Pietra Alberese

Colombino

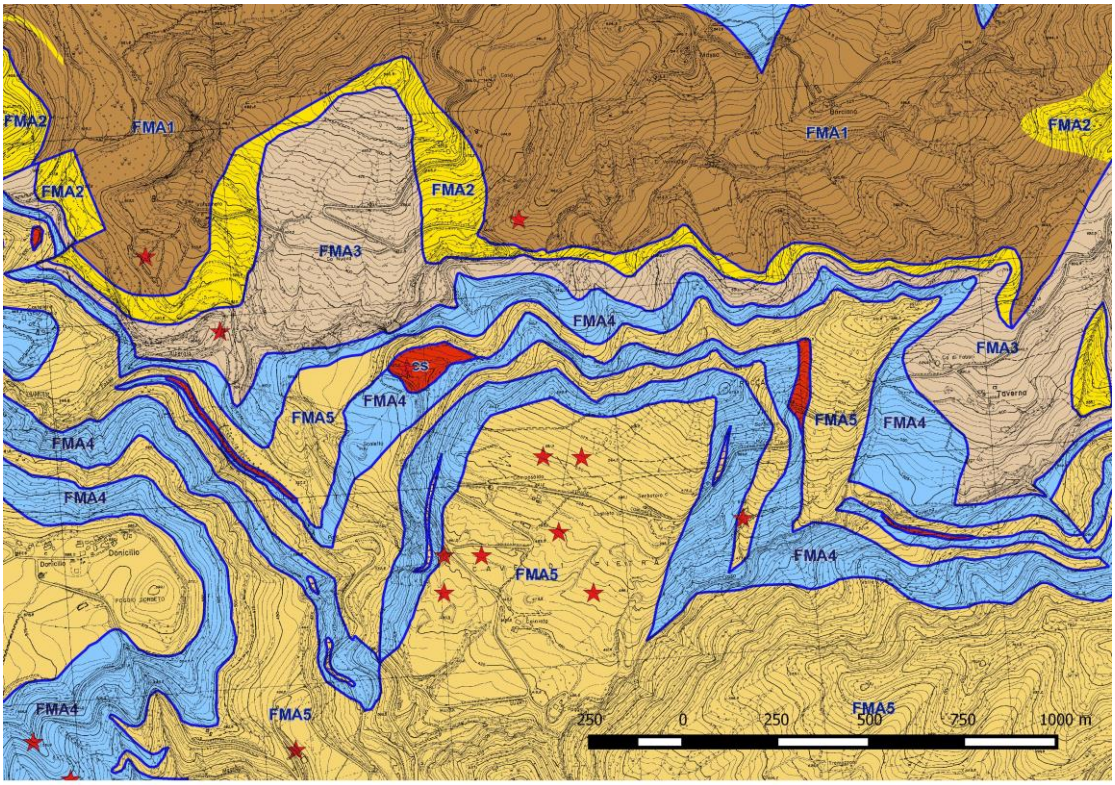
2 m

Short description:
Historically, the name "Alberese" was used in Tuscany, to indicate light-grey to whitish calcareous marlstones, mainly deriving from the Formazione di Monte Morello (MLL). The use of this term was very widespread in the past, referred to ornamental stones of similar or nearly-similar aspect, though deriving from geological units other than the MLL.

In the Eastern Romagna Apennines, Pietra Alberese is provided by a geologically well-known, thick-bedded, arenitic and marly-calcareous turbidite layer, the so called «Contessa» key-bed within the Formazione Marnoso-arenacea.
Quarries may be scattered, according to the location of outcropping «Contessa» key-bed; locally, in the same quarry or in neighbouring quarries both Pietra Alberese and Pietra Serena are extracted from the Formazione Marnoso-arenacea itself.
Photo:
https://www.comune.sarsina.fc.it/documents/17581443/17654012/eaborato_2_signed.pdf/38ab8f7d-23f4-43e5-9922-903dc0961d72 and https://www.eurocavesnc.com/pietra_alberese.php

