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FOREWORD



Guidelines on Standard and Specification of Recovered Waste Oil in Malaysia

Waste oil is one of the waste streams prescribed under the Environmental Quality (Scheduled Wastes) Regulations 2005. Although it is a waste, it has economic value, thus, it promotes the setting up of recovery plants to process the waste oil into finished products such as fuel oil, lubrication oil, hydraulic oil, base oil and etc.

The recovery or processing of waste oil requires an operating licence from the Department of Environment. These guidelines provide procedures in determining and classifying a product generated from recovery, or recycling or reconstituting processes of waste oil. Waste oil that has undergone a recovery process and met the standard or specification stipulated in these guidelines will no longer be considered a scheduled waste, hence the product is allowed to be traded as any other goods.

It is hoped that with this standards and specification of recovered oil, it will further promote the business of recovery of waste oil in Malaysia in producing better quality products for various uses. This subsequently will pose less risk to consumers who will be using the recovered waste oil either as fuel or for lubrication purposes, while in the longer term will help to protect the environment.

These guidelines have been prepared in consultation with the Department of Chemistry, University Malaysia Pahang, oil companies and licensed recovery facilities of waste oil in the country. The Department of Environment wishes to record appreciation to all who have contributed.

Environment is our shared responsibility.

A handwritten signature in black ink, which appears to read 'Rosnani', written over a horizontal line.

Dato' Hajah Rosnani binti Ibarahim
Director General of the Environment, Malaysia

INTRODUCTION

1. Waste oil may contain physical and chemical impurities that can induce a variety of illness and diseases in human and living organisms through inhalation, ingestion or skin contact. Table 1 below shows the main contaminants in waste oil:

Table 1: Principal Contaminants in Waste Oil

Metals and Inorganics	Chlorinated hydrocarbons	Other organics
Aluminium	Dichlorodifluoromethane	Benzene
Antimony	Trichlorodifluoromethane	Toluene
Arsenic	1,1,1-Trichloroethane	Xylenes
Barium	Trichloroethylene	Benzo(a)anthracene
Cadmium	Tetrachloroethylene	Benzo(a)pyrene
Calcium	Total chlorine	Naphthalene
Chromium	Polychlorinated biphenyls	Other PAHs
Cobalt		
Copper		
Lead		
Magnesium		
Manganese		
Mercury		
Nickel		
Phosphorus		
Silicon		
Sulphur		
Zinc		

Source: *Waste Oil: Technology, Economics and Environment, Health and Safety Considerations*, US Department of Energy, January 1987

2. In Malaysia, waste oil is classified as scheduled wastes under the First Schedule of the Environmental Quality (Scheduled Wastes) Regulations 2005, with the following codes and descriptions:

- (a) SW 305 – Spent lubricating oil
- (b) SW 306 – Spent hydraulic oil
- (c) SW 307 – Spent mineral oil-water emulsion
- (d) SW 308 – Oil tanker sludges
- (e) SW 309 – Oil-water mixture such as ballast water

- (f) SW 310 – Sludge from mineral oil storage tank
- (g) SW 311 – Waste oil or oily sludges
- (h) SW 312 – Oily residue from automotive workshop, service station oil or grease interceptor
- (i) SW 314 – Oil or sludge from oil refinery or petrochemical plant

3. Waste oil is also listed as code A4060 under Annex VIII, List A of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal 1989. As Malaysia is one of the Parties to the Basel Convention, the importation and exportation of such wastes must follow the procedures of the Convention. Importation or exportation of the wastes require prior written approval from the Department of Environment as mandated under Section 34B(1)(b)&(c), of the Environmental Quality Act, 1974. Any person who contravenes this section and shall on upon conviction shall be punished with imprisonment for a term not exceeding five years and shall also be liable to a fine not exceeding five hundred thousand Ringgit.

4. Waste oil should be managed properly according to the requirements of the Environmental Quality (Scheduled Wastes) Regulations 2005. For waste oil that still has an economic value, it can be recovered by waste oil recovery facilities that are licenced by Department of Environment. The list of the licenced recovery facilities can be obtained from the official website of Department of Environment at www.doe.gov.my. The recovered, recycled, or reconstituted processes of waste oil that does not meet the standard and specification set, it still categorised as scheduled waste.

