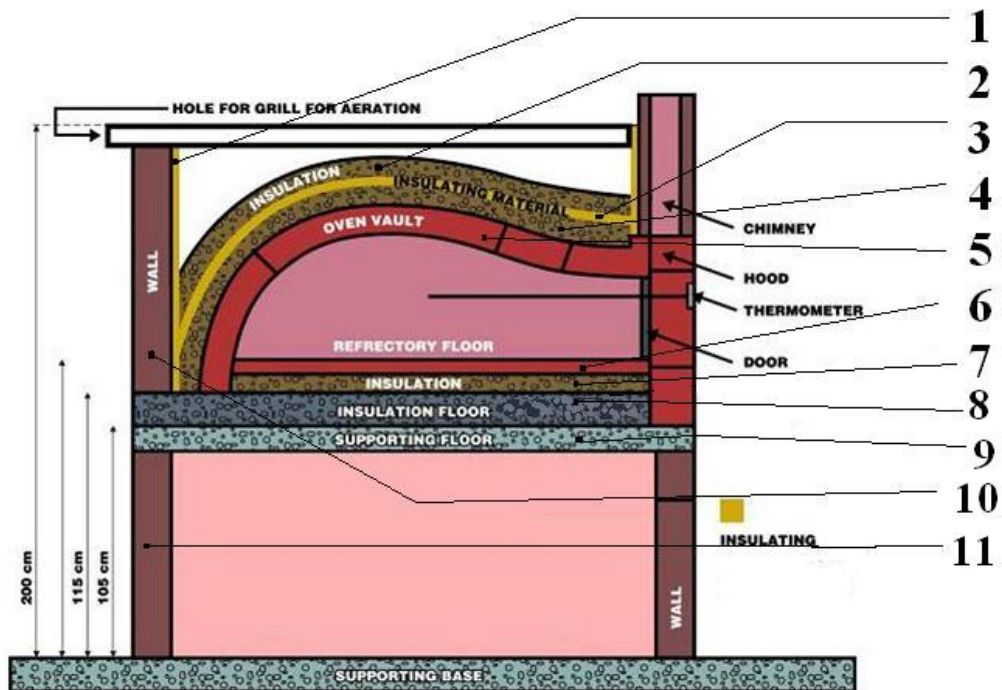


Description of Isolation Materials and Refractory Materials



| Item | Description | Composition | Thickness In mm | Density kg/m ³ |
|------|------------------------------|--------------------------------------------------------------------|----------------------------|------------------------------|
| 1 | Rock wool with aluminum foil | See the tech data. | 40 | 80 |
| 2 | Isolate mixture | 120 kg expanded clay 20 kg vermiculite 60 kg cement water | 150 | 600 |
| 3 | Rock wool | See the tech data. | 40 | 80 |
| 4 | Isolate mixture | 180 kg expanded clay 30 kg vermiculite 90 kg cement water | 150 | 600 |
| 5 | Refractory vault | See the tech data | 100 | 1800 |
| 6 | Cooking Floor | See the tech data | | |
| 7 | Isolate mixture | 40 kg expanded clay 20 kg vermiculite 50 kg cement water | 60 | 600 |
| 8 | Isolate mixture | 80 kg expanded clay 100 kg cement water | 100 | 700 |
| 9 | Reinforced concrete | Standard concrete with Iron wire net | 100 | 1600 |
| 10 | Metal or brick covering | 2mm galvanized steel plant or | 2 mm steel 150 mm brick | |
| 11 | Brick base or metal base | 150 mm of standard building brick or steel frame | | |

| Name of product | Manufacturer | SIZE | Fire resistance |
|----------------------|-------------------------------------------------------------------------|------------------------|-----------------|
| Expanded vermiculite | BPB Italy SPA www.bpbitalia.it | Calcestruzzi 2-8 mm | Euroclass A1 |

TYPICAL CHEMICAL ANALYSIS

| Element | Percent by Weight |
|--------------------------------|-------------------|
| SiO ₂ | 38-46 |
| AL ₂ O ₃ | 10-16 |
| MgO | 16-35 |
| CaO | 1-5 |
| K ₂ O | 1-6 |
| Fe ₂ O ₃ | 6-13 |
| TiO ₂ | 1-3 |
| H ₂ O | 8-16 |
| Other | 0.2-1.2 |

