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**Palm oil - Specification
(Third revision)**

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Committee representation

The National Standards Committee on Oil Palm and Its Products (NSC 24) under whose authority this Malaysian Standard was developed, comprises representatives from the following organisations:

Malaysian Biodiesel Association
Malaysian Nature Society
Malaysian Oleochemicals Manufacturers Group
Malaysian Palm Oil Association
Malaysian Palm Oil Board
Malaysian Sustainable Palm Oil
Malaysian Palm Oil Council
Ministry of Plantation and Commodities
National Association of Smallholders
Palm Oil Refiners Association of Malaysia
Sarawak Dayak Iban Association
Sarawak Dayak Oil Palm Planters Association
Sarawak Oil Palm Plantation Owners Association
The East Malaysia Planters' Association
The National Union of Plantation Workers
Universiti Malaysia Sarawak
Universiti Putra Malaysia

The Technical Committee on Palm-Based Oils and Fats (NSC 24/TC 3) which developed this Malaysian Standard consists of representatives from the following organisations:

Department of Standards Malaysia
Federation of Malaysian Manufacturers
Halal Development Corporation Berhad
Malayan Edible Oil Manufacturers' Association
Malaysian Agricultural Research and Development Institute
Malaysian Oleochemicals Manufacturers Group
Malaysian Palm Oil Board
Ministry of Health Malaysia
Palm Oil Refiners Association of Malaysia
Persatuan Pengguna Islam Malaysia
The Federation of Palm Oil Millers Associations of Malaysia
Universiti Putra Malaysia

FOREWORD

This Malaysian Standard was developed by the Technical Committee on Palm-Based Oils and Fats (NSC 24/TC 3) under the authority of the National Standards Committee on Oil Palm and Its Products (NSC 24).

This Malaysian Standard is the third revision of MS 814, *Palm oil - Specification* which was published in 1983, revised in 1994 and 2007 and amended in 1984 and 2018.

The major modifications in this revision are as follows:

- a) to update normative reference;
- b) to include reference to Annex A below Table 2 for additional information on the maximum limits of total chloride content, 3-monochloropropane-1,2-diol esters (3-MCPDE), glycidyl esters (GE) and iron (Fe) content; and
- c) to include new Annex A (informative) - Additional information on the maximum limits of contaminants in palm oil products.

This Malaysian Standard cancels and replaces MS 814:2007, *Palm oil - Specification*.

Compliance with a Malaysian Standard does not of itself confer immunity from legal obligations.

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PALM OIL - SPECIFICATION (THIRD REVISION)

1 Scope

This Malaysian Standard prescribes requirements for crude and processed palm oil.

2 Normative references

The following normative references are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the normative references (including any amendments) applies.

Malaysian Food Act 1983 and Food Regulations 1985

MS 817 related series

MS 1231-1, *Sampling of Palm Oil and Palm Oil Products - 1: Sampling from packages (First revision)*

MS 1231-2, *Sampling of Palm Oil and Palm Oil Products - 2: Sampling from bulk*

Codex CXS 234-1999, *Recommended Methods of Analysis and Sampling*

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1

crude palm oil (CPO)

crude palm oil is the oil derived by mechanical expression from the fleshy pulp (mesocarp) of the fruit of *Elaeis guineensis* Jacq

3.2

neutralised palm oil (NPO)

neutralised palm oil is obtained by neutralisation of crude palm oil with alkali

3.3

neutralised, bleached palm oil (NBPO)

neutralised, bleached palm oil is obtained from crude palm oil by neutralisation with alkali and treatment with bleaching earth or activated carbon or both; or from neutralised palm oil by treatment with bleaching earth or activated carbon or both

3.4

neutralised, bleached and deodorised palm oil (NBD palm oil)

neutralised, bleached and deodorised palm oil is obtained from crude or semi-refined palm oil which has been refined by neutralisation with alkali, bleached with bleaching earth or activated carbon or both and deodorised by steam

3.5

refined, bleached and deodorised palm oil (RBD Palm oil)

refined, bleached and deodorised palm oil is obtained from crude or semi-refined palm oil which has been bleached, deodorised and deacidified by physical means

4 Identity characteristics

The identity characteristics for palm oil are given in Table 1. The ranges of these identity characteristics are not mandatory and are considered as guideline levels.

Table 1. Guideline identity characteristics for palm oil

Identity characteristics	Observed range	Mean	Standard deviation
Apparent density, kg/l, at 50 °C	0.889 to 0.895	0.890 50	0.000 2
Refractive index, n_D 50 °C	1.454 to 1.456	1.454 3	0.000 2
Saponification value, mg KOH/g oil	194 to 205	199	2.4
Unsaponifiable matter, %	0.19 to 0.44	0.32	0.066
Fatty acid composition, (wt % as methyl esters)			
C12:0	0.0 to 0.5	0.2	0.10
C14:0	0.9 to 1.5	1.1	0.08
C16:0	39.2 to 45.8	43.5	0.95
C16:1	0.0 to 0.4	0.2	0.05
C18:0	3.7 to 5.1	4.3	0.18
C18:1	37.4 to 44.1	39.8	0.94
C18:2	8.7 to 12.5	10.3	0.56
C18:3	0.0 to 0.6	0.3	0.07
C20:0	0.0 to 0.5	0.2	0.16
Iodine value (Wijs)	50.4 to 53.7	52.0	0.66
Slip melting point, °C	33.8 to 39.2	36.7	0.84
Total carotenoids (as β -carotene), mg/kg	474 to 689	581	45.5

NOTE. The identity characteristics of processed palm oil differ in no significant ways from those of crude palm oil with the exception of total carotenoids.

