DIN EN 474-1:2023-02 (E)

Earth-moving machinery - Safety - Part 1: General requirements

Contents

Page

European foreword 4

Introduction 6

1 Scope 7

2 Normative references 7

3 Terms and definitions 11

4 Safety requirements and/or protective/risk reduction measures 14
4.1 General 14
4.2 Access 14
4.3 Operator's station 15
4.4 Seat 18
4.5 Operator's controls and indicators 18
4.6 Steering system 20
4.7 Brake systems for travelling 20
4.8 Visibility 21
4.9 Forward horns and machine safety labels 21
4.10 Tyres and rims 21
4.11 Stability 22
4.12 Lifting operation 22
4.13 Noise 24
4.14 Protective measures and devices 25
4.15 Recovery, towing away for recovery purposes (TARP), tying-down, lifting and transporting 26
4.16 Electro-magnetic compatibility (EMC) 27
4.17 Electrical and electronic systems 27
4.18 Hydraulic fluid systems 29
4.19 Fuel tanks, DEF/urea tanks, hydraulic tanks and pressure vessels 30
4.20 Fire protection 30
4.21 Quick coupler 30
4.22 Maintenance 31
4.23 Underground operation in non-explosive atmosphere 32
4.24 Speed limit for non-riding machines 32

5 Verification of the safety requirements and/or protective/risk reduction measures 32

6 Information for use 36
6.1 General 36
6.2 Machine safety labels 36
6.3 Operator's manual 37
6.4 Machine marking 39

Annex A (informative) List of significant hazards 40

Annex B (normative) Requirements for movable operator's station with the operator at the operator's station 46

B.1 Terms and definitions 46
B.2 General 46

B.3 Control of movement 47
B.4 Emergency descent 47
B.5 Crushing hazards 47
B.6 Falling down protection for the operator 47
B.7 ROPS 47
B.8 Operator's manual 47
B.9 Marking 48
B.10 Verification of the safety requirements and/or protective/risk reduction measures 48

Annex C (normative) Requirements for lifting devices used for lifting operations 50

C.1 General 50
C.2 Terms, definitions and abbreviations 50
C.3 Safety requirements 50
C.4 Additional requirements for attachable hooks used as lifting device(s) 52
C.5 Additional information to the operator's manual 54
C.6 Verification of the safety requirements and/or protective/risk reduction measures 54

Annex D (normative) Requirements for earth-moving machinery used in underground working in non-explosive atmosphere 56

D.1 General 56
D.2 Operator's station 56
D.3 Engine exhaust emission and fuel 56
D.4 Lighting, signalling and marking lights and reflex-reflector devices 57
D.5 Fire protection 57
D.6 Verification of the safety requirements and/or protective/risk reduction measures 57

Annex ZA (informative) Relationship between this European Standard and the essential requirements of Directive 2006/42/EC machinery, and amending Directive 95/16/EC (recast) [2006 L157] aimed to be covered 59

Bibliography 65