Coal dust in greensand moulding

Why use coal dust?
1. To prevent sand burn-on and thus impart good surface finish to the casting.
2. To aid separation of sand and casting at knockout.
3. To lessen the incidence of expansion defects such as 'rat-tailing' and screeching.

What quality standards apply to coal dust?
Volatile matter: Good surface finish on castings obtained by the use of coal dust depends on a high volatile matter content. Coal dust for foundry use generally has a minimum of 30 per cent volatile matter.
Ash content: The ash content of foundry coal dust should not exceed approximately 10 per cent.
Sulphur content: Pick-up of sulphur by the metal at the mould face from coal dust of high sulphur content can cause defects. The sulphur content of foundry coal dust should therefore be restricted to about 1-0 per cent maximum.

Grading: There is an approximate relationship between average section thickness of the castings produced in a foundry and the grade of coal dust which should be used. It is essential that as the thickness of the casting increases the duration of the stage during which volatile matter is being evolved from the coal dust should be prolonged by increasing particle size. On the other hand, if the coal dust in sand for thin section castings contains large particles these can act as localised areas high in gas content and give a pitted surface.

How much coal dust should be added?
The proportion by weight of coal dust required in greensand varies from 2 to 3 per cent for very small castings and 7 to 8 per cent for heavy work, although higher levels are sometimes used in special cases. Optimum control levels of coal dust should be established by trial. Coal dust additions should be weighed or metered.

Effects of adding too much coal dust
If too much coal dust is added to a moulding sand, the casting may have the following defects:
- Crazed surfaces
- Gas holes
- Rounded edges and mis-run
- Santa Fe (Spotted Fail)

When any of these defects are encountered, the advisability of reducing the amount of coal dust added should be considered.

All build-up of coal dust in the sand can sometimes be detected by the appearance of a blue skin on the casting. A decrease in permeability and an increase in moisture requirement of the sand both point to excess coal dust.

Additions of coal dust to sodium silicate-bonded sands
An addition of 2-3 per cent may be made to assist in the breakdown at knockout. There is, however, a tendency for the mould to become friable if it is over-gassed.

Defective section cut from a brake drum casting. The defects were associated with coarse particles of coal dust. The coarse particles taken from the coal dust are also shown.

Sigue el defecto, o dálm, tenden def-teo, o def-dito está asociado as particulas grossas del pre-te. Comiendo, también se ha encontrado, as particulas responsables de defecto.
As unhas do dedo carvoeiro continuam, que e condado

Rodeu o castelo, fez-se notar, que o condado

Storage of coal dust

The material must be dried to prevent the risk of spontaneous combustion. Large stockpiles are undesirable and should be dispersed on the ground. The coal dust must be dried before it is to be stored in a dustbin or similar facility. See the safety data sheet on the coal dust supplied.

Recommended further reading


Blast furnace operators must ensure that the dust content of the mould and sand is within the acceptable limits. See the safety data sheet on the coal dust supplied.