Refining Overview

The Challenge

Owners of refineries continue to confront many challenges — rising feedstock prices, shrinking margins, varying global demand, a changing regulatory landscape including ever more stringent specifications for product sulfur content and carbon footprint, and competition from around the globe instead of just down the street.

As refinery owners debottleneck and enhance existing facilities they call on KBR Technology to deliver. Our state of the art technology, our emphasis on bottom-of-the-barrel solutions, coupled with our extensive experience in refining processes, continues our long-standing commitment to deliver leading edge, cost effective solutions for diverse refining needs in every market, every day.

Introduction

KBR delivers world-class results to the Petroleum Refining Market. Our business as a process developer and licensor, in addition to our widely acclaimed project delivery capabilities, has resulted in licensing, designing or constructing more than 60 greenfield refineries and well over 1000 refining units of every type and size the world over. Our licensed technology is found in more than half of the world’s FCC units, an overwhelming majority of resid upgrading units and more than 100 hydroprocessing units. Our emphasis on heavy oil upgrading, improving the bottom-of-the-barrel material, producing clean fuels, and providing a wider range of operating flexibility to refiners makes KBR a clear partner in any refining challenge. From grassroots design to revamps, no job is too large — or too small. We know refining and we know how to make refining make money.

Resid Upgrading

Bottom-of-the-barrel processing begins with resid upgrading. Here are some of the many KBR capabilities dedicated to this challenge.

Residuum Oil Supercritical Extraction (ROSE®)

Our ROSE technology is used by refineries and is ideal to upgrade heavy oil anywhere. It provides a reliable, energy-efficient option for maximizing yields of highly valued transport fuels. ROSE technology is highly reliable and regularly achieves on-stream factors in excess of 95%. ROSE uses supercritical solvent recovery which reduces energy usage by more than 50% over conventional solvent deasphalting. By deploying ROSE technology refiners are able to maximize their use of lower quality and lower cost heavy oil feedstocks.

Figure 1: Refining Process Overview
Fluid Catalytic Cracking (FCC)
KBR is a pioneer in FCC technology. We bring more than 120 years of experience and are constantly pursuing new process improvements to FCC operations. Our Orthoflow™ FCC process offers maximum performance with unparalleled operational flexibility and ease of operation, and minimizes plot space requirements, leaving room for other investments on the site. The technology we offer our licensees is also available to upgrade existing FCC units. Our ATOMAX™ feed injection system leads the market as the best available technology. Closed Cyclones Riser Termination, DynaFlux™ Spent Catalyst Stripping and Riser Quench all contribute to superior yields and reduced environmental impact.

Hydroprocessing
KBR delivers a family of hydrotreating technologies for the production of low-sulfur, clean burning transportation fuels. Our technologies are designed to address a full range of feedstocks and processing objectives. Our expertise includes:

Veba Combi Cracker (VCC)
KBR has added the Veba Combi Cracker to its licensed technology to upgrade heavy feedstock and remove contaminants at conversion rates in excess of 95% on a once through basis. Using a unique two-stage reactor with a fluidized bed in the first stage, the VCC unit provides a range of feed options from sour crude to coal, improving both volumetric gain and processing flexibility at a site.

Hydrotreating, Hydrocracking, Catalytic Diesel Dewaxing and Lube Oil Hydroprocessing
KBR’s portfolio covers the full range of hydroprocessing technologies necessary to convert and treat refinery streams to meet ever more stringent gasoline and diesel specifications.

Advanced Distillation
Efficient distillation configurations make a significant difference to the profitability of a process plant. Innovative utilization of advanced distillation configurations can produce capital cost savings, reductions in energy demands and emissions and improvements in yields.

Deep Flash Distillation
Proven reliable high vacuum distillation column design combines proprietary heater and tower internals to maximize distillate yields and qualities.

Distill-Max™
Allows development of a compact fractionation system that combines two distillation columns within a single column.

For more information, visit us online at refining.kbr.com

KBR’s full range of bottom-of-the-barrel upgrading technologies is the clear choice to remove contaminants, crack heavy materials into saleable fuels, and contribute to overall refining output. We deliver know-how for any market challenge.