INTERNATIONAL STANDARD

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AMENDMENT 1
2009-10-01

Mechanical vibration — Evaluation of machine vibration by measurements on non-rotating parts —

Part 1: General guidelines

AMENDMENT 1

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Vibrations mécaniques — Évaluation des vibrations des machines par mesurages sur les parties non tournantes —

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Partie 1: Lignes directrices générales

AMENDEMENT 1

Reference number
ISO 10816-1:1995/Amd.1:2009(E)

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Fax + 41 22 749 09 47
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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

Amendment 1 to ISO 10816-1:1995 was prepared by Technical Committee ISO/TC 108, *Mechanical vibration, shock and condition monitoring*, Subcommittee SC 2, *Measurement and evaluation of mechanical vibration and shock as applied to machines, vehicles and structures*.

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Mechanical vibration — Evaluation of machine vibration by measurements on non-rotating parts —

Part 1: General guidelines

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Cover, French title

"*Directives générales*" has been replaced by "*Lignes directrices générales*"

Page 1, Clause 2

Replace the clause with the following:

> 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.
>
> ISO 7919-1, *Mechanical vibration of non-reciprocating machines — Measurements on rotating shafts and evaluation criteria — Part 1: General guidelines*

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Page 7, 5.3.1

Replace the first paragraph with the following:

> The following typical evaluation zones are defined to permit a qualitative assessment of the vibration on a given machine and to provide guidelines on possible actions. Different categorization and number of zones may apply for specific machine types. These are provided in additional parts of ISO 10816, which also define specific values for the zone boundary limits. For those machine types for which no specific part has been developed, see Annex B.

Page 11, Equation (A.2)

Add a square closing bracket at the end of the first line of the equation as follows:

$$v_{\text{r.m.s.}} = \pi \times 10^{-3} \sqrt{\frac{1}{2}\left[(s_1 f_1)^2 + (s_2 f_2)^2 + \ldots + (s_n f_n)^2\right]} \qquad \text{(A.2)}$$

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Page 13, Annex B

Replace existing Annex B with the following:

Annex B
(informative)

Informative guidelines for setting zone boundary limits

This part of ISO 10816 is a basis document which establishes general procedures for the measurement and evaluation of mechanical vibration of machines, as measured on non-rotating parts. It does not define specific evaluation criteria. These are provided for many common machine types in other parts of ISO 10816.

The evaluation criteria for machine types for which no specific parts have been developed are normally based on successful operating experience with machines of similar design and should be subject to agreement between the supplier and the purchaser of the machine. Factors which should be taken into account include the position and direction of measurement, frequency range, support flexibility and operating conditions.

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In those cases where there is no suitable experience or part of ISO 10816 available, a range of typical values for the zone A/B, B/C and C/D boundaries, respectively (see 5.3.1), are given in Table B.1.

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In general, the zone boundary limits

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a) for small machines (e.g. electric motors with power up to 15 kW) tend to lie at the lower end of the range, and

b) for larger machines (e.g. prime movers with flexible supports in the direction of measurement) tend to lie at the upper end of the range.

These values provide a basis for facilitating discussion and agreement between the supplier and the purchaser and should ensure that in most cases gross deficiencies or unrealistic requirements are avoided.

Caution should be exercised when applying the values given in Table B.1 as there may be specific features associated with a particular machine which would require the use of different values.

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Table B.1 — Range of typical values for the zone A/B, B/C and C/D boundaries

	Range of typical zone boundary values r.m.s. vibration velocity mm/s			
0,28				0,28
0,45				0,45
0,71	Zone boundary A/B 0,71 to 4,5			0,71
1,12				1,12
1,8		Zone boundary B/C 1,8 to 9,3		1,8
2,8				2,8
4,5			Zone boundary C/D 4,5 to 14,7	4,5
7,1				7,1
9,3				9,3
11,2				11,2
14,7				14,7
18				18
28				28
45				45

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NOTE 1 This table only applies to machines for which specific parts of ISO 10816 have not been developed and for which there is no past satisfactory experience available.

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NOTE 2 Acceptance criteria should be subject to agreement between the supplier and the purchaser of the machine.

NOTE 3 The values selected should take into account the measurement position and the support flexibility/resilience.

NOTE 4 Small machines (e.g. electric motors with power up to 15 kW) tend to lie at the lower end of the range and larger machines (e.g. prime movers with flexible supports in the direction of measurement) tend to lie at the upper end of the range.

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Page 19, Annex F

Replace Annex F with the following bibliography:

Bibliography

[1] ISO 2041, *Mechanical vibration, shock and condition monitoring — Vocabulary*

[2] ISO 2954, *Mechanical vibration of rotating and reciprocating machinery — Requirements for instruments for measuring vibration severity*

[3] ISO 7919-2, *Mechanical vibration — Evaluation of machine vibration by measurements on rotating shafts — Part 2: Land-based steam turbines and generators in excess of 50 MW with normal operating speeds of 1 500 r/min, 1 800 r/min, 3 000 r/min and 3 600 r/min*

[4] ISO 7919-3, *Mechanical vibration — Evaluation of machine vibration by measurements on rotating shafts — Part 3: Coupled industrial machines*

[5] ISO 7919-4, *Mechanical vibration — Evaluation of machine vibration by measurements on rotating shafts — Part 4: Gas turbine sets with fluid-film bearings*

[6] ISO 7919-5, *Mechanical vibration — Evaluation of machine vibration by measurements on rotating shafts — Part 5: Machine sets in hydraulic power generating and pumping plants*

[7] ISO 10437, *Petroleum, petrochemical and natural gas industries — Steam turbines — Special-purpose applications*

[8] ISO 13709, *Centrifugal pumps for petroleum, petrochemical and natural gas industries*

[9] ISO 22266-1, *Mechanical vibration — Torsional vibration of rotating machinery — Part 1: Land-based steam and gas turbine generator sets in excess of 50 MW*

[10] VDI 3836, *Messung und Beurteilung mechanischer Schwingungen von Schraubenverdichtern und Rootsgebläsen*; *Ergänzung von DIN ISO 10816-3 (Measurement and evaluation of mechanical vibration of screw-type compressors and Root compressors*; *Addition to DIN ISO 10816-3)*. Bilingual

[11] VDI 3838, *Messung und Beurteilung mechanischer Schwingungen von Hubkolbenmotoren und -kompressoren mit Leistungen über 100 kW*; *Ergänzung von DIN ISO 10816-6* (*Measurement and evaluation of mechanical vibration of reciprocating piston engines and piston compressors with power ratings above 100 kW*; *Addition to DIN ISO 10816-6)*. Bilingual

[12] API 611, *General-Purpose Steam Turbines for Petroleum, Chemical, and Gas Industry Services*

[13] API 616, *Gas Turbines for Petroleum, Chemical, and Gas Industry Services*

[14] API 617, *Axial and Centrifugal Compressors and Expander-compressors for Petroleum, Chemical and Gas Industry Services*

[15] API 618, *Reciprocating Compressors for Petroleum, Chemical, and Gas Industry Services*

[16] API 619, *Rotary-type Positive-displacement Compressors for Petroleum, Petrochemical, and Natural Gas Industries*

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