

Reference section(s): Greitnerkogel (N 47°12'55" / E 15°17'25") (FRITZ, 1991).

Derivation of name: After the hill Parmasegg (785 m) 28 km north of Graz (FRITZ, 1991).

Synonyms: Crinoiden-Schichten (H. FLÜGEL, 1960, 1961, 1975); partly: Kalkschiefer-Folge (CLAR, 1874); unterer Crinoidenkalk (HOERNES, 1880); Kalkschieferstufe (HERITSCH, 1906); Kalkschieferstufe i.A. (WAAGEN, 1937); Plattenkalke und Schiefer des e-gamma (SEELMEIER, 1944); ef-Flaser-Plattenkalke (SCHOUPE, 1953); plattige Kalkschiefer (WEBER, 1990).

Lithology: Major parts of the succession consist of platy crinoidal limestones intercalated with sandy marls and sand/siltstones.

Fossils: Fossils are rare (conodonts, badly preserved rugose corals, indeterminable crinoids).

Origin, facies: Intertidal to shallow subtidal environment.

Chronostratigraphic age: Pragian (may locally also contain uppermost Silurian (*eosteinhornensis* conodont zone); FRITZ, 1991: p. 232)–lower Emsian (?).

Biostratigraphy: See above.

Thickness: 150–200 m.

Lithostratigraphically higher rank unit: Rannach Group.

Lithostratigraphic subdivision: FRITZ (1991) distinguished four members (Dolomit-Siltschiefer Member, Karbonat-Mergel Member, Plattenkalk Member and Siltstein Member) in the type region. FLÜGEL (2000) divided the formation into three members:

Greitnerkogel Member: Blue-grey platy limestones and crinoidal limestones; less than 100 m in thickness.

Oberbichl Member: Succession of brown platy silty limestones, flaser- and crinoid-limestones, and sand/siltstones; some tens of meters in thickness.

Stiwoll Member: Yellowish marly sand/siltstones; about 80 m in thickness.

Underlying unit(s): Kötschberg Formation.

Overlying unit(s): Flösserkogel Formation.

Lateral unit(s): Bameder Formation, Heigger Formation.

Geographic distribution: Styria, highland in the surroundings of Graz; ÖK50-BMN, map sheets 134 Passail, 163 Voitsberg, 164 Graz.

Remarks: -

Complementary references: HUBMANN & MESSNER (2007).

Kogler-Formation / Kogler Formation

BERNHARD HUBMANN

Validity: Valid; first nomination by GOLLNER & ZIER (1985: "Koglerformation"), formalized by FLÜGEL (2000: p. 43; Kogler-Formation).

Type area: ÖK50-UTM, map sheet 4223 Weiz (ÖK50-BMN, map sheet 134 Passail).

Type section: No type section defined, but FLÜGEL (2000) selected a type region in the vicinity of the farmstead "Kogler", south of St. Erhard, ÖK50-BMN, map sheet 134 Passail (N 47°22'43" / E 15°27'13").

Reference section(s): -

Derivation of name: After the farmstead "Kogler", south of St. Erhard (Breitenau valley), approx. 55 km north of Graz.

Synonyms: Partly: Kalkschiefer-Folge (CLAR, 1874); Kalkschieferstufe i. A. (WAAGEN, 1937).

Lithology: Darkblue to darkgrey, platy and banded limestones, locally with sandstone alternations.

Fossils: Conodonts; rare tabulate and rugose corals.

Origin, facies: Shallow marine deposits.

Chronostratigraphic age: Due to the lack of stratigraphically meaningful fossils no exact age determinable; presumably Lower to Middle Devonian (?Upper Devonian).

Biostratigraphy: -

Thickness: Up to 800 m.

Lithostratigraphically higher rank unit: Peggau Group (FLÜGEL, 2000).

Lithostratigraphic subdivision: FLÜGEL (2000) distinguished three members:

Geschwend Member: Alternating limestones, silt- to sandstones and subordinate argillaceous shales and dolomites, locally volcanites; up to 800 m (?) in thickness.

