


This MotoCAP safety rating applies to:

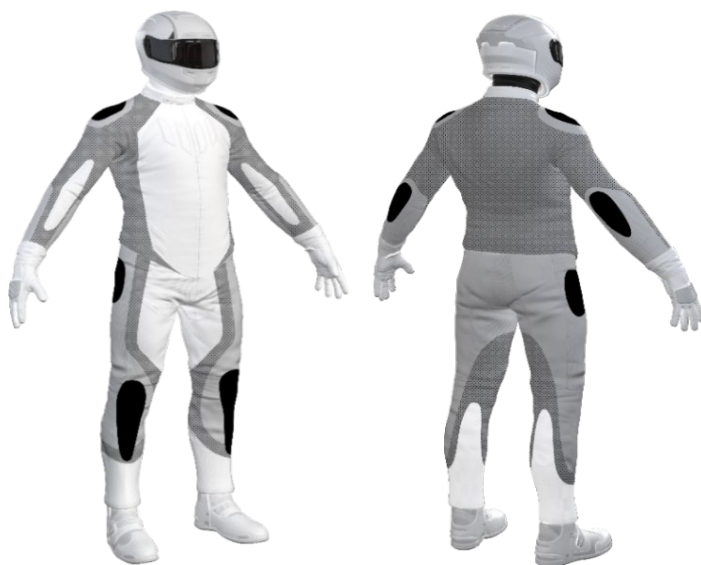
Brand	Macna
Model	Bora
Type	Pants - Textile
Date purchased	18 January 2022
Sizes tested	XL and 2XL
Test garment gender	Male
Style	Tourer
RRP	\$269.95


Test Results Summary	Rating	Score
MotoCAP Protection Rating	↘	9.3
Abrasion	1/10	0.23
Burst	8/10	815
Impact	1/10	0.0
MotoCAP Breathability Rating	★★	0.403
Moisture Vapour Resistance	-	35.6
Thermal Resistance	-	0.239
Water resistance	N/A	N/A


This garment is fitted with impact protectors for the knees. Pockets are provided at the hips for fitting aftermarket impact protectors. Replacing the knee and hip armour with higher performing impact protectors would improve the protection levels of this garment. Mesh panels are located in the front of the upper and lower legs 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

 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
- Water-resistant liner

Removable impact protection

	Pockets	Armour
Knee	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Hip	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Abrasion Resistance

These pants were 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	0.23

Determining Criteria	Area	Good	Acceptable	Marginal	Poor
High abrasion risk	Zones 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)

Zones 1 & 2	Coverage (%)	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Average	
Material A	25%	1.37	0.95	1.44	1.30			1.27	P
Material B	75%	0.71	0.59	0.71	0.81	0.65	0.62	0.68	P
Zone 3	Coverage (%)	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Average	
Material B	15%	0.71	0.59	0.71	0.81	0.65	0.62	0.68	P
Material C	85%	0.45	0.52	0.31	0.52	0.39	0.18	0.39	P
Zone 4	Coverage (%)	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Average	
Material C	100%	0.45	0.52	0.31	0.52	0.39	0.18	0.39	P

Details of materials used in jacket

Material A	Woven fabric shell, foam layer and mesh inner liner
Material B	Woven fabric shell with mesh inner liner
Material C	Mesh fabric shell with mesh inner liner

Burst Strength

These pants were 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	8/10
Burst score	815

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	659	1188	968	959	584	641	833	A
Zones 3 & 4	441	496	901	1389	510	718	743	M

Impact Protection

These pants were 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

Impact Protector Results: - The table below shows the average and maximum force transmitted through each impact protector type in kilonewtons (kN) and their area of coverage as a proportion (%) of the Zone.

Impact protector type	Knee		Hip	
Average force (kN)	23.3	A		P
Maximum force (kN)	29.3	M		P
Coverage of Zone 1 area	115%		0%	
Coverage of Zone after displacement	90%		0%	

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	Knee			Hip		
	Centre	Mid	Edge	Centre	Mid	Edge
Impact Protector 1	18.9	22.4	26.7			
Impact Protector 2	19.8	22.3	25.7			
Impact Protector 3	21.4	23.1	29.3			

Breathability

These pants were 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	0.403	Breathability score	N/A

Moisture Vapour Resistance - R_{et} (kPa.m ² /W)	1	2	Average
Without removable liners	35.4	35.7	35.6
With water-resistant liner	N/A	N/A	N/A
Thermal Resistance - R_{ct} (K.m ² /W)	1	2	Average
Without removable liners	0.239	0.239	0.239
With water-resistant liner	N/A	N/A	N/A

Water spray and rain resistance

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

Assessment Details.

Brand	Macna
Model	Bora
Type	Pants - Textile
Date purchased	18 January 2022
Tested by	AMCAF, Deakin University
Report approved by	MotoCAP Chief Scientist
Garment test reference	P20T18
Rating first published	May 2022
Rating updated	23 May 2022