

Marrón Emperador

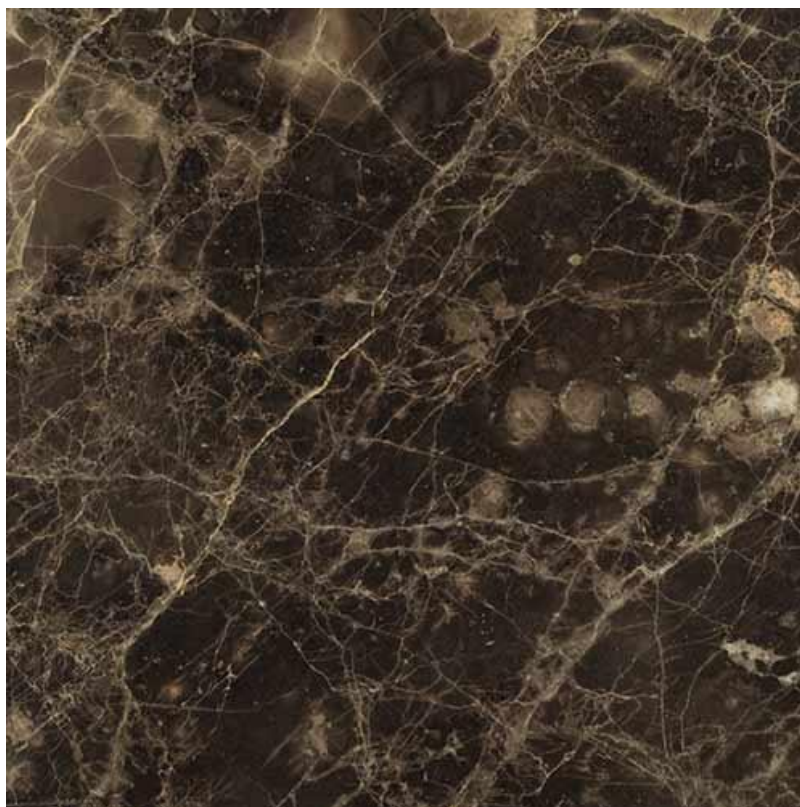


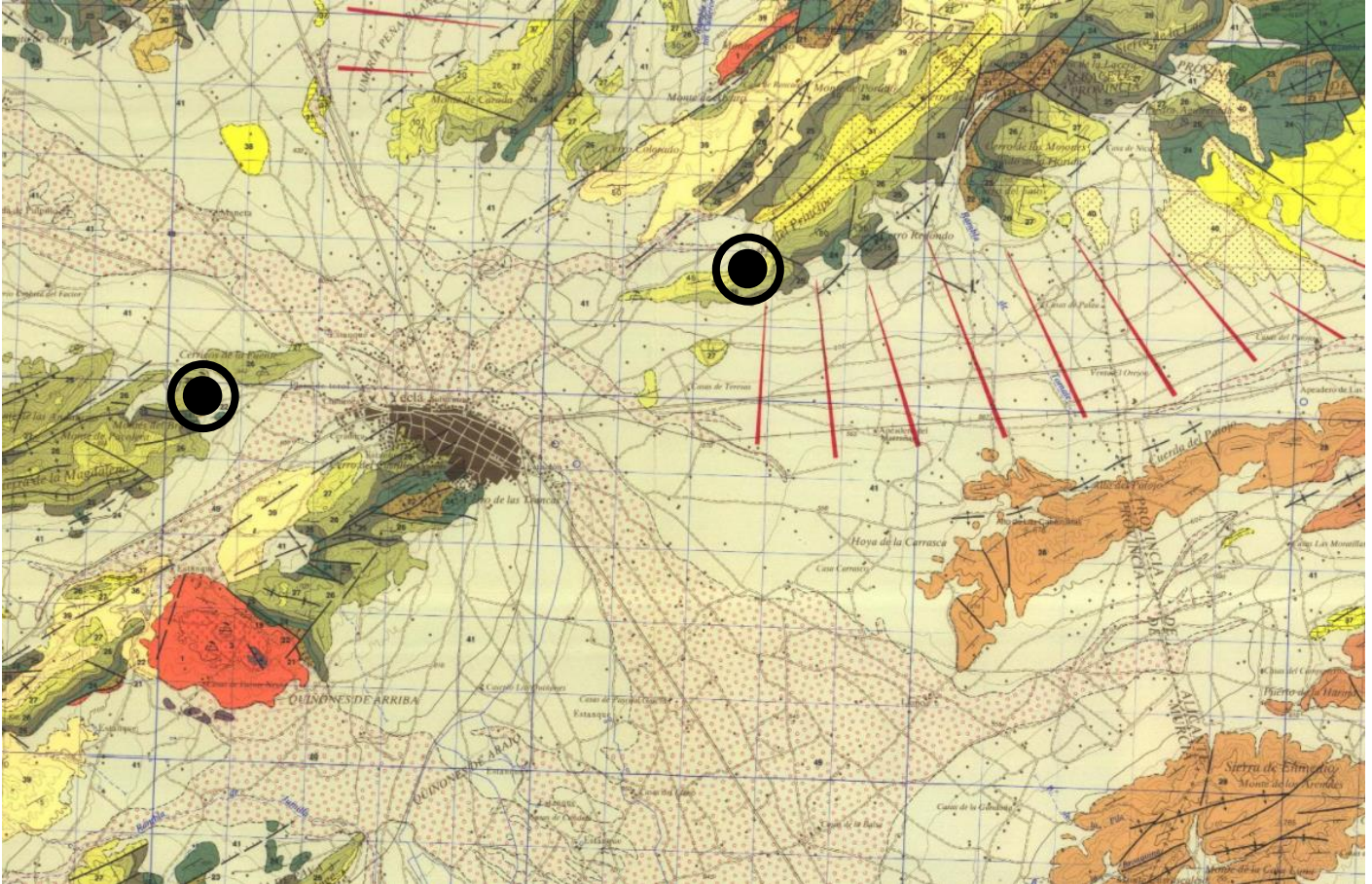
Image source: www.levantina.com

3 cm

Short description:

Brecciated brown dolostone with light brown fractures and veins. Clast size is heterometric (mm-dm). Frequent white calcite-filled veins are recognised.

Commodity (vocabulary)	Lithology (vocabulary)	Typical colour (code list)	Place of origin			
			Country	County / District / Province	Municipality / Community	Place/town / Village
Limestone	Brecciated dolostone	brown	Spain	Murcia	Yecla	Yecla



