

## Processed Fuel Oil

### Purpose

This guidance supports the production and use of Processed Fuel Oil (PFO) from waste oil such as waste lubricating oil and oil based mud cuttings. SEPA will not regulate PFO produced and used in compliance with this guidance as waste. Producers and users are not obliged to comply with the terms of this guidance but if they do not SEPA will regulate the oil as waste.

### Background

Every year in Scotland between 50,000 to 60,000 tonnes of waste oil are collected and managed through the waste management system. Various metals, sulphur and chlorine are present in the oils at elevated concentrations as a result of, for example, the use of additives and through engine wear. The direct use of these waste oils for energy recovery would be considered the incineration of waste and can only take place in a [Waste Incineration Directive](#) compliant plant.

Further, an estimated 70,000 to 100,000 tonnes of oil based mud cuttings are landed annually from the UK continental shelf. These cuttings can either be treated off-shore or transported on-shore for treatment. Significant quantities of fuel oil can be recovered from this waste stream.

With sufficient treatment, it is possible to process these wastes into replacement distillate and residual fuel oils and supplied into the wider economy. SEPA supports the recovery of these fuels as a key part of moving towards a zero waste Scotland. The provisions set out here aim to encourage the recovery of these fuels, ensure protection the environment and aid fuels users in their compliance.

### SEPA Position

When sold and dispatched, PFO derived exclusively from the waste types listed in Appendix 1, meeting the specification in Appendix 2 and tested and supplied for use in accordance with this guidance will not be regulated as waste by SEPA. Therefore, such PFO does not have to be incinerated as a waste or in compliance with the Waste Incineration Directive.

Where the terms of this guidance are not complied with, SEPA will regulate the oil as waste. The producer and user then must comply with the appropriate waste management controls for the movement, storage and incineration of the waste oil and SEPA will take the view that they are committing an offence if they do not do so.

Producers of PFO should note that processing and storage of PFO prior to its sale and dispatch are regarded as waste activities by SEPA. These activities must be carried out under and in compliance with a Waste Management Licence or Pollution Prevention and Control (PPC) Permit.

Even if the terms of this guidance are complied with the PFO can become waste again and so be subject to waste management controls. PFO will again be regulated as waste if, for example, it is at any stage;

- discarded; or
- stored indefinitely with little prospect of being used.

## Initial Supply Approval – Provision of Evidence from Producers

In order for producers to take advantage of this position and supply PFO without waste controls within or into Scotland, they must contact SEPA and provide evidence that the output of their process can comply with the terms of this guidance.

This evidence must consist of compositional analysis of process batch samples showing that the process is capable of consistently meeting the distillate or residual fuel specification in Appendix 2. SEPA expects analysis of samples of three separate batches to be provided for assessment. If satisfied with this evidence, SEPA will provide written confirmation that the PFO will not be regulated as waste and that the PFO can be used as detailed below.

## Ongoing Conformance Monitoring

After SEPA confirms supply approval, producers must continue to sample and analyse each process batch and keep records of the analytical results. Continued submission of batch analyses to SEPA is not required but records must be retained for inspection by SEPA.

All sampling procedures must be performed and undertaken by an ISO17025 accredited body, to [IP475](#) or similar approved and accredited method. Producers of PFO must have the facility to analyse the PFO for all test parameters specified, included those in [BS2869:2010](#), in laboratories accredited to ISO17025 (either in-house or contract laboratories).

Each process batch must be analysed for compliance against the specification; if additions are made to a batch tank then it becomes a new batch and should be reanalysed. Loads should not be dispatched until the batch analysis is known. If a batch is tested and does not meet the analytical limits then the terms of this position would not apply and the oil will remain subject to waste regulatory controls. SEPA may undertake targeted monitoring at producer and user sites to ensure compliance with this guidance

## Use of PFO

PFO can be sold or supplied for use under the terms of this guidance without waste regulatory controls in any application where virgin oil use is allowed and appropriate. For example PFO that meets all the given criteria for a residual fuel equivalent can be sold, supplied or used in any application where it is a substitute for a virgin residual fuel (e.g. heavy fuel oil).

