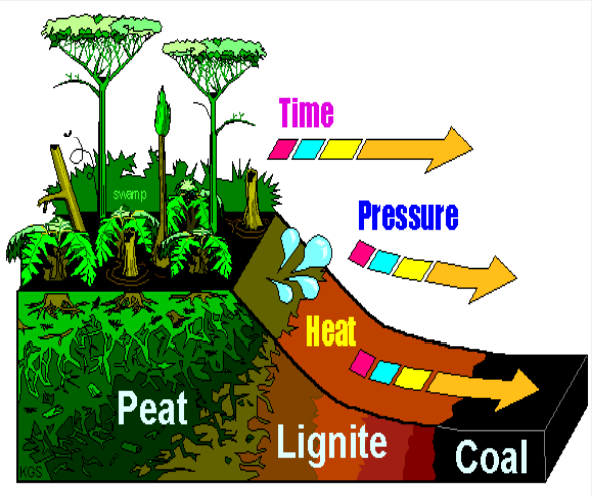
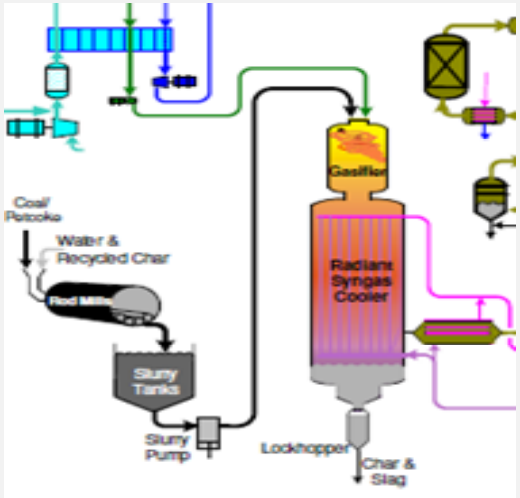
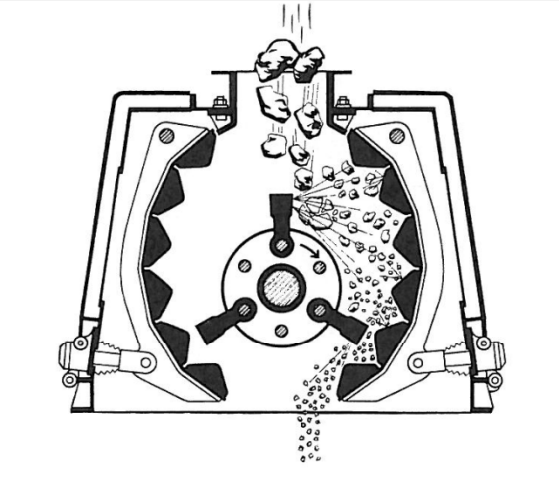
KHE SLAG CRUSHER







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What is Slag in Gasification?

- Hundreds of tons of slag, a byproduct are produced from gasification units all over the world.
- Slag is a glassy lump of varying sizes formed at high gasification temperatures and pressures by melting and vitrification of inorganic components in gasifer feedstock (i.e., rocks, ashes, dirt and other impurities) which do not gasify.

Why Slag Crusher?

- Slag of varying lump sizes or liner refractory brick occasionally spalling off, falls to the bottom of the gasifier and must be removed from the quench chamber to avoid accumulation that can choke the gasifier operation.
- Slag evacuates the gasifier through a lock hopper or continuous depressurization pipe depending on the gasifier design.
- Slag or refractory brick whose size is larger than the opening (diameter) of the nozzle to the lock hopper or continuous depressurization pipe can not evacuate the gasifier and its size must be reduced accordingly.
- A Slag Crusher is installed between the quench chamber and lock hopper or continuous depressurization pipe to perform the required size reduction duty.
- The Slag Crusher is composed of a crusher, pressure vessel and pressure seals.

KHE Slag Crusher Design Philosophy

- KHE's Slag Crusher is designed to handle a maximum of 20 tons/hr slag corresponding to the amount produced from 2500 tons/day gasification with about 20% ash content coal feedstock.
- KHE's slag crusher is designed to crush gasifier liner refractory brick of high compressive strength (12" in size) occasionally falling off the reactor wall and therefore it can handle larger size slag similar to brick as well.
- KHE's Slag Crusher is single stage reversible impactor capable of reducing slag sizes from 80% passing 12" to 80% passing 2". If less than 2" product size is required, KHE will add a second stage crusher accordingly.
- KHE's Slag Crusher is designed with one-size-fit-all capacity (20 tons/hr) to handle slag produced from feed stocks of varying ash content constituents and a wide range of operating conditions, extended drive shaft operating at much lower speed (rpm) than a normal crusher does and more than enough installed HP.
- KHE's Slag Crusher is designed with its pressure vessel to meet specified gasifier operating pressure and temperature requirements including cladding and seals.

