AMENDMENT NO. 1 SEPTEMBER 2024

TO

IS 14910 : 2001/ISO 8727 : 1997 MECHANICAL VIBRATION AND SHOCK — HUMAN EXPOSURE — BIODYNAMIC COORDINATE SYSTEMS

This Amendment No. 1 is identical to Amendment No. 1 of ISO 8727 : 1997 ‘Mechanical vibration and shock — Human exposure — Biodynamic coordinate systems’ issued by International Organization for Standardization.

Price Group 3

AMENDMENT 1

Page 1, Clause 2

Replace this clause with the following*:*

2 Normative references

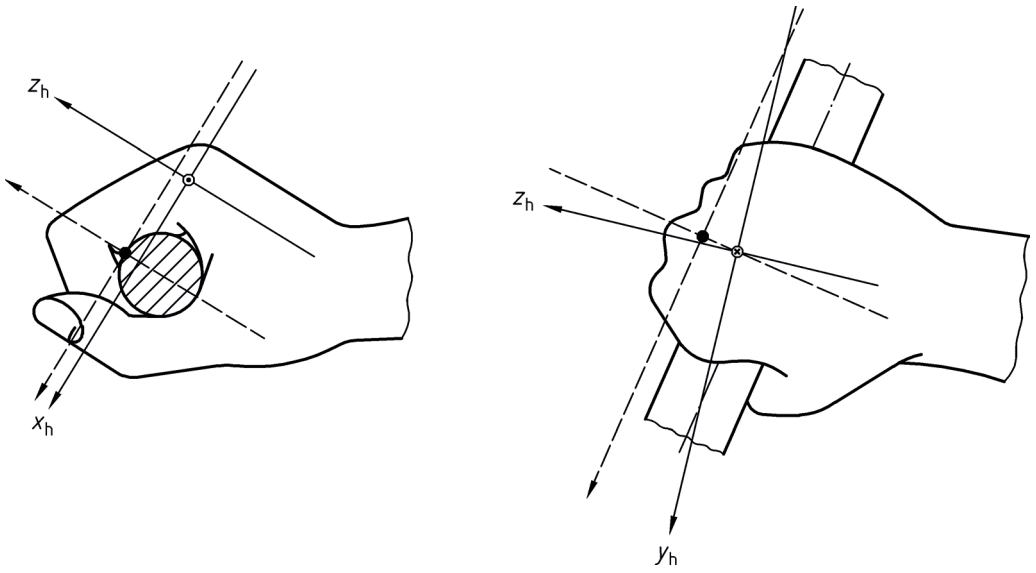
The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1503, *Spatial orientation and direction of movement — Ergonomic requirements*

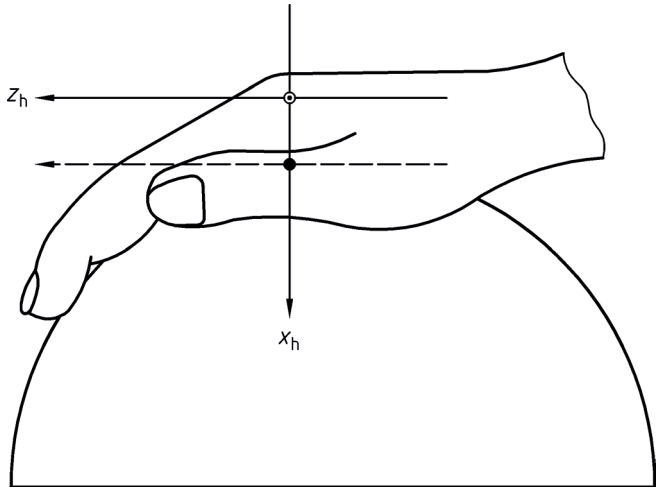
ISO 5805, *Mechanical vibration and shock — Human exposure — Vocabulary*

Page 11, Figure A.6

Replace this figure with the following:



a) "Handgrip" position (in this position, the hand adopts a standardized grip on a cylindrical bar)



b) "Flat palm" position (in this position, the hand presses down onto a sphere)

Key

— biodynamic coordinate system

– – basicentric coordinate system

NOTE The origin of the biodynamic coordinate system is the head of the third metacarpal (distal extremity). The z_h-axis (i.e. hand axis) is defined as the longitudinal axis of the third metacarpal bone and is oriented positively towards the distal end of the finger. The x_h-axis passes through the origin, is perpendicular to the z_h-axis, and is positive in the forwards direction when the hand is in the normal anatomical position (palm facing forwards). The y_h-axis is perpendicular to the other two axes and is positive in the direction towards the fifth finger (thumb). In practice, a basicentric coordinate system is used in which the y-axis is commonly parallel to the handle axis, as shown here.