Sattelbauer Member: Lightgrey, locally fossiliferous limestones (corals, brachiopods) with chert nodules; thickness about 150 m.

Spatl Member: Reddish to violet micritic (flaser) limestones, sandstone and argillaceous shales with intercalations of thin-bedded alkaline volcanoclastics; about 100 m in thickness.

Underlying unit(s): In the area east of the Hochlantsch and the basin of Passail the Kogler Formation is underlain by the Rauchenberg Member of the Schönberg Formation.

Overlying unit(s): North of the Tyrnaueralm successions of the Laufnitzdorf Nappe overlying the Kogler Formation, whereas south of the Tyrnaueralm the formation is overlain by successions of the Schöckel Nappe.

Lateral unit(s): -

Geographic distribution: Styria, highland in the surroundings of Graz; ÖK50-BMN, map sheets 133 Leoben, 134 Passail, 163 Voitsberg.

Remarks: Lithological content of the formation is very similar to the Hochschlag Formation and the Hubenhalt Formation respectively (FLÜGEL, 2000).

Complementary references: EBNER (1998).

Hubenhalt-Formation / Hubenhalt Formation

BERNHARD HUBMANN

Validity: Valid; first description by PENECKE (1890: "Kalke und Kalkschiefer der Hubenhalt"), formalized by FLÜGEL (2000: p. 44–45; Hubenhalt-Formation).

Type area: Hubenhalt northwest of Fladnitz (Teichalpe area), ÖK50-UTM, map sheet 4223 Weiz (ÖK50-BMN, map sheet 134 Passail).

Type section: No type section defined. FLÜGEL (2000) selected a type region at Hubenhalt, northwest of Fladnitz ÖK50-BMN, map sheet 134 Passail (N 47°19'15" / E 15°26'40"), approx. 40 km north of Graz.

Reference section(s): -

Derivation of name: After Hubenhalt an area east of Tyrnau, approx. 40 km north of Graz.

Synonyms: Kalke und Kalkschiefer der Hubenhalt (PENECKE, 1890); Kalkschiefer der Hubenhalt (CLAR et al., 1929); Schichten der Hubenhalt (H. FLÜGEL, 1975).

Lithology: Various platy to slaty limestones and dolomites with sandstone intercalations.

Fossils: Conodonts and corals.

Origin, facies: Deeper marine environment with restricted water circulation (HUBAUER, 1986).

Chronostratigraphic age: Pragian–Emsian.

Biostratigraphy: -

Thickness: 130–250 m.

Lithostratigraphically higher rank unit: Peggau Group (FLÜGEL, 2000).

Lithostratigraphic subdivision: HUBAUER (1986) distinguished four formations within the “Kalkschieferformationen” between Tyrnauergraben and Schremsbach (Hochlantsch area, west of Passail basin); FLÜGEL (2000) adopted HUBAUER’s subdivisions but changed their hierarchy into members.

Gscheidberg Member: Brownish, limonitic limestones and subordinate alkaline metatuffs; up to 200 m in thickness.

Hausebner Member: Alternating crinoidal limestones, flaser limestones, marly siltstones and calcareous sandstones, subordinate dolostones and tuffitic shales; thickness up to 250 m.

Heuberg Member: Grey to brown flaser limestones, dolomitic marls and slaty sandstones; about 200 m in thickness.

Sulberg Member: Blue-grey (flaser)limestones, sandstone with frequent intercalations of dolostones and carbonatic sandstones; up to 130 m in thickness.

Underlying unit(s): Unknown due to tectonic cut.

Overlying unit(s): Plabutsch Formation, Tyrnaueralm Formation.

Lateral unit(s): -

Geographic distribution: Styria, highland in the surroundings of Graz; ÖK50-BMN, map sheet 134 Passail.

Remarks: -

Complementary references: FLÜGEL & HUBAUER (1984).

Harrberger-Formation / Harrberger Formation

BERNHARD HUBMANN

Validity: Valid; first description and formalization by GOLLNER (1981: p. 62; Harrberger-Formation).

