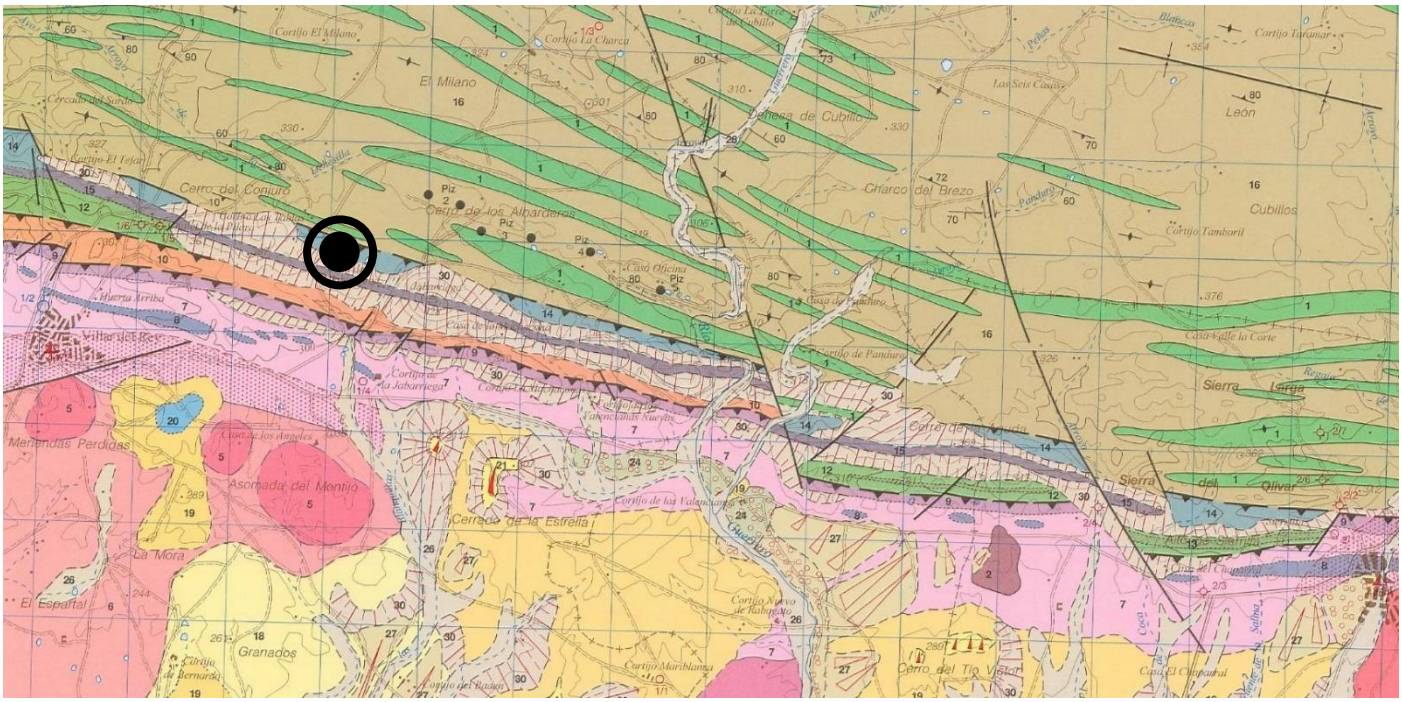
# Pizarra de Villar del Rey

**Short description**: Slate with a very smooth, homogeneous surface and some small metallic inclusions. Main minerals: sericite, chlorite; Secondary minerals: tourmaline, quartz, opaque.

| Commodity (vocabulary) | Lithology (vocabulary) | Typical colour (code list) | Place of origin | | | |
|---|---|---|---|---|---|---|
| | | | Country | County / District / Province | Municipality / Community | Place/town / Village |
| sericitic slate | slate | black | Spain | Badajoz | Villar del Rey | Villar del Rey |

# Geological setting




**Geology**: The Villar del Rey Slates have an intense black color as well as a smooth and homogeneous surface that make them considerably demanded in the ornamental rock market. They are located in Villar del Rey (Badajoz). These are sericitic slates, composed mainly of sericite (70%) and chlorite (15%), arranged vertically and subvertically, in an outcrop that extends over 3,000 meters and with a thickness of about 40 meters. These materials were deposited during the Upper Devonian.