SCOPE

5. The scope of these guidelines is to assist all parties concerned in determining and classifying a product generated from recovery, or recycling, or reconstituting processes of waste oil, whether it is categorised as scheduled waste under the First Schedule of the Environmental Quality (Scheduled Wastes) Regulations 2005.

6. In addition, this standard and specification will also promote the recovery facilities of waste oil in Malaysia to produce a better quality of recovered waste oil as their product.

STANDARD AND SPECIFICATION FOR RECOVERED WASTE OIL

7. Waste oil that has been processed by recovery facilities and met the standard and specification of recovered waste oil as in Table 2 can be considered as non scheduled waste. For waste oil that has been processed but does not meet the standard and specification of recovered waste oil as in Table 2, it still categorised as scheduled waste.

8. The allowable level of contaminant and specification of recovered waste oil is as in Table 2 below:

Table 2: Standard and Specification of Recovered Waste Oil

Parameters / Constituents	Allowable Level
Arsenic	5 ppm maximum
Cadmium	2 ppm maximum
Chromium	10 ppm maximum
Lead	100 ppm maximum
Total Halogen (as chlorine)	1000 ppm maximum
Flash point	37.7°C or higher
Appearance	The recovered waste oil must have a clear and bright appearance
Poly-aromatic hydrocarbons	
Benzo(a)pyrene	10 mg / 1 kg oil (10 ppm) maximum
Dibenz(ah)anthracene	10 mg / 1 kg oil (10 ppm) maximum
Benz(a)anthracene	100 mg / 1 kg oil (100 ppm) maximum
Benzo(b)fluoranthene	100 mg / 1 kg oil (100 ppm) maximum
Benzo(k)fluoranthene	100 mg / 1 kg oil (100 ppm) maximum
Chrysene	100 mg / 1 kg oil (100 ppm) maximum
Indeno(123-cd)pyrene	100 mg / 1 kg oil (100 ppm) maximum

9. The test method to analyse the level of contaminant in the recovered waste oil is as in Table 3 below:

Table 3: Method of Testing

Parameters / Constituents	Method
Arsenic	Any established method
Cadmium	Any established method
Chromium	Any established method
Lead	Any established method
Total Halogen (as chlorine)	ASTM D 5384 / EPA 9075
Flash point	MS 686
Appearance	In house method (Visual)
Poly-aromatic hydrocarbons	
Benzo(a)pyrene	EPA SW-846 Method 8270C
Dibenz(ah)anthracene	EPA SW-846 Method 8270C
Benz(a)anthracene	EPA SW-846 Method 8270C
Benzo(b)fluoranthene	EPA SW-846 Method 8270C
Benzo(k)fluoranthene	EPA SW-846 Method 8270C
Chrysene	EPA SW-846 Method 8270C
Indeno(123-cd)pyrene	EPA SW-846 Method 8270C

10. The Director General may specify such other equivalent test methods as he thinks fit, provided that the standards of sampling and test methods shall not be lower than the standards provided for in these guidelines.

11. The list of accredited laboratories can be obtained from the official website of Department of Standards Malaysia at www.standardsmalaysia.gov.my.

REFERENCES

1. Part 279 - Standards for the Management of Used Oil, Title 40: Protection of Environment Code of Federal Regulations (CFR), US Environmental Protection Agency's (USEPA)
2. Product Stewardship (Oil) Regulations 2000, Product Stewardship (Oil) Act, 2000, Australia
3. Malaysia Standard MS 122:1998 – Specification for Fuel Oils For Use in Engines and Burning Equipment (Second Revision)
4. ASTM D6448-99 – Standard Specification for Industrial Burner Fuels from Used Lubricating Oils
5. Technical Guidance Document HW 99-01, Kansas Department of Health and Environment
6. Environmental Quality (Control of Petrol and Diesel Properties) Regulations 2007
7. Environmental Quality (Scheduled Wastes) Regulations 2005

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