

ISO 7933:2023-07 (E)

Ergonomics of the thermal environment - Analytical determination and interpretation of heat stress using calculation of the predicted heat strain

Contents		Page
Foreword		iv
Introduction		v
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Symbols	1
5	Principles of the predicted heat strain (PHS) model	4
6	Main steps of the calculation	5
6.1	Heat balance equation	5
6.1.1	General	5
6.1.2	Metabolic rate, M	5
6.1.3	Effective mechanical power, W	5
6.1.4	Heat flow by respiratory convection, C_{res}	5
6.1.5	Heat flow by respiratory evaporation, E_{res}	5
6.1.6	Heat flow by conduction, K	5
6.1.7	Heat flow by convection, C	6
6.1.8	Heat flow by radiation, R	6
6.1.9	Heat flow by evaporation, E	6
6.1.10	Heat storage for increase of core temperature associated with the metabolic rate, Q_{eq}	6
6.1.11	Heat storage, S	6
6.2	Calculation of the required evaporative heat flow, the required skin wettedness and the required sweat rate	7
7	Interpretation of required sweat rate	7
7.1	Basis of the method of interpretation	7
7.1.1	General	7
7.1.2	Stress criteria	7
7.1.3	Strain criteria	8
7.1.4	Reference values	8
7.2	Analysis of the work situation	8
7.3	Determination of allowable exposure time, D_{lim}	8
Annex A (normative)	Data necessary for the computation of thermal balance	9
Annex B (informative)	Criteria for estimating acceptable exposure time in a hot work environment	17
Annex C (informative)	Metabolic rate	19
Annex D (informative)	Clothing thermal characteristics	20
Annex E (informative)	Computer program for the computation of the predicted heat strain model	22
Annex F (informative)	Examples of the predicted heat strain model computations	27
Bibliography		28