

Fuel and Oil Purification & Stabilization

The ROBYS™ Process

The “ROBYS™ Process” purifies and stabilizes reclaimed and refined gas oils. ROBYS™ is designed as an add-on unit to used oil recycling and petroleum refining operations. The process was developed by the CANMET Energy Technology Centre (CETC) and is licensed to Par Excellence Developments (PED) of Sudbury, Ontario for worldwide application.

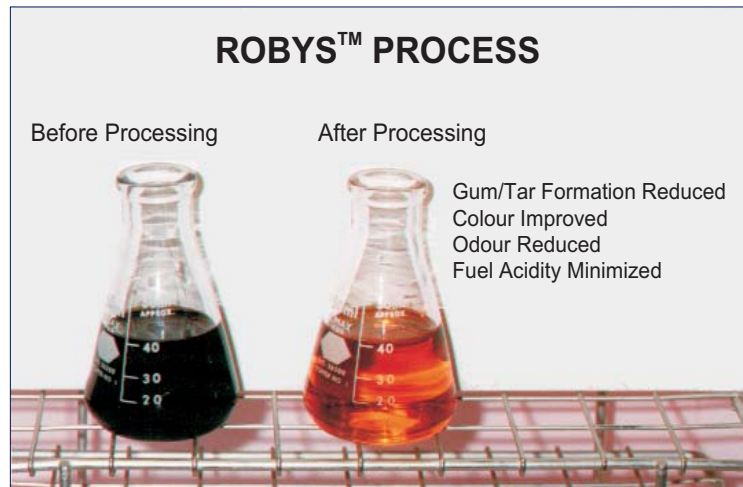


Fig. 1: Used oil before and after processing

The ROBYS™ technology owes its beginnings to efforts to solve severe product quality problems at used oil reprocessing plants. Used oils typically include spent crankcase motor oil and journal-bearing lubricants used in industrial applications. In the course of being recycled, used oils undergo a thermal cracking process to produce gas oil. ROBYS™ then effectively stabilizes and purifies the gas oil. It is felt that because of ROBYS™, recycling used oils will become more economically attractive for a wider range of applications, offering another option for the disposal of used oils.

One of the great advantages of the ROBYS™ process is that it can be designed as a stand-alone fuel purification and stabilization process. It can be skid-mounted and installed in plants with minimum interruption to production. Since the ROBYS™ process is an independent purification unit that treats the product stream, it can be adapted to other applications where hydrocarbons need to be purified and stabilized.

Odour and Colour: Several processes on the market attempt to convert used oils into fuels. But without ROBYS™, their partially processed or final products often contain compounds that

What's Special about ROBYS™?

The ROBYS™ process can produce gas oils that:

- are not odorous (foul smelling);
- meet regulatory and consumer colour criteria;
- minimize the formation of gums and tars during storage; and
- are not highly acidic

cause foul odours. A relatively rapid deterioration of products also causes them to become darker in colour, which makes them even less marketable.

Gums and Tars: In some processes, used oils are cracked at high temperatures so that the product oils are rich in olefins. Olefins cause instability in the resulting gas oil; they tend to polymerize and form tarry deposits that impair equipment by plugging pumps, lines, and burner tips. This, in turn, causes maintenance problems, plant and equipment downtime, fuel wastage and incomplete combustion. The ROBYS™ process can eliminate these problems.

Acids: Acids cause thermally cracked used oils to be corrosive and excessively high acid numbers fail the ASTM criteria for fuels. Normal waste-oil conversion processes seldom deal effectively with the large amounts of acid present in the reprocessed fuel.

ROBYS™, however, substantially reduces the content of sulphur, nitrogen and chlorine, the very elements that give rise to all the acids. That reduction also accounts for the absence of malodour from gas oils that have been through the ROBYS™ process.

For most waste-derived fuels, the above-mentioned factors limit markets and lower their value. Therefore, ROBYS™, a process that purifies and stabilizes waste-derived fuels, can increase their marketability.

Improved Economics of Waste-Oil Reprocessing

The ROBYS™ process has great potential to improve the economics of waste-oil reprocessing and possibly to replace conventional methods of stabilizing fuels and oils. It was developed through collaboration between Par Excellence Developments (PED) and the CANMET Energy Technology Centre. (PED is a Canadian industrial consulting and technology development company.)

The process effectively and economically stabilizes and purifies gas oil. Through this process, acids, odour and precipitates are very much reduced. So also are sulphur, chlorine and nitrogen compounds.

What Next?

If you wish to explore the feasibility of this innovative technology for your facility, here are some courses of action:

- obtain more detailed technical information regarding the ROBYS™ process by contacting Par Excellence Developments directly;
- submit your product to the CANMET Energy Technology Centre, where, for a fee, it will then undergo a customized screening run to evaluate the potential for ROBYS™ to eliminate the undesirable characteristics of your oil; and
- visit Par Excellence Developments' website (www.ped.vianet.ca) and related links for current information, including photographs.

Have Your Products Tested

A bench-scale version of the ROBYS™ process is in operation at the CANMET Energy Technology Centre (CETC). Potential sub-licensees may wish to provide samples of their product oil to CETC where it will be screened for its potential to be purified and stabilized by the ROBYS™ process. Clients will be issued a confidential, customized report once investigations have been completed.

Call Par Excellence Developments

- for specific details regarding the process economics for a wide variety of applications of the ROBYS™ process; and
- about sub-licensing the ROBYS™ process.

You can also call the CANMET Energy Technology Centre for information on product testing.

About the Co-Developers of ROBYS™

Par Excellence Developments has extensive expertise in used oil processing, fuel purification technology and odour control.

The company is the world-wide licensee of this new technology and is seeking contact with petroleum or waste management companies for the purpose of sub-licensing.

The CANMET Energy Technology Centre is Canada's premier organization in the field of energy science and technology. Its scientists and engineers are leaders in their fields and its laboratory facilities are one-of-a-kind in Canada.

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