

**Origin, facies:** Marine limestone, pelagic unit.

**Chronostratigraphic age:** Famennian.

**Biostratigraphy:** Conodonts restrict the unit to Upper Famennian (SCHÖNLAUB, 1971c), but a distinct zone is not mentioned.

**Thickness:** Approx. 2 m.

**Lithostratigraphically higher rank unit:** Althofen Group (see remarks at Lower Althofen Limestone).

**Lithostratigraphic subdivision:** -

**Underlying unit(s):** Upper Auen Dolomite (conformable contact), Althofen Limestone Breccia (conformable contact).

**Overlying unit(s):** Shale, Lydite Breccia (unconformable contact).

**Lateral unit(s):** -

**Geographic distribution:** Carinthia, in the area between Althofen and Töscheldorf.

**Remarks:** -

**Complementary references:** SCHÖNLAUB (1979, 1992), NEUBAUER & PISTOTNIK (1984), KREUTZER et al. (1997).

#### Tonschiefer, Lyditbrekzien / Shale, Lydite Breccias

THOMAS J. SUTTNER

**Validity:** Invalid; first observations within the deposits near Althofen were made by REDLICH (1905) and later described more in detail by HABERFELNER (1936) and SCHÖNLAUB (1971c: Figs. 1, 2, p. 301).

**Type area:** ÖK50-UTM, map sheet 4102 Althofen (ÖK50-BMN, map sheet 186 Sankt Veit an der Glan).

**Type section:** Ancient quarry of Aich (SCHÖNLAUB, 1971c: Figs. 1, 2, p. 289) some hundred meters NNW of Treibach-Althofen (N 46°52'46" / E 14°28'03").

**Reference section(s):** -

**Derivation of name:** After lithological features.

**Synonyms:** Schiefer-Lyditbreccien-Komplex (SCHÖNLAUB, 1971c); Pelite-Chert-Formation (SCHÖNLAUB, 1992).

**Lithology:** Grey siliceous shale, lydites and lydite breccias.

**Fossils:** Radiolarians.

**Origin, facies:** Marine siliciclastics, pelagic unit.

**Chronostratigraphic age:** Tournaisian–Serpukhovian (see remarks).

**Biostratigraphy:** -

**Thickness:** Approx. 15 m.

**Lithostratigraphically higher rank unit:** -

**Lithostratigraphic subdivision:** -

**Underlying unit(s):** Upper Althofen Formation (unconformable contact).

**Overlying unit(s):** -

**Lateral unit(s):** -

**Geographic distribution:** Carinthia, in the area between Althofen and Töscheldorf.

**Remarks:** Due to the lack of stratigraphically relevant fossils, the age assignment follows the suggestions of CLAR et al. (1963) and SCHÖNLAUB (1971c: p. 301), who considered the Shale and Lydite Breccias being deposited above

the Upper Althofen Formation. Since the contact between these two units is unconformable, the Shale and Lydite breccias are probably restricted to lower Carboniferous deposits.

**Complementary references:** HABERFELNER (1936), SCHÖNLAUB (1979), NEUBAUER & PISTOTNIK (1984).

#### „Gurktaler Quarzphyllit-Komplex“ / Gurktal Quartzphyllite Complex

BERNHARD HUBMANN

**Validity:** Invalid; description by BECK-MANNAGETTA (1959: "(Quarz-) Phyllitserie").

**Type area:** ÖK50-UTM, map sheet 4101 Gurk (ÖK50-BMN, map sheet 185 Straßburg).

**Type section:** No type section published; BECK-MANNAGETTA (1964) mentioned a typical occurrence of the Gurktal quartzphyllite at Weitensfeld (N 46°50'54" / E 14°11'30"), approximately 50 km north of Klagenfurt.

**Reference section(s):** -

**Derivation of name:** After the valley Gurktal, north of Feldkirchen in Carinthia.

**Synonyms:** Gurktaler Phyllit (SCHWINNER, 1932, 1936); (Quarz-) Phyllitserie (BECK-MANNAGETTA, 1959); Gurktaler Quarzphyllit (BECK-MANNAGETTA, 1964; KERNER, 1988; KERNER & LOESCHKE, 1991); Gurktaler Quarzphyllit-Komplex [sic!] (SCHÖNLAUB, 1979); Gurktal Quartzphyllite Complex (SCHÖNLAUB & HEINISCH, 1993); partly: Gurktaler Komplex (ZADORLAKY-STETTNER, 1961); Gurktaler und Mittelkärntner Quarzphyllitreal (SCHÖNLAUB, 1979); Altpaläozoischer Phyllit i.a. (FLÜGEL & NEUBAUER, 1984).

