

# **BALLISTIC & ANTI-TRAUMA 2023 CATALOG**

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**INNOVATIVE SOLUTIONS  
TO KEEP YOU IN THE FIGHT**

**RONINARMOUR.COM**







**ABOUT RONIN ARMOUR SYSTEMS**

Located in a small city on the edge of Southern Jutland in Denmark near the German border, we help contribute to keeping a long-standing local tradition of craftsmanship alive.

We pride ourselves on keeping our manufacturing in-house, focusing on quality, consistency, reliability, and a great internal emphasis on keeping our personnel happy and satisfied to avoid mishaps and oversights.

We design, draft and produce all of our soft products, both ballistic and non-ballistic, in our own facility that houses dedicated design, prototyping, cutting, drafting, sewing, sealing and packaging workshops.

**BEYOND SURVIVABILITY**

We go beyond survivability with our products and have extensively focused on multi-hit performance with increased safety margins so our end-users can have peace of mind that their armour will perform when they need it the most.

Similarly, no armour provides any protection if it isn't worn.

Because of this, we emphasise comfort, of which weight and flexibility are the primary criteria.



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






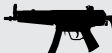






















All pictures shown in this catalog are for illustration purposes only. Due to different production periods and product enhancements, actual products may vary in appearance. WARNING: Certain powder, projectile and barrel length combinations will exceed the capabilities of the armour shown.



## THREAT & STANDARD COMPARISON TABLE

The below matrix provides an overview of the most widely used ballistic standards.

For bespoke threats, please contact us at [roninarmour.com/contact](https://roninarmour.com/contact) or [oem@roninarmour.com](mailto:oem@roninarmour.com)

	NIJ 0101.06	HOSDB 2007	VPAM BSW/APR 2006
<b>HANDGUN PROTECTION</b>	<b>IA</b> 9x19 mm FMJ RN; 8.0g C. 355 m/s ± 10m/s N. 373 m/s ± 10m/s 		<b>1</b> .22 Long Rifle L/RN; 2.6g Winchester 360 m/s ± 10 m/s 
	.40 S&W FMJ; 11.7g C. 325 m/s ± 10m/s N. 352 m/s ± 10m/s 		
	<b>II</b> 9x19 mm FMJ RN; 8.0g C. 379 m/s ± 10m/s N. 398 m/s ± 10m/s 	<b>HG1</b> 9x19 mm FMJ; 8.0g DM11A1B2 365 ± 10 m/s 	<b>2</b> 9x19 mm FMJ/RN/SC; 8.0g RUAG DM41 415 m/s ± 10 m/s 
	.357 Magnum SPFN; 10.2g C. 430 m/s ± 10m/s N. 448 m/s ± 10m/s 	.357 Magnum SPFN; 10.2g Rem. R357M3 390 ± 10 m/s 	
	<b>IIIA</b> .357 SIG FMJ FN; 8.1g C. 430 m/s ± 10 m/s N. 448 m/s ± 10 m/s 	<b>HG2</b> 9x19 mm FMJ; 8.0g DM11A1B2 430 ± 10 m/s 	<b>3</b> 9x19 mm FMJ/RN/SC; 8.0g RUAG DM41 415 m/s ± 10 m/s 
.44 Magnum SJHP; 15.6g C. 408 m/s ± 10 m/s N. 436 m/s ± 10m/s 	.357 Magnum SPFN; 10.2g Rem. R357M3 455 ± 10 m/s 	<b>4</b> .44 Magnum FMJ/FN/SC; 15.6g Speer 440 m/s ± 10 m/s 	
			<b>5</b> .357 Magnum FM/SC; 7.1g DAG Special 580 m/s ± 10 m/s 
<b>RIFLE PROTECTION</b>	<b>II</b> 7.62x51 M80 NATO Ball; 9.6g 847 m/s ± 10m/s 	<b>HG3</b> 5.56x45 LE223T3 Bonded SP; 4.02g 750 ± 15 m/s 	
	<b>III</b> <b>ST</b> 7.62x39 MSC; 7.9g 730 m/s ± 10m/s 	<b>RF1</b> 7.62x51 L2A2 NATO BALL; 9.3g 750 ± 15 m/s 	<b>6</b> 7.62x39 M43 FMJ/PB/FeC; 8.0g PS 720 m/s ± 10 m/s 
	<b>III</b> <b>ST+</b> 5.56x45 SS109; 4.0g 930 m/s ± 10m/s 	<b>RF1</b> <b>ST</b> 5.56x45 L2A1 (SS109 like) 4.0g 930 ± 15 m/s 	<b>7</b> .223 Remington FMJ/PB/SCP; 4.0g MEN, SS109 950 m/s ± 10 m/s 
		<b>RF2</b> 7.62x51 L40A1 NATO Ball HP; 9.7g 850 ± 15 m/s 	
			<b>8</b> 7.62x39 FMJ/PB/HCI; 4.1g BZ 740 m/s ± 10 m/s 
			<b>9</b> .308 Winchester FMJ/PB/HC; 9.45g FNB, P80 820 m/s ± 10 m/s 
	<b>IV</b> 7.62x63 M2 AP; 10.8g 878 m/s ± 10m/s 		<b>10</b> 7.62x54R FMJ/PB/HCI; 10.4g 832 860 m/s ± 10 m/s 
			<b>11</b> .308 Winchester FMJ/PB/WC; 8.4g Nammo, AP8 930 m/s ± 10 m/s 
			<b>12</b> .308 Winchester FMJ/PB/WC; 12.7g SWISS P AP 810 m/s ± 10 m/s 
			<b>13</b> .50 Browning FMJ/PB/HC; 43g SWISS P Penetrator 930 m/s ± 10 m/s 



### OUR SOFT ARMOUR ADVANTAGES



FLEXIBLE



LIGHTWEIGHT



WEATHER RESISTANT



MULTI-HIT RATED



CONTACT-SHOT RESISTANT



TRAUMA MITIGATING

## PALLAS™



Cost-effective, flexible, thin, and with stopping power for the most common threats. To learn more, visit [roninarmour.com/pallas](https://roninarmour.com/pallas)

AREAL DENSITY	THICKNESS	FLEXIBILITY
6.5 kg/m <sup>2</sup> (1.33 lb/ft <sup>2</sup> )	8.5 mm (0.33")	450 N (101.16 lbf) <sup>1</sup>
<sup>1</sup> Flexibility test is done per ASTM D4032-92		
MATERIALS		
<b>CORE</b>	TWARON® UD	
<b>MITIGATION</b>	CURV® Impact™	
<b>DISPERSION</b>	CARNA™ Urethane Polymer	
<b>RESIN SYSTEM</b>	Polyethylene Thermoplastic	
<b>THREAD</b>	Dyneema® SK75	

## ARGO™



Advanced multi-hit threat mitigation in a thin, lightweight package for all-day wear. To learn more, visit [roninarmour.com/argo](https://roninarmour.com/argo)

AREAL DENSITY	THICKNESS	FLEXIBILITY
4.5 kg/m <sup>2</sup> (0.92 lb/ft <sup>2</sup> )	6 mm (0.23")	470 N (105.66 lbf) <sup>1</sup>
<sup>1</sup> Flexibility test is done per ASTM D4032-92		
MATERIALS		
<b>CORE</b>	SPECTRA SHIELD® & GOLD SHIELD®	
<b>RESIN SYSTEM</b>	Polyolefin & Polyurethane	
<b>THREAD</b>	Dyneema® SK75	

## PROTEA™



Unparalleled flexibility based on a unique hybrid laminate solution. To learn more, visit [roninarmour.com/protea](https://roninarmour.com/protea)

AREAL DENSITY	THICKNESS	FLEXIBILITY
5.5 kg/m <sup>2</sup> (1.13 lb/ft <sup>2</sup> )	5.2 mm (0.20")	230 N (51.70 lbf) <sup>1</sup>
<sup>1</sup> Flexibility test is done per ASTM D4032-92		
MATERIALS		
<b>CORE</b>	Dimensionally PES stitched Twaron® microfilaments	
<b>RESIN SYSTEM</b>	Polyethylene	
<b>THREAD</b>	Dyneema® SK75	

## TYR™



Extreme trauma mitigation for the most demanding scenarios. To learn more, visit [roninarmour.com/tyr](https://roninarmour.com/tyr)

AREAL DENSITY	THICKNESS	FLEXIBILITY
8.5 kg/m <sup>2</sup> (1.74 lb/ft <sup>2</sup> )	12 mm (0.47")	520 N (116.90 lbf) <sup>1</sup>
<sup>1</sup> Flexibility test is done per ASTM D4032-92		
MATERIALS		
<b>STRIKE-FACE</b>	Mixed-Weave Twaron®	
<b>CORE</b>	SPECTRA SHIELD® & Twaron® UD	
<b>MITIGATION</b>	Twaron® Reinforced CURV® Impact™	
<b>DISPERSION</b>	CARNA™ Urethane Polymer	
<b>RESIN SYSTEM</b>	Polyethylene, Rubber Elastomer & SBR Adhesive	
<b>THREAD</b>	Dyneema® SK75	

## ATALAN™



High-value hybrid solution providing all-day comfort with advanced threat mitigation. To learn more, visit [roninarmour.com/atalan](https://roninarmour.com/atalan)

AREAL DENSITY	THICKNESS	FLEXIBILITY
5.1 kg/m <sup>2</sup> (1.04 lb/ft <sup>2</sup> )	7 mm (0.27")	445 N (100.03 lbf) <sup>1</sup>
<sup>1</sup> Flexibility test is done per ASTM D4032-92		
MATERIALS		
<b>CORE</b>	SPECTRA SHIELD® & GOLD SHIELD®	
<b>RESIN SYSTEM</b>	Rubber Elastomer & Polyurethane	
<b>THREAD</b>	Dyneema® SK75	

## ARES™



A dedicated backer for hard-armor optimised for energy and fragmentation mitigation. To learn more, visit [roninarmour.com/ares](https://roninarmour.com/ares)

AREAL DENSITY	THICKNESS	FLEXIBILITY
6.4 kg/m <sup>2</sup> (1.31 lb/ft <sup>2</sup> )	8.2 mm (0.32")	640 N (143.87 lbf) <sup>1</sup>
<sup>1</sup> Flexibility test is done per ASTM D4032-92		
MATERIALS		
<b>CORE</b>	SPECTRA SHIELD®	
<b>MITIGATION</b>	Twaron® Reinforced CURV® Impact™	
<b>RESIN SYSTEM</b>	Rubber Elastomer	
<b>THREAD</b>	Dyneema® SK75	



## INDUSTRY-LEADING **WEAR RESISTANCE**

**As standard, every soft insert features a cover consisting of a 78 Dtex polyamide fabric weighing 150 g/m<sup>2</sup>, with an outer DWR coating and an internal TPU laminate.**

**We seal using a two-step process: a mix of laminated heat-treated thermoplastic polyurethane pre-heated in a moulded perimeter, ensuring flexibility and leak-free creases around corners and bends, followed by an ultrasonic edge weld which binds all coatings and layers together for abrasion resistance and perimeter protection.**

**The cover is black by default, but custom colours and patterns are available upon request. Please note that minimum order quantities apply for custom cover materials.**



# GEN. 2

**NEW****SPEC IMPROVEMENTS  
(RELATIVE TO PREVIOUS GENERATION)**

10-12% lighter ballistic core  
5% thinner

**BALLISTIC IMPROVEMENTS**

40-50% increased material engagement on impact  
20% decreased backface signature on impact

# PALLAS™

## COMMON THREAT PROTECTION & COST-EFFECTIVE PERFORMANCE

### COMPLETE **VERSATILITY**

At a thickness of only 8.5 millimetres (0.33"), the PALLAS™ lineup is perfectly concealable under clothing in any well-designed concealable carrier and, as such, can easily be worn by private security patrols and emergency personnel while maintaining form and appearance.

### UNIDIRECTIONAL LAMINATES **DONE RIGHT**

Based on multiple flexible layers of high-tenacity Twaron® microfilament laminated in a thin polyethylene film with both heat and pressure, the final solution provides incredible stopping power and flexibility in one of the most affordable packages possible.

This construction ensures that the PALLAS™ lineup's ballistic performance stays stable, passing accelerated ageing tests at elevated temperatures and high moisture concentration to ensure no performance degradation takes place from typical wear, all while staying remarkably flexible.

### ALL-DAY **WEARING COMFORT**

Thanks to the unique lamination process, the PALLAS™ lineup can easily conform to compound curves, making it usable regardless of body type.

Furthermore, with the small diameter of the microfilaments and near-zero layer void content, the lineup is roughly 40%<sup>1</sup> more flexible than comparable pure UHMWPE solutions at a similar density, thickness and stopping power.

To learn more, please visit [roninarmour.com/pallas](https://roninarmour.com/pallas)

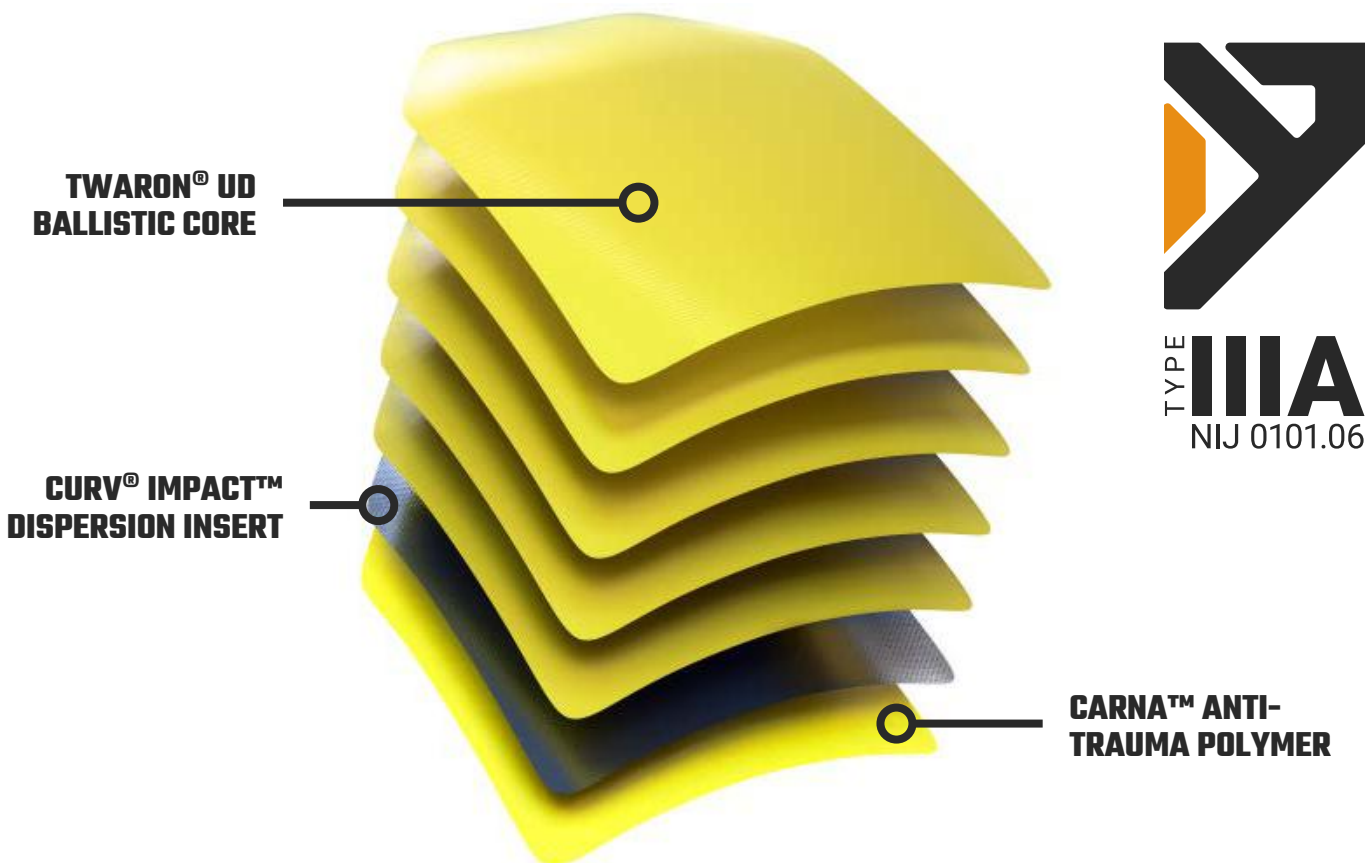
<sup>1</sup> Per ASTM D3574 Test D



# GEN. 2 BALLISTIC LAYUP

PALLAS™ DATA	
AREAL DENSITY	6.5 kg/m <sup>2</sup> (1.33 lb/ft <sup>2</sup> )
THICKNESS	8.5 mm (0.33")
FLEXIBILITY	450 N (101.16 lbf) <sup>1</sup>

<sup>1</sup> Flexibility test is done per ASTM D4032-92



The above widget only illustrates layup composition and is not an accurate representation of layer count or relative thickness.

