



**TEST REPORT** 

Report No.: CH:TX:1242009885 DATE: 20/03/2021

ARAMID FABRIC AND SPANDEX WITH TPR PATCH ON BLACK

CP REF NO: 2021-02-26-021(CA59339)

FUMO SMART SDN BHD

ZERO ARMOUR

A/C F580101 SGS (MALAYSIA) SDN. BHD.

**CONTACT PERSON:** 

THE FOLLOWING SAMPLE(S) WAS/WERE SUBMITTED AND IDENTIFIED BY/ON BEHALF OF THE CUSTOMER AS:

**SAMPLE DESCRIPTION** 

**GLOVES** 

HEAVY DUTY IMPACT GLOVE

COLOUR

BLACK AND GREEN

STYLE NO.

MK - 1

FIBRE CONTENT PRODUCT NAME / BRAND COUNTRY OF DESTINATION

ZERO ARMOUR

COUNTRY OF ORIGIN PHOTO APPENDIX.

MALAYSIA CHINA



**SAMPLE RECD ON** 

11/03/2021

**TESTING PERIOD**: 11/03/2021 - 19/03/2021

Summary of Test Results/Conclusion						
Test Method / Standard	t Method / Standard Clause/Test Name					
	Protective Gloves against mechanical risks					
	Clause 6.1- Abrasion Resistance	Performance level 4				
	Clause 6.2- Blade Cut Resistance (Coupe test)	Performance level 4				
BS EN 388:2016	Clause 6.2- TDM Cut Resistance	Performance level E				
+A1.2018	Clause 6.4- Tear Resistance	Performance level 4				
	Clause 6.5- Puncture Resistance	Performance level 4				
	Clause 6.6- Impact test (Knuckle protector)	Performance level 1				
ANSI/ISEA 105-2016	American National Standard for Hand Protection lassification					
ANSI/ISEA 103-2010	Cut Resistance	Level A5				
EN 420:2003+A1.2009	Protective gloves - General requirements					
EN 420.2003+A1.2009	Dexterity	Performance level 5				

Per pro SGS India Private Ltd.

R. GANESAN

SECTION INCHARGE

Email your Test Report Related Enquiries at Feedback.SLT@sgs.com

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## RESULTS

BS EN 388: 2016+A1.2018 Protective Gloves against mechanical risks

Clause	Test Name		Result	Performance level
6.1	Abrasion resistance	Sample # 1	Break Through Between /(Rubs) >8000	
	Protection part : Palm	2 3	>8000 >8000	Level – 4
		4 Observation : rubs	>8000 Break through not occurred until 8000	
6.2	Blade cut resistance (Coupe test)	Sample #	Blade cut Index /(Index) 14.64   14.33   16.19   14.95   16.38  Mean: 15.30	Level – 4
	Protection part : Palm	2	17.00   15.81   15.29   15.46   16.79   Mean: 16.07	(See Note)
6.4	Tear resistance	Sample #	Maximum Force/(N) 426.5	
	Protection part : Palm	2 3 4	414.5 259.2 268.3	Level – 4
6.5	Puncture resistance	Sample #	Maximum Force/(N) 173.6	
	Protection part : Palm	2 3 4	191.1 156.4 166.1	Level – 4

Note: Sample dulling the blade of coupe cut test (number of cycles on control specimen after first sequence of test specimen is greater than 3 times of initial control fabric value)

#### Requirement as per BS EN 388:2016+A1.2018

Table - 1

Clause/Test Name	Level 1	Level 2	Level 3	Level 4	Level 5
6.1 Abrasion resistance (Number of rubs)	100	500	2000	8000	-
6.2 Coupe test: Blade cut resistance (index)	1.2	2.5	5.0	10.0	20.0
6.4 Tear resistance (N)	10	25	50	75	-
6.5 Puncture resistance (N)	20	60	100	150	-

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# RESULTS

### BS EN ISO 13997:1999 Protective clothing – Mechanical properties – Determination of resistance to cutting by sharp objects

Machine used: Tomodynamometer

Protection Part: Palm

Test	Rating Force, in N	Cutting stroke lengths, in mm	Normalized cutting strok in mm	e length
	24	11.7	10.1	
	23	22.9	19.7	
-	22	36.7	31.6	
	24	14.2	12.2	
	23	26.7	23.0	
	22	39.8	34.2	
	24	8.9	7.7	
Initial trail Cuts	22	41.7	35.9	
	23	24.8	21.3	
	22	36.8	31.6	
	24	9.6	8.3	
	22	39.2	33.7	
	23	23.4	20.1	
	24	12.8	11.0	
	23	25.6	22.0	
		22.6	19.4	
		25.3	21.8	
Estimate based on Graph-1	23	24.8	21.3	
on orapin i		23.5	20.2	
		24.3	20.9	
orce required to cu	t through the material in a	20 mm cutting stroke from the	curve plotted in Graph-2	22.9 N
		Blade sh	arpness correction factor	0.86
	Performance le	vel in accordance with BS EN	388:2016+A1.2018 Table 2	Е

