

ALFALUZ TECHNOLOGY: APPLICATIONS FOR THE PETROLEUM INDUSTRY

Disrupting the
Economics of
Bitumen & Heavy Oil
Production



ALFALUZ

ALFALUZ: AN INTRODUCTION

We're an innovative engineering and manufacturing company with a disruptive technology bringing economical and green solutions to the production and commercialization of bitumen and heavy oil.

Over the course of the past few years, we have perfected our proprietary M-CRACK and Workhorse® Systems. These systems instantaneously breaks stable emulsions, reduces or eliminates H₂S content, separates asphaltenes, sulfur, solids and other contaminants, resulting in a dramatic reduction of viscosity, density and acidity without using diluents, heat or other chemicals. It's a simple system, with low Capex and Opex, that produces pipeline-ready oil.

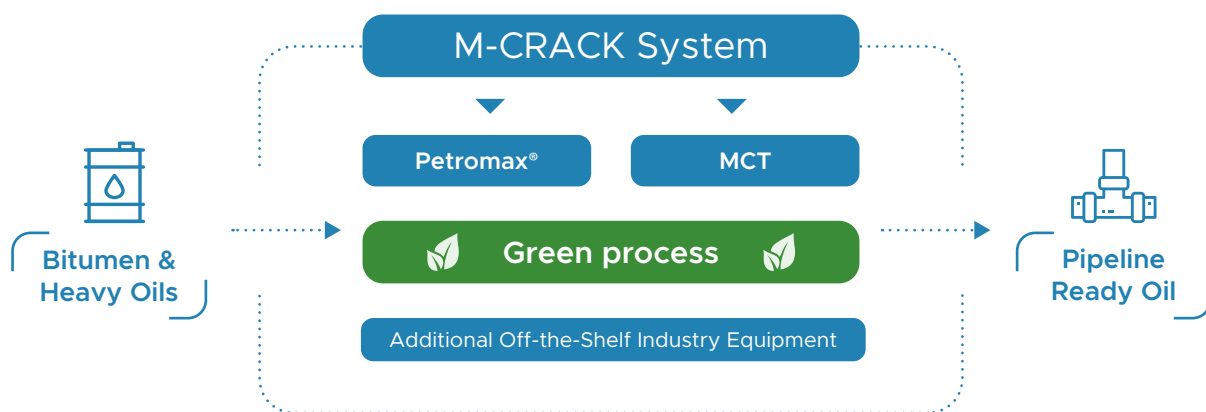
Designed to maximize the many benefits of Petromax®, our green “plug and play” M-CRACK system is installed directly in line with the operator's production process, with little or no change in equipment or infrastructure. Bitumen and heavy oils, combined with Petromax® and water at ambient temperature, decrease in density and viscosity as they move through the system.

The M-CRACK process consists of the combination of special purpose equipment and our proprietary chemical Petromax® working together. The M-CRACK process reverses the charge of the particles in the crude oil emulsion. The resulting repulsion between oil, solids and heavy contaminants instantaneously breaks the water/oil and oil/water emulsion, leaving the solids free of oil, eliminating the H₂S and separating the oil. The remaining salts and heavy metals then move to the water phase, and the remaining solids - including resins, asphaltenes, sulfur, crystalized paraffin, heavy metals and crystalized salt - are separated to a significant degree and drop out.

The three outputs of our three-step M-CRACK system are:

1. Clean water that is separated and recirculated within the M-CRACK system and the Central Processing Facility (CPF)
2. A lighter, more valuable and pipeline-ready commercial oil processed with negligible environmental impact
3. Cleaned solids

Our unique M-CRACK system is comprised of standard industry equipment and proprietary components that make the magic happen



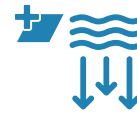
MAIN BENEFITS OF THE M-CRACK SYSTEM



Reduces operating costs



Increases production capacity because diluent eliminated



Reduces viscosity and density of the sales oil stream



100% Green: Water-based, non toxic, biodegradable, no CO₂ emissions



No diluents required, increasing pipeline oil volume



Fast, easy to apply, and economical



Eliminates H₂S



Partially upgrades to pipeline-spec requirements



Significantly increases profit margins



Significantly reduces sulfur, asphaltenes, salts, heavy metals, toxins

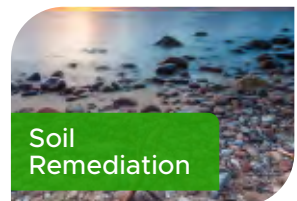


Works at ambient temperatures



Uses economical, readily-available equipment: Low Capex

Market Sectors

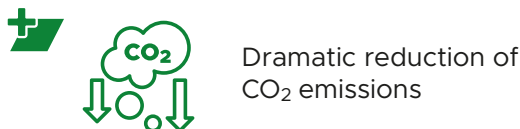
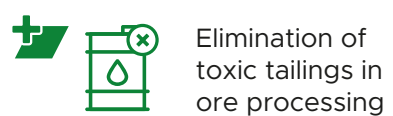
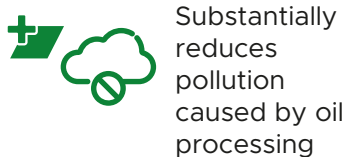
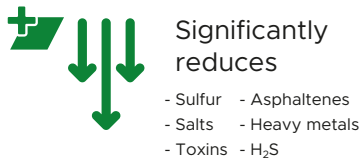


THE GREENEST WAY TO MAKE A GREAT PROFIT

Petromax® Environmental Benefits



M-CRACK System Environmental Benefits



OIL SANDS



Mining

For mining applications, Alfaluz uses its Workhorse® system, which is an advanced version of the M-CRACK with additional functions such as tailings treatment.



