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البترول ومشتقاته ـ الخصائص القياسية لروح النفط المعدني (روح النفط الأبيض ـ وايت سبيريت) (مذيب هيدروكربوني للتنظيف الجاف)

Petroleum and petroleum products -- Standard specification for mineral petroleum spirits (white spirit) (Hydrocarbon dry cleaning solvent)

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مؤسسة المواصفات والمقاييس

المملكة الأردنية الهاشمية

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This Jordanian Standard cancels and replaces the Jordanian Standard 571 issued in 2006.

Foreword

Jordan Standards and Metrology Organization is the national standardization body in Jordan. The work of preparing Jordanian Standards is normally carried out by technical committees composed of the interested parties, which are involved in the scope of the standard. All the interested parties have the right to comment on the draft Jordanian Standard during the inquiry stage, taking into consideration the importance of harmonizing Jordanian Standards with the international, regional or national standards (as much as possible) for the purpose of eliminating technical barriers to trade and facilitating the international trade.

Jordanian Standards are drafted in accordance with the rules given in the Jordanian Directive 1-2:2005, part 2: Rules for the structure and drafting of Jordanian Standards related to standardization department *.

The permanent technical committee for Petroleum and petroleum products 6 has studied the prepared project of the Jordanian Standard 2428:2026 related to " **Petroleum and petroleum products – Standard specification for mineral petroleum spirits (white spirit) (Hydrocarbon dry cleaning solvent)**", and the Jordanian Standard 571:2006 related to **"Paints and varnishes Mineral solvents (white spirit) and related hydrocarbon solvents for paints and varnishes"**, where it has recommended to withdraw the above Jordanian Standard and to approve the amended project as a Jordanian Standard 2428:2026, according to article (12) of Standards and Metrology Law No. (22) For the year 2000 and its amendments.

This Jordanian Standard 2428:2026 is a modified adoption of the ASTM D235:2022 "**Standard specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent)**", using reprint method, single vertical bars (|) in the margins are used to indicate the applicable technical modifications which have been changed and shown in annex NA, and single vertical dotted bars (:) in the margins are used to indicate the applicable editorial modifications which have been changed and listed below.

For the purposes of this Jordanian Standard, the following editorial changes have been made:
– Substitution of "this specification", by "this Jordanian Standard", applying the Jordanian Directive 1-2:2005, part 2: rules for the structure and drafting of Jordanian Standards:
– Deletion of clauses 1-3, 1-4 and 1-6 because they relate to ASTM requirements, and renumbering clause 1-5 to 1-3
– Deletion of footnote 1 and 2, and 3, because they relate to ASTM requirements.
– Deletion of clause 8, as it is not required.
– Inclusion of Bibliography in an informative Annex A.

* under amendment.

Petroleum and petroleum products – Standard specification for mineral petroleum spirits (white spirit) (Hydrocarbon dry cleaning solvent)

1- Scope

1-1 This Jordanian Standard covers four types of hydrocarbon solvents, normally petroleum distillates, used primarily in the coatings and dry-cleaning industries. "Mineral spirits" is the most common name for these solvents. They are also called "Stoddard Solvents" when used for dry cleaning.

1-2 For specific hazard information and guidance, see the supplier's Material Safety Data Sheet for materials listed in this specification.

1-3 The following hazard caveat pertains only to the test method portion, clause 6-1-10, of this specification. This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.

2- Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies. Indexes for published standard can be found in JSMO's library.

- ASTM D56, Standard Test method for flash point by tag closed cup tester.
- ASTM D86, Standard Test method for distillation of petroleum products and liquid fuels at atmospheric pressure.
- ASTM D130, Standard Test method for corrosiveness to copper from petroleum products by copper strip test.
- ASTM D156, Standard Test method for saybolt color of petroleum products (saybolt chromometer method).
- ASTM D1133, Standard Test method for Kauri-Butanol value of hydrocarbon solvents
- ASTM D1159, Standard Test method for bromine numbers of petroleum distillates and commercial aliphatic olefins by electrometric titration.
- ASTM D 1209, Standard Test method for color of clear liquids (Platinum- Cobalt Scale).
- ASTM D1296, Standard Test method for odor of volatile solvents and diluents.
- ASTM D2710, Standard Test method for bromine index of petroleum hydrocarbons by electrometric titration.
- ASTM D3227, Standard Test method for (Thiol Mercaptan) sulfur in gasoline, kerosine, aviation turbine, and distillate fuels (Potentiometric Method).
- ASTM D 3257, Standard Test methods for aromatics in mineral spirits by gas chromatography.
- ASTM D 3278, Standard Test methods for flash point of liquids by small scale closed-cup apparatus.
- ASTM E 300, Standard Practice for sampling industrial chemicals.