**Lithology:** Various epimetamorphic rocks; mostly dark-grey phyllites; in the upper parts dolomitic lenses up to 20 m in thickness may occur.

**Fossils:** Unknown.

**Origin, facies:** ?

**Chronostratigraphic age:** Presumably Ordovician–Carboniferous.

**Biostratigraphy:** -

**Thickness:** About 250 m.

**Lithostratigraphically higher rank unit:** -

**Lithostratigraphic subdivision:** -

**Underlying unit(s):** ?

**Overlying unit(s):** ?

**Lateral unit(s):** ?Murau Group.

**Geographic distribution:** Gurktal range; ÖK50-BMN, map sheets 184 Ebene Reichenau, 186 Stankt Veit an der Glan.

**Remarks:** -

**Complementary references:** NEUBAUER & SASSI (1993).

#### Stangnock-Formation / Stangnock Formation

HANS P. SCHÖNLAUB

**Validity:** Valid; the term was introduced and formalized by KRAINER (1989: p. 568) at the northwestern margin of the Gurktal Nappe System of Carinthia.

**Type area:** ÖK50-UTM, map sheet 3106 Radenthein (ÖK50-BMN, map sheet 183 Radenthein) (PISTOTNIK, 1996), Carinthia. Area of Stangnock and mountain Königsstuhl

(2,336 m) in the Nock Mountains, in particular the area north of mountain Stangnock, approx. 2 km northeast of Karlbach and 6 km northwest of Turracher Höhe.

**Type section:** North of mountain Stangnock with exposures covering more than 300 m of the complete section; N 46°56'12" / E 13°47'50".

**Reference section(s):** -

**Derivation of name:** After the mountain Stangnock (2,316 m).

**Synonyms:** Anthrazitformation der Stangalpe; Oberkarbon der Stangalpe; Stangalm-Karbon; Königstuhl-Turracher-Karbon; Königstuhlkarbon; Turracher Karbon (cf. KRÄINER, 1989: p. 566).

**Lithology:** At the base coarse to fine-grained molasse-type sediments of a braided river network composed of quartz-rich polymict conglomerates, sandstones and arenaceous shales.

**Fossils:** Speciose flora (see FRITZ et al., 1990: p. 154–166).

**Origin, facies:** Intermontane molasse deposit containing abundant plant remains. The basal part grades upward into a gravel-sandstone facies of a meandering river system. In this sequence in the surroundings of Turracher Höhe meter-thick coal seams occur suggesting an overall humid climate.

**Chronostratigraphic age:** Kasimovian–Gzhelian (Stephanian), Pennsylvanian, upper Carboniferous.

**Biostratigraphy:** *Odontopteris cantabrica*–*Sphenophyllum angustifolium* Zone (Kasimovian–Gzhelian).

**Thickness:** > 400 m.

**Lithostratigraphically higher rank unit:** -

**Lithostratigraphic subdivision:** -

**Underlying unit(s):** Lower Paleozoic Series of the Stolzalpen Nappe (not shown in the ASC 2004).

**Overlying unit(s):** Werchzirm Formation.

**Lateral unit(s):** -

**Geographic distribution:** In the Gurktal Alps between Turracher Höhe and Flattnitz in the east and the area around the village of Innerkrams in the west.

**Remarks:** -

**Complementary references:** -

### „Oberkarbon von St. Paul“ / Upper Carboniferous of St. Paul

HANS P. SCHÖNLAUB

**Validity:** Invalid (THIEDIG & KLUSMANN, 1974: p. 81; THIEDIG et al., 1975: p. 271).

**Type area:** ÖK50-UTM, map sheet 4109 Sankt Paul im Lavanttal (ÖK50-BMN, map sheet 205 Sankt Paul im Lavanttal), Carinthia (KLEINSCHMIDT et al., 1989).

**Type section:** -

**Reference section(s):** -

Remarks: The Carboniferous sequence is exposed in two small outcrops southeast of St. Paul some 500 m east of the church of St. Josef and 200 m northwest of the farmhouse Pum.

