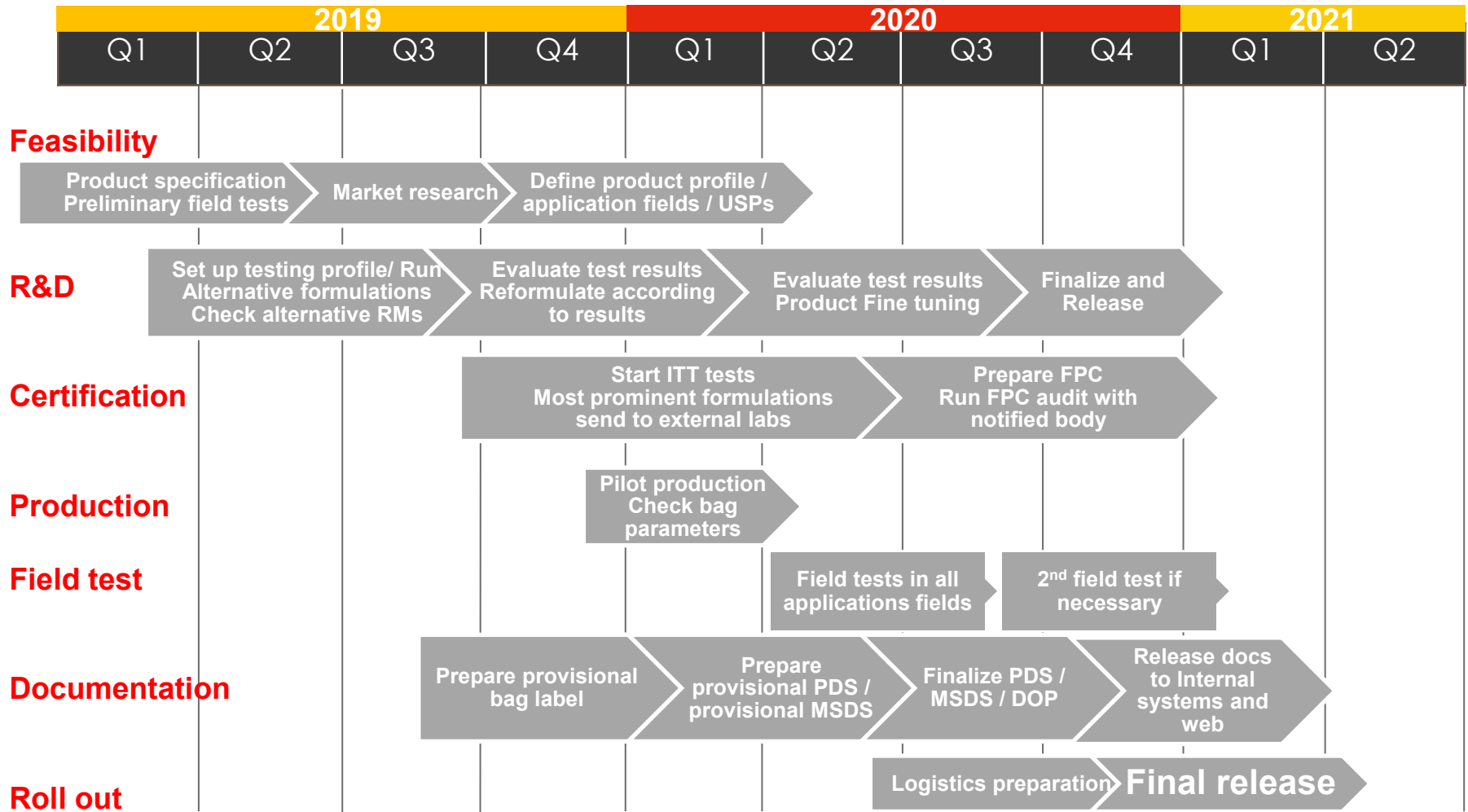


Gunittech

The sustainable solution for lightweight shotcrete repair mortar

Product Development Timeline

Designed and Co developed from Heracles & Sika technical and commercial teams



Gunittech

A two-component lightweight cementitious mortar for dry shotcrete application

- Based on pumice stone
- meeting the requirements of class R3 according to EN 1504-3
- for high performance structural repairs and reinforcing application

