



DPC: 25/30498777 DC

BSI Group Headquarters

389 Chiswick High Road London W4 4AL

Tel: +44 (0)20 8996 9000

Fax: +44 (0)20 8996 7400

www.bsigroup.com

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E-mail: admin.start@bsigroup.com

Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



JTC1-SC41/529/CD

COMMITTEE DRAFT (CD)

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IEC ISO/IEC JTC 1/SC 41 : INTERNET OF THINGS AND DIGITAL TWIN

SECRETARIAT:

Korea, Republic of

SECRETARY:

Ms Jooran Lee

OF INTEREST TO THE FOLLOWING COMMITTEES:

TC 124, SyC BDC

HORIZONTAL FUNCTION(S):

ASPECTS CONCERNED:

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Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any local regulations or technical reasons that may exist and should be considered should this proposal proceed, recognizing that failure to address such requirements could result in the need for new or existing "In Some Countries" clauses. (SEE [AC/22/2007](#) OR [NEW GUIDANCE DOC](#)).

TITLE:

Internet of Things (IoT) - IoT for stress management, good health and well-being

NOTE FROM TC/SC OFFICERS:

In accordance with SC 41 Resolution #573 (June 2025, Montreal), this document is submitted to the IEC Secretariat for CD consultation. As this project is under JWG 33 with IEC/ISO JSyC BDC and IEC/TC 124, CD 30197 will be also shared with these committees for comments.

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INTERNET OF THINGS (IOT) – IOT FOR STRESS MANAGEMENT, GOOD HEALTH AND WELL BEING

FOREWORD

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ISO/IEC XXXXX has been prepared by subcommittee 41: Internet of Things & Digital Twin, of ISO/IEC joint of technical committee 1: Information technology. It is an International Standard.

The text of this International Standard is based on the following documents:

CD	Report on commenting
XX/XX/CD	XX/XX/XX

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC directives www.iec.ch/members_experts/refdocs and www.iso.org/directives.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- 84 – reconfirmed,
- 85 – withdrawn,
- 86 – replaced by a revised edition, or
- 87 – amended.

The National Committees are requested to note that for this document the stability date is 20XX.

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

88

89

INTRODUCTION

The history of mankind has recently seen the result of a deadly pandemic. The time-tested reality proved that a substantial chunk of the untimely fatalities took place as a result of the invisible stress that impacted many of the people who were otherwise fit and healthy. The pandemic has not only acted as an eye opener but also served as an opportunity to have academic logistics to deal with situations like this. There is a genuine need to have an international standard, which is capable of addressing stress management using IoT with an end to end perspective.

Stress was first defined by in 1936 by Hans Selye, a pioneering endocrinologist from Hungary (Rochette and Vergely, 2017), as: "the non-specific response of the body to any demand." (Fink, 2009).

Stress is a normal reaction of the body to any change. The body reacts to the change in various ways that could be physical, psychological, or emotional. These changes are collectively defined as stress and for the purpose of this document when we refer to stress, we are referring to these changes only, irrespective of the trigger for the change.

The World Health Organization (WHO) defines stress as "the reaction people may have when presented with demands and pressures that are not matched to their knowledge and abilities and which challenge their ability to cope."

Hence it is clear that stress is not a disease and does not have any pathological disease markers, but it is definitely a condition. Mild to moderate stress for a limited periods of time are considered positive stress. This helps us focus on task at hand, for example a surgeon performing a surgery would need to be alert and have full concentration on the procedure. But continuous stress without relief or relaxation is referred to as negative stress or chronic stress.

The Yerkes-Dodson law is a model of the relationship between stress and task performance. It proposes that you reach your peak level of performance with an intermediate level of stress, or arousal. Too little or too much arousal results in poorer performance. This is also known as the inverted-U model of arousal. The chart in figure 1 indicates relationship between stress and performance as per existing study.

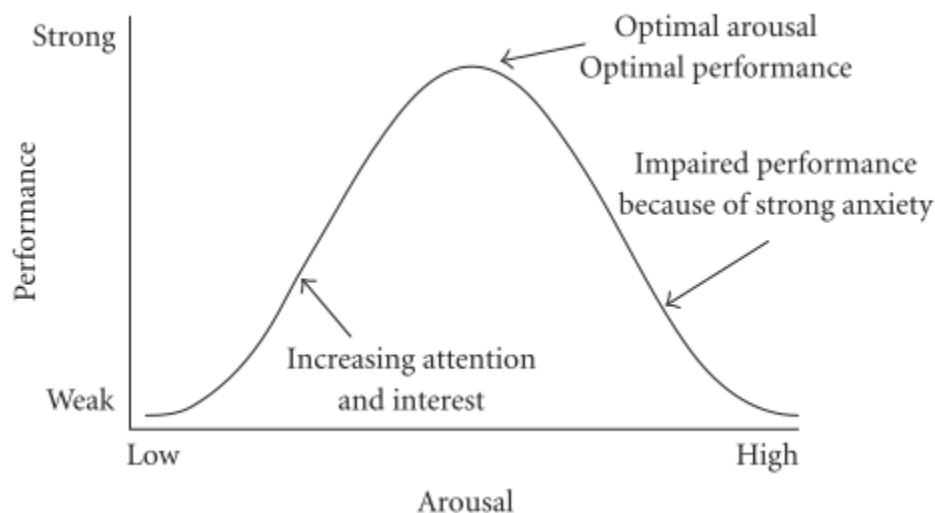


Figure 1 - Reference Relationship between stress and performance as per Yerkes-Dodson law

Chronic Stress has impact on the body, on the mood and the behaviour. It needs to be managed and hence requires measurement devices to aid proper management. Stress is a global phenomenon and unfortunately, an inseparable adjunct of human health. Since stress is such an important leading and primary indicator of good health, it needs to be given the importance it warrants by making a reference standard around its measurement and management using commercially available off-the-shelf IoT devices and systems.

