CHAPTER - 1

INTRODUCTION

In recent years the Foundry Industry has been showing an increasing awareness in reclaiming sands used in moulding and core making processes. Even though many new materials and techniques have been developed in recent decades in moulding and core making processes, Silica sand still remains as the most important raw material for moulding and core making in foundries. Although sand is one of the most abundant materials, we all know that the industry's demand for quality castings often necessitates the use of those types of sand which are not locally available. In fact even the best available sand in nature may need some degree of processing before it can be used for certain applications. With the increasing demands of quality, many foundries have insisted on properly classified sand and are prepared to pay premium prices as well as high transportation costs, so as to ensure the availability of the ideal moulding sand mix. Dumping of old sand is difficult and expensive due to government environmental regulations.

Recycling and reuse of sand has therefore become an economic necessity, and this has been practiced over a long time. In general, foundries use two types of binders, namely regenerative type and non regenerative type. Foundries that use the bentonite type of bonding agent regenerate the sand by adding make up ingredients as required and remulling them. On the other hand, foundries which use non regenerative type of binders have to remove residual product of the binder from the sand grains before adding fresh binder for reusing the same sand.
Foundries which use non regenerative type chemical binders are faced with the problem of disposing large quantities of used sand. These foundries generally use organic chemical binders. Various reclamation methods have been developed to prepare the sand for reuse. However, foundries that use non-regenerative type of binder with inorganic chemicals like sodium silicate the reclamation process has not yet been developed to the satisfaction of the foundries. Hence in the present scenario, the reclamation of the CO₂-sodium silicate bonded sand in an economical way will answer an urgent need, because using the waste sand from the CO₂ process as a raw material in green sand moulding still seems to be a mystery for foundrymen.

The data on reclamation and reuse of CO₂ sand is virtually negligible. In order to fill the serious lacuna, the present detailed investigation was carried out on reclamation of CO₂-sodium silicate bonded sand by chemical method, wet method, pneumatic method, horizontal centrifugal scrubbing as well as combined reclamation and reuse sand in CO₂ moulding and green sand moulding.