

Mauthausen

Mauthausener Granit

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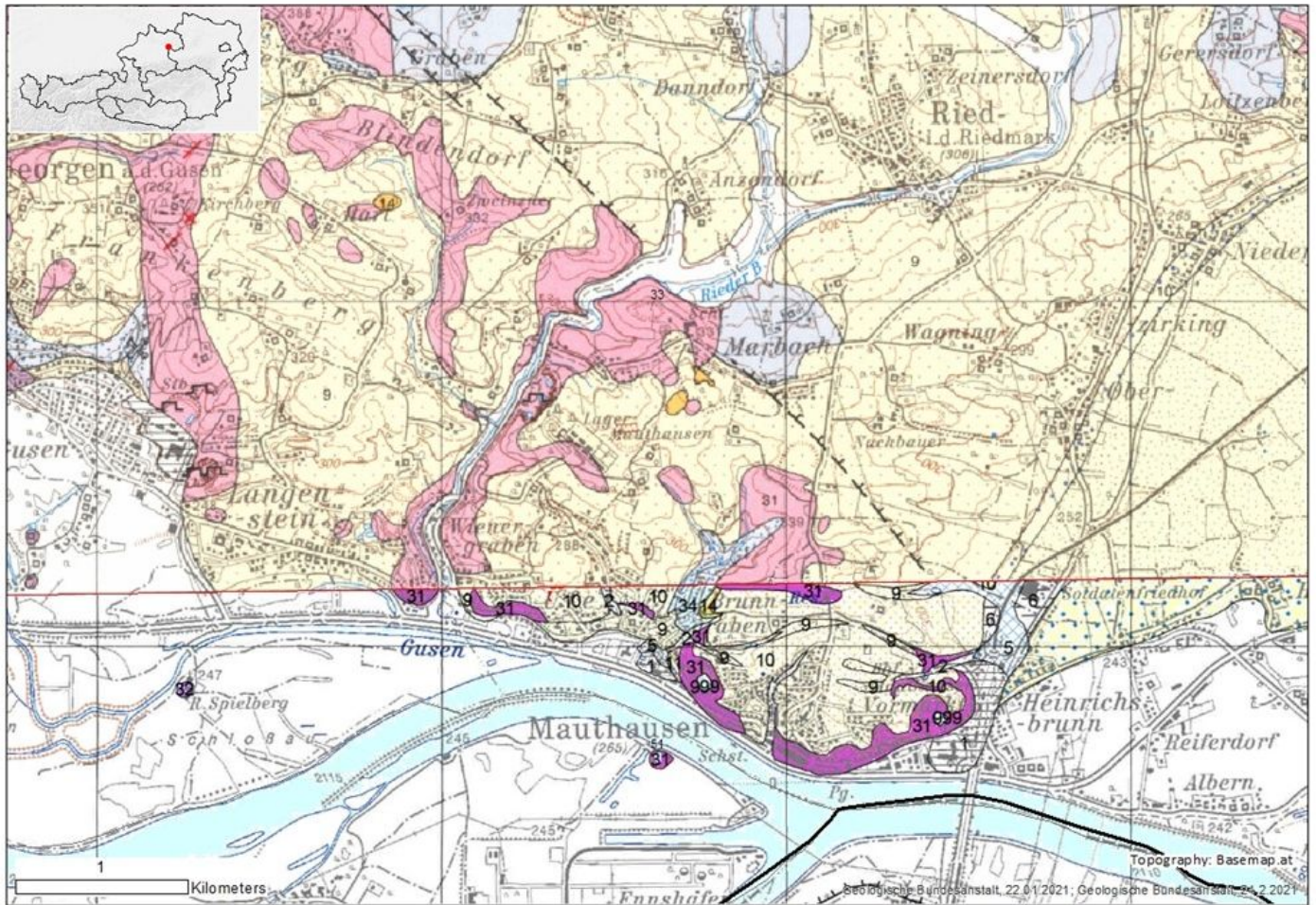


appr. 4 cm

Short description: fine- to medium-grained, blue-grey biotite granite of highly uniform texture; plagioclase always outweighs potassium feldspar

Commodity (vocabulary)	Lithology (vocabulary)	Typical colour (code list)	Place of origin			
			Country	County / District / Province	Municipality / Community	Place/town / Village
Commercial Granite	Granite	Light-grey	Austria	Perg / Oberösterreich (Upper Austria)	Mauthausen	Mauthausen Wienergraben

Geological setting



Geology: The Mauthausen granite (pink signature on the map) is a fine- to medium-grained intrusive granite, which is found at its type locality near the village of Mauthausen (Mühlviertel, Upper Austria) over an area of about 7x3 km - partly under thick loess cover. The intrusion occurred towards the end of the Variscan orogeny.