**Derivation of name:** Named after the village of St. Paul east of Völkermarkt in the Lavant Valley.

**Synonyms:** -

**Lithology:** Soft greyish shales, greywackes and arkosic shales.

**Fossils:** Plants (*Sphenophyllum angustifolium*, *Aphlebia elongata*, *Pseudomariopteris busqueti* and others; FRITZ et al., 1990).

**Origin, facies:** Molasse-type sedimentation.

**Chronostratigraphic age:** Gzhelian (Stephanian)–Asselian.

**Biostratigraphy:** Based on plant fossils.

**Thickness:** Unknown.

**Lithostratigraphically higher rank unit:** -

**Lithostratigraphic subdivision:** -

**Underlying unit(s):** Magdalensberg Group, Gurktal Quartzphyllite Complex (tectonic contact).

**Overlying unit(s):** Werchzirm Formation.

**Lateral unit(s):** -

**Geographic distribution:** Small isolated outcrops between St. Paul and the town of St. Veit in eastern Carinthia.

**Remarks:** -

**Complementary references:** -

### Werchzirm-Formation / Werchzirm Formation

HANS P. SCHÖNLAUB

**Validity:** Invalid; the term was introduced by SCHWINNER (1931, 1932) at the northwestern margin of the Gurktal Nappe System of Styria.

**Type area:** ÖK50-UTM, map sheet 3106 Radenthein (ÖK50-BMN, map sheet 183 Radenthein): Werchzirbenalm (“Roter Rain”) some 3 km west of the village of Turrach, Styria.

**Type section:** Northeast directed crest along “Roter Rain” to “Werchzirmkessel”. The best outcrops are located between altitudes 2,000 m and 1,950 m (N 46°57'00" / E 13°49'23").

**Reference section(s):** Another section runs along the crest between the mountains Königstuhl and Karlnock west of Turracher Höhe overlying the Stangnock-Formation (SCHWINNER, 1938; KRÄINER, 1987b).

**Derivation of name:** After Werchzirmalm (today named “Werchzirbenalm”) west of the village of Turrach (Styria).

**Synonyms:** Werchzirmschichten, Freudenberger Schichten, Christofbergschichten, Postvariszische Transgressionsserien, Kontinentaldetritisches Perm (cf. KRÄINER, 1984: p. 169, 1987b: p. 52).

**Lithology:** Red siltstones, mudstones and sandstones with interbedded polymict conglomerates and fanglomerates (Red Beds).

**Fossils:** Plant remains.

**Origin, facies:** Debris flows alternating with playa-like sediments (caliche crusts, algal layers) and rhyolitic pyroclastics in the upper part (tuffs and tuffites) suggesting a semiarid and arid climate.

**Chronostratigraphic age:** Asselian.

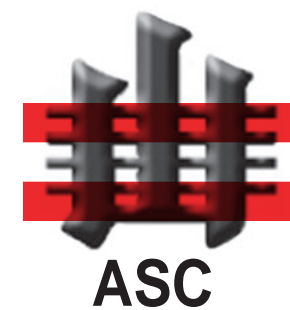
**Biostratigraphy:** Based on plant occurrences at several localities at Christofberg, Ulrichsberg and the surround-