Application, use and heritage

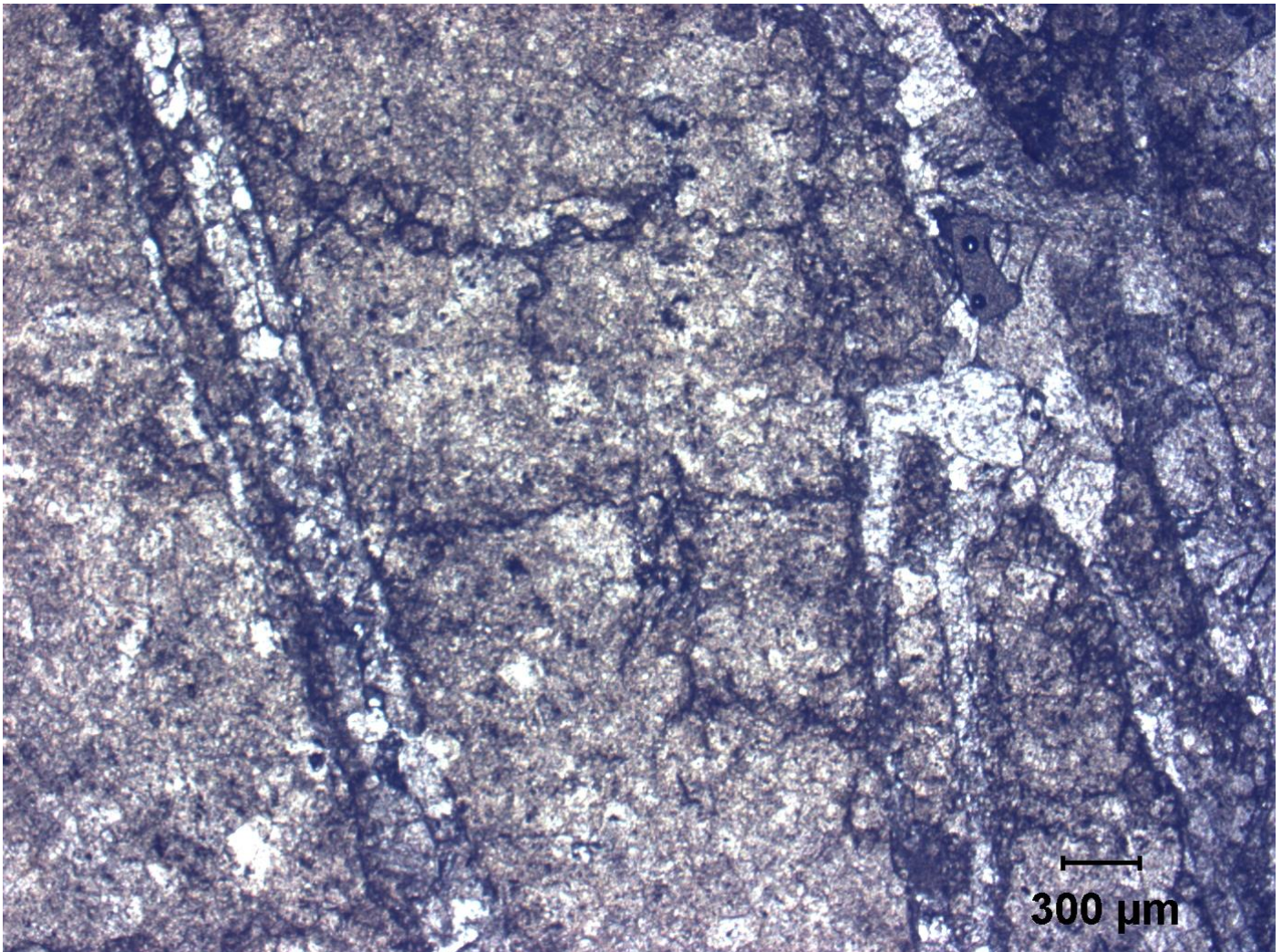


Images source: www.levantina.com

Description:

Marrón Emperador brecciated dolostone is a highly prized ornamental stone today. It is mainly used as both indoor and outdoor paving and cladding.

Petrography



Description:

Dolomite clasts with microcrystalline texture. Some clasts can show dedolomitization processes. Blocky sparite calcite cement fullfills the white veins. Sparite crystals can reach maximum size of 3 mm.

Source of information:

- 1) Spanish Geological Survey (IGME)
- 2) RocMaquina, Piedras Naturales, maquinaria y equipos. ISSN: 0214-0217.

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 (%)
Dolomite (75-95%)	Calcite (5-25%)	Feldespars (0-10%)	Quartz (0-5%)			
Mineral 8 (%)	Mineral n (%)					

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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
2740	1.6	0.3	140	18.5

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
		0.8	

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	
9.6	56			

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
21.5					

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		
polished	46.56	8.71		

Source of information:

www.levantina.com: Technical Report – Marrón Emperador

<https://www.levantina.com/wp-content/uploads/2016/05/9-MARRON-EMPERADOR-Ficha.pdf>

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 (%)
0.27	0.08	0.11		18.58	53.75	0.12	0.03				