PALLAS™ - MATERIALS & INFORMATION	
CORE	TWARON® UD
MITIGATION	CURV® Impact™
DISPERSION	CARNA™ Urethane Polymer
RESIN SYSTEM	Polyethylene Thermoplastic
THREAD	Dyneema® SK75
COVER	DWR & TPU coated Polyamide
COUNTRY OF ORIGIN	Denmark
WARRANTY (PROPERTIES)	5 years
WARRANTY (WORKMANSHIP)	1 year

The PALLAS™ lineup is built to provide the best possible bang for the buck without needlessly compromising on flexibility or stopping power. Perfectly fit for all-day wear and with stability to endure extended storage periods, the PALLAS™ lineup is perfect for those working on a budget or with a need to outfit a small team without breaking the bank.



## PALLAS™ LW ALTERNATIVE LAYUP

With the material advancements introduced with the release of our second generation PALLAS™ series of inserts, we're now also introducing the PALLAS™ LW line.

The PALLAS™ LW line forgoes the built-in anti-trauma system, resulting in increased flexibility, and a lower price point in addition to thickness and weight reductions at the expense of increased trauma compared to the fully-featured layup.

A result of the previously mentioned material advancements enables the PALLAS™ LW line to stay well within the trauma limitations of both NIJ 0101.06 IIIA threats alongside VPAM 3 threats, all without a dedicated anti-trauma system.

### THE PALLAS™ LW LINE IS ON AVERAGE:

- 18% lighter
- 37% thinner
- 7-8% more flexible<sup>1</sup>
- 12-16% lower cost

PALLAS™ LW - MATERIALS & INFORMATION	
CORE	TWARON® UD
RESIN SYSTEM	Polyethylene Thermoplastic
THREAD	Dyneema® SK75
COVER	DWR & TPU coated Polyamide
COUNTRY OF ORIGIN	Denmark
WARRANTY (PROPERTIES)	5 years
WARRANTY (WORKMANSHIP)	1 year

PALLAS™ LW DATA	
AREAL DENSITY	5.4 kg/m <sup>2</sup> (1.11 lb/ft <sup>2</sup> )
THICKNESS	5.3 mm (0.20")
FLEXIBILITY	415 N (93.29 lbf) <sup>1</sup>

<sup>1</sup> Flexibility test is done per ASTM D4032-92





## THREAT OVERVIEW



Our inserts are tested against both the VPAM and NIJ standards, which call for different shot spacing and the number of rounds.

For VPAM threats, we shoot our panels 7 times. 3 of these hits have 75 mm spacing in an equilateral triangle in accordance with Annex 3.1 of VPAM BSW2006. The consequent 3 shots follow the same pattern but have 25 mm spacing to test true multi-hit performance. The last round is fired 30 mm from the edge of the panel, to ensure edge-hit protection.

For NIJ threats, the panel is shot 6 times with equal spacing between each shot and the edge of the insert in accordance with NIJ 0101.06.

Please be aware that our multi-hit tests are carried out on 30x30 cm panels to provide adequate spacing between different tests. As such, real-world performance may differ on smaller panels.

STANDARD	PLATFORM	PROJECTILE	WEIGHT	VELOCITY	VARIANCE	TRAUMA LIMIT
VPAM 2006	Handgun	9×19mm (FMJ) <sup>2</sup> RN <sup>5</sup> SC <sup>6</sup>	8g (124 gr)	415 m/s (1360 fps)	±10 m/s (±30 fps)	< 22mm (< 0.8")
NIJ 0101.06	Handgun	9×19mm (FMJ) <sup>2</sup> RN <sup>5</sup>	8g (124 gr)	436 m/s (1430 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.357 Magnum (JSP) <sup>1</sup>	10.2g (158 gr)	427 m/s (1400 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.40 S&W (FMJ) <sup>2</sup>	11.6g (180 gr)	352 m/s (1155 fps)	352 m/s (1155 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.357 SIG (FMJ) <sup>2</sup> FN <sup>3</sup>	8g (125 gr)	448 m/s (1470 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.44 Magnum (SJHP) <sup>4</sup>	15.5g (240 gr)	436 m/s (1430 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")

The above table applies to both the PALLAS™ & PALLAS™ LW lineups.

<sup>1</sup> Jacketed Soft Point, <sup>2</sup> Full Metal Jacketed, <sup>3</sup> Flat Nose, <sup>4</sup> Semi Jacketed Hollow Point, <sup>5</sup> Round Nose, <sup>6</sup> Lead Soft Core, <sup>7</sup> Lead Free Hollow Point  
**WARNING:** Certain powder, projectile and barrel length combinations will exceed the capabilities of this armour.



## PALLAS™ STANDARD MODEL MATRIX

The following matrix provides an overview of our standard offerings and lists applicable details.

For bespoke sizes and cuts, please contact us at [roninarmour.com/contact](https://roninarmour.com/contact) or [oem@roninarmour.com](mailto:oem@roninarmour.com)

ORDER ID	MODEL	SIZE	CUT	WEIGHT	THICKNESS	PROTECTIVE AREA
R567	-	NATO SMALL - 20×25 cm (8×10")	SAPI CUT	330 g (11.6 oz)	8.5 mm (0.33")	504.8 cm <sup>2</sup> (78.2 in <sup>2</sup> )
R566	-	NATO STANDARD - 25×30 cm (10×12")	SAPI CUT	500 g (17.6 oz)	8.5 mm (0.33")	762.7 cm <sup>2</sup> (118.2 in <sup>2</sup> )
R561	-	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SAPI CUT	350 g (12.3 oz)	8.5 mm (0.33")	537.7 cm <sup>2</sup> (83.2 in <sup>2</sup> )
R562	-	SAPI S - 22.2×29.8 cm (8.75×11.75")	SAPI CUT	420 g (14.8 oz)	8.5 mm (0.33")	649.5 cm <sup>2</sup> (100.6 in <sup>2</sup> )
R563	-	SAPI M - 24.1×31.7 cm (9.5×12.5")	SAPI CUT	490 g (17.3 oz)	8.5 mm (0.33")	749.5 cm <sup>2</sup> (116.2 in <sup>2</sup> )
R564	-	SAPI L - 26×33.6 cm (10.25×13.25")	SAPI CUT	550 g (19.4 oz)	8.5 mm (0.33")	846.8 cm <sup>2</sup> (131.25 in <sup>2</sup> )
R565	-	SAPI XL - 28×35.5 cm (11×14")	SAPI CUT	630 g (22.2 oz)	8.5 mm (0.33")	963 cm <sup>2</sup> (149.25 in <sup>2</sup> )
R569	-	SIZE SMALL - 20×25 cm (8×10")	SHOOTER'S CUT	315 g (11.1 oz)	8.5 mm (0.33")	483.4 cm <sup>2</sup> (74.9 in <sup>2</sup> )
R568	-	SIZE LARGE - 25×30 cm (10×12")	SHOOTER'S CUT	485 g (17 oz)	8.5 mm (0.33")	743.8 cm <sup>2</sup> (115.3 in <sup>2</sup> )
R570	-	SIDEPLATE - 15×15 cm (6×6")	SQUARE CUT	160 g (5.6 oz)	8.5 mm (0.33")	247.5 cm <sup>2</sup> (38.3 in <sup>2</sup> )
R571	-	SIDEPLATE - 15×20 cm (6×8")	SQUARE CUT	210 g (7.4 oz)	8.5 mm (0.33")	322.5 cm <sup>2</sup> (50 in <sup>2</sup> )
R578	-	NATO SMALL - 20×25 cm (8×10")	SQUARE CUT	335 g (11.8 oz)	8.5 mm (0.33")	514.7 cm <sup>2</sup> (79.8 in <sup>2</sup> )
R577	-	NATO STANDARD - 25×30 cm (10×12")	SQUARE CUT	500 g (17.6 oz)	8.5 mm (0.33")	773.5 cm <sup>2</sup> (119.9 in <sup>2</sup> )
R572	-	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SQUARE CUT	370 g (13 oz)	8.5 mm (0.33")	562.7 cm <sup>2</sup> (87.2 in <sup>2</sup> )
R573	-	SAPI S - 22.2×29.8 cm (8.75×11.75")	SQUARE CUT	445 g (15.7 oz)	8.5 mm (0.33")	684.9 cm <sup>2</sup> (106.1 in <sup>2</sup> )
R574	-	SAPI M - 24.1×31.7 cm (9.5×12.5")	SQUARE CUT	515 g (18.1 oz)	8.5 mm (0.33")	789.7 cm <sup>2</sup> (122.4 in <sup>2</sup> )
R575	-	SAPI L - 26×33.6 cm (10.25×13.25")	SQUARE CUT	585 g (20.6 oz)	8.5 mm (0.33")	896.8 cm <sup>2</sup> (139 in <sup>2</sup> )
R576	-	SAPI XL - 28×35.5 cm (11×14")	SQUARE CUT	660 g (23.2 oz)	8.5 mm (0.33")	1017.3 cm <sup>2</sup> (157.7 in <sup>2</sup> )

ALL SIZE DIMENSIONS ARE ± 6 MM, AND ALL WEIGHTS ARE ± 5% OR ± 230g OR WHICHEVER IS GREATER.



## PALLAS™ LW STANDARD MODEL MATRIX

This lineup is only available as a bespoke solution.

For information or to order, please refer to [roninarmour.com/contact](https://roninarmour.com/contact) or [oem@roninarmour.com](mailto:oem@roninarmour.com)

ORDER ID	MODEL	SIZE	CUT	WEIGHT	THICKNESS	PROTECTIVE AREA
R729	LW	NATO SMALL - 20×25 cm (8×10")	SAPI CUT	275 g (9.7 oz)	5.3 mm (0.2")	504.8 cm <sup>2</sup> (78.2 in <sup>2</sup> )
R728	LW	NATO STANDARD - 25×30 cm (10×12")	SAPI CUT	410 g (14.5 oz)	5.3 mm (0.2")	762.7 cm <sup>2</sup> (118.2 in <sup>2</sup> )
R723	LW	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SAPI CUT	290 g (10.2oz)	5.3 mm (0.2")	537.7 cm <sup>2</sup> (83.2 in <sup>2</sup> )
R724	LW	SAPI S - 22.2×29.8 cm (8.75×11.75")	SAPI CUT	350 g (12.3 oz)	5.3 mm (0.2")	649.5 cm <sup>2</sup> (100.6 in <sup>2</sup> )
R725	LW	SAPI M - 24.1×31.7 cm (9.5×12.5")	SAPI CUT	405 g (14.3 oz)	5.3 mm (0.2")	749.5 cm <sup>2</sup> (116.2 in <sup>2</sup> )
R726	LW	SAPI L - 26×33.6 cm (10.25×13.25")	SAPI CUT	460 g (16.2 oz)	5.3 mm (0.2")	846.8 cm <sup>2</sup> (131.25 in <sup>2</sup> )
R727	LW	SAPI XL - 28×35.5 cm (11×14")	SAPI CUT	520 g (18.3 oz)	5.3 mm (0.2")	963 cm <sup>2</sup> (149.25 in <sup>2</sup> )
R731	LW	SIZE SMALL - 20×25 cm (8×10")	SHOOTER'S CUT	260 g (9.2 oz)	5.3 mm (0.2")	483.4 cm <sup>2</sup> (74.9 in <sup>2</sup> )
R730	LW	SIZE LARGE - 25×30 cm (10×12")	SHOOTER'S CUT	400 g (14.1 oz)	5.3 mm (0.2")	743.8 cm <sup>2</sup> (115.3 in <sup>2</sup> )
R732	LW	SIDEPLATE - 15×15 cm (6×6")	SQUARE CUT	135 g (4.8 oz)	5.3 mm (0.2")	247.5 cm <sup>2</sup> (38.3 in <sup>2</sup> )
R733	LW	SIDEPLATE - 15×20 cm (6×8")	SQUARE CUT	175 g (6.2 oz)	5.3 mm (0.2")	322.5 cm <sup>2</sup> (50 in <sup>2</sup> )
R740	LW	NATO SMALL - 20×25 cm (8×10")	SQUARE CUT	280 g (9.9 oz)	5.3 mm (0.2")	514.7 cm <sup>2</sup> (79.8 in <sup>2</sup> )
R739	LW	NATO STANDARD - 25×30 cm (10×12")	SQUARE CUT	420 g (14.8 oz)	5.3 mm (0.2")	773.5 cm <sup>2</sup> (119.9 in <sup>2</sup> )
R734	LW	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SQUARE CUT	305 g (10.7 oz)	5.3 mm (0.2")	562.7 cm <sup>2</sup> (87.2 in <sup>2</sup> )
R735	LW	SAPI S - 22.2×29.8 cm (8.75×11.75")	SQUARE CUT	370 g (13 oz)	5.3 mm (0.2")	684.9 cm <sup>2</sup> (106.1 in <sup>2</sup> )
R736	LW	SAPI M - 24.1×31.7 cm (9.5×12.5")	SQUARE CUT	425 g (15 oz)	5.3 mm (0.2")	789.7 cm <sup>2</sup> (122.4 in <sup>2</sup> )
R737	LW	SAPI L - 26×33.6 cm (10.25×13.25")	SQUARE CUT	485 g (17.1 oz)	5.3 mm (0.2")	896.8 cm <sup>2</sup> (139 in <sup>2</sup> )
R738	LW	SAPI XL - 28×35.5 cm (11×14")	SQUARE CUT	550 g (19.4 oz)	5.3 mm (0.2")	1017.3 cm <sup>2</sup> (157.7 in <sup>2</sup> )

ALL SIZE DIMENSIONS ARE ± 6 MM, AND ALL WEIGHTS ARE ± 5% OR ± 230g OR WHICHEVER IS GREATER.







**PROTEA™**

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## UNPARALLELED FLEXIBILITY

### THE **BEST** OF BOTH WORLDS

Our PROTEA™ material combines no-crimp woven Twaron® ultra-microfilament yarn with an incredibly low resin infusion, resulting in a thin, very flexible laminate consisting of two woven layers which are dimensionally bound with high-tenacity PES threads and laminated together.

This fabric construction prevents an intruding projectile from pushing the yarns apart on impact, just like a unidirectional laminate, while allowing the entire assembly to move like a woven fabric.

### CONCEAL YOUR ARMOUR **EFFORTLESSLY**

Because of the ultra-microfilament yarns used, the PROTEA™ lineup boasts an incredibly slim profile at just over 5 millimetres (0.2"), allowing it to conceal even under light clothing easily. This makes it ideal for use in covert and undercover operations where armour printing can have fatal consequences.

Thanks to the unmatched flexibility of the layup, the compression bulges traditionally seen with unidirectional armour solutions can be avoided entirely, as the entire panel can contour to the body. This helps keep your silhouette intact from all angles while also helping distribute the wearing load of the armour, lowering fatigue.

### COMPLETE FREEDOM OF MOVEMENT

As the PROTEA™ layup is as flexible as a woven solution but with a significantly thinner profile, it is exceptionally well suited for those with curvilinear body features, such as personnel with busts.

Thanks to its freedom of movement, the lineup can be donned without any uncomfortable hotspots or pinching, allowing it to be worn intensively with a high degree of comfort.

To learn more, please visit [roninarmour.com/protea](https://roninarmour.com/protea)

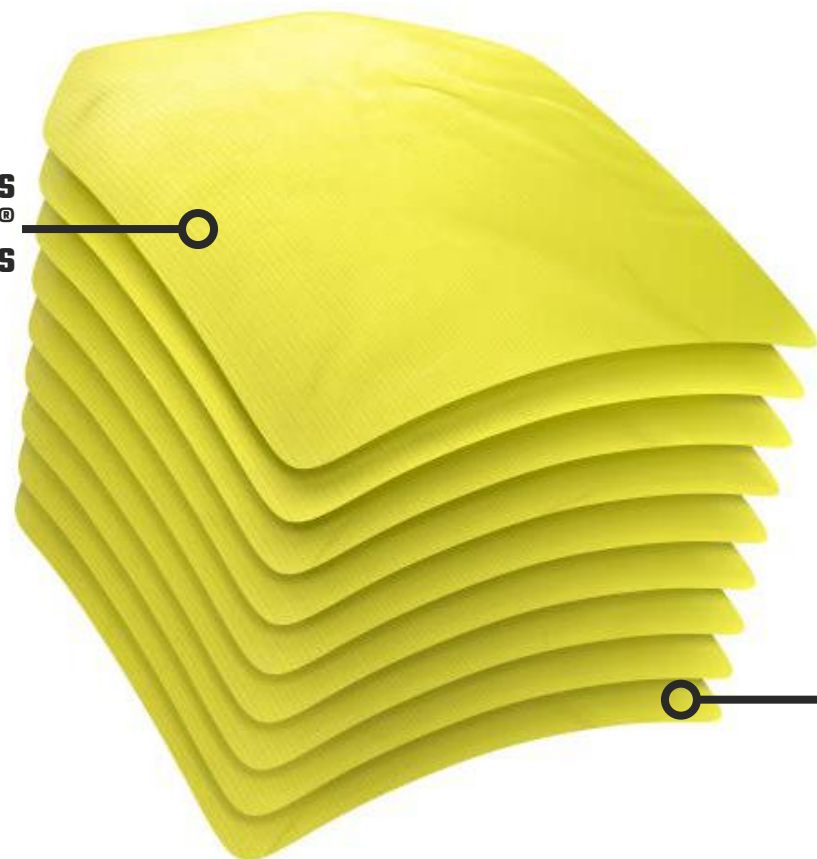


# THE PROTEA™ LAYUP

PROTEA™ DATA	
AREAL DENSITY	5.5 kg/m <sup>2</sup> (1.13 lb/ft <sup>2</sup> )
THICKNESS	5.2 mm (0.2")
FLEXIBILITY	230 N (51.70 lbf) <sup>1</sup>

<sup>1</sup> Flexibility test is done per ASTM D4032-92

DIMENSIONALLY PES STITCHED TWARON® MICROFILAMENTS



POLYETHYLENE RESIN SYSTEM

The above widget only illustrates layup composition and is not an accurate representation of layer count or relative thickness.

