

The present invention provides a process for sintering granular mineral solids, particularly for sintering limestone or dolomite in a parallel vertical furnace (3). The furnace has at least two vertical channels (1)(2) in communication with each other through an overflow channel (19), and alternatively operated in a burning channel and a regenerative waste gas channel by switching the gas stream flowing therein. The pressure in the loading opening (37) region is reduced to atmospheric pressure for the waste gas is sucked out at a higher efficiency over a short time so that a new supply of mineral solids can be supplied after the completion of a time consuming gas switching operation (during which time no pressure is developed in the furnace channel). Furthermore, such a construction can prevent waste gas from flowing out through the loading opening (37). Thus, granular solids can be supplied a number of times in a burning channel. As a result, the temperature of waste gas rises slower, the burning time is longer, and the furnace efficiency is relatively higher.