

Gris Pulpis

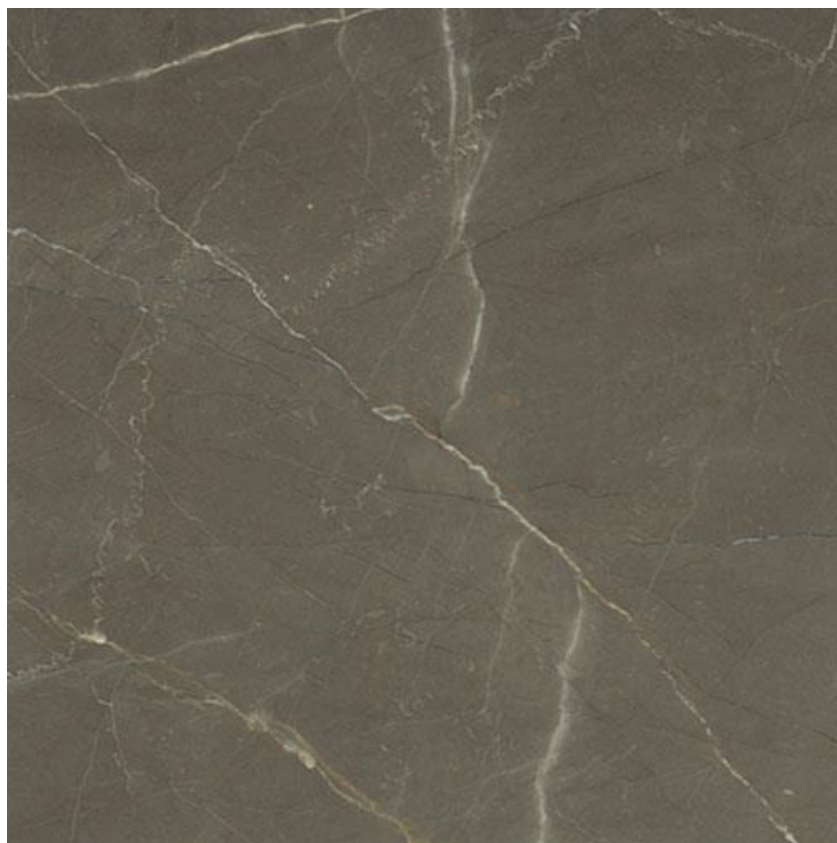


Image source: www.marmolesseerrat.com

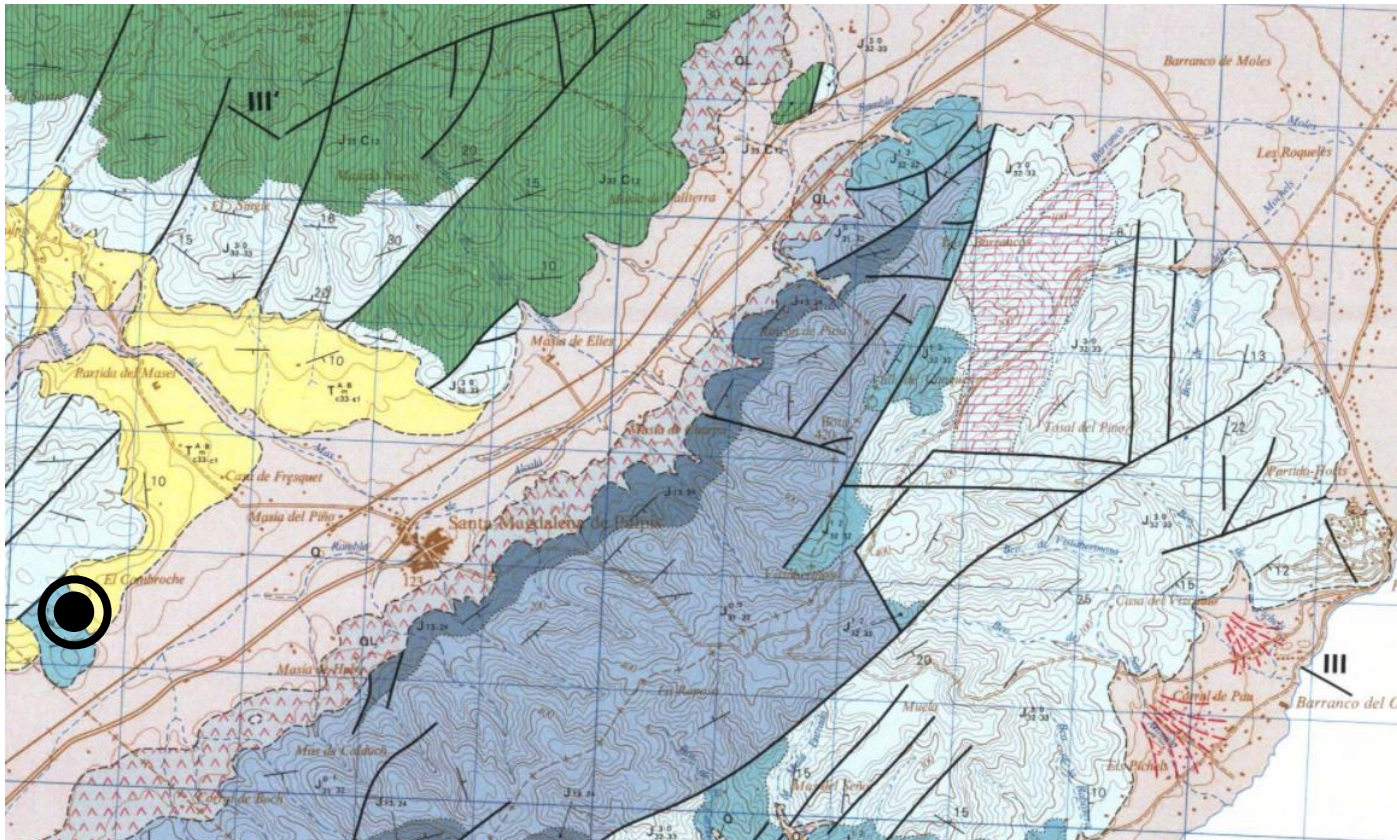
3 cm

Short description:

Grey-brown massive limestone with very homogeneous appearance. Some stylolites appear parallel to the bedding surface.

Commodity (vocabulary)	Lithology (vocabulary)	Typical colour (code list)	Place of origin			
			Country	County / District / Province	Municipality / Community	Place/town / Village
Limestone	Limestone	Grey	Spain	Castellón	Santa Magdalena de Pulpis	Santa Magdalena de Pulpis

Geological setting



Geology:

Gris Pulpis limestone is quarried at Santa Magdalena de Pulpis in the Maestrazgo Area of the Iberian Mountain Range. This rock is dated in the Kimmeridgian Age and the formation is defined as a series of thick micrite successions with sporadic sponge bioherms.

Geological age: Jurassic (Kimmeridgian)

Geological unit: Maestrazgo Area (Iberian Mountain Range)