PROTEA™ hybridises ballistic material engineering, providing the freedom of movement of woven fabrics with the trauma mitigation and stopping power of unidirectional laminates without compromises.

Thanks to the unique material construction, the PROTEA™ lineup can conform to compound curves, allowing it to contour to the body and bend seamlessly in all directions simultaneously while boasting a remarkably thin profile.

PALLAS™ - MATERIALS & INFORMATION	
CORE	Dimensionally PES stitched Twaron® microfilaments
RESIN SYSTEM	Polyethylene
THREAD	Dyneema® SK75
COVER	DWR & TPU coated Polyamide
COUNTRY OF ORIGIN	Denmark
WARRANTY (PROPERTIES)	5 years
WARRANTY (WORKMANSHIP)	1 year

## NEXT GENERATION ARMOUR, TODAY

Traditional woven ballistic fabrics provide some of the most flexible ballistic solutions. However, they fall short when mitigating energy from high-speed and high-density projectiles due to the individual yarns needing to interlock before they can begin catching the projectile.

Unidirectional ballistic laminates solve this issue by laminating the yarns in a no-crimp state, catching the projectile from the moment it interfaces with the material. This, however, usually comes at the expense of flexibility and sometimes weight, as the lamination adds additional material to each ballistic layer.

The unique fabric construction used in our PROTEA™ lineup seamlessly combines the best of both worlds, delivering the same flexibility as a woven fabric with the exceptional trauma mitigation and stopping power of a unidirectional laminate, with none of the downsides of either.

Using a groundbreaking, unique hybrid laminate technology based on one of the thinnest yarns ever made in the para-aramid spinning process, the PROTEA™ series provides one of the most flexible armour solutions to date, with incredible trauma mitigation and an impressive threat profile.

Because of the incredibly thin yarns, the final package is among the slimmest ballistic packages available. Paired with its unparalleled flexibility, it is among the most concealable armour packages on the market, perfect for those working undercover or in special operations.

Another benefit is that this hybrid laminate can move co-axially completely unhindered. This makes it particularly well suited for those with curvilinear body features, such as personnel with busts, or those required to be exceptionally agile while on duty.





## PROTEA™ STANDARD MODEL MATRIX

The following matrix provides an overview of our standard offerings and lists applicable details.

For bespoke sizes and cuts, please contact us at [roninarmour.com/contact](https://roninarmour.com/contact) or [oem@roninarmour.com](mailto:oem@roninarmour.com)

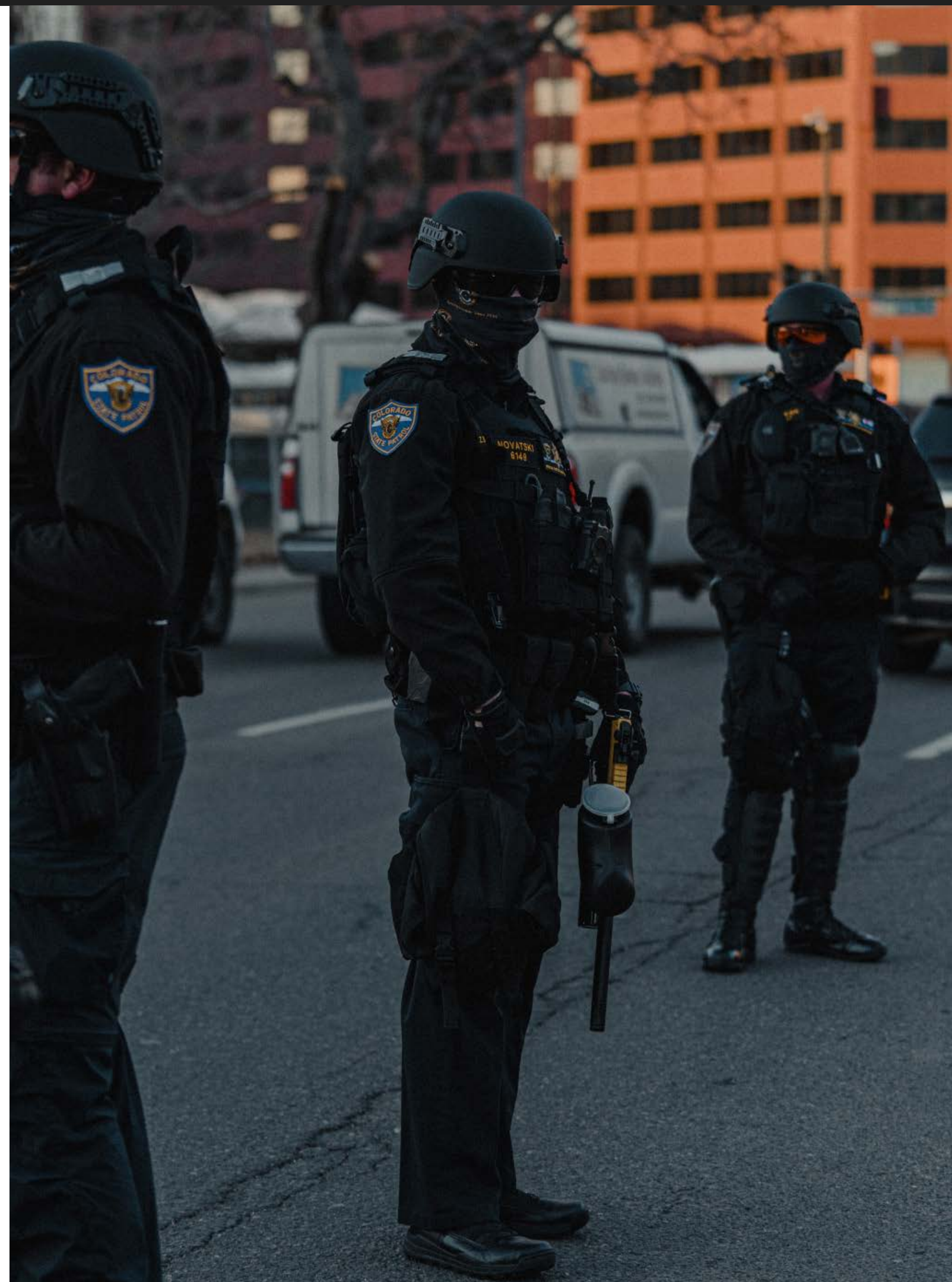
ORDER ID	MODEL	SIZE	CUT	WEIGHT	THICKNESS	PROTECTIVE AREA
R639	-	NATO SMALL - 20×25 cm (8×10")	SAPI CUT	280 g (9.9 oz)	5.2 mm (0.2")	504.8 cm <sup>2</sup> (78.2 in <sup>2</sup> )
R638	-	NATO STANDARD - 25×30 cm (10×12")	SAPI CUT	420 g (14.8 oz)	5.2 mm (0.2")	762.7 cm <sup>2</sup> (118.2 in <sup>2</sup> )
R633	-	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SAPI CUT	300 g (10.6 oz)	5.2 mm (0.2")	537.7 cm <sup>2</sup> (83.2 in <sup>2</sup> )
R634	-	SAPI S - 22.2×29.8 cm (8.75×11.75")	SAPI CUT	360 g (12.7 oz)	5.2 mm (0.2")	649.5 cm <sup>2</sup> (100.6 in <sup>2</sup> )
R635	-	SAPI M - 24.1×31.7 cm (9.5×12.5")	SAPI CUT	410 g (14.5 oz)	5.2 mm (0.2")	749.5 cm <sup>2</sup> (116.2 in <sup>2</sup> )
R636	-	SAPI L - 26×33.6 cm (10.25×13.25")	SAPI CUT	470 g (16.6 oz)	5.2 mm (0.2")	846.8 cm <sup>2</sup> (131.25 in <sup>2</sup> )
R637	-	SAPI XL - 28×35.5 cm (11×14")	SAPI CUT	530 g (18.7 oz)	5.2 mm (0.2")	963 cm <sup>2</sup> (149.25 in <sup>2</sup> )
R641	-	SIZE SMALL - 20×25 cm (8×10")	SHOOTER'S CUT	270 g (9.5 oz)	5.2 mm (0.2")	483.4 cm <sup>2</sup> (74.9 in <sup>2</sup> )
R640	-	SIZE LARGE - 25×30 cm (10×12")	SHOOTER'S CUT	410 g (14.5 oz)	5.2 mm (0.2")	743.8 cm <sup>2</sup> (115.3 in <sup>2</sup> )
R642	-	SIDEPLATE - 15×15 cm (6×6")	SQUARE CUT	135 g (4.8 oz)	5.2 mm (0.2")	247.5 cm <sup>2</sup> (38.3 in <sup>2</sup> )
R643	-	SIDEPLATE - 15×20 cm (6×8")	SQUARE CUT	180 g (6.3 oz)	5.2 mm (0.2")	322.5 cm <sup>2</sup> (50 in <sup>2</sup> )
R650	-	NATO SMALL - 20×25 cm (8×10")	SQUARE CUT	280 g (10 oz)	5.2 mm (0.2")	514.7 cm <sup>2</sup> (79.8 in <sup>2</sup> )
R649	-	NATO STANDARD - 25×30 cm (10×12")	SQUARE CUT	425 g (15 oz)	5.2 mm (0.2")	773.5 cm <sup>2</sup> (119.9 in <sup>2</sup> )
R644	-	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SQUARE CUT	310 g (11 oz)	5.2 mm (0.2")	562.7 cm <sup>2</sup> (87.2 in <sup>2</sup> )
R645	-	SAPI S - 22.2×29.8 cm (8.75×11.75")	SQUARE CUT	380 g (13.4 oz)	5.2 mm (0.2")	684.9 cm <sup>2</sup> (106.1 in <sup>2</sup> )
R646	-	SAPI M - 24.1×31.7 cm (9.5×12.5")	SQUARE CUT	435 g (15.3 oz)	5.2 mm (0.2")	789.7 cm <sup>2</sup> (122.4 in <sup>2</sup> )
R647	-	SAPI L - 26×33.6 cm (10.25×13.25")	SQUARE CUT	500 g (17.6 oz)	5.2 mm (0.2")	896.8 cm <sup>2</sup> (139 in <sup>2</sup> )
R648	-	SAPI XL - 28×35.5 cm (11×14")	SQUARE CUT	560 g (19.7 oz)	5.2 mm (0.2")	1017.3 cm <sup>2</sup> (157.7 in <sup>2</sup> )

ALL SIZE DIMENSIONS ARE ± 6 MM, AND ALL WEIGHTS ARE ± 5% OR ± 230g OR WHICHEVER IS GREATER.

STANDARD	PLATFORM	PROJECTILE	WEIGHT	VELOCITY	VARIANCE	TRAUMA LIMIT
VPAM 2006	Handgun	9×19mm (FMJ <sup>2</sup> RN <sup>5</sup> SC <sup>6</sup> )	8g (124 gr)	415 m/s (1360 fps)	±10 m/s (±30 fps)	< 22mm (< 0.8")
NIJ 0101.06	Handgun	9×19mm (FMJ <sup>2</sup> RN <sup>5</sup> )	8g (124 gr)	436 m/s (1430 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.357 Magnum (JSP <sup>1</sup> )	10.2g (158 gr)	427 m/s (1400 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.40 S&W (FMJ <sup>2</sup> )	11.6g (180 gr)	352 m/s (1155 fps)	352 m/s (1155 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.357 SIG (FMJ <sup>2</sup> FN <sup>3</sup> )	8g (125 gr)	448 m/s (1470 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.44 Magnum (SJHP <sup>4</sup> )	15.5g (240 gr)	436 m/s (1430 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")

The above table applies to the PROTEA™ lineup.

<sup>1</sup> Jacketed Soft Point, <sup>2</sup> Full Metal Jacketed, <sup>3</sup> Flat Nose, <sup>4</sup> Semi Jacketed Hollow Point, <sup>5</sup> Round Nose, <sup>6</sup> Lead Soft Core, <sup>7</sup> Lead Free Hollow Point  
**WARNING:** Certain powder, projectile and barrel length combinations will exceed the capabilities of this armour.







# ATALAN™

## HIGH-VALUE HYBRID LAYUP

### AFFORDABLE **NEXT-LEVEL** PERFORMANCE

Working on similar principles as our ARGO™ lineup, the ATALAN™ features an equivalent hybridised lamination system. Opting for an affordable mix of rubber elastomer and polyurethane resin systems in a joint layup allows the ATALAN™ to keep the benefits but shake the cost.

The result of this hybridised lamination is an increase in yarn-to-yarn and layer-to-layer friction during impact, further expanding the engaged surface area of the material and converting excess energy into heat which is then quickly and efficiently dissipated.

### **ALL-DAY WEARING COMFORT**

With a total thickness of only 7 mm (0.27") and the joint benefits of a hybridised construction, the ATALAN™ can conform to multi-dimensional compound curves without printing or bulging when appropriately worn, making it suitable for any body type.

Its self-structured unidirectional layup significantly increases comfort while also helping to distribute the load of each panel, making it ideal for covert or undercover operations and a comfortable option for day-to-day duty wear.

### **AN ACCESSIBLE HYBRID**

The core of the ATALAN™ lineup consists of Gold Shield® and Spectra Shield® unidirectional laminates, providing unparalleled trauma mitigation and advanced threat protection in an affordable, lightweight package.

To learn more, please visit [roninarmour.com/atalan](https://roninarmour.com/atalan)

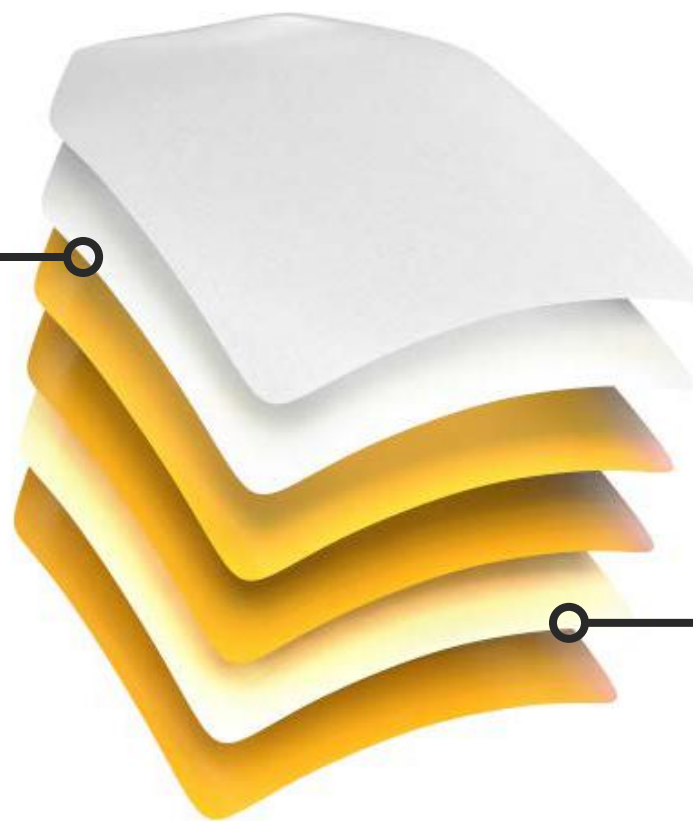


# HIGH-VALUE HYBRID

ATALAN™ DATA	
AREAL DENSITY	5.1 kg/m <sup>2</sup> (1.04 lb/ft <sup>2</sup> )
THICKNESS	7 mm (0.27")
FLEXIBILITY	445 N (100.03 lbf) <sup>1</sup>

<sup>1</sup> Flexibility test is done per ASTM D4032-92

LAYERED SPECTRA SHIELD® & GOLD SHIELD® UD COMPOSITES



TYPE IIIA+ NIJ 0101.06

RUBBER ELASTOMER & POLYURETHANE RESIN SYSTEMS

The above widget only illustrates layup composition and is not an accurate representation of layer count or relative thickness.

ATALAN™ builds on what we learnt when designing our flagship ARGO™ lineup and features high-tenacity Gold Shield® and flexible Spectra Shield® laminates in a high-value alternating hybridised layup.

Employing these high-quality laminates, the ATALAN™ lineup not only provides better performance than competing woven solutions but does so in a significantly lighter and thinner package.

