

	Test	Method	Sample Size	Grain Size	
<b>grindability, Grinding Behavior</b>	<b>Energy controlled grinding tests (dry),</b> tumbling mills: Bond related tests, calculated work index	grinding values for material's characterization, confirmation and comparison (no guarantee) rod mill (100% < 6.3 to 100% < 1 mm; 0.2 mm; calculated work index) 0.3 x 0.15 m	[g]  5000 g/ 6 cycles	[mm]	
	difference to Bond: smaller mills: measurement of energy by torque rods	Laboratory ball mill (energy measurement by torque rod), surface development*)	8000 g/ 6 cycles		
	Elaboration of the surface development vs. Cumulative energy supplied	Laboratory ball mill especially used to find pelletizing fineness			
	<b>roller mills:</b>	VRM 200, see below, torque rod in the drive system	20.000 - 200.000 g		
		Zeisel tester	300 g/ 10 cycles	-1 + 0.7 mm feed	
	<b>roller mill VRM 200 CEMTEC</b> with energy measurement by torque rod, and 3 modes of operation: Koller Gang, classic roller mill with internal air classifier and bypass of coarse material of the classifier	roller mill, disc diameter 200 mm, average roller diameter 140 mm, 2 rolls, helical air classifier 160 mm diameter, (300 - 4000 rpm); additional option: bypass of classifier coarse material	20.000 - 200.000 g/h	- 0.02 - - 0.2 mm depending on settings of classifier	
	Energy values for mill design: in cooperation with suppliers				
	classic BOND tests, rod and ball mill in cooperation with CEMTEC	Work index for mill design; only useful in cooperation with a mill supplier; valid for mill design, apparatus and process guarantee only by equipment supplier			
	<b>Green Pelletizing Tests</b>	Pelletizing tests			
		Elaboration of optimum size distribution and water consumption			
Variation of binder dosage and additives		0.63 m diameter pelletizing disc or drum; adjustable speed	2.000 to 50.000	-0.2 mm	
Implementation of waste material					
Size distribution of Pellets					
Moisture content in size classes					
Drop test in size classes					
Compressive strength: green and dry in size classes		Load cell			
Porosity in size classes		Geopyk 1360 (Micromeritics®)			
Water saturation					
<b>Induration Tests</b>	Induration of dry pellets according to a temperature profile	Netzsch dilatometer (umaxel ("single particle induration") mini pellet pot; 2 kg pellets; temperature profile according to industrial plants, testing of binders and additives at varying temperatures, preparation of regular pot loads)			
	Compressive strength of indurated pellets	Load cell, force and speed controlled; maximum load 5000 N, messphysik			
		*) calculated means: derivation of Bond's index from measured energy values and size values. In Bond's methods energy is not measured but depends on the strict apparatus setup. Our mills are not strict Bond mills			

Table 3: Standard test procedures II: Grinding and agglomeration tests