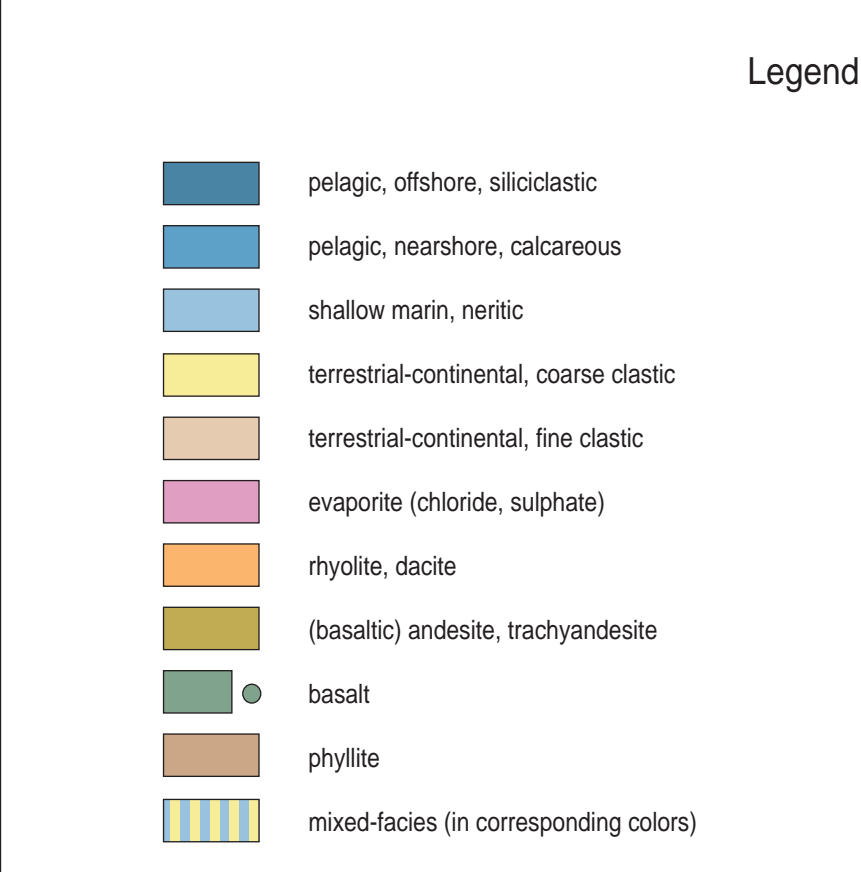
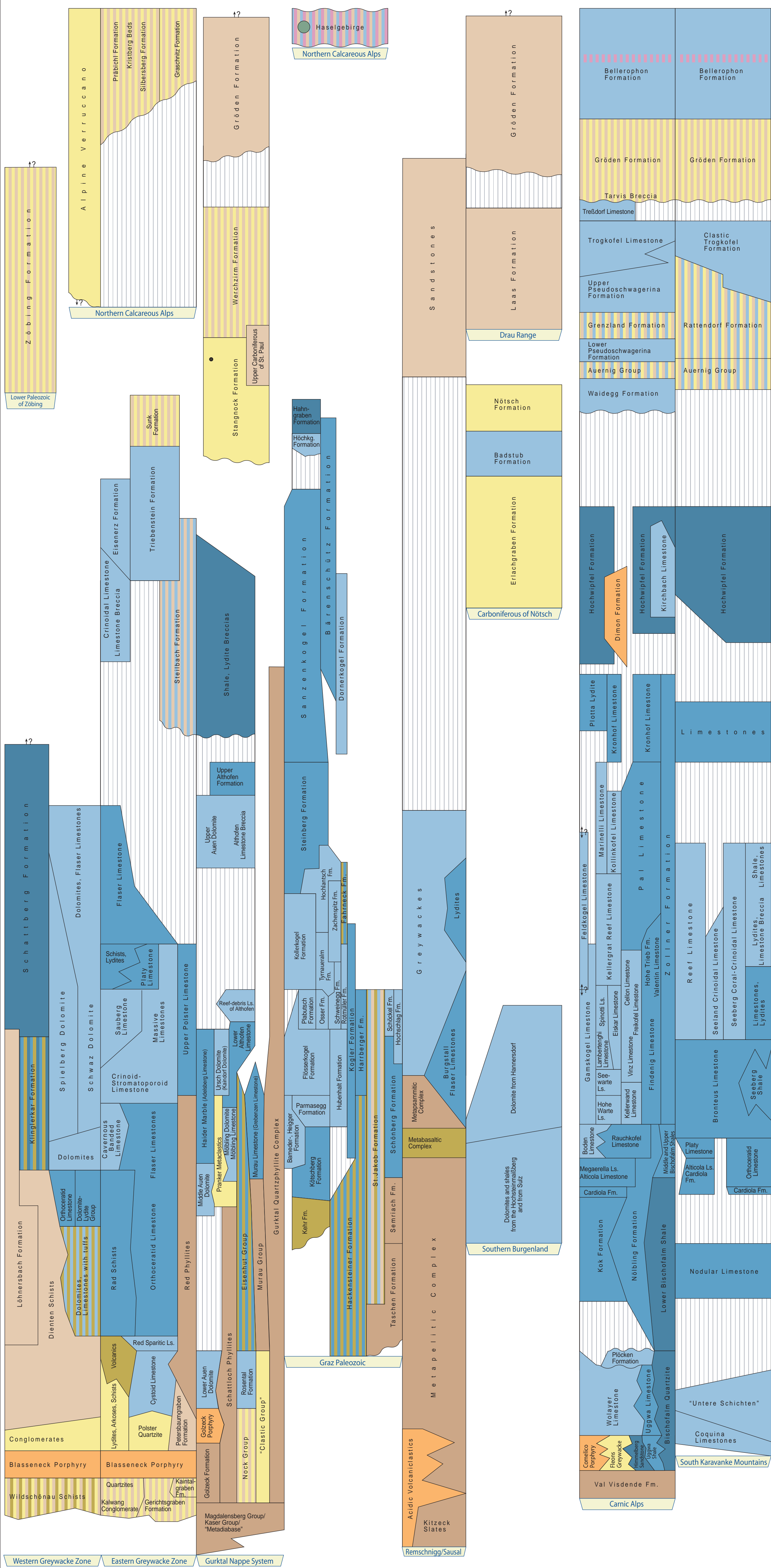
# Austrian Stratigraphic Chart 2004 - Paleozoic