ATALAN™ - MATERIALS & INFORMATION	
CORE	SPECTRA SHIELD® & GOLD SHIELD®
RESIN SYSTEM	Rubber Elastomer & Polyurethane
THREAD	Dyneema® SK75
COVER	DWR & TPU coated Polyamide
COUNTRY OF ORIGIN	Denmark
WARRANTY (PROPERTIES)	5 years
WARRANTY (WORKMANSHIP)	1 year



## ALL-DAY COMFORT WITH ADVANCED THREAT MITIGATION

Following the success of our ARGO™ lineup, we wanted to bring a similar hybrid system to market at a significantly more value-friendly price point.

The culmination of our efforts resulted in the ATALAN™. This hybrid lineup features minimal compromises, an impressive threat profile, a slim layup and an unmatched weight-to-performance ratio at the given asking price.

Explicitly designed to offer similar features to our ARGO™ series in a value-oriented package without compromising on ballistic properties, the series is only slightly denser and thicker than its higher-end counterpart.





## ATALAN™ STANDARD MODEL MATRIX

ORDER ID	MODEL	SIZE	CUT	WEIGHT	THICKNESS	PROTECTIVE AREA
R657	-	NATO SMALL - 20×25 cm (8×10")	SAPI CUT	260 g (9.1 oz)	7 mm (0.27")	504.8 cm <sup>2</sup> (78.2 in <sup>2</sup> )
R656	-	NATO STANDARD - 25×30 cm (10×12")	SAPI CUT	390 g (13.7 oz)	7 mm (0.27")	762.7 cm <sup>2</sup> (118.2 in <sup>2</sup> )
R651	-	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SAPI CUT	275 g (9.7 oz)	7 mm (0.27")	537.7 cm <sup>2</sup> (83.2 in <sup>2</sup> )
R652	-	SAPI S - 22.2×29.8 cm (8.75×11.75")	SAPI CUT	330 g (11.6 oz)	7 mm (0.27")	649.5 cm <sup>2</sup> (100.6 in <sup>2</sup> )
R653	-	SAPI M - 24.1×31.7 cm (9.5×12.5")	SAPI CUT	380 g (13.4 oz)	7 mm (0.27")	749.5 cm <sup>2</sup> (116.2 in <sup>2</sup> )
R654	-	SAPI L - 26×33.6 cm (10.25×13.25")	SAPI CUT	430 g (15.1 oz)	7 mm (0.27")	846.8 cm <sup>2</sup> (131.25 in <sup>2</sup> )
R655	-	SAPI XL - 28×35.5 cm (11×14")	SAPI CUT	490 g (17.3 oz)	7 mm (0.27")	963 cm <sup>2</sup> (149.25 in <sup>2</sup> )
R659	-	SIZE SMALL - 20×25 cm (8×10")	SHOOTER'S CUT	250 g (8.8 oz)	7 mm (0.27")	483.4 cm <sup>2</sup> (74.9 in <sup>2</sup> )
R658	-	SIZE LARGE - 25×30 cm (10×12")	SHOOTER'S CUT	380 g (13.4 oz)	7 mm (0.27")	743.8 cm <sup>2</sup> (115.3 in <sup>2</sup> )
R660	-	SIDEPLATE - 15×15 cm (6×6")	SQUARE CUT	125 g (4.4 oz)	7 mm (0.27")	247.5 cm <sup>2</sup> (38.3 in <sup>2</sup> )
R661	-	SIDEPLATE - 15×20 cm (6×8")	SQUARE CUT	165 g (5.8 oz)	7 mm (0.27")	322.5 cm <sup>2</sup> (50 in <sup>2</sup> )
R668	-	NATO SMALL - 20×25 cm (8×10")	SQUARE CUT	260 g (9.1 oz)	7 mm (0.27")	514.7 cm <sup>2</sup> (79.8 in <sup>2</sup> )
R667	-	NATO STANDARD - 25×30 cm (10×12")	SQUARE CUT	395 g (13.9 oz)	7 mm (0.27")	773.5 cm <sup>2</sup> (119.9 in <sup>2</sup> )
R662	-	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SQUARE CUT	290 g (10.2 oz)	7 mm (0.27")	562.7 cm <sup>2</sup> (87.2 in <sup>2</sup> )
R663	-	SAPI S - 22.2×29.8 cm (8.75×11.75")	SQUARE CUT	350 g (12.3 oz)	7 mm (0.27")	684.9 cm <sup>2</sup> (106.1 in <sup>2</sup> )
R664	-	SAPI M - 24.1×31.7 cm (9.5×12.5")	SQUARE CUT	400 g (14.1 oz)	7 mm (0.27")	789.7 cm <sup>2</sup> (122.4 in <sup>2</sup> )
R665	-	SAPI L - 26×33.6 cm (10.25×13.25")	SQUARE CUT	460 g (16.2 oz)	7 mm (0.27")	896.8 cm <sup>2</sup> (139 in <sup>2</sup> )
R666	-	SAPI XL - 28×35.5 cm (11×14")	SQUARE CUT	660 g (23.2 oz)	7 mm (0.27")	1017.3 cm <sup>2</sup> (157.7 in <sup>2</sup> )

ALL SIZE DIMENSIONS ARE ± 6 MM, AND ALL WEIGHTS ARE ± 5% OR ± 230g OR WHICHEVER IS GREATER.

STANDARD	PLATFORM	PROJECTILE	WEIGHT	VELOCITY	VARIANCE	TRAUMA LIMIT
VPAM 2006	Handgun	9×19mm (FMJ) <sup>2</sup> RN <sup>5</sup> SC <sup>6</sup>	8g (124 gr)	415 m/s (1360 fps)	±10 m/s (±30 fps)	< 22mm (< 0.8")
NIJ 0101.06	Handgun	9×19mm (FMJ) <sup>2</sup> RN <sup>5</sup>	8g (124 gr)	436 m/s (1430 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.357 Magnum (JSP) <sup>1</sup>	10.2g (158 gr)	427 m/s (1400 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.40 S&W (FMJ) <sup>2</sup>	11.6g (180 gr)	352 m/s (1155 fps)	352 m/s (1155 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.357 SIG (FMJ) <sup>2</sup> FN <sup>3</sup>	8g (125 gr)	448 m/s (1470 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.44 Magnum (SJHP) <sup>4</sup>	15.5g (240 gr)	436 m/s (1430 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
SPECIAL	Handgun	7.62×25mm Tokarev (FMJ) <sup>2</sup>	5.5g (85 gr)	450 m/s (1475 fps)	±15 m/s (±50 fps)	NA
SPECIAL	Handgun	9×19mm +P+ (SXT)	8.2g (127 gr)	408 m/s (1340 fps)	±15 m/s (±50 fps)	NA
SPECIAL	Handgun	5.7×28mm SS195 (LFHP) <sup>7</sup>	1.7g (27 gr)	610 m/s (2000 fps)	±10 m/s (±30 fps)	NA
SPECIAL	Handgun	5.7×28mm SS197	2.6g (40 gr)	545 m/s (1790 fps)	±10 m/s (±30 fps)	NA

The above table applies to the ATALAN™ lineup.

<sup>1</sup> Jacketed Soft Point, <sup>2</sup> Full Metal Jacketed, <sup>3</sup> Flat Nose, <sup>4</sup> Semi Jacketed Hollow Point, <sup>5</sup> Round Nose, <sup>6</sup> Lead Soft Core, <sup>7</sup> Lead Free Hollow Point  
**WARNING:** Certain powder, projectile and barrel length combinations will exceed the capabilities of this armour.



## NEXT-GENERATION BALLISTIC PERFORMANCE

### A NEXT-GENERATION HYBRID

The core of the ARGO™ lineup consists of a high-quality Gold Shield® laminate featuring Twaron® microfilament alongside advanced unidirectional Spectra Shield® fibres, providing unparalleled trauma mitigation and advanced threat protection.

### CONCEAL YOUR ARMOUR EFFORTLESSLY

Thanks to the advanced lamination approach, the ARGO™ lineup boasts an incredibly slim profile at just under 6 millimetres (0.23"), allowing it to easily conceal even under light clothing. This makes it ideal for covert or undercover operations as well as a comfortable option for day-to-day duty wear.

With its self-structured unidirectional panels, any ARGO™ insert can easily be bent and flexed to eliminate printing or bulge lines when worn in a wrap-around carrier, significantly increasing comfort while also helping to distribute the load of each panel.

### STAY LIGHTWEIGHT

In conjunction with the hybridised selection of extremely high-performance base fibres, the ARGO™ lineup also features a hybridised lamination system combining lightweight polyolefin and polyurethane resin systems in a joint, alternating layup.

By combining these materials and infusion technologies we've managed to take the ARGO™ to another level of ballistic effectiveness, earning it the designation as the lightest and highest-performing body armour system we've ever designed.

To learn more, please visit [roninarmour.com/argo](https://roninarmour.com/argo)



ARGO™



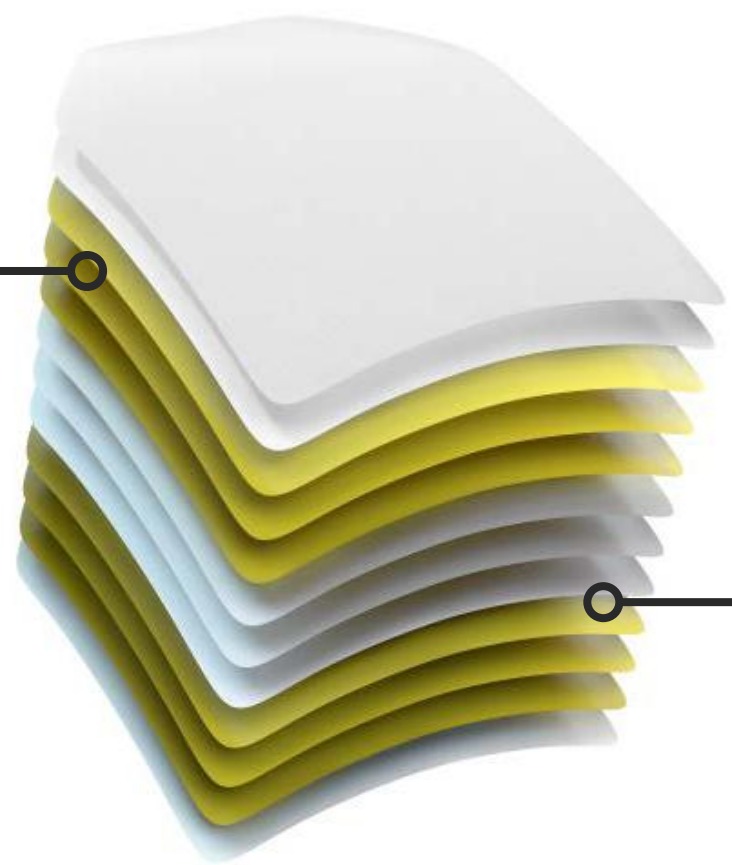
# STATE OF THE ART



ARGO™ DATA	
AREAL DENSITY	4.5 kg/m <sup>2</sup> (0.92 lb/ft <sup>2</sup> )
THICKNESS	6 mm (0.23")
FLEXIBILITY	470 N (105.66 lbf) <sup>1</sup>

<sup>1</sup> Flexibility test is done per ASTM D4032-92

STATE-OF-THE-ART SPECTRA SHIELD® & GOLD SHIELD® UD COMPOSITES



POLYOLEFIN & POLYURETHANE RESIN SYSTEMS

The above widget only illustrates layup composition and is not an accurate representation of layer count or relative thickness.

We've built the ARGO™ lineup with the fewest compromises possible between trauma mitigation, profile and weight, leading to an innovative ballistic lineup that boasts a concealable, slim silhouette and an extraordinarily low weight, allowing for comfortable all-day wear and total concealability.

Without having to depend on rigid stiffeners or excessive padding for trauma mitigation, the ARGO™ lineup can maintain its flexibility, despite the remarkable amount of active ballistic material sandwiched between the hybrid resin systems.

ARGO™ - MATERIALS & INFORMATION	
CORE	SPECTRA SHIELD® & GOLD SHIELD®
RESIN SYSTEM	Polyolefin & Polyurethane
THREAD	Dyneema® SK75
COVER	DWR & TPU coated Polyamide
COUNTRY OF ORIGIN	Denmark
WARRANTY (PROPERTIES)	5 years
WARRANTY (WORKMANSHIP)	1 year

## ADVANCED MULTI-HIT THREAT MITIGATION

The ARGO™ series is an ultra-lightweight hybridised layup using state-of-the-art Spectra Shield® fibres with thin and flexible Gold Shield® laminates using lightweight polyolefin and polyurethane resin systems allowing for more ballistic material at a lower weight.



-  SPECIAL THREAT RATED
-  ULTRA LIGHTWEIGHT
-  EASILY CONCEALABLE

### NEXT-GENERATION LAYUP

This improves yarn-to-yarn and layer-to-layer friction in the event of an impact, further increasing the engaged surface area of the material and converting excess energy into heat which is then quickly and efficiently dissipated

This makes it capable of defeating lighter projectile threats, such as those found natively at the NIJ 0101.06 IIIA and VPAM 3 levels, the ARGO™ lineup is also capable of stopping the FBI and DEA special threats, such as the Five-Seven SS195 LFHP, SS197 Hornady and the 85 gr FMJ Tokarev, to name a few.

The final layup is multi-hit rated and defeats advanced threats while maintaining an incredibly slim profile and boasting unparalleled trauma mitigation, making it the perfect choice for all-day covert wear for special operations and general patrol use.

### HIGH-END THREAT PROFILE

Easily capable of defeating lighter projectile threats, such as those found natively at the NIJ 0101.06 IIIA and VPM 3 levels, the ARGO™ lineup is also capable of stopping the FBI and DEA special threats, such as the Five-Seven SS195 LFHP, SS197 Hornady and the 85 gr FMJ Tokarev, to name a few.

Our ATALAN™ series offers similar features in a value-oriented package for those willing to compromise on thickness and density when working on a budget.



