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AMENDMENT 1
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**Mechanical vibration — Rotor
balancing —**

Part 11:
**Procedures and tolerances for rotors
with rigid behaviour**

AMENDMENT 1

Vibrations mécaniques — Équilibrage des rotors —

*Partie 11: Modes opératoires et tolérances pour rotors à
comportement rigide*

ISO 21940-11:2022

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document 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*.

A list of all parts in the ISO 21940 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Mechanical vibration — Rotor balancing —

Part 11: Procedures and tolerances for rotors with rigid behaviour

AMENDMENT 1

Clause 1

Replace the NOTE with the following:

NOTE In ISO 21940-14, the assessment of balancing errors is considered in detail. Fundamentals of rotor balancing are contained in ISO 21940-1, which introduces balancing.

Clause 2

Replace Clause 2 with the following:

2 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 21940-2, *Mechanical vibration — Rotor balancing — Part 2: Vocabulary*

Clause 11

Add the following clause after Clause 10:

11 Notification of necessary balancing information at the design stage

This document specifies methods and recommends unbalance tolerances for balancing of rotors with rigid behaviour. The application of these methods requires knowledge of rotor-specific parameters and the unbalance tolerance at the design stage.

If this information is not fully made available, the determination of the unbalance tolerance is not comprehensible or even incorrect. It is therefore encouraged to give notification of this information at the design stage in a technical drawing or an additional document. For more details, see Annex E.

Annex E

Add the following annex after Annex D:

Annex E (informative)

Notification of unbalance tolerances on technical drawings

E.1 General

Notification of all necessary balancing information at the design stage is crucial to a successful balancing process (see Clause 11). Table E.1 gives the minimum set of details necessary for a clear determination of unbalance tolerances based on this document. Table E.1 is only a suggestion and can be adapted as required.

Table E.1 — Necessary details for determination of unbalance tolerance

No.	Required information for application of ISO 21940-11
1	Balance quality grade G
2	Maximum operational speed
3	Rotor mass
4	Bearing planes
5	Correction planes
6	Tolerance planes: planes to which the permissible residual unbalances are related ^a
7	Position of the centre of mass CM
8	Permissible residual unbalances (U_{per})
9	Instructions for unbalance correction
10	Remarks

^a Often identical to bearing planes or correction planes

E.2 Example

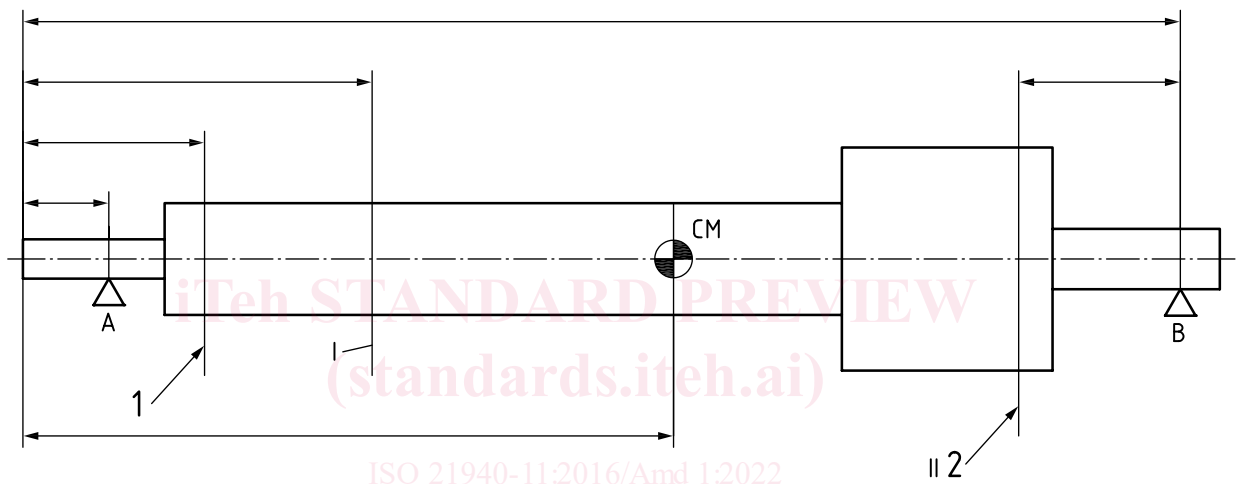
An example of necessary details for determination of unbalance tolerance is given in Table E.2. The example shows an inboard rotor; for any other rotor type, Figure E.1 has to be adapted accordingly. All types of planes shall be dimensioned.

Table E.2 — Example of necessary details for determination of unbalance tolerance

No.	Required information for application of ISO 21940-11	Data
1	Balance quality grade G	6,3
2	Maximum operational speed	10 000 min ⁻¹
3	Rotor mass	2,5 kg
4	Bearing planes	Planes A and B (see Figure E.1)
5	Correction planes	Planes I and II (see Figure E.1)
6	Tolerance planes: planes to which the permissible residual unbalances are related	Planes 1 and 2 (see Figure E.1)
7	Position of the centre of mass CM	See reference in Figure E.1
8	Permissible residual unbalances (U_{per})	$U_{per 1} = 8,2 \text{ g}\cdot\text{mm};$ $U_{per 2} = 6,8 \text{ g}\cdot\text{mm}$

Table E.2 (continued)

No.	Required information for application of ISO 21940-11	Data
9	Instruction for unbalance correction	In correction planes I and II: — radial drill holes $\varnothing 7$ mm; — maximum depth 10 mm.
10	Remark	The rotor is balanced without its operational bearings. The bearing planes A and B are outside the position of the operational roller bearings to prevent these bearing surfaces from wear.



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- A, B bearing planes
- 1, 2 tolerance planes
- I, II correction planes
- CM centre of mass

NOTE Dimensions are not labelled explicitly by purpose, since this is an example. For an actual use case, they correspond to the axial positions of the planes.

Figure E.1 — Rotor sketch

Bibliography:

Replace entry [2] with the following:

[2] ISO 21940-1, *Mechanical vibration — Rotor Balancing — Part 1: Introduction*

Delete entry [3], Footnote 1 and Footnote 2.