

RAPESEED OIL

A) Rapeseed oil properties.

RPSO has approximately 90% the calorific value of light oil. However, RPSO is about 10% heavier than light oil. Consequently, the heat content per litre is similar.

The RPSO is more viscous than light oil. We are gaining experience of its variation at different temperatures. On small installations, we are not using the TIGER LOOP with all its benefits. We are using similar bore pipework of traditional system, with an electrical tracer tape capable of holding temperatures up to 35°C.

There exists a large market for RPSO both in the UK and the World. The end uses are in production of lubricants and many chemical products. The UK Market is handled by several Merchants who serve their customers via 31,000 litres tanker loads - down to a minimum delivery of 5,000 litres. We are told by the Merchants that they anticipate no problem meeting the expanded demand.

For smaller demands, time will be required before the National network of local distributors switch to renewable oils from light oil and kerosene. Meantime, ATLANTIC are prepared to transport 1000 litres containers to smaller sites and pump the contents into the storage tanks.

Presently, against light oil at 35p/litre, RPSO costs between 40p/litre and 53p/litre. As a general rule if crude oil exceeds 35 US dollars per barrel, RPSO is at an advantage.

It is important to note that other renewable oils are available and ATLANTIC have nearly completed Approvals on a multi-fuel burner which can take advantage of alternatives.

B) Rapeseed oil heating – background information

Rapeseed oil a renewable source of energy because the carbon dioxide emitted when the oil is burned has been taken out of the atmosphere by the growing plant. Even allowing for emissions of fossil carbon dioxide in planting, harvesting, processing and transporting the fuel, replacing fossil fuel with rapeseed oil fuel will typically reduce net CO₂ emissions by over 90%.

Rapeseed (*Brassica napus*), also known as **Rape**, **Oilseed Rape**, **Rapa**, **Rapeseed** and (one particular [cultivar](#)) **Canola**, is a bright yellow flowering member of the family [Brassicaceae](#) (mustard or cabbage family). The name is derived through [Old English](#) from a term for [turnip](#), *rapum* (see [Brassica napobrassica](#), which may be considered a cultivar of *Brassica napus*). Some botanists include the closely related *Brassica campestris* within *B. napus*.

Cultivation and uses

Rapeseed is very widely cultivated throughout the world for the production of animal feed, vegetable oil for human consumption, and biodiesel; leading producers include the European Union, Canada, the United States, Australia, China and India. In India, it is grown on 13% of cropped land. According to the United States Department of Agriculture, rapeseed was the third leading source of vegetable oil in the world in 2000, after soybean and oil palm, and also the world's second leading source of protein meal, although only one-fifth of the production of the leading soybean meal. World production is growing rapidly, with Food and Agriculture Organization (FAO) reporting that 36 million tonnes of rapeseed was produced in the 2003-4 season, and 46 million tonnes in 2004-5. In Europe, rapeseed is primarily cultivated for animal feed (due to its very high lipid and medium protein content), and is a leading option for Europeans to avoid importation of GMO products.

Natural rapeseed oil contains erucic acid, which is mildly toxic to humans in large doses but is used as a food additive in smaller doses. Canola is a tradename for low erucic acid rapeseed that is sometimes mis-applied to other cultivars.

The rapeseed is the valuable, harvested component of the crop. The crop is also grown as a winter-cover crop. It provides good coverage of the soil in winter, and limits nitrogenrun-off. The plant is ploughed back in the soil or used as bedding.

Processing of rapeseed for oil production provides rapeseed animal meal as a by-product. The by-product is a high-protein animal feed, competitive with soybean|soya. The feed is mostly employed for cattle feeding, but also for pigs and chickens (though less valuable for these). The meal has a very low content of the glucosinolates responsible for metabolism disruption in cattle and pigs. Rapeseed "oil cake" is also used as a fertilizer in China, and may be used for ornamentals, such as Bonsai, as well.

