This MotoCAP safety rating applies to:

Brand:	Alpinestars
Model:	SP-X Perforated
Type:	Pants - Leather
Date purchased:	13 May 2019
Sizes tested:	54 and 56
Gender:	M
Style:	Sports
Test code:	P19L01

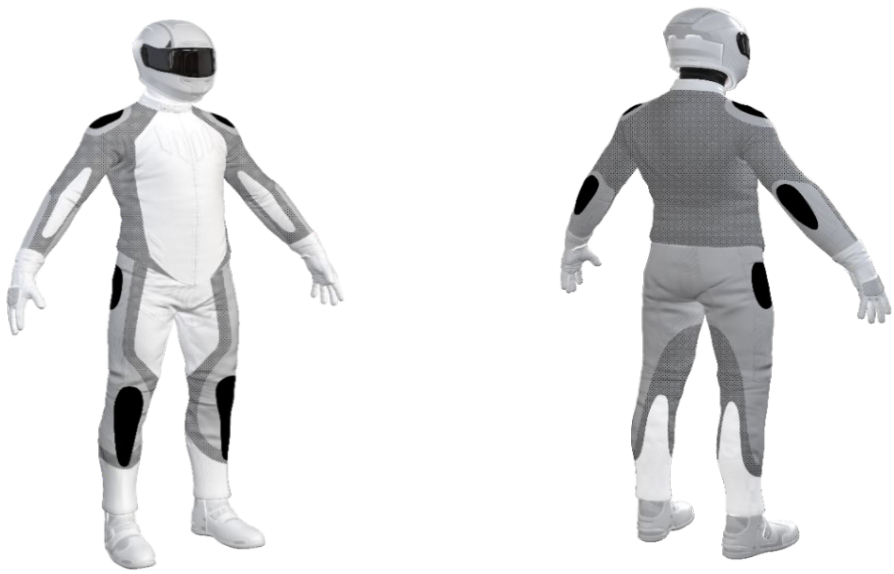
Test Results Summary:

	Rating	Score
MotoCAP Protection Rating	★★★★	53.8
Abrasion	6/10	4.31
Burst	10/10	1065
Impact	9/10	71.8
MotoCAP Comfort Rating	★★★★	0.549
Moisture Vapour Resistance		25.3
Thermal Resistance		0.232
Water resistance	N/A	N/A

This garment is fitted with impact protectors for the knees and hips. Permanent ventilation is provided by perforated leather panels in the crotch and upper legs (front and back) to allow airflow movement through the garment.

Jacket and Pants - Crash Impact Risk Zones

This diagram is a pictorial representation of the crash impact risk Zones.



Zone 1	Zone 2	Zone 3	Zone 4
High risk of abrasion High risk of impact	High risk of abrasion	Medium risk of abrasion	Low risk of abrasion

Abrasion Resistance

The garment was tested for abrasion resistance in accordance with MotoCAP test protocols. The table below shows the test results for time to abrade through all layers of the materials. Calculated for each sample by Zone, type and area coverage of each material as a proportion of that Zone.

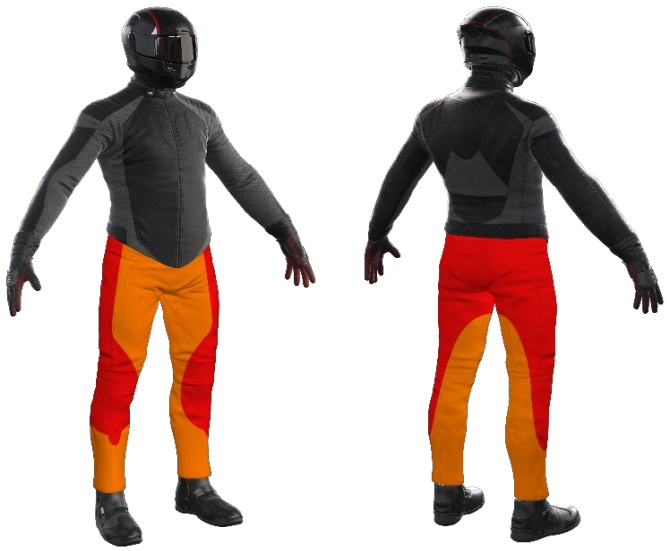
Details of materials used in garment:

