CHAPTER 1

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Among the materials used in foundries, sand for moulding remains an essential raw material inspite of the many developments that have taken place in recent decades in moulding processes. Chemically bonded sands are being used to replace traditional methods for the production of automotive and general engineering castings. With the increasing tendency in foundry industry, to shift from traditional binders such as clay to synthetic resins, it is recognized that the utilization of sand reclamation will play an increasingly important role in reducing foundry costs and increasing profitability.

The growing use of chemically bonded sand for moulds, where reuse of sand is not possible in the same manner as in green sand systems, has made sand reclamation a virtual necessity. The effects of environmental legislation and waste disposal legislation, together with the increasing cost of disposing of sand and other wastes arising in the foundry, have resulted in universal adoption of sand reclamation in foundries.

So in recent years the foundry industry has been showing an increasing interest in reclaiming sands used in moulding process. It is especially important to the sand bonded by various chemical binders such as sodium silicate, resins, where the base sand needs to be relatively pure and homogenous in order to achieve predictable setting times and strength properties.

Though many reclamation processes have been developed the reclamation of CO$_2$ / sodium silicate bonded sands seems to be more difficult than other sands. When
considering sodium silicate sands, the problem of binder residue becomes more pronounced. Sodium silicate remains on the surface of the reclaimed sand grains and acts as a nucleant for new water glass leading to premature hardening of the sand. A thorough cleaning of CO$_2$/sodium silicate bonded sands is therefore important.

A detailed investigation therefore was carried out on reclamation of CO$_2$/sodium silicate bonded sand by a combination of thermal and pneumatic method of reclamation called thermo pneumatic reclamation by employing a fluidized bed and a scrubber.