126

127 As on date, there has been no standard which fulfils this very purpose comprehensively. It is not just a
128 visualisation of an academic or literary approach by the word Stress or Health or Well-being, rather intending
129 to have a holistic approach. The focus should be on the value which this standard would add towards Human
130 health which is also explicable by UN Sustainable Development Goal No. 3 i.e., Good health and Well-
131 being.

132 IoT being a cross-cutting technology in nature is utilized towards the functional data flow through interfaces
133 and between entities. The IoT ecosystem ensures stress management, health, fitness and well-being of an
134 individual through data analytics, integrating personal health records with due consideration to privacy and
135 confidentiality.
136

137 The intention of this standard is to highlight the use of IoT devices and analytics as powerful tools for stress
138 management and well-being. Through the data collected from IoT devices, it is possible to gain valuable
139 insights into an individual's physical, mental and emotional state. This information can be further used to
140 develop personalized stress management plans. Overall, it will enable an IoT ecosystem for management
141 of stress level, monitoring of health parameters and ensuring fitness and well-being of an individual.

142

143 The aim is to provide a non-binding reference standard that will be used:

144 1.By the people to understand and make efforts to manage chronic stress holistically
145

146 2.By the solution providers to take into consideration the end-to-end view of stress management for the
147 individual
148

149 3.To ensure that individual data becomes part of repository like POR so that the history and longitudinal
150 view is available if and when the individual encounters the healthcare ecosystem
151

152 However, it is limited to well-being space only. Once stress manifests into secondary disease conditions, it
153 becomes part of the corresponding clinical pathway of the Healthcare ecosystem which is not addressed by
154 the scope of this standard.
155

INTERNET OF THINGS (IOT) – IOT FOR STRESS MANAGEMENT, GOOD HEALTH AND WELL BEING

1 Scope

This document specifies the utilization of IoT ecosystem for management of stress levels, health, fitness and well-being of an individual. This document provides

- For an overview of stress and its management
- For framework and interfaces among different entities in the IoT ecosystem
- To elaborate and define the functional data flow for stress management
- To integrate the personal health records of the individual while ensuring privacy and confidentiality of the individual
- For monitoring of health parameters using IoT technology & wellness devices
- Use of data analytics for stress management

The scope does not include the clinical domain and medical therapeutics prescribed or required for cure of any disease or ill-health of the individual.

2 Normative references

- ISO/IEC 30141:2018, *Internet of Things (IoT) - Reference Architecture*
- ISO/TR 20055:2018, *Health informatics — Person-owned document repository for PHR applications and health information exchange*
- ISO 18308:2011, *Health informatics — Requirements for an electronic health record architecture*
- ISO/IEC 27400: 2022, *Cyber security — IoT security and privacy — Guidelines*
- ISO 25237: 2017, *Health informatics — Pseudonymization*
- ISO/IEC 27001, *Information security, cybersecurity and privacy protection — Information security management systems — Requirements*
- ISO/IEC 27002:2022, *Information security, cyber security and privacy protection — Information security controls*
- ISO 31000:2018, *Risk management — Guidelines*
- ISO 27799: 2016, *Health Informatics-Information Security*
- ISO/TS 82304-2:2021, *Health software Part 2: Health and wellness apps — Quality and reliability*
- ISO/IEEE 11073, *Health informatics — Device interoperability*

3 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

Personal Owned Repository (POR)

A PoR is a repository of health-related information about an individual which is owned, managed, accessed and shared by the individual using computer technology. A PoR can be implemented in many different ways such as on a mobile device, USB, personal computer, or by using a PHR application or server-based cloud service. [Source: ISO/TR 20055:2018(E)]

3.2

Electronic Health Record (EHR)

Information relevant to the wellness, health and healthcare of an individual, in computer-processable form and represented according to a standardized information model [SOURCE: ISO 18308:2011, 3.20]

3.3

IoT user

In this context, IoT User is any user willing to monitor, control and eliminate stress

3.4

IoT service providers

Any individual or agency providing services including but not limited to prognosis, diagnosis, and analytics

3.5

IoT developers

Any individual or agency responsible for development, management and implementation of system

3.6

Heart Rate Variability (HRV)

Statistical results calculated from consecutive RR intervals [SOURCE: ISO 4135:2022(en), 3.11.5.9]

3.7

Blood Pressure (BP)

Pressure in the large arteries of the body, typically measured in the brachial artery [SOURCE: ISO 16976-6:2023(en), 3.3]

3.8

Breathing Rate (BR)/ Respiratory rate (RR)

Number of breaths per minute [SOURCE: ISO 13138:2012(en), 3.10, ISO 16976-6:2023(en), 3.16]

4 Abbreviated Terms

AI	Artificial Intelligence
ANS	Autonomic Nervous System
BM	Burnout Measure