

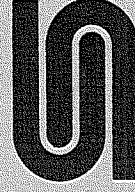
**TEESSIDE LABORATORIES**

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**Measurement of Download on A Belt Feeder Situated  
Beneath A 30 m<sup>3</sup> Capacity Mass Flow Bunker**

British Steel Corporation

Research Organisation



## 7. CONCLUSIONS

The following conclusions apply to a mass flow bunker having an extractive belt feeder positioned directly beneath the outlet. They probably apply in principle to bunkers having other types of extractive feeders.

- (1) The static download will not exceed approximately:  $0.4 \times$  weight of vertical column of bulk solid directly above outlet.
- (2) As the quantity of bulk solid in the bunker increases the static download eventually reaches an asymptotic value. As a rough guide, this will not exceed the vertical force exerted by a column of bulk solid directly above the outlet, the height of which is equal to  $(4.5 \times$  average outlet dimension $^*)$ . If the outlet is only just large enough to give mass flow the asymptotic value will be less than the above figure.
- (3) The dynamic download is about half to a quarter of the static download.
- (4) Under running conditions the coefficient of internal friction " $\mu$ " of a bulk solid in the shear area has a value of approximately 0.4-0.6, the higher value applying to bulk solids consisting largely of coarse particles.
- (5) The power required to drive an extractive belt feeder at a given discharge rate can be reduced by increasing the bed depth (thus allowing a reduction in belt speed) and by reducing the download (e.g. by fitting an impact breaker inside the bunker or by inserting angled chuting between the bunker outlet and the feeder).

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\*Defined in Appendix 3