Figure A.6 — Coordinate systems for the hand

Page 13, Annex C

Replace this annex with the following:

Bibliography

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

[2] ISO 2631-1, *Mechanical vibration and shock — Evaluation of human exposure to whole-body vibration — Part 1: General requirements*

[3] ISO 5349-1, *Mechanical vibration — Measurement and evaluation of human exposure to hand-transmitted vibration — Part 1: General requirements*

[4] ISO 5349-2, *Mechanical vibration — Measurement and evaluation of human exposure to hand-transmitted vibration — Part 2: Practical guidance for measurement at the workplace*

[5] ISO 5353, *Earth-moving machinery, and tractors and machinery for agriculture and forestry — Seat index point*

[6] ISO 5982, *Mechanical vibration and shock — Range of idealized values to characterize seated-body biodynamic response under vertical vibration*

[7] ISO 6897, *Guidelines for the evaluation of the response of occupants of fixed structures, especially buildings and off-shore structures, to low-frequency horizontal motion (0,063 to 1 Hz)*

[8] ISO 7096, *Earth-moving machinery — Laboratory evaluation of operator seat vibration*

[9] ISO 8041, *Human response to vibration — Measuring instrumentation*

[10] ISO 9996, *Mechanical vibration and shock — Disturbance to human activity and performance — Classification*

[11] ISO 10326-1, *Mechanical vibration — Laboratory method for evaluating vehicle seat vibration — Part 1: Basic requirements*

[12] ISO 20643, *Mechanical vibration — Hand-held and hand-guided machinery — Principles for evaluation of vibration emission*

[13] ISO 28927 (all parts), *Hand-held portable power tools — Test methods for evaluation of vibration emission*

[14] Anonymous. *Vibration Syndrome*. Current Intelligence Bulletin 38, US Department of Health and Social Services, National Institute for Occupational Safety and Health. Cincinatti, Ohio: NIOSH Publication 83-110, 29 March 1983

[15] BECKER E.B., WILLEMS G.C. *An experimentally validated 3-D inertial tracking package for application in biodynamic research*, In: P*roceedings of the 19th Stapp Car Crash Conference*, Society of Automotive Engineering Transactions, Warrendale, Pennsylvania, 1975, pp 899-930

[16] BRAMMER A.J., TAYLOR W., eds. *Vibration effects on the hand and arm in industry* (edited presentations at the Third International Conference on Hand-Arm Vibration, Ottawa, May 1981), New York: John Wiley and Sons, 1982

[17] EWING C.L., THOMAS D.J. *Human head and neck response to impact acceleration, United States Army and Navy Joint Report*, Naval Aerospace Medical Research Laboratory Monograph 21 and US Army Aeromedical Research Laboratory Report 73-1, Pensacola, Florida, Naval Aerospace Medical Research Laboratory, August 1972

[18] VON GIERKE H.E., NIXON C.W., GUIGNARD J.C. *Noise and vibration*. In: *Foundations of space medicine and biology*. M. Calvin and O. G. Gazenko (Eds), Joint USA/USSR Publication. Washington, DC: National Aeronautics and Space Administration, and Moscow: Academy of Science of the USSR, Vol. II, Book I, Ch 9, 1975

[19] GRIFFIN M.J. *Vibration injuries of the hand and arm: Their occurrence and the evolution of standards and limits*. United Kingdom Safety and Health Executive Research Report No. 9, London: HM Stationary Office, 1980

[20] GRIFFIN M.J. *Handbook of human vibration*. Academic Press, London, New York, 1990

[21] GUIGNARD J.C. Vibration. In: *A textbook of aviation physiology*, (GILLIES J.A., ed.). Pergamon, Oxford, 1965

[22] GUIGNARD J.C. *Vibration*. In: Guignard, J. C. and King, P. F., *Aeromedical aspects of vibration and noise*. AGARDograph AG-151. Neuilly-sur-Seine, France: NATO/AGARD, 1972, Part 1, pp 2-113

[23] GUIGNARD J.C. Vibration. In: *Patty's industrial hygiene and toxicology, Vol 3B, Theory and Rationale of Industrial Hygiene Practice: Biological responses*, (CRALLEY L.J., CRALLEY L.V., eds.). John Wiley and Sons, New York, 1985

[24] KORHONEN O. *Vibration and work. Proceedings of the Finnish-Soviet-Scandinavian Vibration Symposium*, Helsinki, 10 to 13 March 1975, Helsinki: Institute for Occupational Health, 1976

[25] TAYLOR W., PELMEAR P.L. *Vibration white finger in industry*. Academic Press, London, New York, 1975

[26] THOMAS D.J. (Chairman) and Committee Members: Robbins, D. H., Eppinger, R. H., King, A. I., Hubbard, R. P. and (in 1975) Reynolds, H. M., *Guidelines for the comparison of human and animal analogue biomechanical data, first and second annual reports of an ad hoc-committee*, Chairman, D.J. Thomas, Head, Biomedical Research Department, Naval Aerospace Medical Research Laboratory Detachment (now

the Naval Biodynamics Laboratory), New Orleans, Louisiana, 6 December 1974 and 19 November 1975, respectively. (Requests for copies of these reports should be addressed to: Commanding Officer, Naval Biodynamics Laboratory, New Orleans, LA 70189-0407, USA.)

[27] WASSERMANN D.E. *Human aspects of occupational vibration. Advances in human factors/ ergonomics*, G. Salvendy (Ed) - 8. Amsterdam: Elsevier, 1987