

	Test	Method	Sample Size [g]	Grain Size [mm]		
Material and Ore Characterization	Determination of bulk density	Stamp volumeter, Erweka SVM202 Alpiger screen, 1 m diameter, ATS 600/ 2	dependent on maximum size up to 50.000	- 16 + 0,060 mm		
	Particle size distribution	Screen analysis tests sieves shakers , - UWL 400 Haver Boecker 600 x 600 mm screens (-100 + 8 mm) - Haver Boecker EML 200 mm screens (-6,3 + 0,04 mm)	test sieves	dependent on maximum size range		
		Manual Screen analysis dry (6300, ..., 200, 160, 100, 71, 40,) and wet (Ribaum system down to 25 µm.)	DIN ISO 3310 dry wet	500 500	-0,200 mm (- 1 mm) - 0,060 mm	
	breakage behaviour for intergrowth characterization	air jet screen, Hosokawa A 200	wet	50	- 0,040 mm	
		Lasergranulometry (Mastersizer 2000, Malvern)	wet	50	- 0,040 mm	
		Seedgraph III (Micromeritics 5120)	wet	10	- 0,040 mm	
		Andreasen Pipette	wet	200	- 0,040 mm	
		Sedimentation column; physical size fractions below 25 µm for chemical analysis	wet	1000	+ 0,005 - 0,100 mm	
		Hosokawa, centrifugal air classifier, type 100 MZR	dry			
		jaw crusher; Retsch BB 200			- 40 mm	
	Mineralogy	Material density	impact crusher, Hazemag 6286/60		- 40 mm	
		density distribution (sink float analysis)	laboratory rod mill (L:300 mm; D: 150 mm), rod charge: 7,5 kg; 1/2 Bond mill; batch tests	500 - 800		
		Determination of the susceptibility and susceptibility distribution / preparation of mineralogical investigation	laboratory ball mill, torque rod for energy measurement; 200 mm x 200 mm, ball charge 6,5 kg		800 - 1000	feed 100% - 3,15 minimum product: 100% - 45 µm
			OCS method (development of the Institute of Mineral Processing, Prof. H.J. Steiner) stage wise energy "Optimized Comminution Sequence", (minimum energy expenditure to obtain a comminution product of a defined maximum size); reproducible, only material dependent particle size distributions results: natural breakage characteristic (material dependent "sleepast" size distribution), calculated work index, Energy vs. Specific surface development (Rittinger grindability Index), particle shape factor, minimum size of comminution		usually 50.000 g; (- 40 mm) three stages consisting of 1) jaw crusher; 2) rod mill; 3) ball mill	
		Determination of the Kozeny surface	He-pycnometer (Akkupyk 1330)		50	up to 10 mm
pycnometer, buoyancy methods				depending on size	up to 100 mm	
(liquids: 1 g/cm³ up to 4,5 g/cm³)				100	- 15 mm - 1 mm	
Surface by gas adsorption		Davis Tube, Weida TRM		100	- 1 + 0,1 mm	
		Pick up method (dry susceptibility distribution test; maritic ores, Böhm 2000)		20 per size class	- 0,71 + 0,04 mm	
Chemistry in size classes		Frantz Isodynamic Separator, Frantz L-1 (in size classes between - 1 mm + 0,04 mm)		20	- 2 mm	
		Wet assay for Fe2+, Fe3+	Salmagan (outokumpu) Model 132, physical determination of magnetite content.	20	- 0,2 mm	
preparation of polished sections		Blaine apparatus		20	- 0,2 mm	
	Permian Outokumpu		20	- 2 mm		
	BET (porosity control), Floworb 2300 micromeritics, single point)		20	- 1 mm		
Microscopy of polished sections	XRF (20 elements), Institute of Analytical Chemistry, Montanuniversität (for acid soluble ores, without pressure digestion)		20			
	SEM EDX	Reflected light microscopy (Reichert Polyvar®)				
X-Ray Diffraction	Montanuniversität Leoben					
gemscan, data evaluation idiscover 3.1	XRd, Montanuniversität Leoben					
	cooperation with LK4B, Use of Qemscan equipment in Malmberget					

Table 2: Standard test procedures I: Ore characterization