

A process for producing water-free aluminium oxide from aluminium hydroxide in a circulating fluidised bed comprising a fluidised bed reactor (8), separator (6) and return flow line involves the following steps: the aluminium hydroxide is fed into the gas-side second stage of a two-stage suspension pre-heater (2) operated by the waste gases from the fluidised bed reactor (8) of the circulating fluidised bed and at least partially dewatered; dewatered aluminium hydroxide from the second stage of the suspension pre-heater (2) is fed into the gas-side first stage of a suspension pre-heater (5) operated by the waste gases from the fluidised bed reactor (8) of the circulating fluidised bed, further dewatered and then fed into the circulating fluidised bed which is operated by oxygen-containing fluidisation gas (10) indirectly heated in a subsequent cooling stage by the aluminium oxide produced and by oxygen-containing directly heated secondary gas (11) fed in at a higher level. The temperature in the circulating fluidised bed is set at between 850 and 1000 °C. The aluminium oxide removed from the circulating fluidised bed is mixed for at least two minutes with 10 to 25 wt.% of the partially dewatered aluminium hydroxide yielded by the solid-side first stage of the suspension pre-heater (2) and led past the circulating fluidised bed as a by-pass. The mixed material is then cooled in a multistage suspension cooler (15, 16, 17, 18, 19, 20), heating secondary gas (11), and then in the fluidised bed cooler (23), indirectly heating fluidisation gas (10).