3- Classification

3-1 Mineral spirits shall be of the following types as specified:

3-1-1 Type I: Full Range.

3-1-2 Type II: High Flash Point.

3-1-3 Type III: Odorless.

3-1-4 Type IV: Low Dry Point.

3-2 Mineral spirits types may be further differentiated based on aromatics content as follows:

3-2-1 Class A: (8 to 22) vol % aromatics.
3-2-2 Class B: (2 to 8) max vol % aromatics.
3-2-3 Class C: less than 2 vol % aromatics.

4- Properties

4-1 The physical and chemical properties of the different types and classes of mineral spirits shall conform to the requirements specified in Table 1.

Table 1 – Physical and chemical properties of mineral spirits

	Type I Full range mineral spirits			Type II High flash point		
	Class A	Class B[a)]	Class C[a)]	Class A	Class B[a)]	Class C[a)]
Aromatic Content, range, vol %	8–22	2–8 max	0–2	8–22	2–8 max	0–2
Commercial reference	regular	rule 66	low aromatic	regular	rule 66	low aromatic
Appearance	clear and free of suspended matter when observed at 15,6–25,6°C					
Flash point, °C, min	38	38	38	61	61	61
Color, min	not darker than + 25 on Saybolt Scale or 25 on Pt-Co Scale					
Kauri-Butanol value:						
min	34	29	28	33	29	28
max	43	40	39	43	40	39
Bromine Number, max	5	1	0,1	5	1	0,1
Odor[b)]	characteristic, as agreed between purchaser and supplier					
Doctor test	negative					
Distillation, °C						
Initial boiling point, min	149	149	149	177	177	177
50% Recovered, max	185	185	185	202	202	202
Dry point, max	213	213	213	213	213	213
Residue from distillation:						
Vol %, max	1,5					
Acidity	neutral					
Copper corrosion, max rating	2A					
Apparent Specific Gravity 15,6/15,6°C						
min	0,754	0,754	0,754	0,768	0,768	0,768
max	0,820	0,810	0,800	0,820	0,810	0,810

Table 1 – Physical and chemical properties of mineral spirits (cont.)

	Type III Odorless [c]		Type IV Low Dry Point		
	Class C-1 [a]	Class C-2 [a]	Class A	Class B [a]	Class C [a]
Aromatic Content, range, vol %	0–0,25	0–0,25	8–22	2–8 max	0–2
Commercial reference	odorless	odorless	regular	rule 66	low aromatic
Appearance	clear and free of suspended matter when observed at 15,6–25,6°C				
Flash point, °C, min	38	38	38	38	38
Color, min	not darker than + 25 on Saybolt Scale or 25 on Pt-Co Scale				
Kauri-Butanol value,					
min	---	---	34	29	28
max	29	29	43	41	40
Bromine Number, max	0,1	5	5	1	0,1
Odor [b]	characteristic, as agreed between purchaser and supplier				
Doctor test	negative				
Distillation, °C					
Initial boiling point, min	149	149	149	149	149
50% Recovered, max	196	196	174	174	174
Dry point, max	213	213	185	185	185
Residue from distillation					
Vol %, max	1,5				
Acidity	neutral				
Copper corrosion, max rating	2A				
Apparent Specific Gravity 15,6/15,6°C					
min	0,740	0,740	0,745	0,745	0,745
max	0,775	0,775	0,810	0,800	0,790

[a] Mineral Spirits of Types I, II, III, and IV may be commercially available as Classes B and C to meet certain air pollution regulations (for example, "Rule 66") which set maximum limits on certain constituents as follows: toluene and ethylbenzene 20 vol %; C_8 and higher aromatics 8 vol %, olefins 5 vol %; the sum of all restricted constituents not to exceed 20 vol %.