## ARGO™ STANDARD MODEL MATRIX

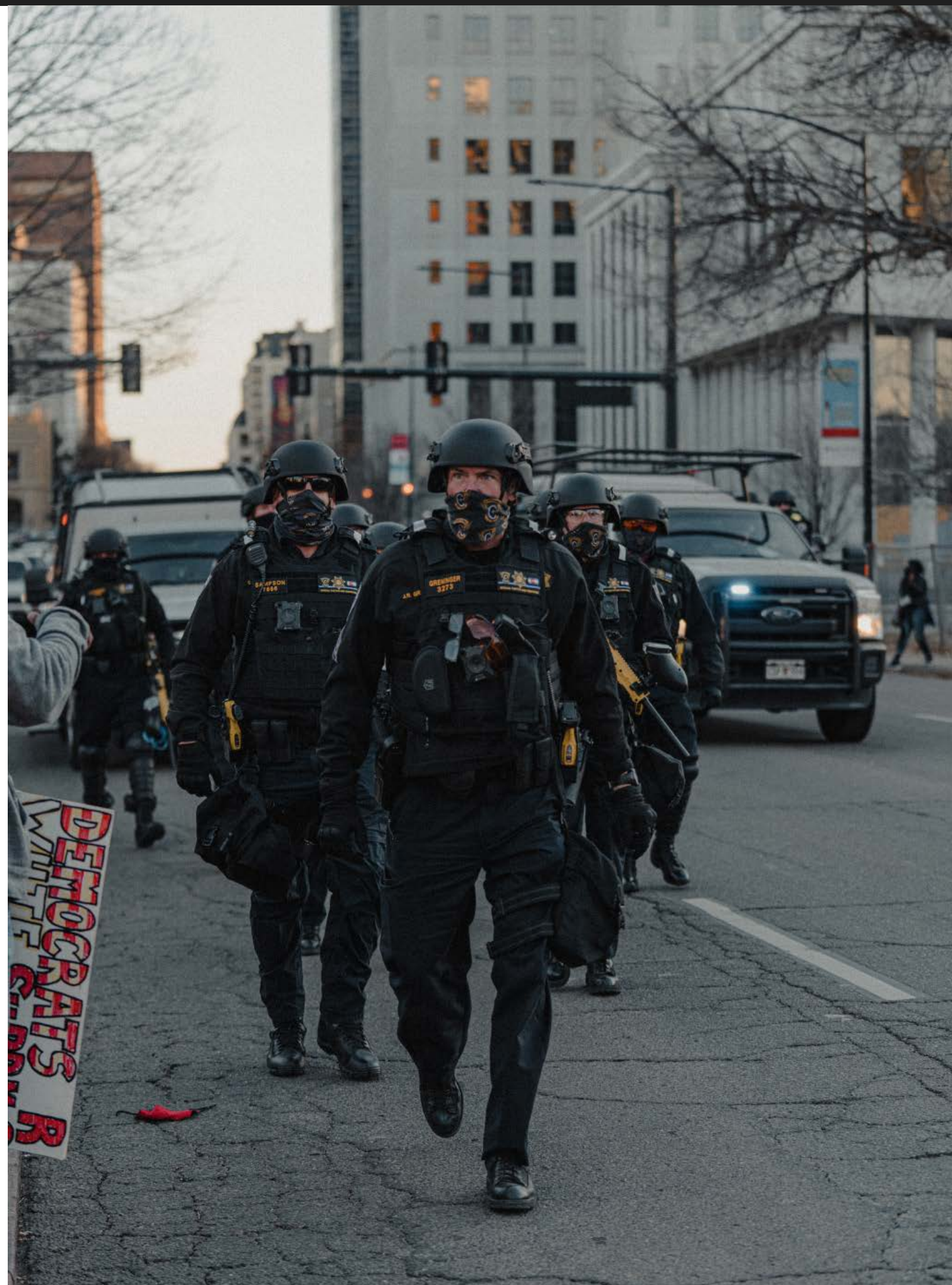
ORDER ID	MODEL	SIZE	CUT	WEIGHT	THICKNESS	PROTECTIVE AREA
R693	-	NATO SMALL - 20×25 cm (8×10")	SAPI CUT	230 g (8.1 oz)	6 mm (0.23")	504.8 cm <sup>2</sup> (78.2 in <sup>2</sup> )
R692	-	NATO STANDARD - 25×30 cm (10×12")	SAPI CUT	340 g (12 oz)	6 mm (0.23")	762.7 cm <sup>2</sup> (118.2 in <sup>2</sup> )
R687	-	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SAPI CUT	240 g (8.4 oz)	6 mm (0.23")	537.7 cm <sup>2</sup> (83.2 in <sup>2</sup> )
R688	-	SAPI S - 22.2×29.8 cm (8.75×11.75")	SAPI CUT	290 g (10.2 oz)	6 mm (0.23")	649.5 cm <sup>2</sup> (100.6 in <sup>2</sup> )
R689	-	SAPI M - 24.1×31.7 cm (9.5×12.5")	SAPI CUT	340 g (12 oz)	6 mm (0.23")	749.5 cm <sup>2</sup> (116.2 in <sup>2</sup> )
R690	-	SAPI L - 26×33.6 cm (10.25×13.25")	SAPI CUT	380 g (13.4 oz)	6 mm (0.23")	846.8 cm <sup>2</sup> (131.25 in <sup>2</sup> )
R691	-	SAPI XL - 28×35.5 cm (11×14")	SAPI CUT	430 g (15.1 oz)	6 mm (0.23")	963 cm <sup>2</sup> (149.25 in <sup>2</sup> )
R695	-	SIZE SMALL - 20×25 cm (8×10")	SHOOTER'S CUT	220 g (7.7 oz)	6 mm (0.23")	483.4 cm <sup>2</sup> (74.9 in <sup>2</sup> )
R694	-	SIZE LARGE - 25×30 cm (10×12")	SHOOTER'S CUT	335 g (11.8 oz)	6 mm (0.23")	743.8 cm <sup>2</sup> (115.3 in <sup>2</sup> )
R696	-	SIDEPLATE - 15×15 cm (6×6")	SQUARE CUT	110 g (3.8 oz)	6 mm (0.23")	247.5 cm <sup>2</sup> (38.3 in <sup>2</sup> )
R697	-	SIDEPLATE - 15×20 cm (6×8")	SQUARE CUT	145 g (5.1 oz)	6 mm (0.23")	322.5 cm <sup>2</sup> (50 in <sup>2</sup> )
R704	-	NATO SMALL - 20×25 cm (8×10")	SQUARE CUT	230 g (8.1 oz)	6 mm (0.23")	514.7 cm <sup>2</sup> (79.8 in <sup>2</sup> )
R703	-	NATO STANDARD - 25×30 cm (10×12")	SQUARE CUT	350 g (12.3 oz)	6 mm (0.23")	773.5 cm <sup>2</sup> (119.9 in <sup>2</sup> )
R698	-	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SQUARE CUT	250 g (8.8 oz)	6 mm (0.23")	562.7 cm <sup>2</sup> (87.2 in <sup>2</sup> )
R699	-	SAPI S - 22.2×29.8 cm (8.75×11.75")	SQUARE CUT	310 g (11 oz)	6 mm (0.23")	684.9 cm <sup>2</sup> (106.1 in <sup>2</sup> )
R700	-	SAPI M - 24.1×31.7 cm (9.5×12.5")	SQUARE CUT	355 g (12.5 oz)	6 mm (0.23")	789.7 cm <sup>2</sup> (122.4 in <sup>2</sup> )
R701	-	SAPI L - 26×33.6 cm (10.25×13.25")	SQUARE CUT	405 g (14.2 oz)	6 mm (0.23")	896.8 cm <sup>2</sup> (139 in <sup>2</sup> )
R702	-	SAPI XL - 28×35.5 cm (11×14")	SQUARE CUT	460 g (16.2 oz)	6 mm (0.23")	1017.3 cm <sup>2</sup> (157.7 in <sup>2</sup> )

ALL SIZE DIMENSIONS ARE ± 6 MM, AND ALL WEIGHTS ARE ± 5% OR ± 230g OR WHICHEVER IS GREATER.

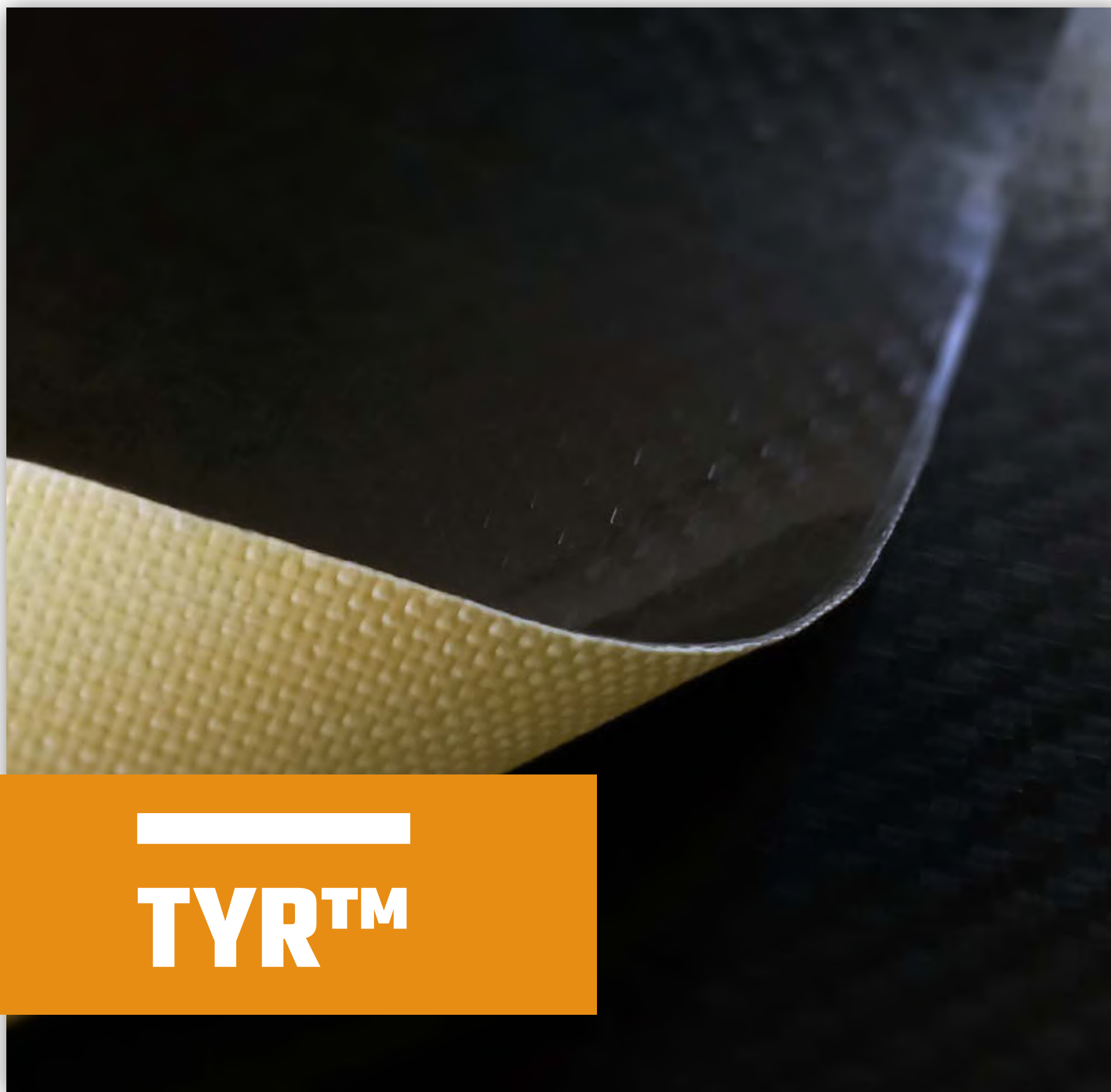
STANDARD	PLATFORM	PROJECTILE	WEIGHT	VELOCITY	VARIANCE	TRAUMA LIMIT
VPAM 2006	Handgun	9×19mm (FMJ <sup>2</sup> RN <sup>5</sup> SC <sup>6</sup> )	8g (124 gr)	415 m/s (1360 fps)	±10 m/s (±30 fps)	< 22mm (< 0.8")
NIJ 0101.06	Handgun	9×19mm (FMJ <sup>2</sup> RN <sup>5</sup> )	8g (124 gr)	436 m/s (1430 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.357 Magnum (JSP <sup>1</sup> )	10.2g (158 gr)	427 m/s (1400 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.40 S&W (FMJ <sup>2</sup> )	11.6g (180 gr)	352 m/s (1155 fps)	352 m/s (1155 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.357 SIG (FMJ <sup>2</sup> FN <sup>3</sup> )	8g (125 gr)	448 m/s (1470 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.44 Magnum (SJHP <sup>4</sup> )	15.5g (240 gr)	436 m/s (1430 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
SPECIAL	Handgun	7.62×25mm Tokarev (FMJ <sup>2</sup> )	5.5g (85 gr)	450 m/s (1475 fps)	±15 m/s (±50 fps)	NA
SPECIAL	Handgun	9×19mm +P+ (SXT)	8.2g (127 gr)	408 m/s (1340 fps)	±15 m/s (±50 fps)	NA
SPECIAL	Handgun	5.7×28mm SS195 (LFHP <sup>7</sup> )	1.7g (27 gr)	610 m/s (2000 fps)	±10 m/s (±30 fps)	NA
SPECIAL	Handgun	5.7×28mm SS197	2.6g (40 gr)	545 m/s (1790 fps)	±10 m/s (±30 fps)	NA

The above table applies to the ARGO™ lineup.

<sup>1</sup> Jacketed Soft Point, <sup>2</sup> Full Metal Jacketed, <sup>3</sup> Flat Nose, <sup>4</sup> Semi Jacketed Hollow Point, <sup>5</sup> Round Nose, <sup>6</sup> Lead Soft Core, <sup>7</sup> Lead Free Hollow Point  
**WARNING:** Certain powder, projectile and barrel length combinations will exceed the capabilities of this armour.







**TYR™**

## EXTREME TRAUMA MITIGATION

### DEDICATED SOFT ARMOUR STRIKE-FACE

Utilising a unique mixed weave style as a soft armour strike-face by combining the ballistic effectiveness of an open satin weave with the structural integrity of a plain weave in a merged woven matrix allows the TYR™ lineup to effectively double the early projectile impact deformation rate.

### AN ALTERNATING HYBRID CORE

Making up the bulk of every TYR™ panel is a hybridised core of Twaron® microfilament laminate combined with cutting-edge unidirectional Spectra Shield® fibres working in tandem to protect against advanced handgun threats.

Lighter projectile threats, such as those found natively at the NIJ 0101.06 IIIA and VPM 3 levels, will rarely perforate a TYR™ panel beyond the strike-face, allowing the remainder of the energy to be effectively dispersed in the laminates beneath.

In addition to these common threats, the TYR™ lineup is also perfectly capable of handling the FBI and DEA special threats, such as the Five-Seven SS195 LFHP, SS197 Hornady and the 85 gr FMJ Tokarev, to name a few.

### NEXT-LEVEL TRAUMA MITIGATION

Providing a 50-60% decrease in blunt force trauma compared to traditional IIIA / HG2 & VPM3 inserts, the TYR™ combines the dedicated strike-face, hybrid core layup, Twaron® laminated Curv® Impact™, and CARNA™ anti-trauma padding to ensure operators will be able to keep their composure and return fire in the event a projectile strikes them.

To learn more, please visit [roninarmour.com/tyr](https://roninarmour.com/tyr)



# FOR THE MOST DEMANDING SCENARIOS

TYR™ DATA	
AREAL DENSITY	8.5 kg/m <sup>2</sup> (1.74 lb/ft <sup>2</sup> )
THICKNESS	12 mm (0.47")
FLEXIBILITY	520 N (116.90 lbf) <sup>1</sup>

<sup>1</sup> Flexibility test is done per ASTM D4032-92

# CORE LAYUP FEATURES

## BUILT FOR HIGH-THREAT OPERATIONS

The TYR™ lineup has explicitly been designed for short wear durations and extreme close-range trauma mitigation against small-calibre munitions for those spearheading CQB/CQC tactical situations such as point-men, shield carriers and counter-terror units.

The joint package of materials and engineering feats has led to the most cutting-edge ballistic layup on the market in terms of trauma mitigation, and perfectly orchestrates every stage of the ballistic event, layer by layer, all while being remarkably flexible, allowing effective operation even in high-threat situations.

## 50-60%\* TRAUMA REDUCTION

Based on a unique hybrid blend of materials and base fibres, the TYR™ layup brings the most cutting-edge ballistic materials currently on the market into a joint package, perfectly orchestrating the different stages of the ballistic event, layer by layer.

These stopping mechanisms lead to earlier mushrooming of the projectile, meaning fewer layers are perforated, providing extremely early bullet deformation, resulting in a 50-60%\* decrease in blunt force trauma compared to traditional IIIA / HG2 & VPM3 inserts.

\*VALUES ARE INDICATIVE OF PERFORMANCE, REAL-WORLD PERFORMANCE MAY VARY.

## SOFT ARMOUR STRIKE-FACE

Featuring a unique soft armour strike-face, which has a hybrid weave that prevents pull-through of the fibres and works in conjunction with the hybrid core to engage more total material and slow the projectile's rotational energy. This catches it more effectively and, as such, dissipates energy significantly faster than pure unidirectional laminates or plain woven weaves for the strike-face.

These stopping mechanisms lead to earlier mushrooming of the projectile, meaning fewer layers are perforated, ultimately leading to a significant reduction in trauma to the wearer without negatively impacting flexibility.

## TRAUMA MITIGATION

The TYR™ lineup features an upgraded ballistic variant of our CARNA™ strike-face, based on Curv®, to increase the axial energy dispersion after the projectile has been caught.

By adhering high-density, tightly woven Twaron® fibres to the Curv® panels, energy dissipation is increased throughout the entire ballistic stack without severely hindering flexibility or adding much additional weight.

MIXED WEAVE  
TWARON®  
STRIKE-FACE



DUAL-LAYERED  
TWARON® UD &  
SPECTRA SHIELD®  
BALLISTIC CORE

CARNA™ ANTI-  
TRAUMA POLYMER

TWARON®  
REINFORCED  
CURV® IMPACT™  
DISPERSION INSERT

The above widget only illustrates layup composition and is not an accurate representation of layer count or relative thickness.

By combining a unique blend of materials and high-quality fibres, the TYR™ lineup combines the most cutting-edge ballistic materials on the market to perfectly orchestrate every stage of the ballistic event, layer by layer, all while being remarkably flexible, allowing you to operate effectively in high-threat situations.