Type area: ÖK50-UTM, map sheet 4223 Weiz (ÖK50-BMN, map sheet 134 Passail).

Type section: GOLLNER (1981) published five sections (A–D) at the northern slope of the Hochlantsch in the vicinity of the farmstead “Harrberger” south of Breitenau valley (N 47°22’15” / E 15°26’10”). Section A at altitude 1,015 and 1,230 m was chosen as type section by GOLLNER (1981).

Reference section(s): In the vicinity of the farmstead Harrberger GOLLNER (1981) described four reference sections of the formation, section B at 1120 to 1185 m altitude, section C at 1,100 and 1,240 m and section D at

1,135 and 1,200 m; section E is along a forest road at 1,150 m altitude.

Remarks: GOLLNER et al. (1982) distinguished three series within the formation which were re-named and considered as members by FLÜGEL (2000).

Derivation of name: After the abandoned farmstead Harrberger south of the Breitenau valley, approx. 55 km north of Graz.

Synonyms: Partly: Bänderkalk-Kalkschiefer-Zug (CLAR et al., 1929).

Lithology: Limestones with tentaculites, argillaceous shales, sandstones, lydites, radiolarites and tuffs.

Fossils: Conodonts, tentaculites, radiolarians.

Origin, facies: Calm pelagic environment of some 10 to 100 m water depth (GOLLNER, 1981).

Chronostratigraphic age: Emsian–Frasnian; not Eifelian as indicated in the ASC 2004.

Biostratigraphy: *gronbergi* to *triangularis* conodont zones.

Thickness: 70–90 m.

Lithostratigraphically higher rank unit: Laufnitzdorf Group (FLÜGEL, 2000).

Lithostratigraphic subdivision: -

Underlying unit(s): Formations of the Gschwend Nappes (tectonic contact).

Overlying unit(s): Formations of the Osser and Hochlantsch Nappe (tectonic contact).

Lateral unit(s): -

Geographic distribution: Styria, highland in the surroundings of Graz; ÖK50-BMN, map sheet 134 Passail.

Remarks: -

Complementary references: GOLLNER & ZIER (1982), FLÜGEL & NEUBAUER (1984).

Flösserkogel-Formation / Flösserkogel Formation

BERNHARD HUBMANN

Validity: Valid; first description by PENECKE (1894: “Quarzit-Dolomit-Stufe”); formalized by FLÜGEL (2000: p. 19; Flösserkogel-Formation).

Type area: ÖK50-UTM, map sheets 4223 Weiz, 4228 Voitsberg, 4229 Graz (ÖK50-BMN, map sheets 134 Passail, 162 Köflach, 163 Voitsberg, 164 Graz).

Type section: No type section defined; FENNINGER & HOLZER (1978) published several dislocated sections; FLÜGEL (2000) proposed a type region at Flösserkogel (elevation spot 696 m on ÖK50-BMN, map sheet 164 Graz) (N 47°06’15” / E 15°22’06”).

Reference section(s): Following sections studied by FENNINGER & HOLZER (1978) may be used for reference: Göstinggraben (N 47°06’01” / E 15°22’49”), Pfaffenkogel (N 47°09’54” / E 15°19’02”) (see also HUBMANN & MESSNER, 2005), Eichberg (N 47°06’54” / E 15°22’47”), and Trefenberg (Treffenkogel, 745 m) (N 47°09’07” / E 15°16’38”).

Remarks: This formation covers large areal parts in the Rannach Nappe but lacks good outcrops due to its high weathering capability; in the Hochlantsch Nappe the thickness is reduced due to tectonic amputation.

