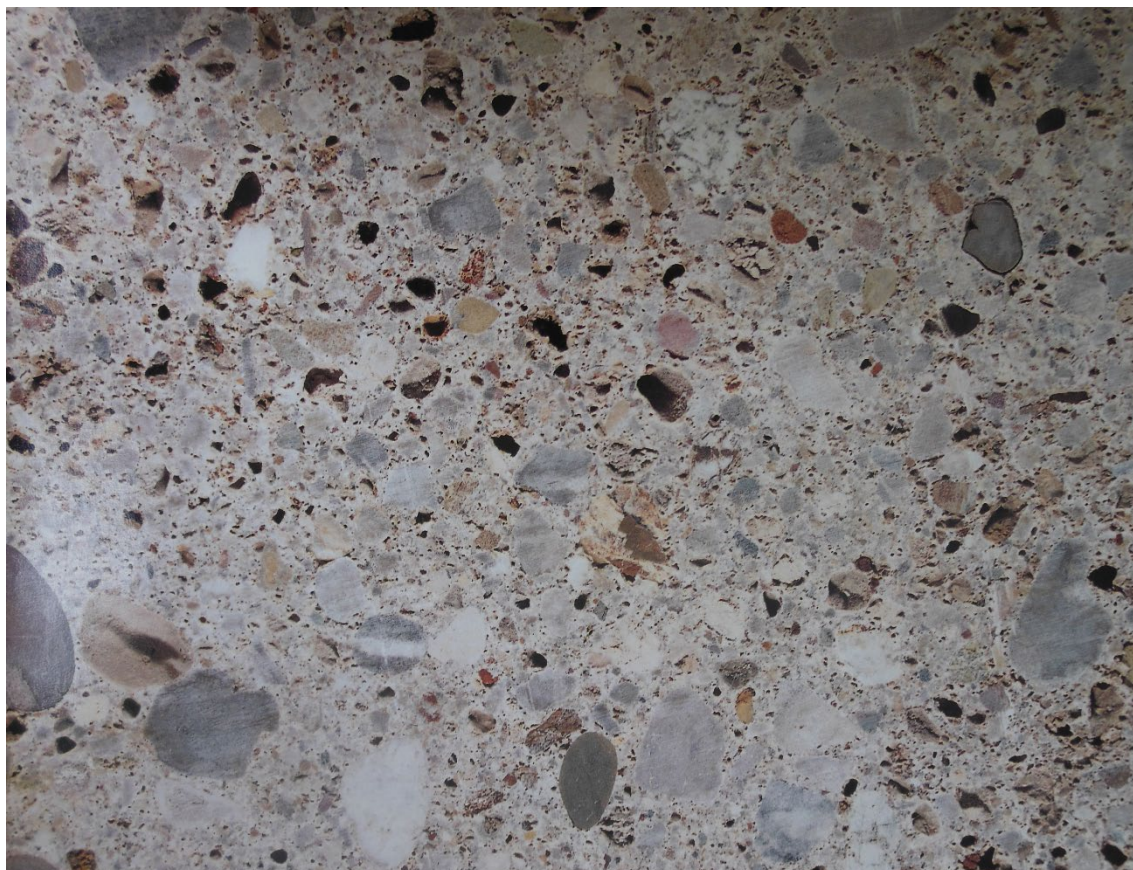


Golling

Gollinger Konglomerat/Nagelfluh

Torrener Nagelfluh

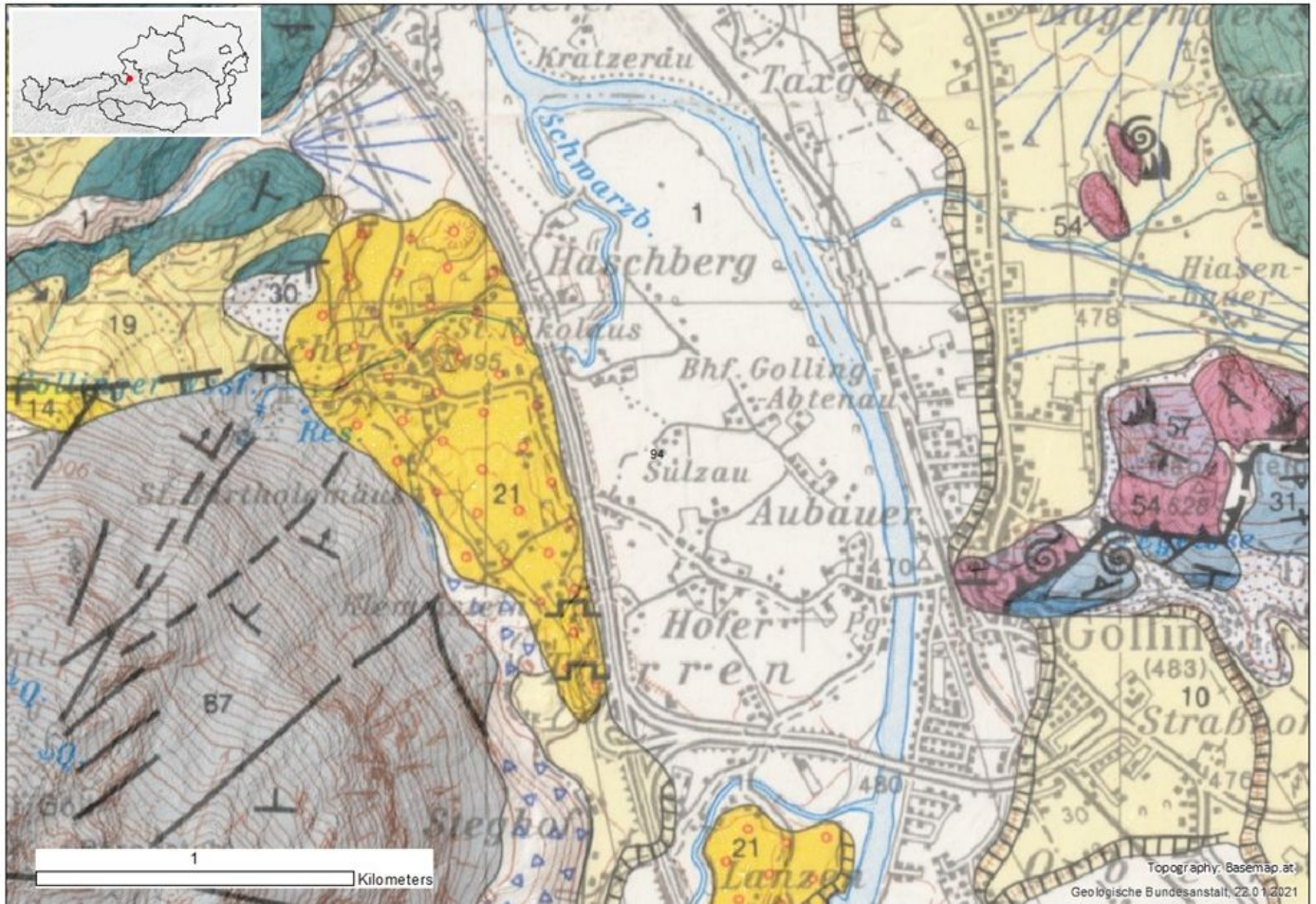


5 cm

Short description: coarse-grained, beige-brown, sandy and well cemented conglomerate with carbonate and crystalline components

Commodity (vocabulary)	Lithology (vocabulary)	Typical colour (code list)	Place of origin			
			Country	County / District / Province	Municipality / Community	Place/town / Village
Commercial Sandstone	Conglomerate	Brown	Austria	Hallein / Salzburg	Golling an der Salzach	Torren bei Golling Klemmstein

Geological setting



Geology: The Golling Conglomerate (dark yellow signature with red circles on the map) is located in the Salzach valley some 20 km south of Salzburg. The sequence is up to 30 m thick. Its depositional environment is a lacustrine delta complex with foresets and topsets. It was probably deposited on laminated clays and is strongly weathered in the uppermost 2 m. However, the cementation of the individual delta sets depends on the clay and silt content of the material and varies greatly; besides, the degree of cementation generally decreases with increasing depth.

Production: The extraction area is limited to a narrow strip of land to the west of Golling (quarry symbols on the map). Due to the varying degree of consolidation of the individual delta sets, only a small percentage of the rock is of the highest quality and is fracture-proof and frost-resistant. Extraction is carried out by large-scale blasting, after which raw blocks are produced for the manufacture of slabs.

Geological age: Pleistocene, Alpine glacial cycles, Riss, MIS 6

Geological unit: Torrener Nagelfluh (URI: <http://resource.geolba.ac.at/GeologicUnit/91>)

Application, use and heritage

Description: The Golling Conglomerate is used for the extraction of construction stones and ornamental stones. The best qualities can be used for façade and floor slabs, wall and bridge stones as well as for stonemasonry. However, about half of the material is used for larger and smaller throwstones, inferior qualities can only be used for path gravel.