TYR™ - MATERIALS & INFORMATION	
STRIKE-FACE	Mixed-weave Twaron®
CORE	SPECTRA SHIELD® & Twaron® UD
MITIGATION	Twaron® Reinforced CURV® Impact™
DISPERSION	CARNA™ Urethane Polymer
RESIN SYSTEM	Polyethylene, Rubber Elastomer & SBR Adhesive
THREAD	Dyneema® SK75
COVER	DWR & TPU coated Polyamide
COUNTRY OF ORIGIN	Denmark
WARRANTY (PROPERTIES)	5 years
WARRANTY (WORKMANSHIP)	1 year





## TYR™ STANDARD MODEL MATRIX

ORDER ID	MODEL	SIZE	CUT	WEIGHT	THICKNESS	PROTECTIVE AREA
R675	-	NATO SMALL - 20×25 cm (8×10")	SAPI CUT	430 g (15.1 oz)	12 mm (0.47")	504.8 cm <sup>2</sup> (78.2 in <sup>2</sup> )
R674	-	NATO STANDARD - 25×30 cm (10×12")	SAPI CUT	650 g (22.9 oz)	12 mm (0.47")	762.7 cm <sup>2</sup> (118.2 in <sup>2</sup> )
R669	-	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SAPI CUT	460 g (16.2 oz)	12 mm (0.47")	537.7 cm <sup>2</sup> (83.2 in <sup>2</sup> )
R670	-	SAPI S - 22.2×29.8 cm (8.75×11.75")	SAPI CUT	550 g (19.4 oz)	12 mm (0.47")	649.5 cm <sup>2</sup> (100.6 in <sup>2</sup> )
R671	-	SAPI M - 24.1×31.7 cm (9.5×12.5")	SAPI CUT	640 g (22.6 oz)	12 mm (0.47")	749.5 cm <sup>2</sup> (116.2 in <sup>2</sup> )
R672	-	SAPI L - 26×33.6 cm (10.25×13.25")	SAPI CUT	720 g (25.4 oz)	12 mm (0.47")	846.8 cm <sup>2</sup> (131.25 in <sup>2</sup> )
R673	-	SAPI XL - 28×35.5 cm (11×14")	SAPI CUT	820 g (29 oz)	12 mm (0.47")	963 cm <sup>2</sup> (149.25 in <sup>2</sup> )
R677	-	SIZE SMALL - 20×25 cm (8×10")	SHOOTER'S CUT	410 g (14.5 oz)	12 mm (0.47")	483.4 cm <sup>2</sup> (74.9 in <sup>2</sup> )
R676	-	SIZE LARGE - 25×30 cm (10×12")	SHOOTER'S CUT	630 g (22.2 oz)	12 mm (0.47")	743.8 cm <sup>2</sup> (115.3 in <sup>2</sup> )
R678	-	SIDEPLATE - 15×15 cm (6×6")	SQUARE CUT	210 g (7.4 oz)	12 mm (0.47")	247.5 cm <sup>2</sup> (38.3 in <sup>2</sup> )
R679	-	SIDEPLATE - 15×20 cm (6×8")	SQUARE CUT	275 g (6.3 oz)	12 mm (0.47")	322.5 cm <sup>2</sup> (50 in <sup>2</sup> )
R686	-	NATO SMALL - 20×25 cm (8×10")	SQUARE CUT	440 g (15.5 oz)	12 mm (0.47")	514.7 cm <sup>2</sup> (79.8 in <sup>2</sup> )
R685	-	NATO STANDARD - 25×30 cm (10×12")	SQUARE CUT	660 g (23.3 oz)	12 mm (0.47")	773.5 cm <sup>2</sup> (119.9 in <sup>2</sup> )
R680	-	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SQUARE CUT	480 g (17 oz)	12 mm (0.47")	562.7 cm <sup>2</sup> (87.2 in <sup>2</sup> )
R681	-	SAPI S - 22.2×29.8 cm (8.75×11.75")	SQUARE CUT	580 g (20.5 oz)	12 mm (0.47")	684.9 cm <sup>2</sup> (106.1 in <sup>2</sup> )
R682	-	SAPI M - 24.1×31.7 cm (9.5×12.5")	SQUARE CUT	670 g (23.6 oz)	12 mm (0.47")	789.7 cm <sup>2</sup> (122.4 in <sup>2</sup> )
R683	-	SAPI L - 26×33.6 cm (10.25×13.25")	SQUARE CUT	760 g (26.8 oz)	12 mm (0.47")	896.8 cm <sup>2</sup> (139 in <sup>2</sup> )
R684	-	SAPI XL - 28×35.5 cm (11×14")	SQUARE CUT	865 g (30.5 oz)	12 mm (0.47")	1017.3 cm <sup>2</sup> (157.7 in <sup>2</sup> )

ALL SIZE DIMENSIONS ARE ± 6 MM, AND ALL WEIGHTS ARE ± 5% OR ± 230g OR WHICHEVER IS GREATER.

STANDARD	PLATFORM	PROJECTILE	WEIGHT	VELOCITY	VARIANCE	TRAUMA LIMIT
VPAM 2006	Handgun	9×19mm (FMJ) <sup>2</sup> RN <sup>5</sup> SC <sup>6</sup>	8g (124 gr)	415 m/s (1360 fps)	±10 m/s (±30 fps)	< 22mm (< 0.8")
NIJ 0101.06	Handgun	9×19mm (FMJ) <sup>2</sup> RN <sup>5</sup>	8g (124 gr)	436 m/s (1430 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.357 Magnum (JSP) <sup>1</sup>	10.2g (158 gr)	427 m/s (1400 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.40 S&W (FMJ) <sup>2</sup>	11.6g (180 gr)	352 m/s (1155 fps)	352 m/s (1155 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.357 SIG (FMJ) <sup>2</sup> FN <sup>3</sup>	8g (125 gr)	448 m/s (1470 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.44 Magnum (SJHP) <sup>4</sup>	15.5g (240 gr)	436 m/s (1430 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
SPECIAL	Handgun	7.62×25mm Tokarev (FMJ) <sup>2</sup>	5.5g (85 gr)	450 m/s (1475 fps)	±15 m/s (±50 fps)	NA
SPECIAL	Handgun	9×19mm +P+ (SXT)	8.2g (127 gr)	408 m/s (1340 fps)	±15 m/s (±50 fps)	NA
SPECIAL	Handgun	5.7×28mm SS195 (LFHP) <sup>7</sup>	1.7g (27 gr)	610 m/s (2000 fps)	±10 m/s (±30 fps)	NA
SPECIAL	Handgun	5.7×28mm SS197	2.6g (40 gr)	545 m/s (1790 fps)	±10 m/s (±30 fps)	NA

The above table applies to the TYR™ lineup.

<sup>1</sup> Jacketed Soft Point, <sup>2</sup> Full Metal Jacketed, <sup>3</sup> Flat Nose, <sup>4</sup> Semi Jacketed Hollow Point, <sup>5</sup> Round Nose, <sup>6</sup> Lead Soft Core, <sup>7</sup> Lead Free Hollow Point  
**WARNING:** Certain powder, projectile and barrel length combinations will exceed the capabilities of this armour.



## DEDICATED HARD-ARMOUR BACKERS

### STANDALONE VERSATILITY

While designed to be worn as a component in an ICW (in conjunction with) armour system, the ARES™ lineup is perfectly suited to be used as a high-performance standalone soft armour insert in plate carriers for protection against advanced handgun threats.

### NEXT-LEVEL TRAUMA MITIGATION

The ARES™ lineup features an upgraded ballistic variant of our CARNA™ strike-face, based on Curv®, sitting in the centre of the ballistic layup. This unique composite layer increases lateral energy dispersion after a projectile has been caught when worn standalone and helps mitigate excess trauma when worn in conjunction with (ICW) a hard-armour plate.

By bonding tightly woven Twaron® fibres and doubling the number of composite strands in the Curv® panel, we can effectively increase the trauma mitigated by 20-30% with just a single additional layer.

### EDGE-STITCHED

While all of our soft armour lineups feature stitching in some sense, it is usually reserved for keeping layers together for durability purposes or, in the case of woven solutions, to decrease trauma. As ARES™ is specifically designed to slot in behind hard-armour systems, its flexibility doesn't have to extend further than the geometry of a multi-curved plate.

Because of this, we can aggressively stitch the entire edge of the insert, keeping layers together for increased multi-hit performance when worn as a standalone soft armour insert or increasing trauma mitigation in ICW systems. The latter is especially advantageous for pure polythene hard-armour plates, which tend to have a higher degree of backface deformation than their ceramic counterparts.

To learn more, please visit [roninarmour.com/ares](https://roninarmour.com/ares)



# ARES™

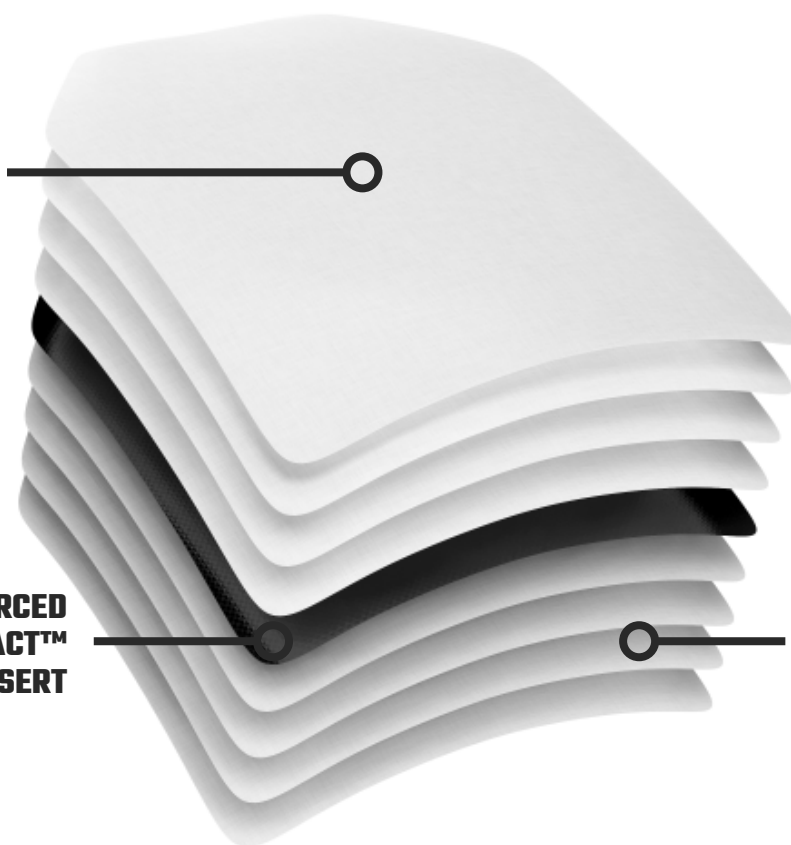


# ARES™ BALLISTIC LAYUP

ARES™ DATA	
AREAL DENSITY	6.4 kg/m <sup>2</sup> (1.31 lb/ft <sup>2</sup> )
THICKNESS	8.2 mm (0.32")
FLEXIBILITY	640 N (143.87 lbf) <sup>1</sup>

<sup>1</sup> Flexibility test is done per ASTM D4032-92

PRIMARY SPECTRA SHIELD® BALLISTIC CORE



TWARON® REINFORCED CURV® IMPACT™ DISPERSION INSERT

SECONDARY SPECTRA SHIELD® BALLISTIC CORE

The above widget only illustrates layup composition and is not an accurate representation of layer count or relative thickness.

Forgoing flexibility on behalf of its highly specialised purpose, the layup has been specifically engineered to mitigate the post-impact trauma and fragmentation threats that can occur behind ICW (in conjunction with) hard-armour systems.

Featuring a monolithic core of Spectra Shield® fibres laminated in a rubber elastomer resin, the ARES™ also features an upgraded ballistic variant of our CARNA™ strike-face, based on Curv®, to help increase the axial energy dispersion throughout the ballistic layup.

ARES™ - MATERIALS & INFORMATION	
CORE	SPECTRA SHIELD®
MITIGATION	Twaron® Reinforced CURV® Impact™
RESIN SYSTEM	Rubber Elastomer
THREAD	Dyneema® SK75
COVER	DWR & TPU coated Polyamide
COUNTRY OF ORIGIN	Denmark
WARRANTY (PROPERTIES)	5 years
WARRANTY (WORKMANSHIP)	1 year



## ARES™ LE STATE OF THE ART

The ARES™ LE lineup is specifically designed to be as uncompromising as possible in terms of its specifications and ballistic capabilities.

Featuring the most cutting-edge Spectra Shield® fibres processed and bound in a polyolefin resin system, the joint unidirectional sheets feature almost no void-content, and as such, pack significantly more ballistic material in per cm<sup>2</sup> while also managing to lower both the profile and its weight.

Because of the improved ballistic performance, the ARES™ LE lineup forgoes the integrated reinforcement panel, and despite its removal, still manages similar or better performance in terms of backface trauma.

### THE ARES™ LE LINE IS ON AVERAGE:

- 28% lighter
- 26% thinner
- 7-8% more flexible<sup>1</sup>
- Similar in trauma mitigation

ARES™ LE - MATERIALS & INFORMATION	
CORE	SPECTRA SHIELD®
RESIN SYSTEM	Polyolefin
THREAD	Dyneema® SK75
COVER	DWR & TPU coated Polyamide
COUNTRY OF ORIGIN	Denmark
WARRANTY (PROPERTIES)	5 years
WARRANTY (WORKMANSHIP)	1 year

ARES™ LE DATA	
AREAL DENSITY	4.6 kg/m <sup>2</sup> (0.94 lb/ft <sup>2</sup> )
THICKNESS	6 mm (0.23")
FLEXIBILITY	590 N (132.63 lbf) <sup>1</sup>

<sup>1</sup> Flexibility test is done per ASTM D4032-92



## ARES™ STANDARD MODEL MATRIX

ORDER ID	MODEL	SIZE	CUT	WEIGHT	THICKNESS	PROTECTIVE AREA
R549	-	NATO SMALL - 20×25 cm (8×10")	SAPI CUT	320 g (11.3 oz)	8.2 mm (0.32")	504.8 cm <sup>2</sup> (78.2 in <sup>2</sup> )
R548	-	NATO STANDARD - 25×30 cm (10×12")	SAPI CUT	490 g (17.3 oz)	8.2 mm (0.32")	762.7 cm <sup>2</sup> (118.2 in <sup>2</sup> )
R543	-	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SAPI CUT	345 g (12.2 oz)	8.2 mm (0.32")	537.7 cm <sup>2</sup> (83.2 in <sup>2</sup> )
R544	-	SAPI S - 22.2×29.8 cm (8.75×11.75")	SAPI CUT	415 g (14.6 oz)	8.2 mm (0.32")	649.5 cm <sup>2</sup> (100.6 in <sup>2</sup> )
R545	-	SAPI M - 24.1×31.7 cm (9.5×12.5")	SAPI CUT	480 g (16.9 oz)	8.2 mm (0.32")	749.5 cm <sup>2</sup> (116.2 in <sup>2</sup> )
R546	-	SAPI L - 26×33.6 cm (10.25×13.25")	SAPI CUT	540 g (19 oz)	8.2 mm (0.32")	846.8 cm <sup>2</sup> (131.25 in <sup>2</sup> )
R547	-	SAPI XL - 28×35.5 cm (11×14")	SAPI CUT	615 g (21.7 oz)	8.2 mm (0.32")	963 cm <sup>2</sup> (149.25 in <sup>2</sup> )
R551	-	SIZE SMALL - 20×25 cm (8×10")	SHOOTER'S CUT	310 g (10.9 oz)	8.2 mm (0.32")	483.4 cm <sup>2</sup> (74.9 in <sup>2</sup> )
R550	-	SIZE LARGE - 25×30 cm (10×12")	SHOOTER'S CUT	480 g (16.9 oz)	8.2 mm (0.32")	743.8 cm <sup>2</sup> (115.3 in <sup>2</sup> )
R552	-	SIDEPLATE - 15×15 cm (6×6")	SQUARE CUT	160 g (5.6 oz)	8.2 mm (0.32")	247.5 cm <sup>2</sup> (38.3 in <sup>2</sup> )
R553	-	SIDEPLATE - 15×20 cm (6×8")	SQUARE CUT	205 g (7.2 oz)	8.2 mm (0.32")	322.5 cm <sup>2</sup> (50 in <sup>2</sup> )
R560	-	NATO SMALL - 20×25 cm (8×10")	SQUARE CUT	330 g (11.6 oz)	8.2 mm (0.32")	514.7 cm <sup>2</sup> (79.8 in <sup>2</sup> )
R559	-	NATO STANDARD - 25×30 cm (10×12")	SQUARE CUT	495 g (17.5 oz)	8.2 mm (0.32")	773.5 cm <sup>2</sup> (119.9 in <sup>2</sup> )
R554	-	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SQUARE CUT	360 g (12.7 oz)	8.2 mm (0.32")	562.7 cm <sup>2</sup> (87.2 in <sup>2</sup> )
R555	-	SAPI S - 22.2×29.8 cm (8.75×11.75")	SQUARE CUT	440 g (15.5 oz)	8.2 mm (0.32")	684.9 cm <sup>2</sup> (106.1 in <sup>2</sup> )
R556	-	SAPI M - 24.1×31.7 cm (9.5×12.5")	SQUARE CUT	505 g (17.8 oz)	8.2 mm (0.32")	789.7 cm <sup>2</sup> (122.4 in <sup>2</sup> )
R557	-	SAPI L - 26×33.6 cm (10.25×13.25")	SQUARE CUT	575 g (20.3 oz)	8.2 mm (0.32")	896.8 cm <sup>2</sup> (139 in <sup>2</sup> )
R558	-	SAPI XL - 28×35.5 cm (11×14")	SQUARE CUT	650 g (22.9 oz)	8.2 mm (0.32")	1017.3 cm <sup>2</sup> (157.7 in <sup>2</sup> )

ALL SIZE DIMENSIONS ARE ± 6 MM, AND ALL WEIGHTS ARE ± 5% OR ± 230g OR WHICHEVER IS GREATER.

