What are the different types of crude oil transported by transmission pipelines?

The contents of a barrel of crude oil may seem straightforward – a dark, thick substance used for heat and fuel. But did you know that some crude oil is thin and almost colourless? In fact, there are many different grades and varieties of crude oil – with vast differences in colour, weight and volatility.

Crude oil is made of plant or animal fossils that have been compressed and slowly heated over millions of years. Crude oil deposits are found all over the world – where the crude oil was produced has an impact on its characteristics, including colour.

While there are many types of crude oil, the oil and gas sector uses these important characteristics to classify them – density (heavy crude versus light crude), viscosity (the degree to which the crude oil resists flow) and sulphur content (sweet crude is low in sulphur and sour crude is high in sulphur).

A good example of heavy crude comes from the Alberta oil sands. This region has vast deposits of bitumen, which is a semi-solid form of oil. Its thick and sandy qualities are different than crude oil found elsewhere in Canada, and is diluted so it can be transported by pipeline.

Despite differences in weight, colour and sulphur content, all types of crude oil are equal when it comes to safe transportation through a transmission pipeline.

Fast Facts

Crude oil

Canada has the world’s third-largest proven oil reserves, after Saudi Arabia and Venezuela.

Oil sands are a mix of sand, water, clay, and bitumen – heavy crude oil which is too thick that needs to be diluted or heated to be pumped or to flow.

There are thousands of consumer products made from crude oil, including carpet, chewing gum and eye glasses.

About Pipelines

Types of crude oil

No. 13

About Pipelines is a series, dedicated to sharing the facts about transmission pipelines in Canada and their role in Canadians’ lives. This information is provided by the Canadian Energy Pipeline Association (CEPA).

Going the Distance

Underground transmission pipelines carry different batches of unrefined crude oil over long distances.

Bitumen basics

- A semi-solid form of crude oil, bitumen needs to be diluted or heated before it’s transported by pipeline.
- A lighter oil is added to bitumen to make it more viscous and less dense.
- The diluted bitumen (dilbit) is similar to conventional crude oil – studies show it is not more corrosive or harmful to pipelines.
What’s in a barrel of oil?

By percentage

- **25.9%** ASPHALT
  - Used for paving roads, tennis courts, etc.

- **35.8%** PETRO-CHEMICAL FEEDSTOCKS
  - Chemicals used to create consumer products from test tubes to toys.

- **5.0%** JET FUEL
  - Almost identical to kerosene, jet fuel is used to power turbine engines used in planes, and as lighting, heating and cooking fuel.

- **4.1%** HEAVY FUEL OIL
  - Used as marine fuel.

- **2.3%** OTHER PRODUCTS
  - Waxes, lubricants and polishes are all derived from crude oil.

- **4.7%** DIESEL
  - Used to power vehicles, especially heavy equipment and military vehicles. Diesel generators are also used to create electricity.

- **22.2%** MOTOR GASOLINE
  - The most commonly-used fuel for cars, trucks, SUVs, boats and recreational vehicles.

Source: Statistics Canada: Cansim Table 134-0004

Applying research

Throughout its 150 year history, the Canadian petroleum industry has focused on research to create advancements in technologies, practices and operations. Research has included gaining a better understanding of how crude oil behaves in different environments. This information is critical to helping pipeline companies better prepare to respond to an emergency.

The role of a pipeline

Transmission pipelines move different batches of unrefined crude oil – on any given day a pipeline could be used to transport different grades or varieties of crude oil – with each batch of liquid being pushed at the same speed along the pipe. These pipelines safely transport crude oil to refineries, where the crude oil is converted into refined petroleum products.

Crude oil is made up of a variety of hydrocarbons, and when it’s heated up during the refining process, the hydrocarbons are separated for different uses – from fuel to plastics. In fact, a typical barrel of oil has seven different types of products in it.

After refining, the products are either shipped by pipeline, truck or train to be made into consumer and industrial products, used by Canadians or exported to other countries.