(64) Production of green and burnt pellets with high strength and testing in a blast furnace simulator

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]) a) Green pellets get their strength by rolling pressure and capillary forces between the particles. In this case the size and form of the particles are important; it was found that even particles with the same amount of fines - but different morphology of the ores - had different crushing and abrasion behaviour.

b) Binders raise the strength of agglomerates, but lower the content of iron; one exception is iron ore in a prereduced status. This addition forms bridges while storing. Pellets can reach by this e.g. a crushing strength more than 20 kg/pellet, (see fig.])

2) a) Burnt pellets get their strength by oxidation, recristallisation or by slag formation. By addition of preburned material higher strength (crushing and abrasion) could be reached by lower burning temperature.

b) By adding of prereduced material a crushing strength higher e.g. than 450 kg/pellet was possible, (see fig. 2)

3) The strength of pellets is important for transportation, but often pellets with high strength show under special reduction conditions a large loss of strength and a swelling appears.
In a blast-furnace-simulator of our Institute in Aachen (with changing temperatures, gas mixtures and pressures like a blast furnace) eg. the same pellet sort showed a normal behaviour and under modified conditions (like another blast furnace) showed needle formation of the reduced iron and swelling.

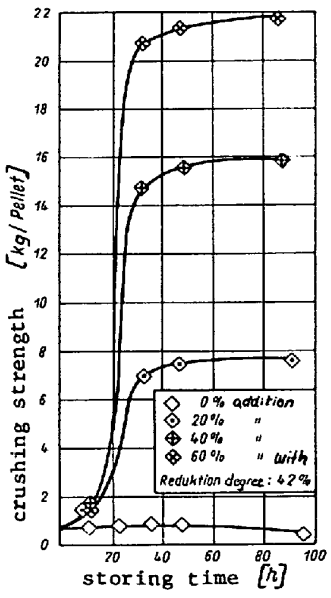
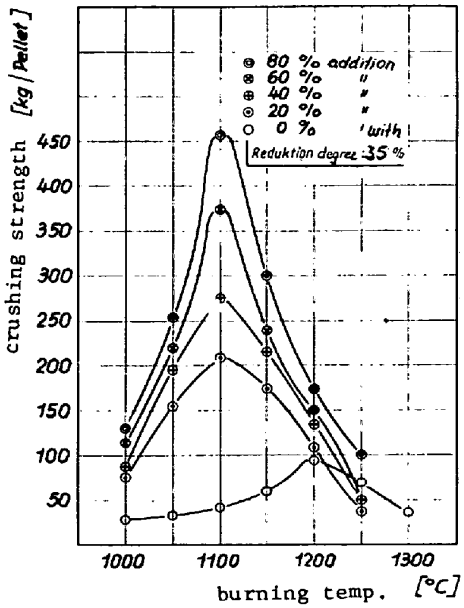


Fig.]) Influence of storing time on crushing strength of Sydvaranger green-pellets with addition of prereduced material



z Fig. 2) Influence of burning temperature on crushing strength of burnt Labrador pellets with addition of prereduced material