Application, use and heritage

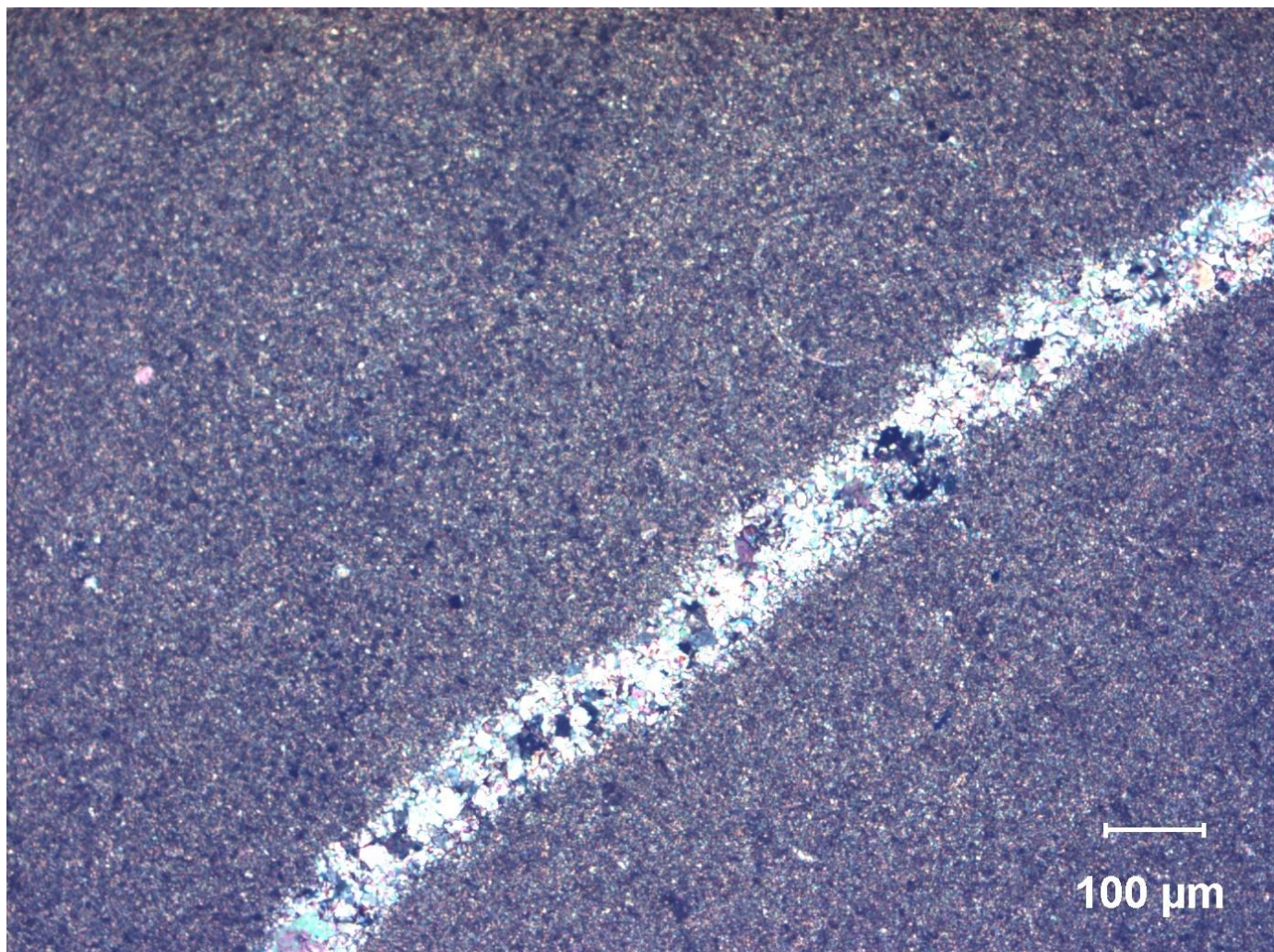


Images source: www.marmoleserrrat.com

Description:

Gris Pulpis limestone is a highly prized ornamental stone today. It is mainly used as both indoor and outdoor paving and cladding.

Petrography



Description:

Micritic limestone (sometimes recrystallized with microcrystalline textures, crystal size up to 10 microns). Rock is streaked with small white mesocrystalline calcite veins. Some bioclasts can be observed (planktonic fossils: *Globochaete* and *Pentacrinus* sp).

Source of information:

- 1) Spanish Geological Survey (IGME)
- 2) García del Cura, M.A., Benavente, D., Bernabéu, A., Fort, R., La Iglesia, A., Ordóñez, S. (2005); Use of microcrystalline limestone as building material: the "Gris Pulpis" case. *Materiales de Construcción*, 55: 5-23.

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 (%)
Calcite (96%)	Dolomite (4%)	Quartz (AM)	Fluorite (AM)			
Mineral 8 (%)	Mineral n (%)					

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- 3) Calizas españolas, 1990, ITGE.
- 4) RockMaquina – Piedras naturales, maquinaria y equipos.

Physical properties

Apparent density (EN 1936) kg/m ³	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
2660	1.7	0.27	123.4	17.4

Real density (EN 1936) kg/m ³	Total porosity (EN 1936) % vol	Water absorption coefficient by capillary (EN 1925) (g/m ² x s ^{0,5})	Flexural strength under constant moment (EN 13161) MPa
		0.73	

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
19.1					

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Chemical properties

Main elements