Trace elements

V (ppm)	Cr (ppm)	Mn (ppm)	Co (ppm)	Ni (ppm)	Cu (ppm)	Zn (ppm)	As (ppm)
17				1.8	1.1	3	5.3
Sr (ppm)	Cd (ppm)	Ba (ppm)	Pb (ppm)	Be (ppm)	Rb (ppm)	Bi (ppm)	U (ppm)
204		4	0.7		1		2.2
Sc (ppm)	Y (ppm)	Th (ppm)	Sb (ppm)	Ta (ppm)	Nb (ppm)	Zr (ppm)	Sn (ppm)
	0.7	0.2	1.5		0.1	1.8	
Ag (ppm)	B (ppm)	Mo (ppm)	W (ppm)	Ga (ppm)	Ge (ppm)	Se (ppm)	Cs (ppm)
		0.1					
Tl (ppm)							

REE

La (ppm)	Ce (ppm)	Pr (ppm)	Nd (ppm)	Sm (ppm)	Eu (ppm)	Gd (ppm)	Tb (ppm)
	0.9		0.7	0.15			
Dy (ppm)	Ho (ppm)	Er (ppm)	Tm (ppm)	Yb (ppm)	Lu (ppm)		

Methods applied and source of information:

Muñoz Cervera, M.C. (2016): Génesis de mármoles comerciales “Marrón Emperador” y “Marrón Imperial” (Cretácico Superior, Prebético Externo, Sector Jumilla-Yecla-Fuente de la Higuera). Tesis Doctoral. Universidad de Alicante. 235 pp. *In Spanish*

Sources of more information

Type of information	Name of provider	URL
This data sheet	Levantina Company	www.levantina.com
Non-commercial directory	Spanish Geological Survey	www.igme.es
Commercial directory	RockMaquina – Piedras naturales, maquinaria y equipos.	
Scientific publication	Muñoz Cervera, M.C. (2016): Génesis de mármoles comerciales “Marrón Emperador” y “Marrón Imperial” (Cretácico Superior, Prebético Externo, Sector Jumilla-Yecla-Fuente de la Higuera). Tesis Doctoral. Universidad de Alicante. 235 pp. <i>In Spanish</i>	
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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