Austrian Stratigraphic Chart 2004 - Paleozoic

(sedimentary successions)

Austrian Stratigraphic Commission



ERA	SYSTEM / PERIOD / SERIES / EPOCH	STAGE / AGE	DURATION Ma	Global Classification					
				ERATHM / ERA	SYSTEM / PERIOD / SERIES / EPOCH				
PALEOZOIC	PERMIAN	CHANGHSINGIAN / Dorashanian	251	PERMIAN	MID PERMIAN / GUADALUPIAN / LOPINGIAN				
		WUCHIAPINGIAN / Dufuflian	255						
		CAPITANIAN	260						
		WORDIAN	265						
		ROADIAN	270						
		PERMIAN	LOWER PERMIAN / CISURALIAN			KUNGURIAN	275		
						ARTINSKIAN	280		
						SAKMARIAN	285		
						ASSELIAN	290		
		PERMIAN	TRIAS			GZHELIAN	295	TRIAS	U. CARBONIFEROUS / PENNSYLVANIAN
KASIMOVIAN	300								
MOSKOVIAN	305								
BASHKIRIAN	310								
TRIAS	LOWER CARBONIFEROUS / MISSISSIPPIAN			SERPUKHOVIAN	315				
				VISEAN	320				
				TOURNAISIAN	325				
PERMIAN	DEVONIAN			FAMENNIAN	350	DEVONIAN	UPPER DEVONIAN		
				FRASNIAN	355				
				GIVETIAN	360				
		EIFELIAN	365						
		EMSIAN	370						
		DEVONIAN	LOWER DEVONIAN	PRAGIAN	375				
				LOCHKOVIAN	380				
				LUDFORDIAN / GORSTIAN	385				
				HOMERIAN / SHEINWOOD	390				
		PERMIAN	DEVONIAN	WEN-LOCK / LOW	395			DEVONIAN	MIDDLE DEVONIAN
TELYCHIAN	400								
AERONIAN	405								
RHUDDANIAN	410								
DEVONIAN	UPPER ORDOVICIAN			DARRIWILIAN	415				
				TREMA-DOCIAN	420				
				PAIBIAN	425				
PERMIAN	CAMBRIAN			WEN-LOCK / HIGH	430	CAMBRIAN	MIDDLE CAMBRIAN		
				LLANDOVERY	435				
				HIRNANTIAN	440				
		ORDOVICIAN	445						
		CAMBRIAN	LOWER CAMBRIAN	WOLYER	450				
				VAL VISDENSE	455				
				VAL VISDENSE	460				
		PERMIAN	CAMBRIAN	WOLYER	465			CAMBRIAN	LOWER CAMBRIAN
				VAL VISDENSE	470				
				VAL VISDENSE	475				
VAL VISDENSE	480								
CAMBRIAN	MIDDLE CAMBRIAN			VAL VISDENSE	485				
				VAL VISDENSE	490				
				VAL VISDENSE	495				
PERMIAN	CAMBRIAN			VAL VISDENSE	500	CAMBRIAN	LOWER CAMBRIAN		
				VAL VISDENSE	505				
				VAL VISDENSE	510				
		VAL VISDENSE	515						
		CAMBRIAN	MIDDLE CAMBRIAN	VAL VISDENSE	520				
				VAL VISDENSE	525				
				VAL VISDENSE	530				
		PERMIAN	CAMBRIAN	VAL VISDENSE	535			CAMBRIAN	LOWER CAMBRIAN
				VAL VISDENSE	540				
				VAL VISDENSE	545				
VAL VISDENSE	550								
CAMBRIAN	MIDDLE CAMBRIAN			VAL VISDENSE	555				
				VAL VISDENSE	560				
				VAL VISDENSE	565				



- Legend**
- pelagic, offshore, siliciclastic
 - pelagic, nearshore, calcareous
 - shallow marin, neritic
 - terrestrial-continental, coarse clastic
 - terrestrial-continental, fine clastic
 - evaporite (chloride, sulphate)
 - rhyolite, dacite
 - (basaltic) andesite, trachyandesite
 - basalt
 - phyllite
 - mixed-facies (in corresponding colors)
 - coal (may include several seams)
 - ? position/age doubtful/controversial
 - | equal units
 - \ older unit left \ younger unit right
 - hiatus
 - unconformity
 - GSSP
 - Fm. Formation
 - Ls. Limestone

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