5 Quality characteristics

5.1 General characteristics

5.1.1 Colour at 50 °C to 55 °C

The colour of crude or neutralised palm oil shall be bright, clear and orange-red. The colour of neutralised, bleached palm oil shall be bright, clear and reddish yellow while that for neutralised/refined, bleached and deodorised palm oil shall be bright, clear and light yellow.

5.1.2 Odour

All palm oil products shall be free from foreign and rancid odour.

5.2 Quality requirements

5.2.1 The standard shall incorporate the following palm oil products: -

- a) Crude palm oil (CPO), special quality (SQ) and standard quality (STD);

- b) Neutralised palm oil (NPO);
- c) Neutralised, bleached palm oil (NBPO); and
- d) Neutralised, bleached and deodorised palm oil/ refined, bleached and deodorised palm oil (NBD/RBD).

5.2.2 The products, at the time of shipment as per current trade practice, *i.e.* at the point and time of delivery of the oil from sellers' tanks, whether ex-refinery, ex-bulking installation, or otherwise, as the case may be, shall conform to the requirements prescribed in Table 2.

Table 2. Quality requirements for palm oil products

Characteristics	Product requirements				
	Crude (CPO)		Neutralised (NPO)	Neutralised, bleached (NBPO)	Neutralised/ refined, bleached and deodorised (NBD/RBD)
	Special quality (SQ) grade	Standard quality (STD grade)			
Free fatty acid (as palmitic), % max	2.5	5.0	0.25	0.25	0.10
Moisture and impurities, % max	0.25	0.25	0.10	0.10	0.10
Peroxide value, meq/kg max	1.0	2.0	-	-	2.0
Anisidine value, max	4.0	5.0	-	-	4.0
Colour, 133.35 mm (5 ¼ in.) Lovibond at 50 °C, max	-	-	-	20.0 R	3.0 R
Deterioration of bleachability index (DOBI), min	2.8	2.3	-	-	-

See Annex A for additional information on the maximum limits of total chloride content (TCC), 3-monochloropropane-1,2-diol esters (3-MCPDE), glycidyl esters (GE) and iron (Fe) content.

6 Hygiene

The product shall be processed and packaged under hygienic conditions in licensed premises as imposed by the competent authorities from time to time in accordance with the local government by laws, public health legislation and codes of practice as well as guidelines in force in Malaysia where relevant.

7 Packaging and labelling

7.1 Packaging

The product shall be supplied in bulk or in rust-free steel drums, or as agreed upon between the purchaser and the supplier.

7.2 Labelling

The product shall comply with current Malaysian Food Act 1983 and Food Regulations 1985 on labelling.

7.2.1 The package shall be marked legibly and indelibly with the following information, but not limited to:

- a) name of the product;
- b) weight of the product;
- c) producer's name and address or trade-mark;
- d) month and year of manufacture and lot identification or code; and
- e) country of origin.

8 Certification

8.1 Each product may, by arrangement with a recognised certification body, be marked with the certification mark of that body, provided the product conforms to the requirements of this Malaysian Standard.

8.2 The product may be certified *Halal* by a recognised authority.

9 Sampling and testing

9.1 Representative samples of the product shall be drawn according to the method prescribed in MS 1231-1 and MS 1231-2 and the sample shall be prepared according to MS 817.

9.2 Tests shall be carried out according to the methods prescribed in the latest edition of MS 817 or equivalent ISO Method, or equivalent test methods as adopted in Codex CXS 234-1999.

10 Compliance

10.1 Upon testing, when each of the samples is found to conform to the requirements specified in this standard, the lot, batch or consignment from which the samples have been drawn shall be deemed to comply with this Malaysian Standard.

10.2 In this context, the term 'sample' shall be taken to include also 'composite sample or samples' where appropriate as agreed upon mutually between seller and buyer.

11 Legal requirements

The product, in all other aspects, shall comply with the requirements of the legislation currently in force in Malaysia.

Annex A
(informative)

Additional information on the maximum limits of contaminants in palm oil products

Table A.1. Additional information on the maximum limits of contaminants in palm oil products

Contaminants	Product			
	Crude	Neutralised	Neutralised, bleached	Refined, bleached and deodorised/ neutralised, bleached and deodorised
3-monochloropropane-1,2-diol esters (3-MCPDE) ^a , ppm max	-	-	-	2.5
Glycidyl esters (GE) ^a , ppm max	-	-	-	1.0
Total chloride content (TCC) ^b , ppm max	2.0	-	-	-
Iron (Fe), ppm max	5.0	-	-	-
NOTE.				
a. Process induced contaminants				
b. The maximum limit of TCC is applicable only to washed crude palm oil				

Bibliography

- [1] PORIM Crude Palm Oil Survey 97/98. *Quality and Identity Characteristics*. PORIM Technology No. 22, 2000.

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Acknowledgements

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