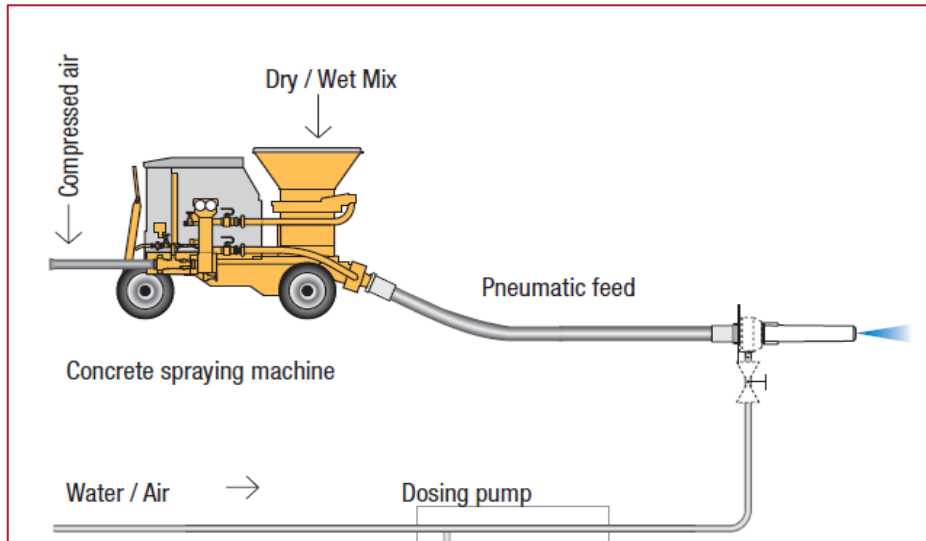


Product developed and co branded by:



Conventional – Dry shotcrete

Gunitech is an innovative solution improving dry shotcrete application performance



- **Flexibility** – implementation at small volumes
- **Capability of shotcrete stoppage**
- **Smaller pump / more flexible**
- **Smaller equipment cost**
- **Capability of detailed application**

- **High volumes of rebound (material loss)**
- **Dust intensive application**
- **Non stable quality**
- **Low spraying rate (<7m³/h)**

Gunitech – Pumice Stone

Pumice stone is a high value added lightweight raw material quarried by LAVA S.A.



Production site: Gyali Island

Production capability: 850 - 1000kt/year

Vessel loading: up to 28Ktn

Porous natural volcanic rock

- White color
- High mechanical compressive strength
- Low density

Gunitech – Pumice Stone

Pumice stone is a high value added lightweight raw material quarried by LAVA S.A.

SiO₂	71.9%
Active SiO₂	52,8%
Al₂O₃	12.6%
Fe₂O₃	1.1%
CaO	1.5%
MgO	0.3%
SO₃	0.03%
K₂O	4.3%
Na₂O	3.5%
Loss of ignition	4.5%

- Pozzolanic activity resulting in chemical bonding with cement paste and long term increase in strength
- Durability enhancement
- Very low SO3 levels due to natural expansion
- Extensive network of open and closed pores

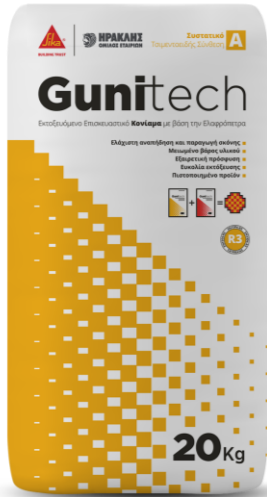
Added value characteristics

- Low thermal transition
- Low noise transition
- Fire resistant
- Environmental friendly
- Pumice stone is a natural lightweight aggregate that does not require chemical / thermal processing for expansion



Gunitech

Cementitious and Pumice Mix Components



Component A (20kg) Component B (15kg)

- CEM I 52.5N
- Special sand
- Alkali-free accelerator
- Admixtures
- Silica fume
- Macro synthetic fibers