STANDARD	PLATFORM	PROJECTILE	WEIGHT	VELOCITY	VARIANCE	TRAUMA LIMIT
VPAM 2006	Handgun	9×19mm (FMJ <sup>2</sup> RN <sup>5</sup> SC <sup>6</sup> )	8g (124 gr)	415 m/s (1360 fps)	±10 m/s (±30 fps)	< 22mm (< 0.8")
NIJ 0101.06	Handgun	9×19mm (FMJ <sup>2</sup> RN <sup>5</sup> )	8g (124 gr)	436 m/s (1430 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.357 Magnum (JSP <sup>1</sup> )	10.2g (158 gr)	427 m/s (1400 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.40 S&W (FMJ <sup>2</sup> )	11.6g (180 gr)	352 m/s (1155 fps)	352 m/s (1155 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.357 SIG (FMJ <sup>2</sup> FN <sup>3</sup> )	8g (125 gr)	448 m/s (1470 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
NIJ 0101.06	Handgun	.44 Magnum (SJHP <sup>4</sup> )	15.5g (240 gr)	436 m/s (1430 fps)	±10 m/s (±30 fps)	< 44mm (< 1.7")
SPECIAL	Handgun	7.62×25mm Tokarev (FMJ <sup>2</sup> )	5.5g (85 gr)	450 m/s (1475 fps)	±15 m/s (±50 fps)	NA
SPECIAL	Handgun	9×19mm +P+ (SXT)	8.2g (127 gr)	408 m/s (1340 fps)	±15 m/s (±50 fps)	NA
SPECIAL	Handgun	5.7×28mm SS195 (LFHP <sup>7</sup> )	1.7g (27 gr)	610 m/s (2000 fps)	±10 m/s (±30 fps)	NA
SPECIAL	Handgun	5.7×28mm SS197	2.6g (40 gr)	545 m/s (1790 fps)	±10 m/s (±30 fps)	NA

The above table applies to the ARES™ lineup.

<sup>1</sup> Jacketed Soft Point, <sup>2</sup> Full Metal Jacketed, <sup>3</sup> Flat Nose, <sup>4</sup> Semi Jacketed Hollow Point, <sup>5</sup> Round Nose, <sup>6</sup> Lead Soft Core, <sup>7</sup> Lead Free Hollow Point  
**WARNING:** Certain powder, projectile and barrel length combinations will exceed the capabilities of this armour.

## ARES™ LE STANDARD MODEL MATRIX

This lineup is only available as a bespoke solution.

For information or to order, please refer to [roninarmour.com/contact](https://roninarmour.com/contact) or [oem@roninarmour.com](mailto:oem@roninarmour.com)

ORDER ID	MODEL	SIZE	CUT	WEIGHT	THICKNESS	PROTECTIVE AREA
R711	LW	NATO SMALL - 20×25 cm (8×10")	SAPI CUT	235 g (8.2 oz)	6 mm (0.23")	504.8 cm <sup>2</sup> (78.2 in <sup>2</sup> )
R710	LW	NATO STANDARD - 25×30 cm (10×12")	SAPI CUT	350 g (12.4 oz)	6 mm (0.23")	762.7 cm <sup>2</sup> (118.2 in <sup>2</sup> )
R705	LW	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SAPI CUT	250 g (8.8oz)	6 mm (0.23")	537.7 cm <sup>2</sup> (83.2 in <sup>2</sup> )
R706	LW	SAPI S - 22.2×29.8 cm (8.75×11.75")	SAPI CUT	300 g (10.6 oz)	6 mm (0.23")	649.5 cm <sup>2</sup> (100.6 in <sup>2</sup> )
R707	LW	SAPI M - 24.1×31.7 cm (9.5×12.5")	SAPI CUT	345 g (12.2 oz)	6 mm (0.23")	749.5 cm <sup>2</sup> (116.2 in <sup>2</sup> )
R708	LW	SAPI L - 26×33.6 cm (10.25×13.25")	SAPI CUT	390 g (13.7 oz)	6 mm (0.23")	846.8 cm <sup>2</sup> (131.25 in <sup>2</sup> )
R709	LW	SAPI XL - 28×35.5 cm (11×14")	SAPI CUT	445 g (15.7 oz)	6 mm (0.23")	963 cm <sup>2</sup> (149.25 in <sup>2</sup> )
R713	LW	SIZE SMALL - 20×25 cm (8×10")	SHOOTER'S CUT	345 g (12.2 oz)	6 mm (0.23")	483.4 cm <sup>2</sup> (74.9 in <sup>2</sup> )
R712	LW	SIZE LARGE - 25×30 cm (10×12")	SHOOTER'S CUT	220 g (7.8 oz)	6 mm (0.23")	743.8 cm <sup>2</sup> (115.3 in <sup>2</sup> )
R714	LW	SIDEPLATE - 15×15 cm (6×6")	SQUARE CUT	115 g (4 oz)	6 mm (0.23")	247.5 cm <sup>2</sup> (38.3 in <sup>2</sup> )
R715	LW	SIDEPLATE - 15×20 cm (6×8")	SQUARE CUT	150 g (5.3 oz)	6 mm (0.23")	322.5 cm <sup>2</sup> (50 in <sup>2</sup> )
R722	LW	NATO SMALL - 20×25 cm (8×10")	SQUARE CUT	240 g (8.5 oz)	6 mm (0.23")	514.7 cm <sup>2</sup> (79.8 in <sup>2</sup> )
R721	LW	NATO STANDARD - 25×30 cm (10×12")	SQUARE CUT	355 g (12.5 oz)	6 mm (0.23")	773.5 cm <sup>2</sup> (119.9 in <sup>2</sup> )
R716	LW	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SQUARE CUT	260 g (9.2 oz)	6 mm (0.23")	562.7 cm <sup>2</sup> (87.2 in <sup>2</sup> )
R717	LW	SAPI S - 22.2×29.8 cm (8.75×11.75")	SQUARE CUT	315 g (11.1 oz)	6 mm (0.23")	684.9 cm <sup>2</sup> (106.1 in <sup>2</sup> )
R718	LW	SAPI M - 24.1×31.7 cm (9.5×12.5")	SQUARE CUT	365 g (12.9 oz)	6 mm (0.23")	789.7 cm <sup>2</sup> (122.4 in <sup>2</sup> )
R719	LW	SAPI L - 26×33.6 cm (10.25×13.25")	SQUARE CUT	415 g (14.6 oz)	6 mm (0.23")	896.8 cm <sup>2</sup> (139 in <sup>2</sup> )
R720	LW	SAPI XL - 28×35.5 cm (11×14")	SQUARE CUT	470 g (16.6 oz)	6 mm (0.23")	1017.3 cm <sup>2</sup> (157.7 in <sup>2</sup> )

ALL SIZE DIMENSIONS ARE ± 6 MM, AND ALL WEIGHTS ARE ± 5% OR ± 230g OR WHICHEVER IS GREATER.







**SCALABLE  
ANTI-TRAUMA &  
TRAINING INSERTS**





**CARNA<sup>AT</sup>**

## NEXT-GENERATION ANTI-TRAUMA LINERS

### DEDICATED STRIKE-FACE

In the front of every CARNA™ insert stands a self-reinforcing, highly molecularly oriented woven and bonded CURV® strike-face, specifically designed to increase shear wave propagation from the prior ballistic impact and increase its axial dispersion into the CARNA™ polymer underneath.

Furthermore, each alternating layer of CURV® and CARNA™ polymer is bound and pressed with a flexible solvent-based SBR adhesive to further increase its mechanical resonance.

### SOFT WHEN WORN, HARD WHEN HIT

The semi-closed CARNA™ urethane blend exhibits impact-hardening properties, meaning its molecular make-up is free-flowing and soft in its rest state, ensuring ease of motion with full-body contouring. On impact, it instantly molecularly aligns and hardens to form a rigid, protective shell.

Featuring an exceptional compression set of <2%<sup>1</sup>, with complete recovery occurring within milliseconds instead of minutes or hours, a CARNA™ trauma pad will disperse just as much energy on the first impact as it will on potential subsequent<sup>2</sup> impacts.

### LIGHTER & STRONGER

Boasting an impressive 40-50% increase in impact dispersion compared to existing high-end soft urethanes and other elastomeric polymers, the CARNA™ polymer blend is not only more performant but also 18-20% lighter than competing anti-trauma solutions at comparable thicknesses and mitigation levels.

This ensures no unnecessary weight is carried around and allows operators to perform at their best, even if struck by a bullet.

To learn more, please visit [roninarmour.com/carna](https://roninarmour.com/carna)

<sup>1</sup> Per ASTM D3574 Test D

<sup>2</sup> Please note that distinctive high-frequency impacts may tear, rip or otherwise puncture the foam despite its elasticity due to the impact-hardening properties.



## CARNA™ - C3P3



SLIM-LINE FOR MAXIMUM FLEXIBILITY, CONCEALED CARRY AND COVERT OPERATIONS.

IDEAL FOR VPAM 3 AND BELOW CONCEALABLE SOFT-ARMOUR INSERTS.

CARNA™ - C3P3 DATA	
Areal Density	1.39 kg/m <sup>2</sup> (0.28 lb/ft <sup>2</sup> )
Thickness	4.85 mm (0.19")
Flexibility	115 N (25.85 lbf) <sup>1</sup>

<sup>1</sup> Flexibility test is done per ASTM D4032-92

## CARNA™ - C6P6



SLIM-LINE FOR MAXIMUM FLEXIBILITY, CONCEALED CARRY AND COVERT OPERATIONS.

IDEAL FOR VPAM 5 AND BELOW SOFT-ARMOUR INSERTS OR RIGID PLATES.

CARNA™ - C6P6 DATA	
Areal Density	2.4 kg/m <sup>2</sup> (0.49 lb/ft <sup>2</sup> )
Thickness	8.2 mm (0.32")
Flexibility	155 N (34.84 lbf) <sup>1</sup>

<sup>1</sup> Flexibility test is done per ASTM D4032-92

## CARNA™ - C6P9



DESIGNED FOR POINT-MEN, BREACHERS AND SHIELD CARRIERS.

IDEAL FOR VPAM 6 AND ABOVE OR PURE POLYTHENE RIGID ARMOUR PLATES.

CARNA™ - C6P9 DATA	
Areal Density	3.79 kg/m <sup>2</sup> (0.78 lb/ft <sup>2</sup> )
Thickness	13 mm (0.51")
Flexibility	190 N (42.71 lbf) <sup>1</sup>

<sup>1</sup> Flexibility test is done per ASTM D4032-92

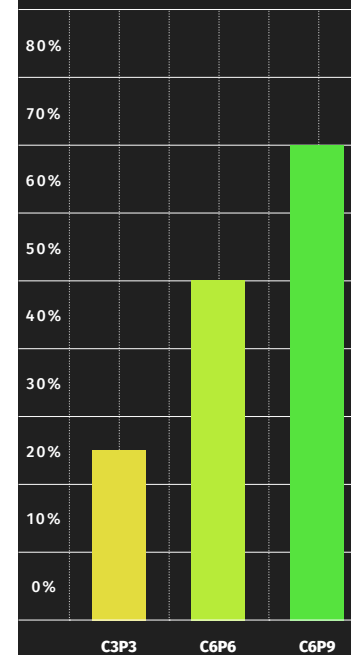
# CARNA™

# ANTI-TRAUMA LINERS



### POTENTIAL TRAUMA MITIGATED\*

The graphs below show the potential span of trauma mitigated by each respective panel.



\* VALUES ARE INDICATIVE OF PERFORMANCE, AND REAL-WORLD PERFORMANCE MAY VARY DEPENDING ON THE THREAT AND ARMOUR.

## Impact-hardening anti-trauma inserts for every environment.

After any armour system has successfully caught a round, due to the law of conservation of energy, excess energy which wasn't converted into friction, mechanical resonance or sufficiently dispersed will eventually be transmitted to the operator wearing the armour in question.

Our CARNA™ Anti-Trauma liners slot in behind your existing ballistic armour system and have been specifically engineered to dissipate this excess energy over a larger area as efficiently as possible, using a mixture of highly molecularly oriented polypropylene for proficient axial dispersion and our proprietary CARNA™ urethane polymer bonded and pressed to transfer mechanical resonance efficiently.

While all of our armour solutions follow the backface deformation requirements of their respective standards, further lowering trauma can help keep your composure in the event you're struck by a bullet, enabling you to return fire or get to safety without being incapacitated by shock or pain.

### MATERIALS & INFORMATION

Mitigation:	CURV® Impact™
Dispersion:	CARNA™ Urethane Polymer
Bonding:	Solvent Based SBR Adhesive
Cover:	DWR & TPU coated Polyamide
Country of Origin:	Denmark
Warranty (Properties):	7 years
Warranty (workmanship):	1 year

No impact-absorbing material can prevent all injuries that may occur when the body is subjected to impact. RONIN ARMOUR ApS makes no representation or warranty that CARNA™ will prevent such injuries. The user of any protective gear should be aware of the limitations of the equipment and should exercise reasonable care and caution in undertaking activities that may cause damage to the body.



## CARNA™ STANDARD MODEL MATRIX

The following matrix provides an overview of our standard offerings and lists applicable details.

For bespoke sizes and cuts, please contact us at [roninarmour.com/contact](https://roninarmour.com/contact) or [oem@roninarmour.com](mailto:oem@roninarmour.com)

ORDER ID	MODEL	SIZE	CUT	WEIGHT	THICKNESS	PROTECTIVE AREA
R567	C3P3	NATO SMALL - 20×25 cm (8×10")	SAPI CUT	70 g (2.4 oz)	4.85 mm (0.19")	504.8 cm <sup>2</sup> (78.2 in <sup>2</sup> )
R566	C3P3	NATO STANDARD - 25×30 cm (10×12")	SAPI CUT	110 g (3.8 oz)	4.85 mm (0.19")	762.7 cm <sup>2</sup> (118.2 in <sup>2</sup> )
R561	C3P3	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SAPI CUT	75 g (2.6 oz)	4.85 mm (0.19")	537.7 cm <sup>2</sup> (83.2 in <sup>2</sup> )
R562	C3P3	SAPI S - 22.2×29.8 cm (8.75×11.75")	SAPI CUT	90 g (3.1 oz)	4.85 mm (0.19")	649.5 cm <sup>2</sup> (100.6 in <sup>2</sup> )
R563	C3P3	SAPI M - 24.1×31.7 cm (9.5×12.5")	SAPI CUT	105 g (3.7 oz)	4.85 mm (0.19")	749.5 cm <sup>2</sup> (116.2 in <sup>2</sup> )
R564	C3P3	SAPI L - 26×33.6 cm (10.25×13.25")	SAPI CUT	120 g (4.2 oz)	4.85 mm (0.19")	846.8 cm <sup>2</sup> (131.25 in <sup>2</sup> )
R565	C3P3	SAPI XL - 28×35.5 cm (11×14")	SAPI CUT	135 g (4.7 oz)	4.85 mm (0.19")	963 cm <sup>2</sup> (149.25 in <sup>2</sup> )
R569	C3P3	SIZE SMALL - 20×25 cm (8×10")	SHOOTER'S CUT	70 g (2.4 oz)	4.85 mm (0.19")	483.4 cm <sup>2</sup> (74.9 in <sup>2</sup> )
R568	C3P3	SIZE LARGE - 25×30 cm (10×12")	SHOOTER'S CUT	105 g (3.7 oz)	4.85 mm (0.19")	743.8 cm <sup>2</sup> (115.3 in <sup>2</sup> )
R570	C3P3	SIDEPLATE - 15×15 cm (6×6")	SQUARE CUT	35 g (1.2 oz)	4.85 mm (0.19")	247.5 cm <sup>2</sup> (38.3 in <sup>2</sup> )
R571	C3P3	SIDEPLATE - 15×20 cm (6×8")	SQUARE CUT	45 g (1.5 oz)	4.85 mm (0.19")	322.5 cm <sup>2</sup> (50 in <sup>2</sup> )
R578	C3P3	NATO SMALL - 20×25 cm (8×10")	SQUARE CUT	75 g (2.6 oz)	4.85 mm (0.19")	514.7 cm <sup>2</sup> (79.8 in <sup>2</sup> )
R577	C3P3	NATO STANDARD - 25×30 cm (10×12")	SQUARE CUT	110 g (3.8 oz)	4.85 mm (0.19")	773.5 cm <sup>2</sup> (119.9 in <sup>2</sup> )
R572	C3P3	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SQUARE CUT	80 g (2.8 oz)	4.85 mm (0.19")	562.7 cm <sup>2</sup> (87.2 in <sup>2</sup> )
R573	C3P3	SAPI S - 22.2×29.8 cm (8.75×11.75")	SQUARE CUT	95 g (3.3 oz)	4.85 mm (0.19")	684.9 cm <sup>2</sup> (106.1 in <sup>2</sup> )
R574	C3P3	SAPI M - 24.1×31.7 cm (9.5×12.5")	SQUARE CUT	110 g (3.8 oz)	4.85 mm (0.19")	789.7 cm <sup>2</sup> (122.4 in <sup>2</sup> )
R575	C3P3	SAPI L - 26×33.6 cm (10.25×13.25")	SQUARE CUT	125 g (4.4 oz)	4.85 mm (0.19")	896.8 cm <sup>2</sup> (139 in <sup>2</sup> )
R576	C3P3	SAPI XL - 28×35.5 cm (11×14")	SQUARE CUT	145 g (5.1 oz)	4.85 mm (0.19")	1017.3 cm <sup>2</sup> (157.7 in <sup>2</sup> )
R585	C6P6	NATO SMALL - 20×25 cm (8×10")	SAPI CUT	125 g (4.4 oz)	8.2 mm (0.32")	504.8 cm <sup>2</sup> (78.2 in <sup>2</sup> )
R584	C6P6	NATO STANDARD - 25×30 cm (10×12")	SAPI CUT	185 g (6.5 oz)	8.2 mm (0.32")	762.7 cm <sup>2</sup> (118.2 in <sup>2</sup> )
R579	C6P6	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SAPI CUT	130 g (4.5 oz)	8.2 mm (0.32")	537.7 cm <sup>2</sup> (83.2 in <sup>2</sup> )
R580	C6P6	SAPI S - 22.2×29.8 cm (8.75×11.75")	SAPI CUT	155 g (5.4 oz)	8.2 mm (0.32")	649.5 cm <sup>2</sup> (100.6 in <sup>2</sup> )
R581	C6P6	SAPI M - 24.1×31.7 cm (9.5×12.5")	SAPI CUT	180 g (6.3 oz)	8.2 mm (0.32")	749.5 cm <sup>2</sup> (116.2 in <sup>2</sup> )
R582	C6P6	SAPI L - 26×33.6 cm (10.25×13.25")	SAPI CUT	205 g (7.2 oz)	8.2 mm (0.32")	846.8 cm <sup>2</sup> (131.25 in <sup>2</sup> )
R583	C6P6	SAPI XL - 28×35.5 cm (11×14")	SAPI CUT	235 g (8.2 oz)	8.2 mm (0.32")	963 cm <sup>2</sup> (149.25 in <sup>2</sup> )
R587	C6P6	SIZE SMALL - 20×25 cm (8×10")	SHOOTER'S CUT	120 g (4.2 oz)	8.2 mm (0.32")	483.4 cm <sup>2</sup> (74.9 in <sup>2</sup> )
R586	C6P6	SIZE LARGE - 25×30 cm (10×12")	SHOOTER'S CUT	180 g (6.3 oz)	8.2 mm (0.32")	743.8 cm <sup>2</sup> (115.3 in <sup>2</sup> )

ALL SIZE DIMENSIONS ARE ± 6 MM, AND ALL WEIGHTS ARE ± 5% OR ± 230g OR WHICHEVER IS GREATER.

