


**This MotoCAP safety rating applies to:**

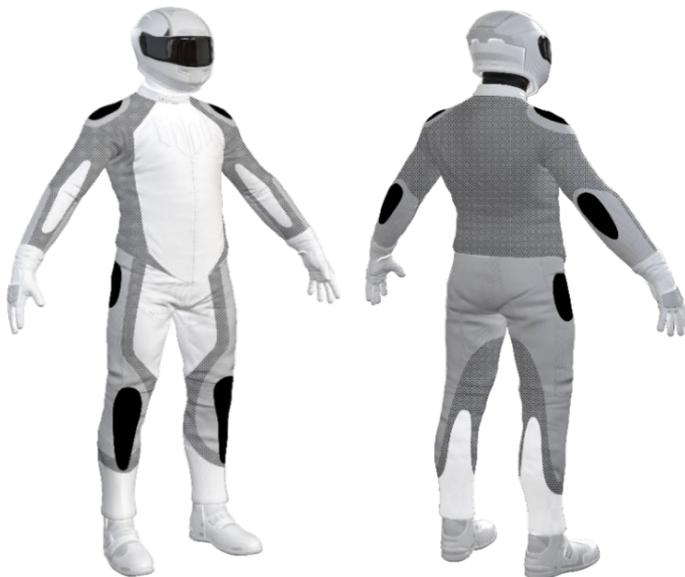
Brand	Mars Leathers
Model	Mars Wax-Cotton
Type	Jacket - Textile
Date purchased	1 June 2023
Sizes tested	XL and 2XL
Test garment gender	Male
Style	All Purpose
RRP	\$249.00

Test Results Summary	Rating	Score
MotoCAP Protection Rating	★	13.9
Abrasion	1/10	0.61
Burst	10/10	1086
Impact	1/10	0.0
MotoCAP Breathability Rating	✚	0.026
Moisture Vapour Resistance	-	561.7
Thermal Resistance	-	0.248
Water resistance	5/10	10.5

This garment is fitted with impact protectors for the elbows, shoulders and back. The limb impact protectors in this garment were found to provide negligible impact protection. Replacing the elbow and shoulder armour with higher performing impact protectors would improve the protection levels of this garment. There are no vents to allow airflow movement through the garment. Breathability was measured without the removable thermal liner installed.

**Jacket and Pants - Crash Impact Risk Zones**

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



**Zone 1**  
  
 High risk of abrasion  
 High risk of impact

**Zone 2**  
  
 High risk of abrasion

**Zone 3**  
  
 Medium risk of abrasion

**Zone 4**  
  
 Low risk of abrasion

**Removable liners**

Thermal liner	<input checked="" type="checkbox"/>
Water resistant liner	<input type="checkbox"/>

**Removable impact protection**

	Pockets	Armour
Elbow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Shoulder	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## Abrasion Resistance

The jacket was tested for abrasion resistance in accordance with MotoCAP test protocols. 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 below. The colour coding is based on the worst performing material in each zone.



### Abrasion Resistance Performance

Abrasion rating	1/10
Abrasion score	0.61

Determining Criteria	Area	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

**Individual Abrasion Resistance Results:** - 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. Abrasion times are capped at a maximum of 10.00s.

### Abrasion time for each test (seconds)

Zone	Coverage (%)	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Average	Grade	
Zone 1 & 2	Material A	100%	0.79	0.40	0.41	0.65	0.74	0.67	0.61	P
	Material A	100%	0.79	0.40	0.41	0.65	0.74	0.67	0.61	P
Zone 3	Material A	100%	0.79	0.40	0.41	0.65	0.74	0.67	0.61	P
	Material A	100%	0.79	0.40	0.41	0.65	0.74	0.67	0.61	M
Zone 4	Material A	100%	0.79	0.40	0.41	0.65	0.74	0.67	0.61	M
	Material A	100%	0.79	0.40	0.41	0.65	0.74	0.67	0.61	M

### Details of materials used in jacket

Material A	Waxed cotton, water-resistant layer and mesh inner liner
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## Burst Strength

The jacket was tested for burst strength in accordance with MotoCAP test protocols. 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 below.



### Burst Strength Performance

Burst rating	10/10
Burst score	1086

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

**Individual Burst Strength Results:** - 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 for each seam (kPA)

Area	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Average	
Zones 1 & 2	1170	863	1209	944	1031	1187	1067	G
Zones 3 & 4	1128	1043	1240	1396	1003	1144	1159	G

## Impact Protection

The jacket was tested for impact protection and coverage in accordance with MotoCAP test protocols. The diagram below is a visual indication of the likely performance of each impact protector calculated from the data in the table below. The colour coding is based on the worst performing score for average or maximum force for each impact zone. Areas shaded black are not considered for impact protection ratings.



### Impact Protection Performance

Impact rating	1/10
Impact score	0.0

Determining Criteria	Unit	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

**Individual Impact Protector Results:** - The table below shows the test results for each strike on each impact protector in kilonewtons (kN) and their area of coverage as a proportion (%) of the Zone. Individual strike results are capped at a maximum of 50kN.

Impact protector type	Elbow		Shoulder	
Average force (kN)	50.0	P	50.0	P
Maximum force (kN)	50.0	P	50.0	P
Coverage of Zone 1 area	125%		125%	
Coverage of Zone after displacement	100%		100%	

**Individual Impact Protector Results:** - The table below shows the test results for each strike on individual impact protectors in kilonewtons (kN) and the position of the strike. Individual strike results are capped at a maximum of 50kN.

### Force transfer for each impact strike (kN)

Impact protector type	Elbow			Shoulder		
	Centre	Mid	Edge	Centre	Mid	Edge
Impact Protector 1	50.0	50.0	50.0	50.0	50.0	50.0
Impact Protector 2	50.0	50.0	50.0	50.0	50.0	50.0
Impact Protector 3	50.0	50.0	50.0	50.0	50.0	50.0

## Breathability

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

Without removable liners		With water-resistant liner	
Breathability rating	↓	Breathability rating	N/A
Breathability score	0.026	Breathability score	N/A

Moisture Vapour Resistance - $R_{et}$ (kPa.m <sup>2</sup> /W)	1	2	Average
Without removable liners	510.0	613.3	561.7
With water-resistant liner	N/A	N/A	N/A

Thermal Resistance - $R_{ct}$ (K.m <sup>2</sup> /W)	1	2	Average
Without removable liners	0.255	0.241	0.248
With water-resistant liner	N/A	N/A	N/A

## Water spray and rain resistance

This jacket is advertised as water-resistant, and so has been tested for water spray and rain resistance according to the MotoCAP test protocols. The table below shows the water absorbed (ml) and the wetting proportion (%) of the garment and undergarments due to water absorption.

	Water absorbed by garment		Water absorbed by underwear	
	Volume (ml)	Percentage (%)	Volume (ml)	Percentage (%)
Jacket 1	132	8%	26	9%
Jacket 2	116	7%	36	12%
<b>Average</b>	124	7%	31	10%

## Location of wetting

There was major wetting to the cotton underwear present at the neck and chest for both jackets and major wetting at the cuffs of the sleeves of the second jacket tested.

### Assessment Details.

Brand	Mars Leathers
Model	Mars Wax-Cotton
Type	Jacket - Textile
Date purchased	1 June 2023
Tested by	AMCAF, Deakin University
Report approved by	MotoCAP Chief Scientist
Garment test reference	J23T28
Rating first published	August 2023
Rating updated	9 August 2023