- Pumice of special granulometric gradation

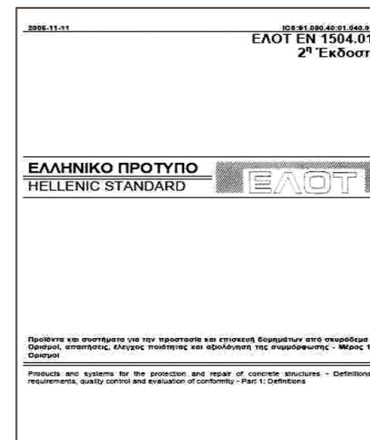


Gunitech Technical Specifications

A unique lightweight certified material

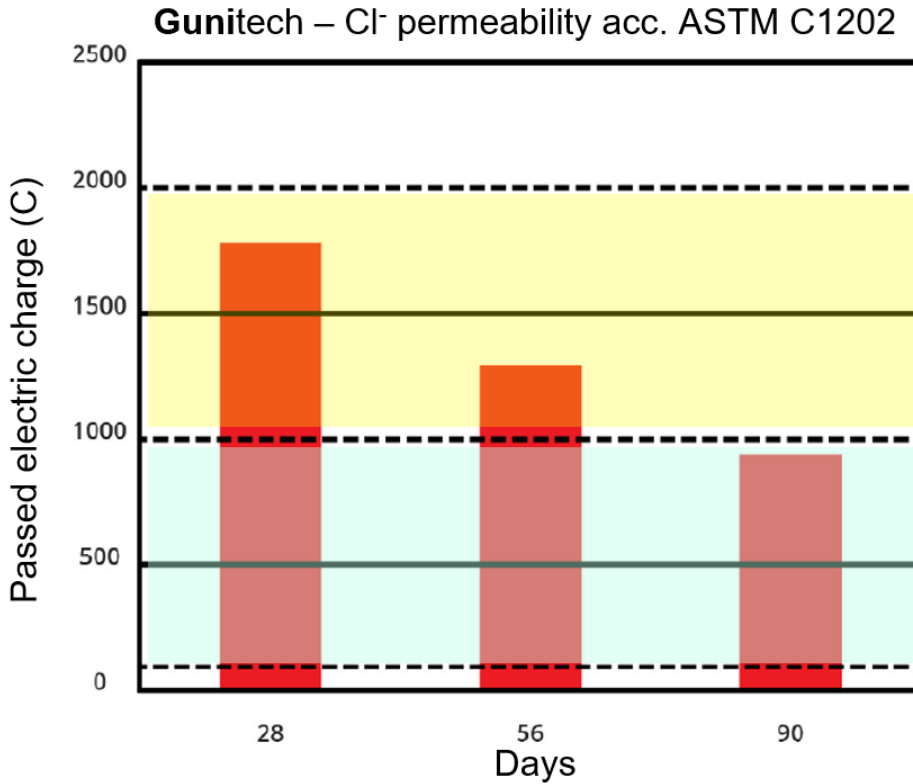
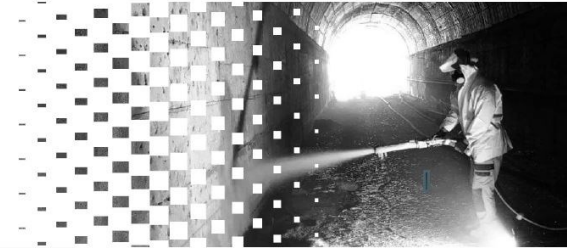


Property	Result	Standard
Early strength	30 min: ≥ 0.2 MPa 60 min: ≥ 0.3 MPa 120 min: ≥ 0.5 MPa	EN 14888-1
Compressive strength in cores from panels (L/D=1)	1 day: ≥ 15 MPa 7 days: ≥ 20 MPa 28 days: ≥ 30 MPa	EN 12504-1 / EN 14888-1
Strength classification	Class R3 C20/25 LC20/22 Cs25 Class M25	EN 1504-3 EN 206-1 (EN 14487-1) EN 206-1 (EN 14487-1) ISO 4012 EN 998-2
Modulus of elasticity (compression)	28 days: ≥ 15 GPa	EN 13412
Retained shrinkage/ expansion	≥ 1.5 MPa	EN 12617-4
Water capillary absorption	≤ 0.5 kg/m ² √h	EN 13057
Resistance to carbonation	d_k (carbonation depth) \leq reference concrete MC (0.45)	EN 13295
Resistance to chloride permeability	Low ≤ 2000 coulombs	ASTM C 1202
Fire classification	EUROCLASS A1 non combustible	



Gunitech Technical Specifications

Excellent durability performance



High Resistance to chloride permeability

High Resistance to carbonation

Ideal for seaside and industrial environments



Guniting Uses

Wide range of repair and structural strengthening works

- ✓ Large volume / surface repairs
 - As an alternative of repair mortars R2 & R3 according to EN 1504-3
- ✓ Strengthening of reinforced concrete elements
- ✓ Strengthening of masonry due to compatible modulus of elasticity
- ✓ Up to 45m high pneumatic transport in the hose
- ✓ Inverse layer thickness up to 120mm