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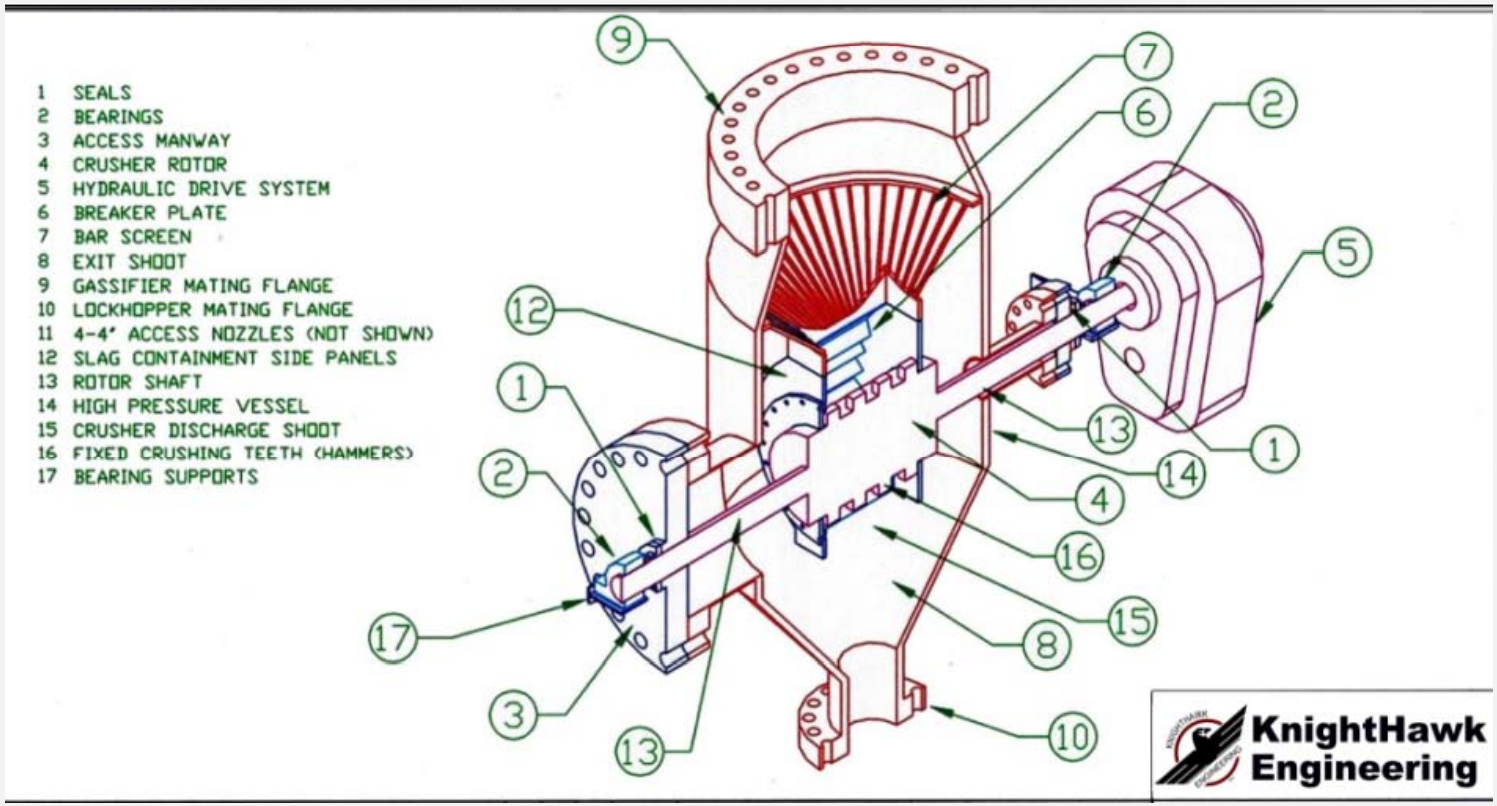
KHE Slag Crusher Component



KHE Slag Crusher Description

- Pressure vessel (slag crusher container) with 900 lbs forgings to meet ASTM pressure vessel code.
  - Shell: SA-387-11 plus 316L cladding
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  - Forgings: SA-182-F-11 weld overlaid with 316L
  - Crusher support internals: SA-240-316L
- Impactor with reversing, reduced voltage solid state motor starter with:
  - Microprocessor based control
  - Programmable solid state overload
  - Adjustable ramp time
  - Start stop push button for soft starter located on keypad
  - NEMA 4 enclosure
  - Hydraulic drive
- High pressure and temperature seals to seal crusher rotor shaft through pressure vessel.