**Production**: Slate production in a single quarry.

**Geological age**: Emsian (Lower Devonian).

**Geological unit:** Gevora del Sinclinorio de Sao Mamede-La Codosera Unit.

# Application, use and heritage

**Description**: Slate roof.

# Mineral composition

If no accurate number, use MM=main minerals, SM = Subordinate minerals, AM=accessory minerals

| Mineral 1 (%) | Mineral 2 (%) | Mineral 3 (%) | Mineral 4 (%) | Mineral 5 (%) | Mineral 6 (%) | Mineral 7 (%) |
|---|---|---|---|---|---|---|
| **Chlorite (25-30%)** | **Feldspars (0-5%)** | **Mica (35-40%)** | **Quartz (25-30%)** | **Acessory minerals (40-60%)** | | |
| Mineral 8 (%) | Mineral n (%) | | | | | |
| | | | | | | |

**Source of information**: V. CÁRDENES, A. RUBIO ORDÓÑEZ, A. LÓPEZ MUNGUIRA Y C. MONTERROSO. 2010. Petrografía y mineralogía de las pizarras para cubiertasde la Península Ibérica en relación con su calidad. Trabajos de Geología, Universidad de Oviedo, 30 : 412-420

# Physical properties

| Apparent density (EN 1936) kg/m3 | Open porosity (EN 1936) % vol | Water absorption at atmospheric pressure (EN 13755) % wt | Uniaxial Compressive strength (EN 1926) MPa | Flexural strength under concentrated load (EN 12372) MPa |
|---|---|---|---|---|
| **2750** | | **1.6** | **104** | **41.19** |

| Real density (EN 1936) kg/m3 | Total porosity (EN 1936) % vol | Water absorption coefficient by capillary (EN 1925) (g/m2 x s0,5) | Flexural strength under constant moment (EN 13161) MPa |
|---|---|---|---|
| | | | |

| **Frost resistance (EN 12371)** | | | | |
|---|---|---|---|---|
| Technological Test (Test A) | | | | Identification Test (Test B): Number of cycles completed prior to stone failure |
| Flexural strength (EN 12372) after freeze-thaw cycling, MPa | Number of cycles | Uniaxial compressive strength (EN 1926) after freeze-thaw cycling, MPa | Number of cycles | |
| | | | | |

| **Resistance to ageing by thermal shock (EN 14066)** | | | |
|---|---|---|---|
| Change in dynamic modulus of elasticity (increase: +; decrease: -) % | Change in open porosity (increase: +; decrease: -) % | Change in ultrasound pulse velocity (increase: +; decrease: -) % | Change in flexural strength under conc. load (increase: +; decrease: -) % |
| | | | |

| **Abrasion resistance (EN 14157)** | | | **Resistance to salt crystallisation (EN 12370)** | **Breaking load at dowel hole (EN 13364)** | |
|---|---|---|---|---|---|
| Method A - Wide Wheel Abrasion Test, mm | Method B - Böhme Abrasion Test, $cm^3$ / $50cm^2$ | Method C - Amsler Abrasion Test, mm | Change in mass (increase: +; decrease: -), % | Breaking load, N | Thickness of the test specimens, mm |
| | | | | **2132** | |

| **Slip resistance by means of the pendulum tester (EN 14231 / CEN/TS 16165)** | | | **Rupture energy (EN 14158), Joule** | **Thermal Conductivity (EN 1745), W/m·K** |
|---|---|---|---|---|
| Tested surface finish | Slip Resistance Value — SRV | | | |
| | Dry test condition | Wet test condition | | |
| | | | | |

**Source of information**: Piedras Naturales de España. Anuario 1998, 2000/01, 2002, 2004. Roc Maquina / García García, M. 2015. Reciclado de lodos de pizarra y granito para la fabricación de cerámicos tradicionales de interés en el sector de los materiales de construcción. Tesis Doctoral. Departamento de Ingeniería Mecánica, Energética y de los Materiales. Universidad de Extremadura. 205pp.

# Sources of more information

| Type of information | Name of provider | URL |
|---|---|---|
| This data sheet | Instituto Geológico y Minero de España (IGME) | http://www.igme.es/ |
| Non-commercial directory | | |
| Commercial directory | | |
| Scientific publication | V. CÁRDENES, A. RUBIO ORDÓÑEZ, A. LÓPEZ MUNGUIRA Y C. MONTERROSO. 2010. Petrografía y mineralogía de las pizarras para cubiertasde la Península Ibérica en relación con su calidad. Trabajos de Geología, Universidad de Oviedo, 30 : 412-420 | |
| Other publication | | |

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| **Compiled by**: | Instituto Geológico y Minero de España (IGME)<br>http://www.igme.es/ | |