In common with virgin fuel oils, the combustion of PFO may be regulated under Section 1.1 (combustion) of the PPC Regulations. Users of PFO must have;

- a PPC Part A Permit where the aggregated combustion capacity has a net rated thermal input of 50MW or greater; or
- a PPC Part B Permit where the appliance has a net rated thermal input of 20MW or greater.

## Record Keeping

PFO must be tested in accordance with Appendix 2. Producers must retain records of all inspection and testing carried out for compliance with this guidance for a period of two years. This requirement applies to both on-site and off-site uses of PFO.

PFO producers should also retain records of each sale, supply or use of PFO. This supply documentation should include the following elements:

- date of supply;
- customer's name, contact details and nature of business;
- producer's name and contact details;
- intended use;
- quantity supplied by weight/volume;
- the specification with which the PFO complies;
- a statement that the PFO was produced in compliance with this guidance.

SEPA recommends that this documentation is supplied to and retained by fuel users in order to demonstrate compliance with this guidance.

## Limitations

This guidance applies only in Scotland and is based on current understanding. The terms of this guidance may be subject to periodical review and be changed or withdrawn in light of technological developments, regulatory or legislative changes, future government guidance or experience of its use. SEPA reserves its discretion to depart from the position outlined in this guidance and to take appropriate action to avoid any risk of pollution or harm to human health or the environment.

## Appendix 1 - Acceptable Waste Inputs for the Production of PFO

EWC Code	Description
<b>01</b>	<b>Wastes resulting from exploration, mining, quarrying and physical and chemical treatment of minerals</b>
<b>01 05</b>	<b>Drilling muds and other drilling wastes</b>
01 05 05*	Oil-containing drilling muds and wastes
<b>12</b>	<b>Wastes from shaping and physical and mechanical surface treatment of metal and plastics</b>
<b>12 01</b>	<b>Wastes from shaping and physical and mechanical surface treatment of metals and plastics</b>
12 01 07*	Mineral based machining oils free of halogens(except emulsions and solutions)
12 01 10*	Synthetic machining oils
12 01 19*	Readily biodegradable machining oil
<b>13</b>	<b>Oil wastes and wastes of liquid fuels (except edible oils, and those in chapters 05, 12 and 19)</b>
<b>13 01</b>	<b>Waste hydraulic oils</b>
13 01 10*	Mineral based non-chlorinated hydraulic oils
13 01 11*	Synthetic hydraulic oils
13 01 12*	Readily biodegradable hydraulic oils
13 01 13*	Other hydraulic oils
<b>13 02</b>	<b>Waste engine, gear and lubricating oils</b>
13 02 05*	Mineral-based non-chlorinated engine, gear and lubricating oils
13 02 06*	Synthetic engine, gear and lubricating oils
13 02 07*	Readily biodegradable engine, gear and lubricating oils
13 02 08*	Other engine, gear and lubricating oils
<b>13 03</b>	<b>Waste insulating and heat transmission oils</b>
13 03 07*	Mineral-based non-chlorinated insulating and heat transmission oils
13 03 08*	Synthetic insulating and heat transmission oils
13 03 09*	Readily biodegradable insulating and heat transmission oils
13 03 10*	Other insulating and heat transmission oils
<b>13 04</b>	<b>Bilge oils</b>
13 04 01*	Bilge oils from inland navigation
13 04 02*	Bilge oils from jetty sewers
13 04 03*	Bilge oils from other navigation
<b>13 05</b>	<b>Oil/water separator contents</b>
13 05 02*	Sludges from oil/water separators
13 05 03*	Interceptor sludges
13 05 06*	Oil from oil/water separators
13 05 08*	Mixtures of wastes from grit chambers and oil/water separators
<b>13 07</b>	<b>Wastes of liquid fuels</b>
13 07 01*	Fuel oil and diesel
13 07 03*	Other fuels (including mixtures)
<b>19</b>	<b>Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use</b>
<b>19 02</b>	<b>Wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)</b>
19 02 07*	Oil and concentrates from separation
<b>20</b>	<b>Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions</b>
<b>20 01</b>	<b>Separately collected fractions (except 15 01)</b>
20 01 26*	Oil and fat other than those mentioned in 20 01 25

## Appendix 2 – Distillate and Residual Fuel Specifications

This appendix distinguishes between PFO that will replace distillate fuel (e.g. gas oil) and PFO that will replace residual fuel (e.g. heavy fuel oil). The specifications require that the parameters contained in [British Standard BS2869:2010 – “Fuel oils for agricultural, domestic and industrial engines and boilers - Specification”](#) are met. Limits for additional properties are added to the BS specification to ensure protection of the environment.