Commodity (vocabulary)	Lithology (vocabulary)	Typical colour (code list)	Place of origin			
			Country	County / District / Province	Municipality / Community	Place/town / Village
Limestone	Marlstone	Light-grey	Italy	Emilia-Romagna, Forlì-Cesena	Sarsina	Lastreto-Fosso Taverna

Geological setting



Geology: The Pietra Alberese derives from the "Contessa" megaturbiditic key-bed ("cs" in the geological sketch-map), interbedded in the stratigraphically lowermost part of the Membro di Galeata (FMA4), a sub-unit of the Formazione Marnoso-arenacea (FMA). The Contessa key-bed is made-up of basal, fine to very fine-grained hybrid arenites, 3 to more than 5 metres thick, upgrading to calcareous marlstones, 5 to 8 meters thick.

Derived from the Geological Map of the Emilia-Romagna Apennines, at the scale of 1:10.000 (simplified, Quaternary continental deposits are not mapped).
https://ambiente.regione.emilia-romagna.it/it/geologia/cartografia/webgis-banchedati/webgis, issued by the Servizio Geologico, Sismico e dei Suoli, Regione Emilia-Romagna.

Production: Quarries (centroids as red stars in the map) are mainly located in the Sarsina municipality, in the Eastern Forlì'-Cesena Apennines.

Geological age: Langhian-Serravallian boundary

Geological unit: Contessa key-bed, Membro di Galeata, Formazione Marnoso-arenacea

Application, use and heritage

Description:
It's a remarkable limestone with outstanding physical and mechanical characteristics. An elegant and refined stone, the Alberese is gray-silver colored with a fine grain. It's resilient and compact and sounds like glass when hit. This stone and his remarkable features make it resilient to ice and freezing, very well suited for outdoor utilization and in the restoration of historical buildings, sidewalks flooring, ladders, curbs and walls covering.

(From: https://www.eurocavesnc.com/pietra_alberese.php)

Petrography

Description:

The Pietra Alberese is made up by hybrid arenites; silicoclasts are mainly represented by quartz and feldspar with more abundant K-feldspar than plagioclases. Among the lithics, the siltstones clearly prevail, less abundant flints and acid volcanites, rare and subordinate serpentinoscists and phyllites. Carbonatic clasts are given by carbonate intraclasts, bioclasts (relict structures of corals, brachiopods and Foraminifera) and subordinately by extrabacinal clasts. The cement is very abundant and calcareous.

Source of information:
https://www.unionevallesavio.it/documents/1484590/5731062/2.+RELAZIONE+GEOLOGICO-MINERARIA-CON+ALLEGATO.pdf/225fb630-1890-4211-a26e-141a8269250b

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 (%)
Mineral 8 (%)	Mineral n (%)					

Source of information:

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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

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

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:

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Chemical properties

Main elements

SiO_2 (%)	Al_2O_3 (%)	Fe_2O_3 (%)	TiO_2 (%)	MgO (%)	CaO (%)	Na_2O (%)	K_2O (%)	MnO (%)	P_2O_5 (%)	SO_3 (%)	LOI (%)

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)
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)							

REE

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

Methods applied and source of information:

Sources of more information

Type of information	Name of provider	URL
This data sheet	Regione Emilia-Romagna, Servizio Geologico, Sismico e dei Suoli. Location of quarries: centroids of polygons derived from the Emilia-Romagna regional databases (in preparation), made available by the Servizio Difesa del Suolo, della Costa e Bonifica	
Non-commercial directory		
Commercial directory		
Scientific publication		
Other publication		

Compiled by:	Regione Emilia-Romagna, Servizio Geologico, Sismico e dei Suoli https://ambiente.regione.emilia-romagna.it/it/geologia/servizio-geologico-sismico-e-dei-suoli	RegioneEmilia-Romagna DIREZIONE GENERALE CURA DEL TERRITORIO E DELL'AMBIENTE