Typical Chemical Formula: (Mg,Ca,K,Fe¹¹)₃(Si,AL,Fe¹¹¹)₄O₁₀(OH)₂O4H₂O

TYPICAL PHYSICAL PROPERTIES

| | |
|---------------------------------------|------------------------------------------|
| Color | Gold-Brown |
| Free Moisture, Maximum | 0.5% |
| pH (of water slurry) | 7.0-9.5 |
| Specific Gravity | 2.5 |
| Expanded Bulk Density (normal) | 4-10 lb/ft³ |
| Mesh Sizes (normal) | 2-40 mesh and finer |
| Fusion Point | 2200-2400F |
| Specific Heat | 1.08 kJ/kg·K |
| Thermal Conductivity | .27-.41 BTU·in/h·ft²·F |

TYPICAL SIZES, DENSITIES, AND NAMES OF EXPANDED VERMICULITE¹

| SIZES | | | DENSITIES | | GRADES OR SIZES | |
|-------|-----------|------|-----------|----------|-----------------|---------------|
| MM | IN | N/A | KG/CU M | LB/CU FT | U.S. SYSTEM | INTERNATIONAL |
| 2-8 | 5/16-0.08 | DOWN | 85 | 5.0 | 1-3 | calcestruzzi |
| | | | | | | |

| Name of Product | Manufacturer | SIZE | Fire Resistance |
|-----------------|--------------|---------|-----------------|
| Expanded Clay | Laterlite | 8-20 mm | Euroclass A1 |

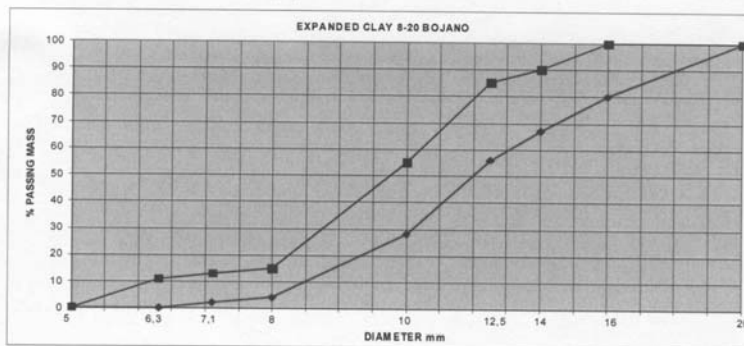
Laterlite

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rev.02-04/06

TECHNICAL SHEET EXPANDED CLAY 8 – 20, PLANT OF BOJANO
(UNI EN 13055 – 1)

AGGREGATE SIZE DISTRIBUTION (4.3): 8-20



BULK DENSITY OF MATERIAL (4.2.1)

$$\gamma = 260 \text{ Kg/m}^3 \pm 15\%$$

CRUSHING RESISTANCE (4.10)

$$\sigma \geq 0,6 \text{ N/mm}^2$$

WATER ABSORPTION AT 30 MINUTES (4.8)

$$C_{\text{mb}} \leq 15\%$$

PARTICLE SHAPE (4.5)

Round

REACTION TO FIRE (D.M. 10/03/2005)

EuroClass A1 (incombustible)

- NOTE -

These data, coming from our experience and tests, are indicative. User needs to evaluate if material is compliant with his needs, being responsible for the use of material.

| Name of Product | Manufacturer | SIZE | Fire Resistance |
|---------------------------|----------------|------|-----------------|
| Refractory vault concrete | Di Fiore Forni | 0-20 | Euroclass A1 |


A premixed air setting refractory mortar. It is an ideal product for mounting fireplaces, wood fired ovens and barbecues. The rapidity of the setting, besides high thermal and mechanical resistance, as well as resistance to humidity and to water after setting, make REFRASET an excellent product for the installation of refractory bricks

| Al ₂ O ₃ [%] | SiO ₂ [%] | CaO [%] | Refrattarietà [°C] | PV [kg/dm ³] | C.C.S. [kg/cm ²] |
|---------------------------------------|-------------------------|------------|-----------------------|-----------------------------|---------------------------------|
| 55-60 | 44-46 | 12-18 | 1500 | 1,300 | 240 |

| Name of Product | Manufacturer | SIZE | Fire Resistance |
|--------------------------|---------------|------------|-----------------|
| Refractory cooking floor | Unistrara SPA | ST 42-Limb | Euroclass A1 |

ST 42 -LIMB

Dry pressed bricks, with low porosity and high alumina content. Unistara can offer a wide range of shapes and dimensions in this quality which provide a valid alternative for the building trade sector. These products are not only suitable for stoves, chimney stacks and baking ovens but also for specific use in the refractory lining of industrial boilers and large scale pizza baking ovens.



