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AMENDMENT 1
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Lubricants, industrial oils and related products (class L) — Family T (Turbines) — Specification for lubricating oils for turbines

AMENDMENT 1: Filterability tests according to ISO 13357-1 and ISO 13357-2 — Requirements related to the stage of the test method

Lubrifiants, huiles industrielles et produits connexes (classe L) — Famille T (Turbines) — Spécifications pour les huiles lubrifiantes pour turbines

AMENDEMENT 1: Essais de filtrabilité selon les normes ISO 13357-1 et ISO 13357-2 — Exigences relatives au stade de la méthode d'essai

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This document was prepared by Technical Committee ISO/TC 28, *Petroleum and related products, fuels and lubricants from natural or synthetic sources*, Subcommittee SC 4, *Classifications and specifications*.

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Lubricants, industrial oils and related products (class L) — Family T (Turbines) — Specification for lubricating oils for turbines

AMENDMENT 1: Filterability tests according to ISO 13357-1 and ISO 13357-2 — Requirements related to the stage of the test method

Normative references

Replace the references to ISO 4259, ASTM D2272-02, and ASTM D2711-01a with the following:

ISO 4259 (all parts), *Petroleum and related products — Precision of measurement methods and results*

ASTM D 2272, *Standard Test Method for Oxidation Stability of Steam Turbine Oils by Rotating Pressure Vessel*

ASTM D 2711, *Standard Test Method for Demulsibility Characteristics of Lubricating Oils*

Delete the reference to DIN 51554-3.

5.10, Table 3 to Table 6

Replace the rows

Filterability (dry) (minimum)	%	85	85	85	ISO 13357-2
Filterability (wet)	%	pass			ISO 13357-1

With the following:

Filterability (dry) stage I (minimum)[h]	%	80	80	80	ISO 13357-2
Filterability (dry) stage II[i]	%	Report			ISO 13357-2
Filterability (wet) stage I (minimum)[h,j]	%	50			ISO 13357-1
Filterability (wet) stage II (minimum)[i,j]	%	50			ISO 13357-1

5.10, Table 3

Add the following footnotes to the table footer:

[h] The stage I determination is based upon a comparison of the mean flow rate of a fluid through a test membrane with its initial flow rate. Oils having good stage I filterability, but only a poor stage II performance (see footnote i), are unlikely to give performance problems in use, unless extremely fine system filters are utilized.

[i] The stage II determination is based upon the ratio between the initial flow rate of fluid through the test membrane and the rate at the end of the test. It is considered that this part of the procedure

is a more severe test, and is more sensitive to the presence of gels and fine silts in the oil. Silts and gels can be present in an oil when it is produced, or can be formed as an oil ages, especially when hot. An oil with good stage II filterability is unlikely to give filtration problems even in the most extreme conditions, and with fine (less than 5 µm) filtration present. Thus, it is suitable for use in critical turbine lubrication systems. A 60 % value is generally considered acceptable.

j Applies to TSA only.

5.10, Table 4

Add the following footnotes to the table footer:

h The stage I determination is based upon a comparison of the mean flow rate of a fluid through a test membrane with its initial flow rate. Oils having good stage I filterability, but only a poor stage II performance (see Footnote i), are unlikely to give performance problems in use, unless extremely fine system filters are utilized.

i The stage II determination is based upon the ratio between the initial flow rate of fluid through the test membrane and the rate at the end of the test. It is considered that this part of the procedure is a more severe test, and is more sensitive to the presence of gels and fine silts in the oil. Silts and gels can be present in an oil when it is produced, or can be formed as an oil ages, especially when hot. An oil with good stage II filterability is unlikely to give filtration problems even in the most extreme conditions, and with fine (less than 5 µm) filtration present. Thus, it is suitable for use in critical turbine lubrication systems. A 60 % value is generally considered acceptable.

j Applies to TSE only.

In the column “Test method”, replace the reference “ASTM D 2272-02” with “ASTM D 2272”.

5.10, Table 5

Add the following footnotes to the table footer:

h The stage I determination is based upon a comparison of the mean flow rate of a fluid through a test membrane with its initial flow rate. Oils having good stage I filterability, but only a poor stage II performance (see Footnote i), are unlikely to give performance problems in use, unless extremely fine system filters are utilized.

