

Altaskifer (Alta Schist)

Alta Quartzite

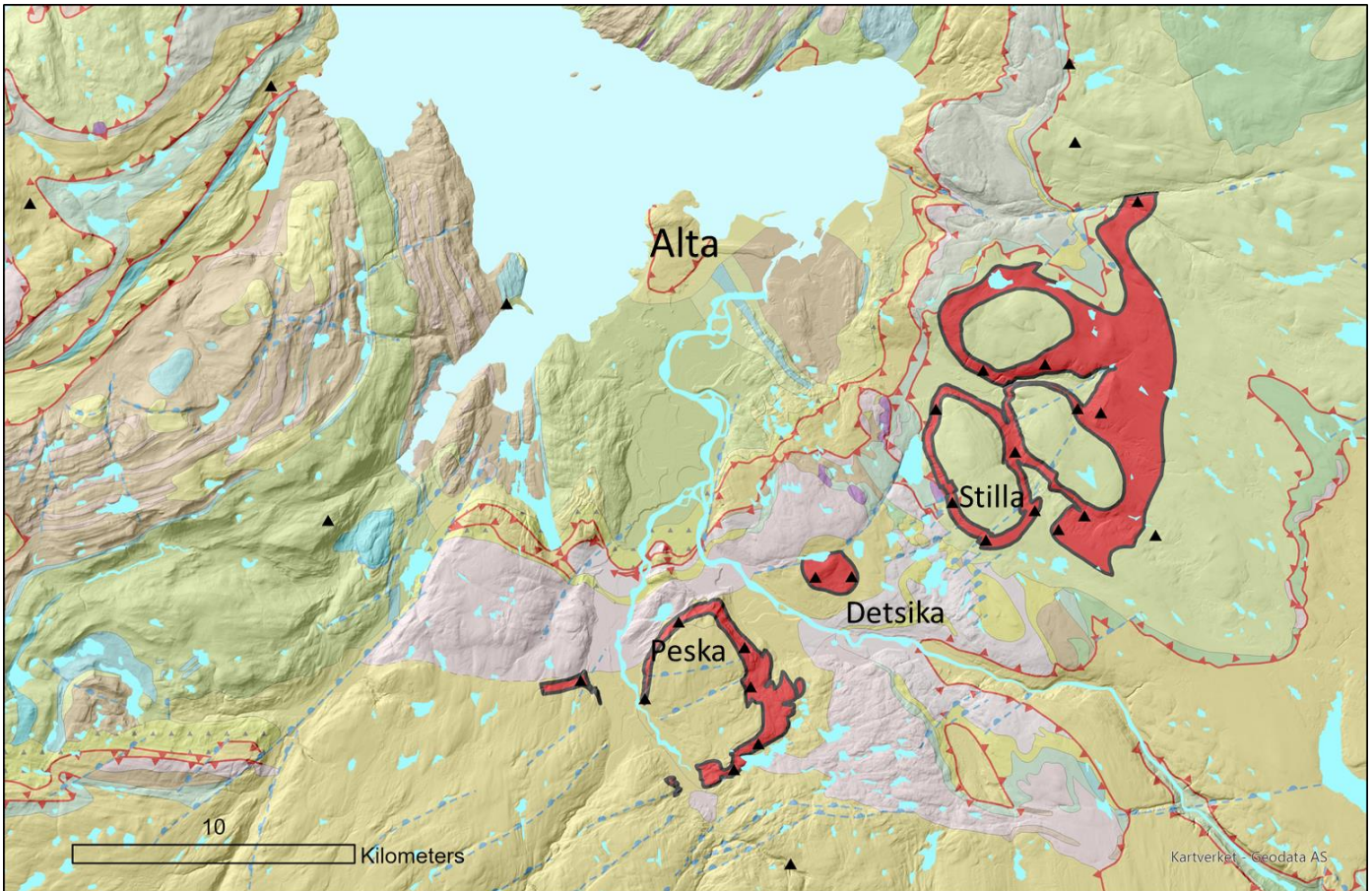


5 centimeters

Short description: Grey quartz-rich schist formed by dynamic metamorphism of sandstone. The image displays a natural split surface.

Commodity (vocabulary)	Lithology (vocabulary)	Typical colour (code list)	Place of origin			
			Country	County / District / Province	Municipality / Community	Place/town / Village
Commercial Slate	Schist	Grey	Norway	Finnmark	Alta	Peska Detsika Stilla

Geological setting



Geology: The Alta Schist represents originally arkosic sandstone units, transformed through dynamic metamorphism to quartz rich schist displaying spaced layers of mica along which the schist can be split to slabs. The main part of this transformation occurred by thrusting of sheets of sandstone and other rocks during the Caledonian Orogeny. The Alta Schist occurs within a few hundred metres thick, almost horizontal, thrust nappe unit to the south and west of the town of Alta. Exploitable thickness varies between 40 and 100 m.

Production: Production started around 1850, and for more than 100 years, the schist was worked in numerous quarries on a cooperative basis. At present time, most of the production is taking place at Peska, the southernmost deposit.

Geological age: Neoproterozoic

Geological unit: [Nalganas Nappe](#)

Application, use and heritage

Description: The Alta Schist can be split into thin slabs, and is perhaps the most well-known roofing slate in Norway. It is known to be very durable, and is often traded second hand. It is also much used as floor covering at heavy-traffic sites, such as railway stations.



Alta Schist (large slabs) at the main square, Bergen



Alta Schist, 84 years old roofing slate

Petrography



Description: Thin section photomicrograph, mosaic (crossed polars). Fine-grained schist, quartz occurring as granoblastic-elongate aggregates (annealed mylonitic texture), feldspars as porphyroclasts and varying amounts of mica as continuous laminae and/or lepidoblastic grains. The mica laminae define the cleavage planes along which the schist can be split (N-S in image). The mylonitic nature of the schist explains its high strength and durability in use.

Source of information: [Geological Survey of Norway](#)

Mineral composition

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

Potassium feldspar (%)	Plagioclase (%)	Quartz (%)	Muscovite (%)	Epidote (%)	Calcite (%)	Biotite (%)
10	11	54	7	3	2	1
Chlorite (%)						
1						

Source of information: [NGU](#)

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
2710		>0,1	246,6	34,3

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		
Polished				

Source of information: [Altaskifer](#)

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 Norway	https://geo.ngu.no/api/faktaark/mineralressurser/vi/sNaturstein.php?objid=9004&lang=eng
Map link	Geological Survey of Norway	https://geo.ngu.no/kart/common_mobil/?_ /kart/mineralressurser_mobil/_ lang=eng::extent=807241.7170200596,7765455.930186273,836775.8420200596,7778911.305186273::map=9
Non-commercial directory	Natural stone online	Detailansicht (naturalstone-online.com)
Commercial directory		
Scientific publication	NGU Bulletin	https://www.ngu.no/upload/Publikasjoner/Bulletin/Bulletin436_137-146.pdf
Other publication		

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