(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 / Dorashamian	251	PERMIAN	MID PERMIAN / GUADALUPIAN / LOPINGIAN				
		WUCHIAPINGIAN / Dzhulfian	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						
		DEVONIAN	LOWER DEVONIAN	EMSIAN	370				
				LOCHKOVIAN	375				
		PERMIAN	DEVONIAN	LUDFORDIAN / GORSTIAN	380			DEVONIAN	MIDDLE DEVONIAN
				HOMERIAN / SHEINWOOD	385				
				TELYCHIAN	390				
				AERONIAN	395				
RHUDDANIAN	400								
DEVONIAN	LOWER DEVONIAN			PRAGIAN	405				
				LOCHKOVIAN	410				
PERMIAN	DEVONIAN			WEN-LOCK / LOW	415	DEVONIAN	LOWER DEVONIAN		
				HIRNANTIAN	420				
				LLANDOVERY	425				
		AERONIAN	430						
		RHUDDANIAN	435						
		DEVONIAN	LOWER DEVONIAN	PRAGIAN	440				
				LOCHKOVIAN	445				
		PERMIAN	DEVONIAN	WEN-LOCK / LOW	450			DEVONIAN	UPPER ORDOVICIAN
				LLANDOVERY	455				
				AERONIAN	460				
RHUDDANIAN	465								
DEVONIAN	LOWER DEVONIAN			PRAGIAN	470				
				LOCHKOVIAN	475				
PERMIAN	DEVONIAN			WEN-LOCK / LOW	480	DEVONIAN	MIDDLE ORDOVICIAN		
				LLANDOVERY	485				
				AERONIAN	490				
				RHUDDANIAN	495				
		DEVONIAN	LOWER DEVONIAN	PRAGIAN	500				
				LOCHKOVIAN	505				
		PERMIAN	DEVONIAN	WEN-LOCK / LOW	510			DEVONIAN	LOWER ORDOVICIAN
				LLANDOVERY	515				
				AERONIAN	520				
				RHUDDANIAN	525				
DEVONIAN	LOWER DEVONIAN			PRAGIAN	530				
				LOCHKOVIAN	535				
PERMIAN	DEVONIAN			WEN-LOCK / LOW	540	DEVONIAN	UPPER CAMBRIAN		
				LLANDOVERY	545				
				AERONIAN	550				
				RHUDDANIAN	555				
		DEVONIAN	LOWER DEVONIAN	PRAGIAN	560				
				LOCHKOVIAN	565				
		PERMIAN	DEVONIAN	WEN-LOCK / LOW	570			DEVONIAN	MIDDLE CAMBRIAN
				LLANDOVERY	575				
				AERONIAN	580				
				RHUDDANIAN	585				
DEVONIAN	LOWER DEVONIAN			PRAGIAN	590				
				LOCHKOVIAN	595				
PERMIAN	DEVONIAN			WEN-LOCK / LOW	600	DEVONIAN	LOWER CAMBRIAN		
				LLANDOVERY	605				
				AERONIAN	610				
				RHUDDANIAN	615				
		DEVONIAN	LOWER DEVONIAN	PRAGIAN	620				
				LOCHKOVIAN	625				



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Cutout and English adaptation of the "Die Stratigraphische Tabelle von Österreich 2004": Geological Survey of Austria

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