The Safety Factor in Drying Equipment

By L. R. CHRISTIE

Problems in Artificial Drying Which Are Met by the Equipment Manufacturer

THE natural tendency of materials to dry deceives many people in the belief that drying is a very simple problem. Consequently, it often happens in designing plants, that this process is given minor consideration although it may be the element which causes the success or failure of a manufacturing plant.

When nature's slow processes are depended upon, many materials go through a period of putrefaction during which the valuable characters are destroyed. On the other hand, if you try to hasten the drying process too much the desirable qualities are equally destroyed and again oxidation may destroy the valuable properties of some materials. There are several other conditions which may effect the product and it is therefore important that a careful study be made of the requirements before deciding as to the method of applying heat to accelerate drying. Heat is absolutely necessary, notwithstanding the frequently expressed opinion that drying can be done without heat if sufficient air is applied.

In the edible oil field the principal drying problem—more properly termed rejuvenating—is the recovery of the filtering medium, which is generally in the nature of an infusorial earth. This material is extremely light and dusty and the finer particles are the more valuable. If a strong current of air is passed through this material the fine particles are naturally carried away by the draft and almost impossible of recovery. For this reason, a rotary dryer has been developed which is substantially a rotary boiler in that it evaporates and removes moisture by direct evaporation without the use of any air to absorb or carry the moisture away, the process being continuous in operation. This same machine can also be used for burning out carbonaceous matter of decomposing compounds which may be accomplished by high temperatures. The fact that no air passes through the drying material, there is no medium for carrying away dust.

There are frequently by-products in this industry in the nature of spent grains, seeds, etc., some of which are very valuable if not excessively heated or oxidized. We have found that these materials, as a rule, will withstand fairly high temperatures while wet, provided these temperatures are transferred with sufficient rapidity to the wet material so as to modify the temperature as applied to the nearly dry material. For these conditions, a machine has been developed wherein the relatively high temperatures are first indirectly applied to the wet material by means of a flue having exceptionally large heating surface. After the heating medium has passed through this flue, it comes in direct contact with the nearly dried material flowing in a counter direction to it, so the result is that only dry gases come

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