

THE FREYENSTEIN SUBORDINATED FAULT SYSTEM – SHEAR ZONE AND FAULT DEVELOPMENT ALONG THE SOUTH BOHEMIAN BATHOLITH (AUSTRIA)

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This work describes the ~ 500 m thick ductile Freyenstein Shear Zone and brittle Freyenstein Fault at the border between the South Bohemian Batholith (SBB) and the Moldanubian Nappes (MN). The area is built up by granites of Weinsberg-type (WBG), which are interlayered by numerous dikes (fine- to medium-grained granites, aplitic dikes, fine-grained granodiorites and pegmatites) and paragneisses of the Ostrong Nappe System.

The Freyenstein Shear Zone is a ductile crustal-scale amphibolite-greenschist facies shear zone at the eastern edge of the SBB. The mylonitic foliation is dipping to the SE with about 60°. Shear-sense criteria like clast geometries, SC' structures as well as microstructures (mica fishes, domino tilting) show normal faulting top to S/SW with steep (ca. 50°) angles. The Freyenstein Shear Zone records a polyphase history of deformation and crystallization: Mylonitized mineral assemblages in deformed granitoides, which consist of pre- to syntectonic muscovite-porphyroclasts and biotite as well as dynamically recrystallized potassium feldspar, plagioclase and quartz, can be observed. The lack of syntectonic chlorite crystals points to metamorphic conditions of lower amphibolite-facies. In a later stage fluid infiltration under lower greenschist-facies conditions locally lead to sericitization of feldspar and syn-mylonitic chloritisation of biotite. The shear zone is reactivated as brittle/ductile NE-SW striking normal fault with top to the north sense of shear (at about 30°) and locally sinistral strike-slip.

The Freyenstein Shear Zone belongs to a system of shear zones and faults in the Moldanubian Superunit and is located at the border between the SBB and MN ductily deforming both. Therefore, it plays an important role in exhumation processes of last stage SBB (synkinematic) intrusions during orogenic extension. Rb/Sr biotite ages in the WBG indicate late Variscan cooling ages (Pennsylvanian) along the shear zone.