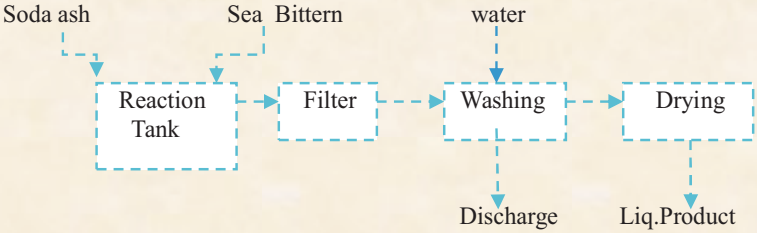
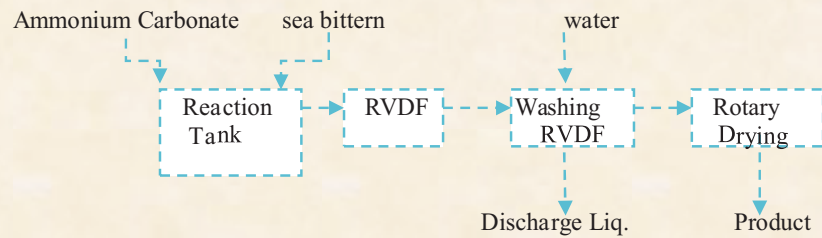
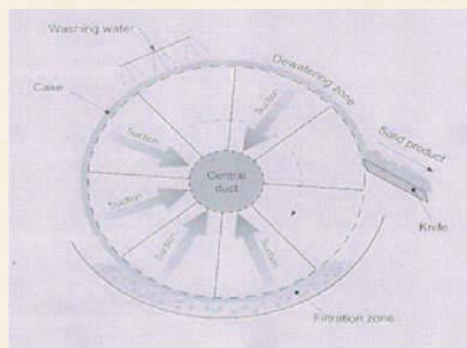


Intervening Technology/Technique	Novel Process for Manufacturing of Magnesium Carbonate
About the industry	M/s. Hariom Fine Chem is a chemical manufacturing company based at Bhavnagar, Gujarat, India. The company is engaged in manufacturing and exporting Light Magnesium Carbonate.
Implemented Techniques/Technology	<p>Before</p>  $\begin{array}{ccccccc} \text{MgCl}_2 & + & (\text{NH}_4)_2\text{CO}_3 & \rightarrow & \text{MgCO}_3 & + & 2\text{NH}_4\text{Cl} \\ 95.1 & + & 96 & & 84.3 & + & 106.8 \end{array}$ <ul style="list-style-type: none"> • Magnesium Carbonate was manufactured by reaction of sea bittern (MgCl₂) with Soda Ash (Na₂CO₃) in reaction tank. Practically 1.3 MT of soda ash was consumed to produce 1 MT of magnesium carbonate. Market price of soda ash around Rs. 24000 was consumed to produce 1 MT of magnesium carbonate. • Magnesium Carbonate was filtered and washed by the Filter press. The cake was discharged from filter press and sun dried in open space. Here, the wash water required in very large quantity and around 6 labours required in each shift to unload filter press and take material from the plant to open space for drying. Labour charge was around Rs. 1200/ MT of magnesium carbonate. • Material was kept in ground for 5-6 days in summer and 9-10 days in winter for drying. Labour charge for sun drying was around Rs. 800/ MT of magnesium carbonate. After drying the cake was pulverized up to certain mesh size and then packed for dispatched. • 10-15% of free moisture content was there in sun dried material, so it has to be further dried in tray dryers. 4 labours per shift required for load and unload the tray dryer. Labour charge was around Rs. 800/ MT of magnesium carbonate.

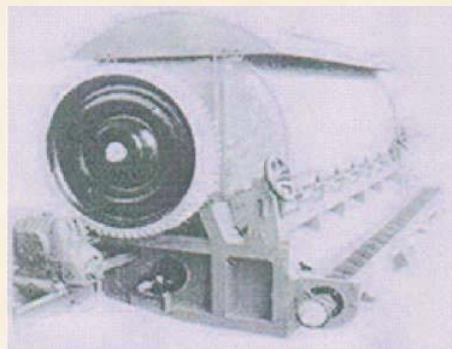


After

- Magnesium Carbonate is manufactured by reaction of sea bittern ($MgCl_2$) with ammonium carbonate in reaction tank. Magnesium carbonate is filtered and washed by the Rotary Vacuum Drum Filter (RVDF). It consist of a drum rotating in a tub where liquid to be filtered. High solids and liquids that would blind or block other forms of filter. The liquid to be filtered is sent to the tub below drum. The drum rotates through the liquid and vacuum sucks liquid and solid on the drum. Liquid portion is sucked by the vacuum in the filter media to internal portion of the drum and pumped away filtrate. The solids adhere outside of the drum is passes to the knife where, it is cutting and discharging to conveyer. The same process is continued further.



- RVDF is continuous and automatic operation, so operating cost is low around Rs. 200/ MT of magnesium carbonate. One operator per shift can handle it. The variation in rotating speed of the drum can be use to control cake thickness.



	<ul style="list-style-type: none"> • Now, the cake is discharge to RVDF and dried in Rotary Drum Dryer is basically conduction dryer. Wet feed film in liquid or paste form is applied to rotating metal cylinder where heating medium (steam) is supplied. Material film dries to the final moisture level and is scrap off to screw conveyor by blades at other end. • Material obtained is in small granular form, so it is easy to pulverize it. Uniform drying due to uniform application of film, consisting quality obtained. Very high thermal efficiency due to that less energy per kg of product required. One operator per shift is required to handle equipment and operating cost is around Rs. 200/ MT of magnesium carbonate. 	
Benefits	Before CP	After CP
<i>Economical</i>	<ul style="list-style-type: none"> • Due to high price of soda ash raw material cost becomes high. • Around 6 labours were required per shift and operating cost was Rs. 1200/ MT for Filter Press. • Labour charge for sun drying to tray dryer was Rs. 800/ MT. 	<ul style="list-style-type: none"> • Due to low price of ammonium carbonate raw material cost becomes low. • Only one operator required per shift can handle the equipment and operating cost is around Rs. 200/ MT for RVDF. • Labour charge for sun drying to Rotary drum dryer is Rs. 200/ MT.