Types of Operation:

Oil recovery and partial upgrading at mine site with high water efficiency, low energy consumption and minimum CO₂e emissions

Froth processing




Application:


Separates and partially upgrades bitumen at the point of extraction with minimum or zero need for diluent and no tailings generation

Oil upgrade and fine particle removal

Benefits

Diluent-free partial **upgrading of heavy oil**

Dramatic **reduction of water** consumption 

Dramatic reduction of **CO₂e emissions** 

Elimination of **toxic tailing** generation 

Significant increase in crude oil transportation volumes

Tailing Ponds Using the Workhorse® System



Type of Operation:

Remediation of toxic tailings ponds generated due to the disposal of waste water from the mining production process



Application:

Separates the fine and ultra fine particles out of the MFT, leaving a cake with less than 30% water which can be rapidly reclaimed

Benefits

Cost effective solution to consolidate solids from MFT while recovering valuable materials contained in the waste materials coming from the CPF

Thermal Bitumen Production: SAGD & Others



Type of Operation:

Located between the pad and the FWKO, partially upgrade the bitumen




Application:

Bitumen upgrading and water cleaning before the CPF

Benefits

Diluent-free **heavy oil** upgrading to pipeline spec

Dramatic displacement of **CO₂e emissions** 

Dramatic reduction of **water treatment costs** 

Significant increase in crude oil transportation volumes

OIL SANDS



Pipeline



Types of Operation:

Pipeline cleaning and reducing costs of transportation

Drag reducer



Application:

Removes deposits in the pipeline inner wall that reduce its diameter and consequently its transportation capacity

Reduces friction which speeds up the flow and reduces the energy required

Benefits

Cost-effective solution for removing scaling and deposits

Cost-effective prevention solution without impacting the oil quality

Dramatic increase in energy savings 

Crude Oil Tank Cleaning & Rail Tank Car Cleaning



Type of Operation: Contactless entry cleaning



Application: Non-human entry, cleans tank bottom sludge with no heat and no diluent, minimizing risk and reducing cleaning time by over 50%

Benefits

Fast, safe, cost effective and inexpensive



Type of Operation: Oil recovery



Application: Recovers additional oil once the sludge has been extracted

Benefits

Converts recovered sludge into a revenue stream economically and with low Capex



Type of Operation: Resource optimization / waste reduction



Application: Reduces waste and optimizes resources by recovering more oil and using less water

Benefits

- ▶ Cost reduction
- ▶ Dramatic reduction of negative impact over the environment 

CONVENTIONAL HEAVY OIL PRODUCERS



Heavy Oil Upgrading

Types of Operation:

Viscosity reduction

Density reduction

Contaminants reduction



Application:


Partially upgrades bitumen and heavy oil, and reduces water and energy consumption with minimum or zero use of diluent

Benefits

Low
Capex

Low
Opex

Non-polluting 

No diluent
required 

Increased profit
margins

Pipeline

Type of Operation: Cleaning



Application: Economical removal of paraffin, asphaltenes, heavy metals and solid deposits that obstruct the pipeline and reduce its transportation capacity

Benefits


- ▶ Cost-effective solution to address scaling and deposits
- ▶ Cost-effective prevention solution without impacting the oil quality

Type of Operation: Drag reducer



Application: Reduces the drag between the inner pipeline wall and the moving oil

Benefits

- ▶ Cost-effective method of reducing drag
- ▶ Dramatic energy savings 
- ▶ Increased throughput



Heavy Oil Upgrading

Type of Operation:

Viscosity reduction

Density reduction

Contaminants reduction

Application:


Partially upgrades bitumen and heavy oil, and reduces water and energy consumption with minimum or zero use of diluent

Benefits

Low Capex

Low Opex

Non-polluting 

No diluent required 

Increased profit margins

Crude Oil Tank Cleaning & Rail Tank Car Cleaning


 **Type of Operation:** Contactless entry cleaning

 **Application:** Non-human entry, cleans tank bottom sludge with no heat and no diluent, minimizing risk and reducing cleaning time by over 50%

Benefits

Fast, safe, cost effective and inexpensive

 **Type of Operation:** Oil recovery

 **Application:** Recovers additional oil once the sludge has been extracted

Benefits


Converts recovered sludge into a revenue stream economically and with low Copex

 **Type of Operation:** Resource optimization / waste reduction

 **Application:** Reduces waste and optimizes resources by recovering more oil and using less water

Benefits

▶ Cost reduction

▶ Dramatic reduction of negative impact over the environment 

SOIL REMEDIATION



Soil remediation uses Alfaluz's Workhorse® system, which removes all hydrocarbons and handles large amounts of material quickly.

Oil Spills Soil Remediation - Open Pits



Type of Operation:

Oil spills from pipelines, rail cars, crude oil tankers, in oilfields. Contamination of river and ocean shorelines and from open oil pits.



Application:

Mobile plant which quickly removes hydrocarbons from the soil in-situ with minimal use of water and while recovering valuable oil.

Benefits

Rapid soil and pit remediation in large volumes

Low CO₂ emissions 

Fast emergency response

Minimal environmental impact 

High speed oil recovery leaving clean soil

Economical, effective and efficient cleaning process





ALFALUZ

www.alfaluz.ca
info@alfaluz.ca