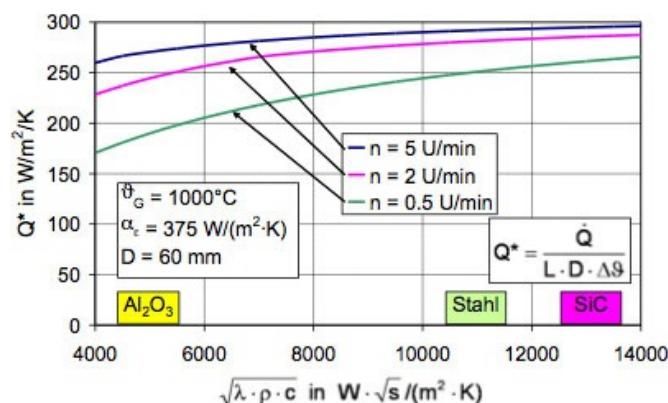


## Simulation of Heat Transfer and Material Heating in Roller Kilns

The heat transfer from the gas to the well at the top and bottom in roller kilns is different (the reason is the feed rollers). To set conditions for an evening of good heating, the heat transfer to the top and bottom must be predictable.

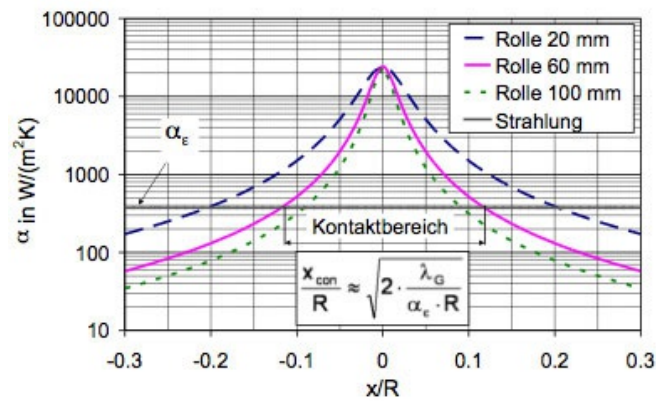
For the contact heat transfer roll - Good, a mathematical model was created. In this contact area it is possible that occur a heat transfer coefficient to  $30,000 \text{ W} / (\text{m}^2 \cdot \text{K})$ .

These values were verified with a pilot plant, in which the heat transfer was measured through a transport roller with electric internal heating and a continuously revolving metal strip by means of infrared thermography. For the heat transfer via the transport roller, a simplified mathematical model was developed, which this can be represented as a function of the rotational speed, material properties, the diameter and the wall thickness. Accordingly, the transport rollers impede the transfer of heat in ceramic. Good. For metallic materials, the heat transfer to the bottom is higher than on the top.



Von der Rolle übertragener Wärmestrom  
in Abhängigkeit vom Wärmeeindringkoeffizienten

For the heat transfer by radiation, the influence of the roll gap, the furnace height, said top arch, the distance of the burner a good width is examined. Based on the results criteria are developed for equalizing the good heating.



Wärmeübergangskoeffizient im Kontaktbereich

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#### Dynamic Simulation of Heat Treatment Processes

- Rotary Kilns
- Shaft Kilns
- Tunnel Kilns
- Roller Kilns
- Combustion Processes
- Measurement of thermophysical Material Properties
- Intensive Cooling
- Drying Processes