#### Requirement as per BS EN 388:2016+A1.2018

Table - 2

Clause/Test Name	Level A	Level B	Level C	Level D	Level E	Level F
6.3 TDM: cut resistance (N)	2	5	10	15	22	30

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**TEST REPORT** 

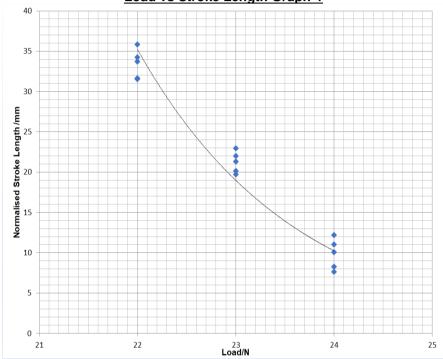
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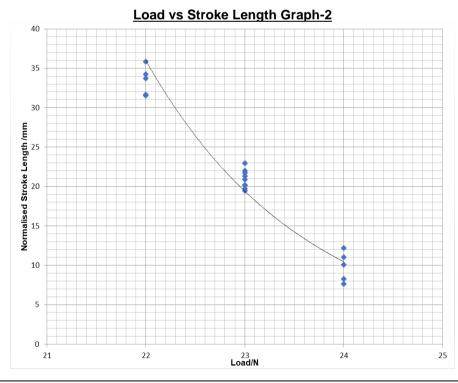


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# RESULTS

### Load vs Stroke Length Graph-1





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# RESULTS

Refer to EN 13594:2015 Protective gloves for motor cycle riders – Requirements and test methods. Impact attenuation test. (Drop Striker Mass: 2.5 kg, Impact energy: 5J)

Test Positions	Single result (kN)	Mean transmitted force (kN)	Performance Level
1	5.5		
2	5.5	F 4	Loyal 1
3	5.3	5.4	Level - 1
4	5.4		

Requirement as per BS EN 388:2016: When the tests were carried out according to EN 13594:2015 6.9 with impact energy of 5J, glove performance shall conform to Level 1 of EN 13594:2015, Table 7.

Table 7 as per EN 13594:2015.

Clause	Requirements				
Clause		Level 1	Level 2		
4.11 Impact attanuation	Single result	≤ 9.0 kN	≤ 5.0 kN		
4.11 Impact attenuation	Mean transmitted force	≤ 7.0 kN	≤ 4.0 kN		

#### EN 420 : 2003+A1: 2009 Protective Gloves - General requirements and test methods

Clause	Test Name	Result		Average	Standard sizing		
	Dexterity						Performance level
5.2	Smallest Pin Diameter (mm)	5	5	5	5	5	5

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### ANSI/ISEA 105-2016 - American national standard for hand protection selection criteria

Clause/ Test name	Method	Test Results/ Rating force (Weight) in g	Performance level
5.1.1 Cut Resistance (Weight (grams) needed to cut through material with 20 mm of blade travel)	ASTM F2992/F2992M-15	2344 grams	Level A5 (Table 1)

#### Performance requirements:

Table 1 (Cut Resistance) - Weight (grams) needed to cut through material with 20 mm of blade travel

level	Weight (g)	level	Weight (g)
A1	≥ 200	A6	≥ 3000
A2	≥ 500	A7	≥ 4000
A3	≥ 1000	A8	≥ 5000
A4	≥ 1500	A9	≥ 6000
A5	≥ 2200		

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## RESULTS

#### ASTM F2992/F2992M-15 - Measuring Cut Resistance of Materials

Machine used: Tomodynamometer

Test	Rating Force, in g	Cutting stroke lengths, in mm	Normalized cutting stroke length in mm	Log ( Normalized cutting stroke length)		
	2450	13.4	11.5	1.06		
	2450	18.3	15.7	1.20		
	2450	10.7	9.2	0.96		
	2450	14.9	12.8	1.11		
	2450	12.7	10.9	1.04		
	2240	37.2	32.0	1.51		
	2240	34.6	29.8	1.47		
Initial trail Cuts	2240	39.2	33.7	1.53		
	2240	33.7	29.0	1.46		
	2240	35.8	30.8	1.49		
	2350	22.4	19.3	1.29		
	2350	24.7	21.2	1.33		
	2350	25.1	21.6	1.33		
	2350	23.8	20.5	1.31		
	2350	26.2	22.5	1.35		
	Inerpolated weight to cut after 20 mm blade travel					
	Blade sharpness correction factor					

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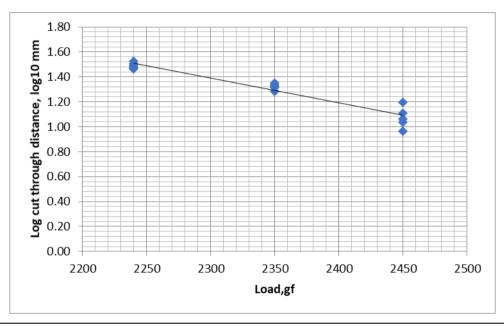
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#### **Regression Analysis**



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