Rapeseed leaves and stems are also edible, similar to those of the related bok choy or kale. Some varieties of rapeseed (called "oil vegetable" in Chinese language; "yu choy" in Cantonese; and "nanohana" in Japanese language) are sold as greens, primarily in Asian groceries.

Rapeseed is a heavy nectar producer, and honeybees produce a light coloured, but peppery honey from it. It must be extracted immediately after processing is finished, as it will quickly granulate in the honeycomb and will be impossible to extract. The honey is usually blended with milder honeys, if used for table use, or sold as bakery grade. Rapeseed growers contract with beekeepers for the pollination of the crop.

Biodiesel

Rapeseed oil is used in the manufacture of biodiesel for powering motor vehicles. Biodiesel may be used in pure form in newer engines without engine damage, and is frequently combined with standard diesel in ratios varying from 2% to 20% biodiesel. Formerly, due to the costs of growing, crushing, and refining rapeseed biodiesel, rapeseed derived biodiesel cost more to produce than standard diesel fuel. Prices of rapeseed oil are at very high levels presently (start November 05) due to increased demand on rapeseed oil for this purpose. Rapeseed oil is the preferred oil stock for biodiesel production in most of Europe, partly because rapeseed produces more oil per unit of land area as compared to other oil sources, such as soy beans.

Production

Worldwide production of rapeseed (including canola) rose to 46.4 million metric tons in 2005, the highest recorded total (source: [FAO](#)).

Top Rapeseed Producers – 2005 (Million metric ton)	
China	13.0
Canada	8.4
India	6.4
Germany	4.7
France	4.4
United Kingdom	1.9
Poland	1.4
Australia	1.1
World Total	46.4

Worldwide Rapeseed Production (Million metric ton)	
1965	5.2
1975	8.8
1985	19.2
1995	34.2
2005	46.4
<i>Source:</i> UN Food & Agriculture Organisation	

C) Rapeseed oil – storage

Oil storage is generally equated to 6 weeks supply mid-winter. Where supplies are readily available, this may be reduced to 4 weeks. Where supplies are unreliable the storage may be 12 weeks. In addition there will be a minimum buffer to overcome sludge and potential oil flow problems.

An example would be a typical office building with 150 kW connected space heating load, in operation for 60 hours average per week in mid-winter and burning 15 litres/hour on full output.

On 4 weeks mid-winter, the consumption would be:

$$4 \times 60 \times 15 = 3600 \text{ litres approximately.}$$

On 6 weeks mid-winter, the consumption would be:

$$6 \times 60 \times 15 \times 0,925 = 4995 \text{ litres approximately}$$

On 12 weeks mid-winter, the consumption would be:

$$12 \times 60 \times 15 \times 0.75 = 8,100 \text{ litres approximately}$$

Therefore, storage may be chosen at

4 weeks	$3600 + 1000 \text{ buffer} = \text{say } 5,000 \text{ litres}$
6 weeks	$4995 + 1000 \text{ buffer} = \text{say } 6,000 \text{ litres}$
12 weeks	$8100 + 1000 \text{ buffer} = \text{say } 10,000 \text{ litres}$

Box type tanks can be welded on site. Factory made tanks typically will be:

3,000 litres – 2,700mm L x 1,250mm D

5,000 litres – 3,100mm L x 1,500mm D

10,000 litres – 3,870mm L x 1,900mm D

Sometimes, two tanks are employed so that the tank out of use is the one to be filled – so there is continuity of oil supply to the burner(s).

In warm weather, there is a tendency to oxidisation on the top surface and, therefore, vertical vessels are preferred to horizontal. Vessels tend to be kept full so that the

degree of oxidisation is minimal. Also storage locations should be chosen to be cool - but, preferably, not freezing.

Where conditions below 5°C are to be experienced, a tank outflow heater can be employed and the line can be traced electrically in a gentle manner. In the case of light oil, it was always necessary to plan for and be aware of the sump - so that extraneous matter could settle below the feed outlet. Similarly, electrical tracing was always considered.