

DIN EN 12195-1:2021-01 (E)

Load restraining on road vehicles - Safety - Part 1: Calculation of securing forces (includes Corrigendum :2014)

Contents		Page
Foreword		4
Introduction		5
1	Scope	6
2	Normative references	6
3	Terms, definitions, symbols, units and abbreviations	6
3.1	General terms and definitions	6
3.2	Terms and definition of calculation parameters	8
3.3	Symbols, units and terms	10
4	Acceleration coefficients	11
4.1	General	11
4.2	Load on load carriers during road transport	11
4.3	Load on load carriers during rail transport	12
4.4	Load on load carriers during sea transport	12
5	Methods of calculation	13
5.1	General	13
5.2	Stability of unsecured load	14
5.3	Blocking	15
5.4	Frictional lashing	16
5.4.1	General	16
5.4.2	Avoiding sliding	16
5.4.3	Avoiding tilting	17
5.5	Direct lashing	20
5.5.1	General	20
5.5.2	Slope lashing in longitudinal or transverse direction	20
5.5.3	Diagonal lashing	21
5.5.4	Loop lashing	24
5.5.5	Spring lashing	27
6	Parameters	28
6.1	Friction factor	28
6.2	Transmission of force during frictional lashing	29
7	Cargo securing testing	29
8	Instruction for use	29
8.1	General	29
8.2	Marking	30
Annex A (informative) Examples for the calculation of lashing forces		31
Annex B (normative) Friction		38
B.1	Practical methods for the determination of the friction factor μ	38
B.1.1	General	38
B.1.2	Inclination test	38

B.1.3	Pulling test	38
B.2	Friction factors μ of some usual goods and surfaces	39
Annex C (informative) Load securing protocol		41
Annex D (normative) Practical tests for determination of the efficiency of cargo securing arrangements		42
D.1	Dynamic driving test	42
EN12195-1:2010+AC:2014(E) D.2 Inclination test		42
D.2.1	Description of test	42
D.2.2	Example	44
D.2.3	Theoretical background	45
Annex E (informative) Documentation of practical tests		47
Bibliography		48