SiO ₂ (%)	Al ₂ O ₃ (%)	Fe ₂ O ₃ (%)	TiO ₂ (%)	MgO (%)	CaO (%)	Na ₂ O (%)	K ₂ O (%)	MnO (%)	P ₂ O ₅ (%)	SO ₃ (%)	LOI (%)
1.41	0.48	0.04		0.97	53.75	0.16	0.22	0.007			

Trace elements

V (ppm)	Cr (ppm)	Mn (ppm)	Co (ppm)	Ni (ppm)	Cu (ppm)	Zn (ppm)	As (ppm)
Sr (ppm)	Cd (ppm)	Ba (ppm)	Pb (ppm)	Be (ppm)	Rb (ppm)	Bi (ppm)	U (ppm)
340		190					
Sc (ppm)	Y (ppm)	Th (ppm)	Sb (ppm)	Ta (ppm)	Nb (ppm)	Zr (ppm)	Sn (ppm)
Ag (ppm)	B (ppm)	Mo (ppm)	W (ppm)	Ga (ppm)	Ge (ppm)	Se (ppm)	Cs (ppm)
Tl (ppm)							

Methods applied and source of information:

- 1) Spanish Geological Survey (IGME)
- 2) García del Cura, M.A., Benavente, D., Bernabéu, A., Fort, R., La Iglesia, A., Ordóñez, S. (2005); Use of microcrystalline limestone as building material: the "Gris Pulpis" case. *Materiales de Construcción*, 55: 5-23.
- 3) Calizas españolas, 1990, ITGE.
- 4) RockMaquina – Piedras naturales, maquinaria y equipos

Sources of more information

Type of information	Name of provider	URL
This data sheet		
Non-commercial directory	Spanish Geological Survey	www.igme.es
Commercial directory	RockMaquina – Piedras naturales, maquinaria y equipos. Marmoles Serrat Company	www.marmolesserrat.com
Scientific publication	García del Cura, M.A., Benavente, D., Bernabéu, A., Fort, R., La Iglesia, A., Ordóñez, S. (2005); Use of microcrystalline limestone as building material: the “Gris Pulpis” case. <i>Materiales de Construcción</i> , 55: 5-23.	
Other publication		

Compiled by:	Instituto Geológico y Minero de España (IGME) http://www.igme.es/	 Instituto Geológico y Minero de España
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