### Specification for a Distillate Oil Equivalent

PFO that is to be used in place of a distillate fuel oil must meet the parameters set in the most up to date version of the [BS2869:2010](#) for class D fuels, with the exception of viscosity. In addition to these parameters, the PFO must also be analysed for total halogens expressed as chlorine, and metals and their compounds. The test methods which should be used and the maximum limits are as detailed in Table 2 below.

**Table 2 – Specification for a distillate oil equivalent**

Specification for a distillate oil equivalent			
Property	Units	Limit (max)	Test method
Total Halogens, as chlorine	mg/kg	5	<a href="#">IP 503</a>
PCBs	mg/kg	5	<a href="#">IP 462</a>
<b>Metals</b>			
Mercury	mg/kg	5	IP PM DZ*
Lead	mg/kg	5	IP PM ED*
Nickel	mg/kg	5	
Chromium	mg/kg	5	
Copper	mg/kg	5	
Zinc	mg/kg	5	
Arsenic	mg/kg	5	
Cadmium	mg/kg	5	
Thallium	mg/kg	5	
Antimony	mg/kg	5	
Cobalt	mg/kg	5	
Manganese	mg/kg	5	
Vanadium	mg/kg	5	

\*Test methods under development – Please contact SEPA in the interim

## Specification for a Residual Fuel Equivalent

PFO that is to be used to replace a residual oil must meet the parameters set in the most up to date version of the [BS2869:2010](#) for class E, or F or G fuels, with the exception of viscosity. In addition to these parameters, the PFO must also be analysed for total halogens expressed as chlorine, and metals and their compounds. The test methods which should be used and the maximum limits are as detailed in Table 3 below. Note that the limit for sulphated ash content contained in Table 3 below replaces that contained in the [BS2869:2010](#).

**Table 3 – Specification for a Residual Oil Equivalent**

Specification for a residual oil equivalent			
Property	Units	Limit (max)	Test method
Sulphated ash content	% (m/m)	0.20	<a href="#">IP 550</a>
Total Halogens, as chlorine	mg/kg	150	<a href="#">IP 503</a>
PCBs	mg/kg	5	<a href="#">IP 462</a>
<b>Metals</b>			
Mercury	mg/kg	5	<a href="#">IP 594</a>
Lead	mg/kg	25	<a href="#">IP 592</a>
Nickel	mg/kg	5	
Chromium	mg/kg	5	
Copper	mg/kg	40	
Zinc	mg/kg	300	
Arsenic	mg/kg	5	
Cadmium	mg/kg	5	
Thallium	mg/kg	5	
Antimony	mg/kg	5	
Cobalt	mg/kg	5	
Manganese	mg/kg	5	
Vanadium	mg/kg	5	

### Notes

For the analysis of metals (except mercury) SEPA will, as an equivalent, accept the use of test method [IP593](#) (WD-XRF) instead of [IP 592](#).

For the analysis of sulphur, SEPA will accept the WD-XRF method [ASTM D 2622](#) as an equivalent method to [IP336](#) (ED-XRF)

### Useful Links

#### Oil Care Campaign

<http://www.oilbankline.org.uk/oil-care-campaign.asp>

#### SEPA Oil Storage Guidance

[http://www.sepa.org.uk/water/water\\_regulation/regimes/pollution\\_control/oil\\_storage/scottish\\_oil\\_care.aspx](http://www.sepa.org.uk/water/water_regulation/regimes/pollution_control/oil_storage/scottish_oil_care.aspx)

#### Energy Institute – Test Method Search Engine

<http://ein.powerweb.co.uk/cssipmethodsqbe.htm>

#### Oil Recycling Association

<http://www.oilrecyclingassociation.co.uk/home/>