Production: The main quarrying area is located directly in or around the village of Mauthausen. Many of the quarries were already established in the 19th century. During the Second World War, a concentration camp was built onsite the main quarry and Mauthausen became synonymous with one of the darkest chapters in Austrian history. Today, the quarry and the former camp host an important memorial to the victims of the National Socialist regime.

Geological age: 316 Ma

Geological unit: Mauthausener Granit, (tectonic unit): Südböhmischer Batholith / Southern Bohemian Batholith (URI: <http://resource.geolba.ac.at/tectonicunit/106>)

Application, use and heritage

Description: The granite was and is mainly used for paving stones and kerbstones on a large scale for the cities of Vienna, Linz and Graz. In addition, it is used as wall stones and plinth stones, for bridge constructions, river embankments and for funeral monuments and memorials.

The plinths or steps of several monuments and fountains in the old town of Vienna are from Mauthausen granite, like those of the monument of Empress Maria Theresia in front of the Imperial Museums, the monument of Emperor Franz I. in the Castle, or from the fountains and the plague column along the Graben. When used for slabs on the floor it usually becomes inconspicuously grey with time.



Description: monument of Empress Maria Theresia in front of the Imperial Museums – the plinth and the perimeter fences (detail right) are made of Mauthausen granite

Petrography

Description: fine to medium-grained granite consisting of quartz, xenomorphic potassium feldspar and hypidiomorphic to idiomorphic plagioclase, which shows a distinct zonar structure; biotite is always hypidiomorphic and characterised by pleochroism

Source of information: Geological Survey of Austria (GBA)

Mineral composition

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

Potassium feldspar (%)	Plagioclase (%)	Quartz (%)	Biotite (%)	Muscovite (%)	Chlorite	Titanite
28-30	35-40	20-25	8-13	1	SM	SM
Apatite	Zircon	Rutile				
AM	AM	AM				

Source of information: Geological Survey of Austria (GBA)

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

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

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:

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 (%)
68,67	15,83	0,40	0,34	0,98	2,02	3,60	5,20	0,07	0,13		

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: energy-dispersive X-ray fluorescence analysis; Geological Survey of Austria (GBA)

Sources of more information

Type of information	Name of provider	URL
This data sheet	Geological Survey of Austria (GBA)	https://www.geologie.ac.at
Non-commercial directory		
Commercial directory		
Scientific publication		
Other publication		

Anthes, G., Heinrich, M., Lipiarski, P., Massimo, D., Kollars, B. & Rabeder, J. (2006): Grundlagenerhebung zu Vorkommen von Granitgesteinen in Österreich: Voruntersuchungen der nutzbaren Festgesteinsarten unter schwerpunktmäßiger Betrachtung der qualitativen Eigenschaften für den Verkehrsflächen- & Wasserbau als Basis für den Österreichischen Rohstoffplan.- Studie zu Projekt Ü-LG-050, 64 S., 2 Anl., 3 Blg., Stobl/Wien.

Seemann, R., Summesberger, H. & Schumacher, A. (1998): Wiener Steinwanderwege: Die Geologie der Großstadt.- Verlag Brandstätter, 159 S., Wien.

Summesberger, H., Seemann, R., Schumacher, A. & Rohatsch, A. (2008): Geologische Wanderwege in Wien. 1. Innere Stadt - vom Maria-Theresien-Denkmal zum Stephansdom.- Journal of Alpine Geology, 49; Exkursionsführer PANGEO 2008, S. 173-200, Wien.

Picture of stone surfaces: Source: B. Moshhammer

Geological maps: Brüggemann, H. & Finger, F. (2002): Geologische Karte der Republik Österreich 1:50.000, Blatt 33 Steyregg.- 1 Blatt, Geologische Bundesanstalt, Wien.

Moser, M. (2019): GEOFAST Provisorische Geologische Karte der Republik Österreich 1:50.000 Blatt 51 Steyr.- 1 Bl., Geologische Bundesanstalt, Wien.

Topographic map: Basemap.at (<https://basemap.at>)

Compiled by:	Geological Survey of Austria (GBA) https://www.geologie.ac.at	 Geologische Bundesanstalt
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