



Technical Article

A Review of Hopper Discharge Aids

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If a hopper is performing unsatisfactorily it is not uncommon for engineers to look to a proprietary discharge aid to help solve their problems. However, without any previous experience to fall back on he is faced with the problem of which device, from the wide range of proprietary aids currently available, will best suit his needs? Therefore, the purpose of this paper is not only to introduce some of the more commonly used devices but also to give the reader an indication as to their advantages and limitations. Hopefully, this will give the engineer a better basis for the selection of such aids

1. Introduction.

The hopper is one of the most important items of equipment in any bulk materials installation, since the repercussions of a poorly flowing hopper can be widespread throughout the rest of the plant as a whole. If a hopper is performing unsatisfactorily it is not uncommon for engineers to look to a proprietary discharge aid to help solve their problems. However, without any previous experience to fall back on he is faced with the problem of which device, from the bewildering range of proprietary aids currently available [1], will best suit his needs? Unfortunately, whilst gravity flow hoppers can be designed on a scientific basis, insufficient research has been carried out to date to say the same for hoppers incorporating discharge aids.

The present situation is that whilst research at the Bulk Solids Handling Unit at Thames Polytechnic, Materials Handling Division of Warren Spring Laboratory and other institutions throughout the world have provided an improved understanding of the operating mechanism of various proprietary devices, a unified approach to the design of hoppers incorporating discharge aids has still to be developed. Under such circumstances it is then clear that the use of such aids is, at present, a matter of selection based on good Judgement rather than design.

Consequently, the purpose of this paper is not only to introduce some of the more commonly used devices but also to give the reader an indication as to their advantages and limitations. Hopefully, this will then give the reader a better basis for the selection of such aids.