

This supplement contains information for Chapter 5 Technology of the substance dossiers on gypsum, which was not included the main document due to limited space.

Gypsum is only mined at a few locations in Switzerland (SD chap. 3). The rock is mechanically crushed and ground.

Gypsum products are produced in various firing aggregates (Tab. 1). Rotary dryers, calciners or kettles are used to produce stucco.

Both plaster of paris and multiphase gypsum can be produced in carrier gas burning installations. In the first stage, the low-fire gypsum is fired (at 250 °C) and in a second the high-fire gypsum (500 °C)⁴. A multi-phase high-fire gypsum is also produced in grate furnaces, it is used for making plasters and mortars.

The recycling of gypsum from solid plaster and plasterboard should be possible with relatively little technical effort, whereas recovering gypsum from concrete, plasters and screeds would not be viable due to the expense and the high proportion of foreign substances (Tab. 2).

Tab. 1 Production method, Type of gypsum and Use of gypsum, as well as Bulk density and practical Heat requirement (6).

Production Method (aggregate)	Type of gypsum	Bulk density [kg/m ³]	Heat requirement [MJ/t]	Use for the production of
Rotary dryers	β hemihydrate (stucco)	1070	945	Building plaster, boards
Large kiln	β hemihydrate (stucco)	1133	808	Building plaster, boards
Grate furnaces	Multiphase gypsum (plaster of paris)	1225	1118	Gypsum dry mortar
Carrier gas burning installation	Multiphase gypsum	1300	950–1050	Gypsum dry mortar, boards

Tab. 2 Quality criteria for the use of FGD and recycled gypsum (13).

Quality parameters	defined as	Unit	Quality criteria	
			FGD gypsum	Recycled gypsum
Free moisture	H ₂ O	Weight %	<10	<10
Calcium sulphate dihydrate	CaSO ₄ · 2 H ₂ O	Weight %	>95	>80
Magnesium salts	water soluble MgO	Weight %	<0.10	<0.02
Sodium salts	water soluble Na ₂ O	Weight %	<0.06	<0.02
Potassium salts	water soluble K ₂ O	Weight %		<0.02
Chloride	Cl	Weight %	<0.01	<0.01
Calcium sulphate hemihydrate	CaSO ₄ · ½ H ₂ O	Weight %	<0.50	<0.50
pH			5–9	5–9
Colour		%	white ¹	white ¹
Odour			neutral	neutral
Toxic ingredients			harmless	harmless
Grain size		mm		<5

1) Depending on the use of the FGD gypsum and the respective finished products, there may be different colour values.