

Plochwald

Plochwalder Granit

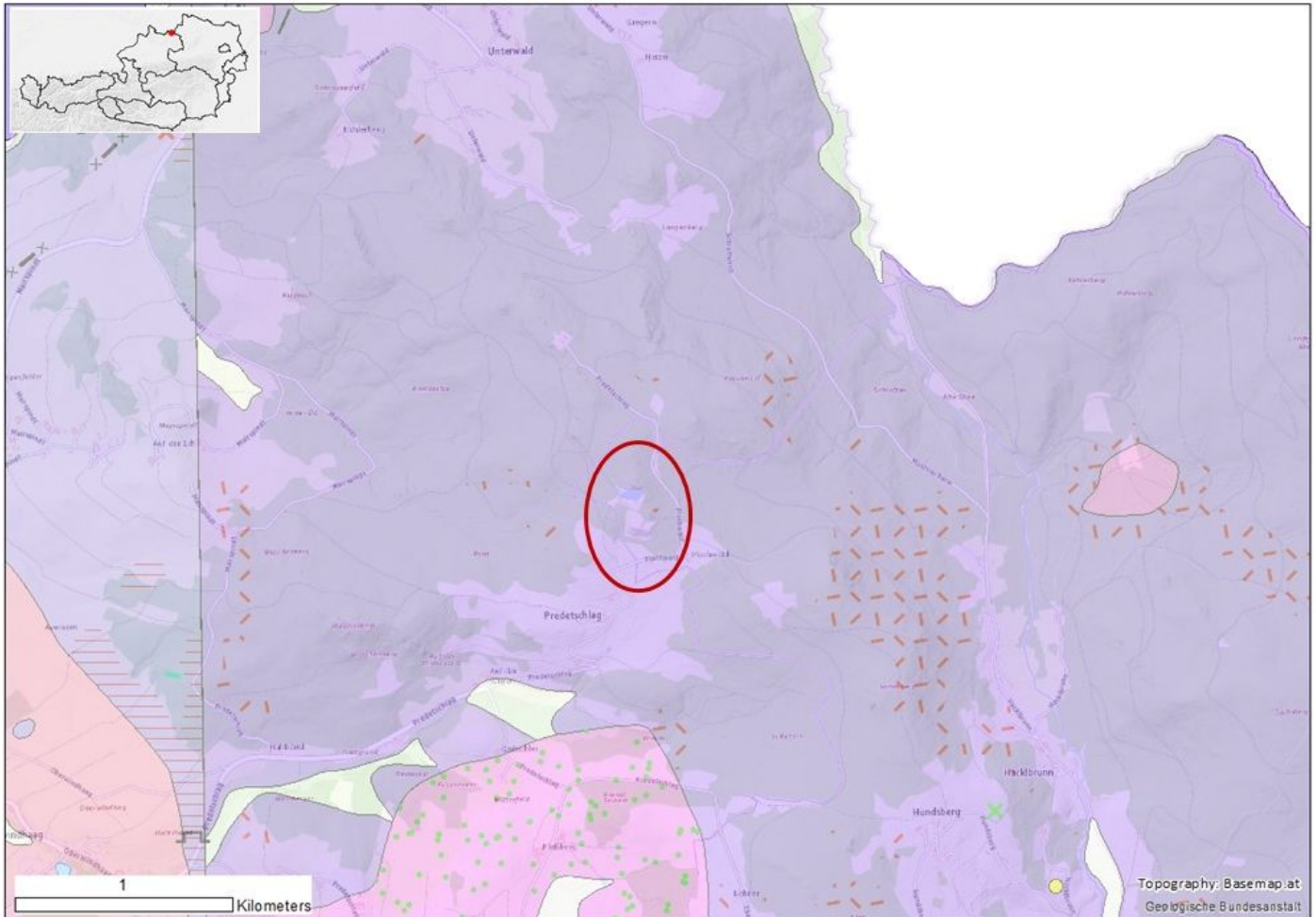


4 cm

Short description: medium- to coarse-grained, grey-blue granite with individual porphyritic potassium feldspars (up to 7 cm), large, roundish quartz and distinct muscovite content

Commodity (vocabulary)	Lithology (vocabulary)	Typical colour (code list)	Place of origin			
			Country	County / District / Province	Municipality / Community	Place/town / Village
Commercial Granite	Granite	Blue-grey	Austria	Freistadt / Oberösterreich (Upper Austria)	Sandl	Plochwald

Geological setting



Geology: The Plochwald granite does not form a compact stock, but intrudes the Weinsberg granite (purple signature on the map) in a several km wide WNW-ESE striking belt of many small, layered bodies. It can be classified as a late- to post-collisional, coarse-grained biotite granitoid with S-/I-transition type characteristics and Hercynian alignment as a result of deep-crustal melting of a volcanosedimentary protolith.

