PROCESSING OF LOW RANK COALS FOR VARIOUS APPLICATIONS

*Dr. Roland Aeckersberg, Gerhard Salewski, Silke Schlegel
Loesche GmbH
Hansaallee 243, 40549 Düsseldorf, Germany

Abstract:

The high moisture content in low rank coals (LRC) usually entails a local utilization in a mine-mouth power plant [1, 2]. For other applications these coals must be dried to reduce transport costs and thus increase the calorific value but with the hazard of spontaneous combustion. Different upgrading technologies with various approaches were developed but the typically drying process in the industry is done in a steam tube dryer with crushed low rank coals and a mandatory steam generation from a power plant. [1, 2, 3, 4]

A new developed and patented upgrading technology for LRC by Loesche GmbH is based on the simultaneous grinding and drying process of the raw coal, where the required energy for the drying process in the mill is generated in a coal dust fired hot gas generator [5]. Due to the comminution of the raw coal new surface areas are exposed which leads to a possible residue moisture content of below 10 m.-% even for LRC with a feed moisture of above 50 m.%. Besides the drying the gas flow also transports the coal dust to the bag house filter where it is separated from the gas. A part of of the gas is recirculated to the hot gas generator for inerting the grinding process. The fuel for the hot gas generator is produced by separating the fines from a part of the pulverized coal in a downstream classifier and the coarser material is again combined with the remaining coal dust in a silo. For transport purposes the pulverized coal may be briquetted e.g. on a double roller press to reduce its tendency to spontaneous combustion with the benefit of an increased energy density.

This upgrading process by Loesche enables the utilisation of LRC next to the mine for various applications without the high demand of different operating supplies. Presently Loesche GmbH has verified the functional capability of the upgrading process with different LRC in test center scale and is designing a demo plant with a capacity of 7 tons per hour.

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* Corresponding author:
e-mail: roland.aeckersberg@loesche.de
Tel: +49 211 5353265, fax. +49 211 53535265