

# Technical Article Series

Vibratory screen separators increase efficiency and minimize downtime in the regeneration of fixed catalyst beds.

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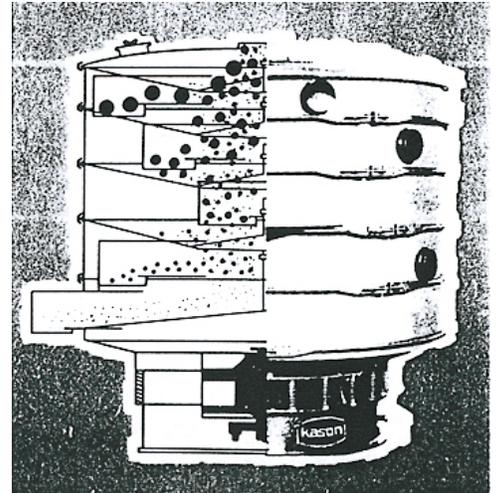
# Vibrating Screen Separators Increase Efficiency and Minimize Down Time in Regeneration of Fixed Catalyst Beds

## REGENERATING FIXED CATALYST BEDS. . .

Cracking heavier petroleum molecules to yield more gasoline than is available through straight distillation separation of a given volume of crude usually is accomplished by means of a fixed bed composed of a catalyst and catalyst pellet, such as an alundum ball or platinum cylinder. Examples of this type are reforming units such as Platformers, Ultraformers, etc. Hydrodesulfurization reactors may employ cobalt molybdenum on alumina or bauxite carriers used for removal of sulfur by partial hydrogenation of sulfur-containing molecules. Periodic regeneration of the bed is made necessary by the drop in reactor pressure occasioned by the disintegration of the catalyst, formation of scale and carrier breakage. Modern continuous processing techniques and the high cost of downtime in petroleum refining require that the turnabout be rapid and that shutdown be reduced to an absolute minimum.

## THE KASON SOLUTION. . .

An important link in the regeneration process is the means by which catalyst wastes are separated from usable materials. The catalyst from the reactor usually is fed to a three-deck ( or four-deck, when it is necessary to segregate carrier balls to size) Kason vibrating screen separator equipped with screens having gradually diminishing openings. The screens most commonly employed have openings of 0.375", 0.202" and 0.108", top to bottom respectively. The top screen discharges whole alundum balls, the center screen broken balls and scale to waste, and the bottom screen clean catalyst pellets. The dust passing through this finest screen is valuable catalyst collected and returned to the maker for credit. The capacity machine selected depends upon the carrier and the catalyst used; most reformer beds, however, are screened at the rate of 7 -15 tons per hour. The Kason separator employed in this service weighs under a ton.



## RESULTS ...

The relatively light weight of the Kason separator simplifies holding it in maintenance stores on a portable dolly, ready for immediate service when required. The completely unitized assembly may be moved into place on a moment's notice because, since the separator transmits no vibration, no supporting substructure is needed. This feature, together with the unit's high capacity at maximum efficiency, ensures the shortest possible downtime during the regeneration process.

## FRINGE BENEFIT...

In addition to meeting these all-important requirements, the Kason Vibrating screen separator offers an attractive bonus: losses are virtually eliminated by means of a metal cover and flexible connections to the discharge spouts, which render the entire screening operation dust-tight. This is especially beneficial when expensive platinum catalyst is handled. Some refinery operators report that the equipment pays for itself on first use through savings over other methods of classification.

## TYPICAL CHEMICAL INDUSTRY APPLICATIONS...

Dry Separation: classification of catalyst beds into alundum balls, scale, clean catalyst pellets and dust. Dry Classification: polyvinyl chloride, polyethylene pellets. melamine, phenolics. cellulose acetate, polystyrene. sodium carbonate. calcium carbide. copper sulfate. detergents, adipic acid, iron oxide, caustic soda flake, dicalcium phosphate, stearic acid, titanium dioxide, zinc oxide, sodium sulfate, potassium iodide, sodium alginate. borax, calcium carbonate.