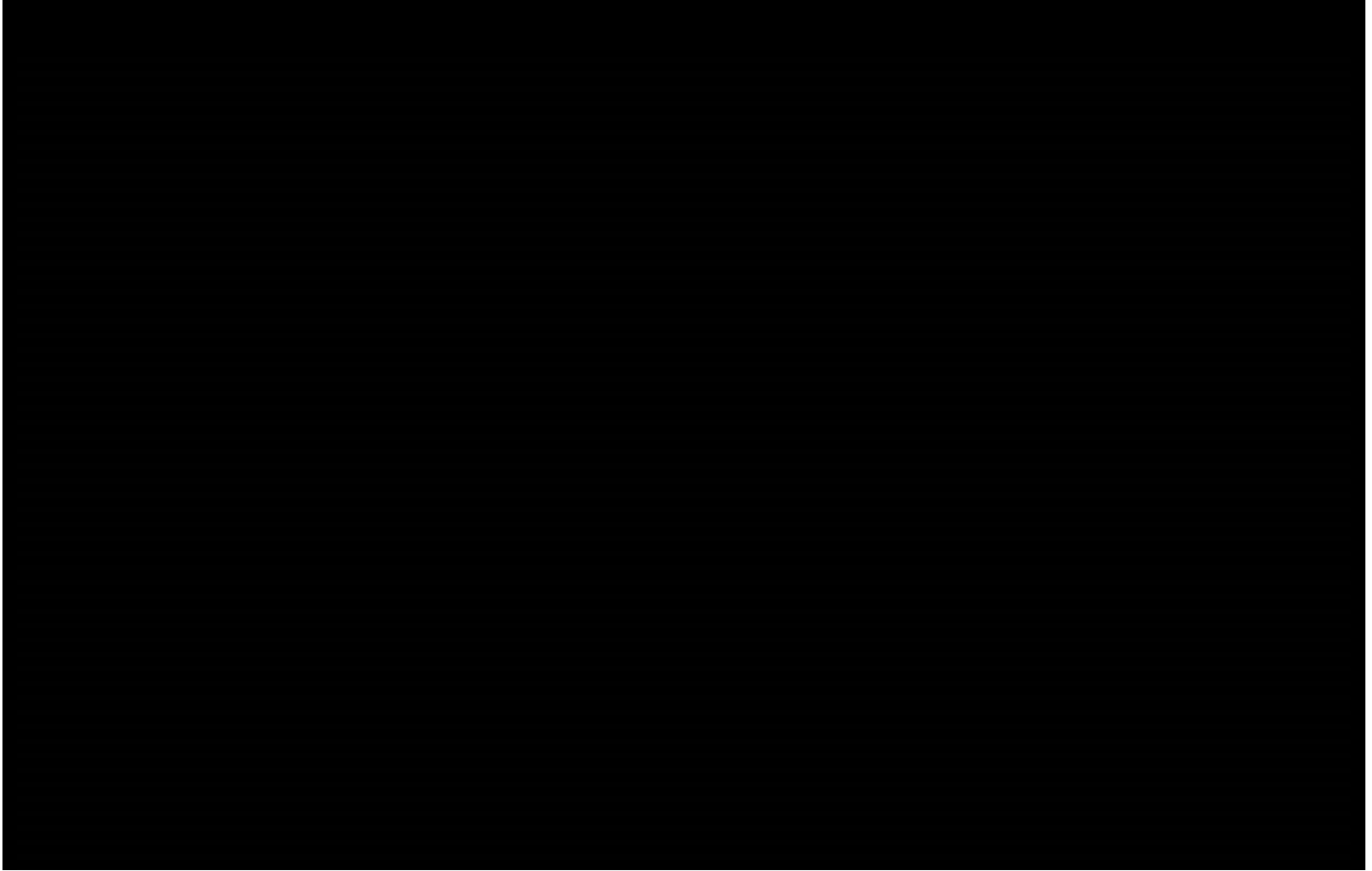


Gunitech - sum up

An innovative pumice based dry shotcrete application

- ✓ Stable quality due to certified performance (EN 1504-3, Class R3)
- ✓ Significant rebound reduction(-50% vs conventional products)
- ✓ Less weight on the structure (>25% lighter – density 1700kg/m³ vs 2300kg/m³)
- ✓ Reduced CO₂ emissions
- ✓ Excellent adhesion
- ✓ Dust reduction
- ✓ Ease of shotcreting
- ✓ Extremely homogeneous final product
- ✓ Low shrinkage and reduced cracking tendency
- ✓ Rapid strength development
- ✓ Limited curing need after the application – internal curing







ΗΡΑΚΛΗΣ
ΟΜΙΛΟΣ ΕΤΑΙΡΙΩΝ

THANK YOU

Maria Nomikou

HERACLES Research & Technology
Center (EKET) Supervisor

Tel: +30 210 2804612 | Mob: +30
6973031809

maria.nomikou@lafarge.com