[b] Optional: Test for odor only when agreed as necessary by purchaser and supplier.

[c] Only products that have a very high isoparaffinic hydrocarbon content, that is, approaching 100 %, are considered to fit the odorless category. Type III Class C-1 is hydrogenated product; Class C-2 is a distillation fraction.

5- Sampling

The material shall be sampled in accordance with ASTM E300.

6- Test Methods

6-1 The properties enumerated in this Jordanian Standard shall be determined in accordance with the following ASTM test methods:

6-1-1 Bromine Number: ASTM D1159. Bromine number is expressed as g bromine reacted per 100-g sample.

For products having low olefin contents, Bromine Index (mg bromine reacted per 100-g sample) by ASTM D2710 may be used.

6-1-2 Color: ASTM D156 or ASTM D1209. In case of dispute, ASTM D156 shall be the referee method.

6-1-3 Corrosion: ASTM D130. Perform test under the prescribed conditions for 3 h at 100°C.

6-1-4 Distillation: ASTM D86.

6-1-5 Flash Point: ASTM D56 or ASTM D3278. In case of dispute, ASTM D56 shall be the referee method.

6-1-6 Kauri-Butanol Value: ASTM D1133.

6-1-7 Odor: ASTM D1296. Samples of particular types of products being tested, having odor characteristics satisfactory to consumer and producer, are to be used as reference standards for comparison.

6-1-8 Mercaptan Sulfur: ASTM D3227.

6-1-9 Apparent Specific Gravity: Determine the apparent specific gravity by any convenient method that is accurate to the third decimal place, the temperature of both specimen and water being 15,6°C. See ASTM D 268.

6-1-10 Doctor Test:

6-1-10-1 Preparation of Doctor (Sodium Plumbite) Solution: Dissolve approximately 125 g of sodium hydroxide (NaOH) in 1 L of reagent water. Add 60 g of lead monoxide (PbO) and shake vigorously for 15 min, or let stand with occasional shakings for at least a day. Allow to settle and decant or siphon off the clear liquid. If the solution does not settle clear, filter it through filter paper. Keep the solution in a tightly corked bottle and refilter before use if not perfectly clear.

6-1-10-2 Procedure: Shake vigorously together in a test tube 10 mL of the solvent being tested and 5 mL of sodium plumbite solution for about 15 s. Add a small amount of pure, dry flowers of sulfur so that practically all of it floats on the interface between the solvent and the sodium plumbite solution after shaking. Again, shake for 15 s, allow to settle and observe within 2 min.

6-1-10-3 Interpretation of Results: If the solvent is discolored or if the yellow color of the sulfur film is noticeably masked, consider the test positive and the solvent as "sour." If the sample remains unchanged in color and the sulfur film is bright yellow or only slightly discolored with gray or flecked with black, consider the test negative and the solvent as "sweet."

6-1-10-4 If the doctor test result is positive, mercaptan content may be determined using ASTM D 3227 and reported.

6-1-11 Aromatics: ASTM D 3257.

7-Labeling

The following information shall be written clearly, visible and difficult to remove in Arabic and/or English on label for each container:

a) The name of the product.

b) The name and address of the manufacturer and importer. The trademark may be mentioned (if any).

c) type and class of the product.

d) Warning statements and/or warning symbols for the transfer, handling and/or use.

e) Storage conditions.

f) Weight, volume, or nominal capacity using international standard units (SI).

g) Country of origin.

Annex A
(Informative)
Bibliography

[1] - ASTM D268, Standard Guide for sampling and testing volatile solvents and chemical intermediates for use in paint and related coatings and material.

Annex NA
(Normative)
National technical modifications

Table NA – 1 illustrates the technical national deviations from ASTM D235:2022 adopted as a Jordanian Standard, where single vertical bars (|) in the margins are used to indicate these technical national modifications have been changed.

Table NA – 1 – List of national technical modifications

Clause	Modification	Explanation
7	Deletion clause 7	Decision of the Technical Committee
7	Add clause for Labeling	Applying the Jordanian Technical Regulation 119:2022 "Labeling – Labeling of industrial products".