Production: The most important quarry was the Plochwald Quarry (red marking) in the Mühlviertel, Upper Austria, where the stone was mined for many decades.

Geological age: Late Variscan to Post Variscan, 322 – 310 Ma

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

Application, use and heritage

Description: Plochwald granite was particularly appreciated for façade cladding, floor panels and funeral monuments.

Petrography

Description: coarse- to large-grained, mica-bearing granite with individual porphyritic potassium feldspars; potassium feldspar is usually clearly regulated in schistosity and is represented in two forms: (1) isolated, up to 7 cm in size, often idiomorphic, stocky, large feldspars with twinning and perthite segregation and (2) frequently xenomorphic, 1-3 cm feldspars with thin tabular Karlsbad twins; quartz mostly in form of xenomorphic, diffusely distributed, roundish aggregates up to 1.5 cm in size, consisting of many small individual grains; plagioclase often subidiomorphic, about 0.5 cm in size and with zonar structure; biotite dark brown to black, evenly distributed over the rock; muscovite mostly in form of flakes several mm in size, irregularly distributed in the matrix

Source of information: Haunschmid, 1989

Mineral composition

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

Quartz (%)	Potassium Feldspar (%)	Plagioclase (%)	Biotite (%)	Muscovite (%)		
35	35	21	5	4		

Source of information: Frasl & Finger, 1988; Haunschmid, 1989

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 (%)	FeO (%)	TiO ₂ (%)	MgO (%)	CaO (%)	Na ₂ O (%)	K ₂ O (%)	MnO (%)	P ₂ O ₅ (%)	SO ₃ (%)	LOI (%)
75,25	13,51	1,54	0,18	0,26	0,67	3,08	4,70	0,04	0,17		

Trace elements

V (ppm)	Cr (ppm)	Mn (ppm)	Co (ppm)	Ni (ppm)	Cu (ppm)	Zn (ppm)	As (ppm)
	7			15			
Sr (ppm)	Cd (ppm)	Ba (ppm)	Pb (ppm)	Be (ppm)	Rb (ppm)	Bi (ppm)	U (ppm)
45		176			230		
Sc (ppm)	Y (ppm)	Th (ppm)	Sb (ppm)	Ta (ppm)	Nb (ppm)	Zr (ppm)	Sn (ppm)
	17				10	94	
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: electron probe micro analysis; Haunschmid, 1989

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.

Frasl, G. & Finger, F. (1988): Jahrestagung 1988 der Österreichischen Geologischen Gesellschaft Exkursion: Mühlviertel und Sauwald 22. - 23. September 1988.- 29 S., Exkursionsführer der Österreichischen Geologischen Gesellschaft, 8, Salzburg.

Fuchs, G. & Schwaighofer, B. (1978): Erläuterungen zur Geologischen Karte der Republik Österreich 1:50.000 Blatt 17 Großpertholz.- 26 S., Geologische Bundesanstalt, Wien.

Haunschmid, B. (1989): Das Granitgebiet um Plochwald zwischen Sandl und Windhaag im nordöstlichen Oberösterreich: mit besonderer Berücksichtigung des dortigen Plochwalder Granit-Typs und des Pseudokinzigits.- 171 S., Diplomarbeit Universität Salzburg, Salzburg.

Rupp, C., Linner, M. & Mandl, G. (Red.) (2011): Geologische Karte von Oberösterreich 1:200.000: Erläuterungen.- 255 S., Geologische Bundesanstalt, Wien.

Picture of stone surfaces: Source: Werbegemeinschaft der Steinmetzmeister im Rahmen der österreichischen Bundesinnung unter Mitarbeit der Landesinnungen Wien, Niederösterreich, Oberösterreich und Steiermark (Ed., 1991): Naturstein.- Natursteinkatalog, 96 Bl., Wien.

Geological map: Fuchs, G. & Schwaighofer, B. (1977): Geologische Karte der Republik Österreich 1:50.000 Blatt 17 Großpertholz.- 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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