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j Applies to TGSB only.

In the column “Test method”, replace the reference “ASTM D 2272-02” with “ASTM D 2272”.

5.10, Table 6

Add the following footnotes to the table footer:

[h] The stage I determination is based upon a comparison of the mean flow rate of a fluid through a test membrane with its initial flow rate. Oils having good stage I filterability, but only a poor stage II performance (see Footnote i), are unlikely to give performance problems in use, unless extremely fine system filters are utilized.

[i] The stage II determination is based upon the ratio between the initial flow rate of fluid through the test membrane and the rate at the end of the test. It is considered that this part of the procedure is a more severe test, and is more sensitive to the presence of gels and fine silts in the oil. Silts and gels can be present in an oil when it is produced, or can be formed as an oil ages, especially when hot. An oil with good stage II filterability is unlikely to give filtration problems even in the most extreme conditions, and with fine (less than 5 µm) filtration present. Thus, it is suitable for use in critical turbine lubrication systems. A 60 % value is generally considered acceptable.

[j] Applies to TGSE only.

In the column "Test method", replace the reference "ASTM D 2272-02" with "ASTM D 2272".

5.10, Table 7

Replace the rows

Filterability (dry) (minimum)	%	80	80	ISO 13357-2
Filterability (wet)	%	pass		ISO 13357-1

With the following:

Filterability (dry) stage I (minimum)[f]	%	80	80	ISO 13357-2
Filterability (dry) stage II[g]	%	Report		ISO 13357-2
Filterability (wet) stage I (minimum)[f]	%	50		ISO 13357-1
Filterability (wet) stage II (minimum)[g]	%	50		ISO 13357-1

Add the following footnotes to the table footer:

[f] The stage I determination is based upon a comparison of the mean flow rate of a fluid through a test membrane with its initial flow rate. Oils having good stage I filterability, but only a poor stage II performance (see footnote g), are unlikely to give performance problems in use, unless extremely fine system filters are utilized.

[g] The stage II determination is based upon the ratio between the initial flow rate of fluid through the test membrane and the rate at the end of the test. It is considered that this part of the procedure is a more severe test, and is more sensitive to the presence of gels and fine silts in the oil. Silts and gels can be present in an oil when it is produced, or can be formed as an oil ages, especially when hot. An oil with good stage II filterability is unlikely to give filtration problems even in the most extreme conditions, and with fine (less than 5 µm) filtration present. Thus, it is suitable for use in critical turbine lubrication systems. A 60 % value is generally considered acceptable.

In the column "Test method", replace the reference "ASTM D 2272-02" with "ASTM D 2272".

5.10, Table 8

Replace the rows

Filterability (dry) (minimum)	%	80	80	not required	ISO 13357-2
Filterability (wet)	%	pass		not required	ISO 13357-1

With the following:

Filterability (dry) stage I (minimum)	%	80	80	not required	ISO 13357-2
Filterability (wet) stage I	%	pass		not required	ISO 13357-1

In the column "Test method", replace the reference "ASTM D 2711-01a (Appendix X 2)" with "ASTM D 2711".

In the column "Test method", replace the reference "ASTM D 2893-04" with "ASTM D 2893".

5.10, Table 9

Replace the rows

Filterability (dry) (minimum)	%	80	80	80	ISO 13357-2
Filterability (wet)	%	pass			ISO 13357-1

With the following:

Filterability (dry) stage I (minimum)	%	80	80	80	ISO 13357-2
Filterability (wet) stage I	%	pass			ISO 13357-1

5.10, Table 10

Replace the row

Filterability (dry) (minimum)[d]	%	80	80	80	ISO 13357-2

With the following:

Filterability (dry) stage I (minimum)[d]	%	80	80	80	ISO 13357-2

Delete the following row:

Oxidation stability Baader test 72 h at 110 °C Viscosity at 40 °C increase (maximum)	%	20	20	20	DIN 51554-3

Bibliography

Replace the reference ISO 6743-5:2006 with the following:

ISO 6743-5, *Lubricants, industrial oils and related products (class L) — Classification — Part 5: Family T (Turbines)*