

DIN EN 12453:2022-08 (E)

Industrial, commercial and garage doors and gates - Safety in use of power operated doors - Requirements and test methods (includes Amendment :2021)

Contents	Page
European foreword	5
Introduction	7
1 Scope	8
2 Normative references	9
3 Terms and definitions	10
4 List of significant hazards	12
4.1 General	12
4.2 Hazards caused by crushing, shearing and drawing-in	13
4.2.1 General	13
4.2.2 !Hazards caused when persons can travel with the door"	13
4.2.3 Hazards caused by impact	13
4.3 Hazards caused by source of energy and power controls	13
4.4 Manual operation	14
4.5 Other hazards	14
4.5.1 General	14
4.5.2 Hazards caused by pass doors	14
4.5.3 Hazards caused by imprisonment	14
4.5.4 Hazards caused by trapping	14
4.5.5 Hazards caused by falling or ejected parts or uncontrolled movement	14
4.5.6 Hazards caused by the locking devices	14
4.5.7 Hazards caused due to a loss of stability	14
4.5.8 Hazards caused by glazing material	15
4.5.9 Hazards caused by modification of settings	15
5 Safety requirements and/or protective measures	15
5.1 General	15
5.1.1 General requirements	15
5.1.2 Safety Function performed by control system	15
5.1.3 Minimum level of safeguarding at the main closing edge	16
5.2 Crushing, shearing and drawing-in	17
5.2.1 General	17
5.2.2 Safeguarding against hazards caused when persons can travel with the door	21
5.2.3 Safeguarding against impact hazard	21
5.3 Source of energy and power controls	22
5.3.1 General	22
5.3.2 Electrical drive units	22
5.3.3 Hydraulic drive units	25
5.3.4 Pneumatic drive units	25
5.3.5 Restart after unintended interruption	26
5.3.6 Supply disconnection	26
5.4 Manual operation	26
5.4.1 General	26
5.4.2 Manual operation by direct movement of the door leaf	26
5.4.3 Manual operation directly applied to the drive unit	26
5.4.4 Balancing failure at manual operation	26
5.4.5 Human physical strength for manual operation of the door leaf	27

5.5	Other hazards	27
5.5.1	Pass doors	27
5.5.2	Imprisonment	27
5.5.3	Trapping	27
5.5.4	Falling or ejected parts or uncontrolled movement	27
5.5.5	Locking devices	28
5.5.6	Loss of stability	28
5.5.7	Glazing material	29
5.5.8	Modification of setting	29
6	Verification of the safety requirements and/or protective measures	29
6.1	General	29
6.2	Crushing, shearing and drawing-in points	29
6.2.1	General	29
6.2.2	!Hazards caused when persons can travel with the door"	31
6.2.3	Impact hazard	31
6.3	Source of energy	31
6.3.1	Electrical drive units	31
6.3.2	Hydraulic drive units	32
6.3.3	Pneumatic drive units	32
6.3.4	Restart after unintended interruption	32
6.3.5	Supply disconnection	32
6.4	Manual operation	32
6.4.1	Manual operation by direct movement of the door leaf	32
6.4.2	Manual operation directly applied to the drive unit	32
6.4.3	Balancing failure at manual operation	32
6.4.4	Human physical strength for manual operation of the door leaf	33
6.5	Other hazards	33
6.5.1	Pass doors	33
6.5.2	Imprisonment	33
6.5.3	Trapping	33
6.5.4	Falling or ejected parts or uncontrolled movement	33
6.5.5	Locking devices	34
6.5.6	Loss of stability	34
6.5.7	Glazing material	34
6.5.8	Modification of settings	34
7	Information for use	34
7.1	General	34
7.2	Marking	37
Annex A (normative) Limitation of forces	38	
A.1	Specifications	38
A.2	Admissible forces	38
Annex B (informative) Examples of mechanical protection and safety distances	40	
B.1	Examples of mechanical protection	40
B.2	Examples of appropriate safety clearances and safety distances	41
Annex C (normative) Force measuring method	43	
C.1	General	43
C.2	Measuring equipment	43
C.3	Points of measuring	43
Annex D (normative) Testing method for presence detection	53	
D.1	General	53
D.2	Test pieces	53
D.3	Testing of supplementary device to be used with force limitation	54

D.4	Testing of presence detection system to be used without force limitation	57
Annex E (informative)	Safeguarding against dropping by other design features incorporated in the suspension system of vertically moving power operated door leaves	61
Annex F (informative)	Relationship between Hazards, Requirements and Test clauses	62
Annex G (informative)	Logbook	64
Annex ZA (informative)	Relationship between this European standard and the Essential Requirements of Directive 2006/42/EC aimed to be covered	65
Bibliography	68