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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 40261.1-2023

**Ergonomics of thermal environment - Evaluation of thermal environments in
vehicles - Part 1: Principles and methods for assessment of thermal stress and
determination of equivalent temperature**

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

This document is Part 1 of GB/T 40261 "Thermal Environment Ergonomics Evaluation of Thermal Environment in Vehicles". GB/T 40261

The following sections have been published.

---Part 1. Principles and methods of heat stress assessment and equivalent temperature determination;

---Part 2. Use subjects to evaluate thermal comfort.

This document is modified to adopt ISO /T S14505-1.2007 "Thermal Environment Ergonomics Evaluation of Thermal Environment in Vehicles Part 1"

"Thermal Stress Assessment Principles and Methods" and ISO 14505-2.2006 "Ergonomics of Thermal Environment - Assessment of Thermal Environment in Vehicles"

Part 2. Equivalent Temperature Determination", in which the ISO /T S14505-1.2007 document type is adjusted from ISO 's technical specification to my country's national standard.

Compared with ISO /T S14505-1.2007 and ISO 14505-2.2006, this document has many structural adjustments. This document corresponds to

See Appendix A for structure number changes between ISO files.

The technical differences between this document and ISO /T S14505-1.2007 and ISO 14505-2.2006 and their reasons are as follows.

---Replaced ISO 7730 (see Chapter 5) with the informative reference GB/T 18049, and GB/T 40261.2 replaced ISO 14505-3

(See Chapter 6), in order to adapt to my country's technical conditions and improve operability.

The following editorial changes have been made to this document.

---In order to coordinate with the existing standards, the name of the standard is changed to "Ergonomics of Thermal Environment - Evaluation of Thermal Environment in Vehicles - Part 1"

Points. Principles and methods of heat stress assessment and equivalent temperature determination";

---Incorporated the contents of ISO 14505-2.2006/COR.1.2007, and changed the radiation heat transfer coefficient of 4.2 in ISO 14505-2.2006

The unit of convection heat transfer coefficient is corrected from "W/m²" to "W/(m². degrees C)" (see 7.1.3);

---Replaced ISO 7730 with GB/T 18049 (see Appendix B);

---Replaced ISO 8996 with GB/T 18048 (see Appendix C);

---Changed Figure E.1 and Table E.1 in Appendix E (Informative) Measuring Instrument Examples (see Appendix E);

---Deleted Appendix E of ISO 14505-2.2006.

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

Introduction

Convection heat transfer, radiation heat transfer and conduction heat transfer and their interactions in vehicles are complex. External heat load and internal heating and ventilation

The wind system combines to form a local climate that changes spatially and temporally within the vehicle. Asymmetric thermal conditions within vehicles tend to be

The main reason for poor thermal comfort of the internal environment. In vehicles with no or poor HVAC systems, heat stress depends mainly on the external environment

Effect of climate conditions on the cabin. Subjects form a comprehensive response to the combined effects of several thermal stimuli, and their subjective evaluation is a comprehensive

The evaluation is not detailed or accurate enough and is not suitable for reuse. Technical measurements provide detailed information by integrating various thermal environment parameters within the vehicle.

and accurate information to predict thermal effects on people. Since a variety of climate factors affect the final heat dissipation of the human body, in order to determine these factors

The relative importance of these factors requires comprehensive measurement of these climate factors.

The direct method to evaluate the vehicle thermal environment (hot, medium, cold) includes the measurement of various human body reactions, and has three forms. subjective method, objective method

method and behavioral approach. Subjective methods use subjective scales to quantify people's reactions to their environment. Objective method refers to the use of instruments or outputs

A method of measuring (such as performance measurement) to quantify a person's physical, physiological, or mental condition. Behavioral methods quantify or represent human responses to the environment.

Each method is developed based on fundamental principles, and the most appropriate method form and combination of methods for thermal environmental assessment depends on the assessment concerned

content and transportation environment.

GB/T 40261 "Ergonomic Thermal Environment Evaluation of Thermal Environment in Vehicles" aims to provide information for the evaluation of the thermal environment in vehicles.

Principles and methods for the development and evaluation of transportation vehicles. GB/T 40261 is planned to consist of three parts.

---Part 1.Principles and methods of heat stress assessment and equivalent temperature determination. The purpose is to describe land, sea and air traffic

Principles and methods for the assessment of heat stress within tools.

---Part 2.Use subjects to evaluate thermal comfort. The purpose is to describe the use of subjects to evaluate thermal comfort in vehicle environments.

method.

---Part 3.Determination of equivalent temperature using digital dummy. The purpose is to provide the use of numerical calculations to evaluate thermal comfort in vehicles.

normative forecasting method.

Ergonomic transportation for thermal environments

Internal Thermal Environment Assessment Part 1.Heat Stress Assessment

Principles and methods and equivalent temperature determination

1 Scope

This document provides methods for the assessment of internal heat stress in transportation vehicles in the land, marine and aviation sectors. Different methods for assessing transportation engineering

Provides information on hot, cold and moderate thermal environments inside, stipulates specific in-vehicle climate assessment requirements, and describes the equivalent temperature of the thermal environment inside the vehicle

test methods.

This document applies to the thermal environment in vehicle cabins and also to other confined spaces with asymmetric climate conditions. etc. in this document

The effective temperature measurement method is mainly suitable for evaluating thermal environments that deviate slightly from the thermal neutral state, and is also suitable for testing vehicles or similar enclosed spaces.

HVAC system performance.

2 Normative reference documents

This document has no normative references.

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

cold stress coldstress

A caloric balance that causes the body's heat loss to be just equal to or greater than the level that produces a significant, even irreparable, physiological stress response (thermal balance).

Debt) climate symptoms.

3.2

heat stress heatstress