Material A:	Leather shell over second leather layer and mesh inner liner
Material B:	Stretch fabric shell with mesh inner liner
Material C:	Perforated leather shell with mesh inner liner

Zone	Coverage (%)	Abrasion time for each test (seconds) 1	2	3	4	5	6	Average (seconds)	
Zone 1 and 2 areas (High abrasion risk)									
Material A	85%	8.21	10.00	10.00	10.00	10.00	9.01	9.54	G
Material B	15%	0.99	0.92	0.88	0.90			0.92	P
Zone 3 area (Medium abrasion risk)									
Material C	10%	5.14	4.83	4.84	5.06	4.68	4.92	4.91	G
Material B	90%	0.99	0.92	0.88	0.90			0.92	M
Zone 4 area (Low abrasion risk)									
Material C	15%	5.14	4.83	4.84	5.06	4.68	4.92	4.91	G
Material B	85%	0.99	0.92	0.88	0.90			0.92	M

Abrasion times are capped at a maximum of 10.00s.

The diagram below is a visual indication of the likely abrasion performance of the materials in each zone calculated from the data in the table above. The colour coding is based on the worst performing material in each zone.



Determining Criteria		Good	Acceptable	Marginal	Poor
High abrasion risk	Zone 1/2:	> 5.6	3.0 - 5.6	1.3 - 2.9	< 1.3
Medium abrasion risk	Zone 3:	> 2.5	1.8 - 2.5	0.8 - 1.7	< 0.8
Low abrasion risk	Zone 4:	>1.5	1.0 - 1.5	0.4 - 0.9	< 0.4

Burst Strength

The garment's burst strength was tested in accordance with MotoCAP test protocols. The table below shows the burst pressure in kilopascals (kPA) for each sample tested by Zone and the average result for each zone.

Burst pressure (kPA)

Area	1	2	3	4	5	Average	
Zones 1 & 2	1035	1073	1029	1950	1352	1288	G
Zone EZ	1047	872	719	378	1939	991	A
Zones 3 & 4	844	935	836	785	427	765	M

The diagram below illustrates the burst strength results in terms of the likely performance of the garment in an impact and is a pictorial representation of the data from the table above.

Determining Criteria		Good	Acceptable	Marginal	Poor
Burst strength	(kPa)	> 1000	800 - 1000	500 - 799	< 500

Impact Protection

The garment was tested for impact protection and coverage in accordance with MotoCAP test protocols. The table below shows the test results for each strike on each impact protector in kilonewton (kN) and their area of coverage as a proportion (%) of the Zone.

Impact protector type	Knee		Hip	
Average force (kN)	14.9	G	16.5	A
Maximum force (kN)	21.4	A	18.3	A
Coverage of zone 1 area	150%		150%	
Coverage of zone after displacement	100%		100%	

Individual test results

Impact force (kN)	Knee			Hip		
Strike location	**A**	**B**	**C**	**A**	**B**	**C**
Impact Protector 1	10.7	15.5	12.0	14.7	16.9	16.8
Impact Protector 2	14.6	17.6	21.4	15.6	17.6	18.3
Impact Protector 3	11.8	16.4	14.0	14.7	16.0	18.1

The diagram below is a visual indication of the likely performance of each impact protector calculated from the data in the table above. The colour coding is based on the worst performing score for average or maximium force for each impact zone.

Determining Criteria		Good	Acceptable	Marginal	Poor*
Impact force	(kN)	< 15	15 - 24	25 - 30	> 30

* Poor may also indicate that no impact protector, or impact protector pocket is present in the garment

Areas shaded black are not considered in the impact protection ratings.

Thermal comfort

The garment was tested for thermal comfort following the MotoCAP test protocols. The table below shows the moisture vapour resistance and the thermal resistance values obtained.

	1	2	**Average**
Moisture Vapour Resistance - R_{et} ($kPam^2/W$)	27.0	23.6	25.3

	1	2	**Average**
Thermal Resistance - R_{ct} (Km^2/W)	0.231	0.233	0.232

Water spray and rain resistance

This garment has not been advertised as water resistant so has not been tested for water spray and rain resistance.

Assessment Details.

Brand	Alpinestars
Model	SP-X Perforated
Type	Pants - Leather
Date purchased	13 May 2019
Tested by	AMCAF, Deakin University
Garment test reference	P19L01
Rating first published	September 2021
Rating updated	1 October 2021