

ISO/TS 20458:2023-07 (E)

Road vehicles - Design and performance specifications for advanced Pedestrian Legform Impactor (aPLI)

Contents		Page
Foreword		v
Introduction		vi
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Abbreviated terms	6
5	Mechanical requirements for an aPLI	7
5.1	Upper mass	7
5.1.1	General description	7
5.1.2	Drawings and specifications	7
5.1.3	Compliant material specifications	8
5.1.4	Certification	9
5.2	Lower limb	9
5.2.1	General description	9
5.2.2	Drawings and specifications	10
5.2.3	Compliant material specifications	12
5.2.4	Certification	13
5.3	Flesh and skin assembly	14
5.3.1	General description	14
5.3.2	Drawings and specifications	14
5.3.3	Compliant material specifications	14
5.3.4	Certification	18
5.4	Full assembly	18
5.4.1	General description	18
5.4.2	Drawings and specifications	18
5.4.3	Certification	19
6	Certification test procedure	19
6.1	Upper mass	19
6.1.1	Hip joint	19
6.2	Lower limb	23
6.2.1	Femur bone assembly	23
6.2.2	Tibia bone assembly	26
6.2.3	Femur assembly	29
6.2.4	Knee assembly	32
6.2.5	Tibia assembly	36
6.3	Full assembly	40
6.3.1	Full-assembly test setup	40
6.4	Certification timing	44
6.5	Assessment interval for vehicle tests	44
7	Electronic subsystems requirements	45
7.1	Required sensors	45
7.1.1	General	45
7.1.2	Locations and specifications	45

7.1.3	Sensor specifications and mass	45
7.2	Permissible sensors	49
7.2.1	General	49
7.2.2	Locations and specifications	49
7.2.3	Sensor specifications and mass	50
7.3	Required internal data acquisition system (DAS)	52
7.3.1	General	52
7.3.2	Data acquisition system characteristics	52
7.3.3	DAS mass and location	52
8	User's manual	52
8.1	Requirements	52
8.1.1	Disassembly and assembly	52
Annex A (informative) Rationale regarding background and goals for aPLI		54
Annex B (informative) Rationale regarding performance of aPLI		108
Annex C (informative) Assessment interval for vehicle tests		121
Annex D (informative) Outer contour of the struck side of the bony structure		135
Annex E (informative) Biofidelity and injury assessment capability evaluation data		138
Annex F (informative) Repeatability and reproducibility data		203
Annex G (informative) Durability assessment data		205
Annex H (informative) Parts list		208
Annex I (normative) Drawings and specifications, PDF and/or STP files		213
Annex J (informative) Information regarding sensor output polarities		214
Annex K (normative) Procedures for disassembling and assembling aPLI		218
Annex L (normative) Fastener torque values		228
Annex M (informative) Overview of an exemplar required internal DAS		229
Annex N (informative) Recommended aPLI general practices		232
Annex O (informative) Assessment procedure for dynamic test equipment		234
Annex P (informative) Validation results of aPLI models (A, C, E, F) against hardware		236
Annex Q (informative) Exemplar of aPLI hip joint certification test rig		246
Bibliography		247