A major area of use is for restoration works, for example for numerous historical buildings in Salzburg's old town, such as the Salzburg Cathedral, the Salzburg Residence or the Franciscan Church. These buildings were originally constructed from Mönchsberg conglomerate, a rock with almost the same appearance and history of formation as the Golling conglomerate. Since the former quarrying sites of Mönchsberg conglomerate are now located in the middle of the urban area of the city of Salzburg, further quarrying is no longer possible and as an alternative, Golling conglomerate is used for renovation work.

Petrography

Description:

Source of information:

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:

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 (%)

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	Geological Survey of Austria (GBA)	https://www.geologie.ac.at
Non-commercial directory		
Commercial directory		
Scientific publication		
Other publication		

Kieslinger, A. (1963): Die nutzbaren Gesteine Salzburgs.- Mitteilungen der Gesellschaft für Salzburger Landeskunde: Ergänzungsband, xi+435 S., Bergland-Buch, Salzburg.

Plöchinger, B. mit Beiträgen von Brandecker, H., Leditzky, H.P., Maurin, V., Tichy, G. & van Husen, D. (1990): Erläuterungen zur Geologischen Karte der Republik Österreich 1:50.000 Blatt 94 Hallein.- 76 S., Geologische Bundesanstalt, Wien.

Van Husen, D. & Reitner, J. (2011): An Outline of the Quaternary Stratigraphy of Austria. – E&G-Quaternary Science Journal, 60/2-3.

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: Plöchinger, B. (1987): Geologische Karte der Republik Österreich 1:50.000 Blatt 94 Hallein.- 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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