| Al ₂ O ₃ [%] | SiO ₂ [%] | Refrattarietà [°C] | PV [kg/dm ³] | P.A. [%] | C.C.S. [kg/cm ²] |
|---------------------------------------|-------------------------|-----------------------|-----------------------------|-------------|---------------------------------|
| 43 | 49 | 1680 | 2,100 - 2,150 | 20-22 | 300 - 400 |

| Name of Product | Manufacturer | SIZE | Fire Resistance |
|------------------------------|--------------|-------------------------------------|-----------------|
| Rock wool with aluminum foil | Tervolan | 30 mm thickness 80 kg/mq density | Euroclass A1 |

TERVOL® LAM-ALU

TERVOL® LAM-ALU are light lamella mats made up of lamellas glued on an Al-foil. They are used for the insulation of air-condition ducts, remote heating pipes, pipe lines, boilers. The Al-foil at the same time performs the function of a vapour barrier.



PRODUCT DESCRIPTION

- Thermal insulation
- Fire protection
- Non combustible
- Shape retaining
- Compressive load resistance
- Resistant to chemicals
- Odourless
- Resistant to ageing
- Non rotting
- Environment and health friendly

Technical characteristics of TERVOL® LAM-ALU

| | Designation | Value | | | | Unit | Standard |
|------------------------------------------------|--------------------|--------------------------------|-------|-------|-------|-------|--------------|
| Type of application | - | 12.05.99.30.04 | | | | - | AGI Q 132 |
| Thermal conductivity at mean temperature | T _m | 50 | 100 | 150 | 200 | °C | - |
| | λ | 0,042 | 0,052 | 0,064 | 0,078 | W/mK | EN ISO 8497 |
| Reaction to fire | Non combustibility | Class A2 | | | | - | DIN 4102 |
| | Melting point | > 1000 | | | | °C | DIN 4102/T17 |
| Operating temperature | - | ≤ 300 | | | | °C | DIN 52271 |
| Equivalent thickness of diffusion permeability | S _d | > 100 | | | | m | DIN 52615 |
| Specific heat capacity | c _p | 840 | | | | J/kgK | - |
| AS quality | - | Insulation of austenitic steel | | | | - | AGI Q 135 |

Al facing can be exposed to the temperature up to 100 °C.

| Name of Product | Manufacturer | SIZE | Fire Resistance |
|-----------------|--------------|----------------------------------------------|-----------------|
| Rock wool | Tervolan | 40 mm thickness 80 kg/mq density F 216 | Euroclass A1 |

TERVOL® F216 is used for thermal, sound and fire protection in industry, e.g. fire resistant doors, covering of hot-air ducts, electrical installations.



PRODUCT DESCRIPTION

- Thermal insulation
- Fire protection
- Non combustible
- Temperature stability up to 780 °C
- Shape retaining
- Resistant to chemicals
- Odourless
- Resistant to ageing
- Non rotting
- Environment and health friendly

Technical characteristics of TERVOL® BS-10, BS-12, BS-15, BS-18

| Material | Designation | Value | | | | | | Unit | Standard |
|------------------------------------------|--------------------|-----------|--------------------------------|----------------|----------------|----------------|-------|--------------------|-----------|
| | | BS - 10 | BS - 12 | BS- 15 | BS-18 | | | | |
| Type of application | | - | 12.07.20.76.10 | 12.07.20.80.12 | 12.07.20.84.15 | 12.07.20.86.18 | | - | AGI Q 132 |
| Thermal conductivity at mean temperature | T_m | 50 | 100 | 150 | 200 | 300 | | °C | - |
| | BS-10 | λ | 0,039 | 0,046 | 0,052 | 0,060 | 0,076 | W/mK | EN 12667 |
| | BS-12 | λ | 0,038 | 0,044 | 0,050 | 0,057 | 0,074 | W/mK | EN 12667 |
| | BS-15 | λ | 0,037 | 0,042 | 0,048 | 0,053 | 0,066 | W/mK | EN 12667 |
| Reaction to fire | Non combustibility | - | Class A1 | | | | - | DIN 4102 | |
| | Melting point | - | > 1000 | | | | °C | DIN 4102/T17 | |
| Operating temperature | | - | 760 | 800 | 840 | 860 | | °C | DIN 52271 |
| Water-vapour diffusion resistance | μ | | 1,1 – 1,4 | | | | - | EN 12086 | |
| Specific heat capacity | c_p | | 840 | | | | J/kgK | - | |
| Longitudinal air-diffusion resistance | Ξ | | 42 | 71 | 88 | 112 | | kNs/m ⁴ | EN 29053 |
| AS quality | | - | Insulation of austenitic steel | | | | - | AGI Q 135 | |

All facing can be exposed to the Temperature up to 100 °C.