## CARNA™ STANDARD MODEL MATRIX - Continued

ORDER ID	MODEL	SIZE	CUT	WEIGHT	THICKNESS	PROTECTIVE AREA
R588	C6P6	SIDEPLATE - 15×15 cm (6×6")	SQUARE CUT	60 g (2.1 oz)	8.2 mm (0.32")	247.5 cm <sup>2</sup> (38.3 in <sup>2</sup> )
R589	C6P6	SIDEPLATE - 15×20 cm (6×8")	SQUARE CUT	78 g (2.7 oz)	8.2 mm (0.32")	322.5 cm <sup>2</sup> (50 in <sup>2</sup> )
R596	C6P6	NATO SMALL - 20×25 cm (8×10")	SQUARE CUT	125 g (4.4 oz)	8.2 mm (0.32")	514.7 cm <sup>2</sup> (79.8 in <sup>2</sup> )
R595	C6P6	NATO STANDARD - 25×30 cm (10×12")	SQUARE CUT	185 g (6.5 oz)	8.2 mm (0.32")	773.5 cm <sup>2</sup> (119.9 in <sup>2</sup> )
R590	C6P6	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SQUARE CUT	135 g (4.7 oz)	8.2 mm (0.32")	562.7 cm <sup>2</sup> (87.2 in <sup>2</sup> )
R591	C6P6	SAPI S - 22.2×29.8 cm (8.75×11.75")	SQUARE CUT	165 g (5.8 oz)	8.2 mm (0.32")	684.9 cm <sup>2</sup> (106.1 in <sup>2</sup> )
R592	C6P6	SAPI M - 24.1×31.7 cm (9.5×12.5")	SQUARE CUT	190 g (6.7 oz)	8.2 mm (0.32")	789.7 cm <sup>2</sup> (122.4 in <sup>2</sup> )
R593	C6P6	SAPI L - 26×33.6 cm (10.25×13.25")	SQUARE CUT	215 g (7.5 oz)	8.2 mm (0.32")	896.8 cm <sup>2</sup> (139 in <sup>2</sup> )
R594	C6P6	SAPI XL - 28×35.5 cm (11×14")	SQUARE CUT	245 g (8.6 oz)	8.2 mm (0.32")	1017.3 cm <sup>2</sup> (157.7 in <sup>2</sup> )
R603	C6P9	NATO SMALL - 20×25 cm (8×10")	SAPI CUT	195 g (6.8 oz)	13 mm (0.51")	504.8 cm <sup>2</sup> (78.2 in <sup>2</sup> )
R602	C6P9	NATO STANDARD - 25×30 cm (10×12")	SAPI CUT	290 g (10.2 oz)	13 mm (0.51")	762.7 cm <sup>2</sup> (118.2 in <sup>2</sup> )
R597	C6P9	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SAPI CUT	205 g (7.2 oz)	13 mm (0.51")	537.7 cm <sup>2</sup> (83.2 in <sup>2</sup> )
R598	C6P9	SAPI S - 22.2×29.8 cm (8.75×11.75")	SAPI CUT	250 g (8.8 oz)	13 mm (0.51")	649.5 cm <sup>2</sup> (100.6 in <sup>2</sup> )
R599	C6P9	SAPI M - 24.1×31.7 cm (9.5×12.5")	SAPI CUT	285 g (10 oz)	13 mm (0.51")	749.5 cm <sup>2</sup> (116.2 in <sup>2</sup> )
R600	C6P9	SAPI L - 26×33.6 cm (10.25×13.25")	SAPI CUT	320 g (11.2 oz)	13 mm (0.51")	846.8 cm <sup>2</sup> (131.25 in <sup>2</sup> )
R601	C6P9	SAPI XL - 28×35.5 cm (11×14")	SAPI CUT	365 g (12.9 oz)	13 mm (0.51")	963 cm <sup>2</sup> (149.25 in <sup>2</sup> )
R605	C6P9	SIZE SMALL - 20×25 cm (8×10")	SHOOTER'S CUT	13 mm (0.51")	13 mm (0.51")	483.4 cm <sup>2</sup> (74.9 in <sup>2</sup> )
R604	C6P9	SIZE LARGE - 25×30 cm (10×12")	SHOOTER'S CUT	13 mm (0.51")	13 mm (0.51")	743.8 cm <sup>2</sup> (115.3 in <sup>2</sup> )
R606	C6P9	SIDEPLATE - 15×15 cm (6×6")	SQUARE CUT	94 g (3.3 oz)	13 mm (0.51")	247.5 cm <sup>2</sup> (38.3 in <sup>2</sup> )
R607	C6P9	SIDEPLATE - 15×20 cm (6×8")	SQUARE CUT	125 g (4.4 oz)	13 mm (0.51")	322.5 cm <sup>2</sup> (50 in <sup>2</sup> )
R614	C6P9	NATO SMALL - 20×25 cm (8×10")	SQUARE CUT	195 g (6.8 oz)	13 mm (0.51")	514.7 cm <sup>2</sup> (79.8 in <sup>2</sup> )
R613	C6P9	NATO STANDARD - 25×30 cm (10×12")	SQUARE CUT	295 g (10.4 oz)	13 mm (0.51")	773.5 cm <sup>2</sup> (119.9 in <sup>2</sup> )
R608	C6P9	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SQUARE CUT	215 g (7.5 oz)	13 mm (0.51")	562.7 cm <sup>2</sup> (87.2 in <sup>2</sup> )
R609	C6P9	SAPI S - 22.2×29.8 cm (8.75×11.75")	SQUARE CUT	260 g (9.1 oz)	13 mm (0.51")	684.9 cm <sup>2</sup> (106.1 in <sup>2</sup> )
R610	C6P9	SAPI M - 24.1×31.7 cm (9.5×12.5")	SQUARE CUT	300 g (10.5 oz)	13 mm (0.51")	789.7 cm <sup>2</sup> (122.4 in <sup>2</sup> )
R611	C6P9	SAPI L - 26×33.6 cm (10.25×13.25")	SQUARE CUT	340 g (12 oz)	13 mm (0.51")	896.8 cm <sup>2</sup> (139 in <sup>2</sup> )
R612	C6P9	SAPI XL - 28×35.5 cm (11×14")	SQUARE CUT	385 g (13.5 oz)	13 mm (0.51")	1017.3 cm <sup>2</sup> (157.7 in <sup>2</sup> )

ALL SIZE DIMENSIONS ARE ± 6 MM, AND ALL WEIGHTS ARE ± 5% OR ± 230g OR WHICHEVER IS GREATER.



## FX<sup>®</sup> Simunition<sup>®</sup> TRAINING INSERTS

Our UMBRA™ lineup is designed to allow operators to realistically train using FX<sup>®</sup> Simunition<sup>®</sup> in force-on-force scenarios while wearing their vests or platforms of choice without needlessly fatiguing their ballistic panels or forgoing the structural rigidity they provide.

### AVOID THE BRUISING, KEEP THE FUNCTION

Featuring a CURV<sup>®</sup> IMPACT™ strike-face, UMBRA™ panels help mitigate and disperse energy across a larger surface area than pure foam inserts, allowing end users to easily distinguish and call shots without having to deal with bruising after a training session.

Below the strike-face is a low-density Evazote<sup>®</sup> EV50 layer at a thickness of 4.5 millimetres (0.17"), providing adequate "bulk" to the vest, ensuring no void content within the platform cavity, and preventing the panel from shifting around when worn.

### TRAIN WITHOUT THE SAG

Removing the ballistic panels from any vest or platform will introduce a significant amount of sag, making pouches and containers fastened dangle around or disallow high-retention mags from properly releasing magazines entirely.

Apart from functioning as a strike-face, the composite CURV<sup>®</sup> IMPACT™ layer allows the panel to be self-structured while remaining flexible, letting end users seamlessly perform gear drills without fighting against a floppy vest or platform.

To learn more, please visit [roninarmour.com/umbra](https://roninarmour.com/umbra)

**NOTE:** UMBRA™ inserts are non-ballistic and are NOT intended to be worn with ballistic body armour as a trauma pad or as a ballistic insert ICW (in conjunction with) hard-armour plates.

No impact-absorbing material can prevent all injuries that may occur when the body is subjected to impact. RONIN ARMOUR ApS makes no representation or warranty that UMBRA™ will prevent such injuries.

The user of any protective gear should be aware of the limitations of the equipment and should exercise reasonable care and caution in undertaking activities that may cause damage to the body.



# UMBRA™



## UMBRA™ STANDARD MODEL MATRIX

The following matrix provides an overview of our standard offerings and lists applicable details.

For bespoke sizes and cuts, please contact us at [roninarmour.com/contact](https://roninarmour.com/contact) or [oem@roninarmour.com](mailto:oem@roninarmour.com)

ORDER ID	MODEL	SIZE	CUT	WEIGHT	THICKNESS	PROTECTIVE AREA
R621	-	NATO SMALL - 20×25 cm (8×10")	SAPI CUT	18 g (0.6 oz)	4.5 mm (0.17")	504.8 cm <sup>2</sup> (78.2 in <sup>2</sup> )
R620	-	NATO STANDARD - 25×30 cm (10×12")	SAPI CUT	27 g (1 oz)	4.5 mm (0.17")	762.7 cm <sup>2</sup> (118.2 in <sup>2</sup> )
R615	-	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SAPI CUT	19 g (0.7 oz)	4.5 mm (0.17")	537.7 cm <sup>2</sup> (83.2 in <sup>2</sup> )
R616	-	SAPI S - 22.2×29.8 cm (8.75×11.75")	SAPI CUT	23 g (0.8 oz)	4.5 mm (0.17")	649.5 cm <sup>2</sup> (100.6 in <sup>2</sup> )
R617	-	SAPI M - 24.1×31.7 cm (9.5×12.5")	SAPI CUT	27 g (1 oz)	4.5 mm (0.17")	749.5 cm <sup>2</sup> (116.2 in <sup>2</sup> )
R618	-	SAPI L - 26×33.6 cm (10.25×13.25")	SAPI CUT	30 g (1 oz)	4.5 mm (0.17")	846.8 cm <sup>2</sup> (131.25 in <sup>2</sup> )
R619	-	SAPI XL - 28×35.5 cm (11×14")	SAPI CUT	35 g (1.2 oz)	4.5 mm (0.17")	963 cm <sup>2</sup> (149.25 in <sup>2</sup> )
R623	-	SIZE SMALL - 20×25 cm (8×10")	SHOOTER'S CUT	17 g (0.6 oz)	4.5 mm (0.17")	483.4 cm <sup>2</sup> (74.9 in <sup>2</sup> )
R622	-	SIZE LARGE - 25×30 cm (10×12")	SHOOTER'S CUT	27 g (1 oz)	4.5 mm (0.17")	743.8 cm <sup>2</sup> (115.3 in <sup>2</sup> )
R624	-	SIDEPLATE - 15×15 cm (6×6")	SQUARE CUT	9 g (0.3 oz)	4.5 mm (0.17")	247.5 cm <sup>2</sup> (38.3 in <sup>2</sup> )
R625	-	SIDEPLATE - 15×20 cm (6×8")	SQUARE CUT	12 g (0.4 oz)	4.5 mm (0.17")	322.5 cm <sup>2</sup> (50 in <sup>2</sup> )
R632	-	NATO SMALL - 20×25 cm (8×10")	SQUARE CUT	19 g (0.7 oz)	4.5 mm (0.17")	514.7 cm <sup>2</sup> (79.8 in <sup>2</sup> )
R631	-	NATO STANDARD - 25×30 cm (10×12")	SQUARE CUT	28 g (1 oz)	4.5 mm (0.17")	773.5 cm <sup>2</sup> (119.9 in <sup>2</sup> )
R626	-	SAPI XS - 18.4×29.2 cm (7.25×11.5")	SQUARE CUT	20 g (0.7 oz)	4.5 mm (0.17")	562.7 cm <sup>2</sup> (87.2 in <sup>2</sup> )
R627	-	SAPI S - 22.2×29.8 cm (8.75×11.75")	SQUARE CUT	25 g (0.9 oz)	4.5 mm (0.17")	684.9 cm <sup>2</sup> (106.1 in <sup>2</sup> )
R628	-	SAPI M - 24.1×31.7 cm (9.5×12.5")	SQUARE CUT	28 g (1 oz)	4.5 mm (0.17")	789.7 cm <sup>2</sup> (122.4 in <sup>2</sup> )
R629	-	SAPI L - 26×33.6 cm (10.25×13.25")	SQUARE CUT	32 g (1.1 oz)	4.5 mm (0.17")	896.8 cm <sup>2</sup> (139 in <sup>2</sup> )
R630	-	SAPI XL - 28×35.5 cm (11×14")	SQUARE CUT	37 g (1.3 oz)	4.5 mm (0.17")	1017.3 cm <sup>2</sup> (157.7 in <sup>2</sup> )

ALL SIZE DIMENSIONS ARE ± 6 MM, AND ALL WEIGHTS ARE ± 5% OR ± 230g OR WHICHEVER IS GREATER.

### UMBRA™ - MATERIALS & INFORMATION

MITIGATION	CURV® Impact™
DISPERSION	Autoclaved Evazote® EV50
BONDING	Solvent Based SBR Adhesive
THREAD	Dyneema® SK75
COVER	DWR & TPU coated Polyamide
COUNTRY OF ORIGIN	Denmark
WARRANTY (PROPERTIES)	5 years
WARRANTY (WORKMANSHIP)	1 year

### UMBRA™ DATA

AREAL DENSITY	0.36 kg/m <sup>2</sup> (0.07 lb/ft <sup>2</sup> )
THICKNESS	4.5 mm (0.17")
FLEXIBILITY	95 N (21.35 lbf) <sup>1</sup>

<sup>1</sup> Flexibility test is done per ASTM D4032-92





## RELIABILITY & QUALITY



### INVESTING IN BALLISTICS R&D FOR OUR END USERS

The past couple of years has shown significant advancements in ballistic engineering and material development. Leveraging improvements at the fibre and lamination level, we're operating on the leading edge of armour solutions, working alongside our suppliers, partners, end users and ballistics researchers to bring the most innovative ballistic packages to market.

We help lighten the load for our end users, increase comfort by improving flexibility and keep them safe every day from new and emerging threats alike.

### A COMMITMENT TO SAFETY IS A COMMITMENT TO QUALITY

Manufacturing armour systems requires a unique dedication to quality. When our end users don any platform that carries our armour, we want to ensure they can reliably count on that armour to perform flawlessly if it ever has to serve its purpose, regardless of what it has been through.

To ensure this, we have dedicated quality control checkpoints throughout the manufacturing process, spanning from material entry to final packaging and shipment. Our internal quality control system allows us to know exactly which piece of armour contains which rolls of material, and how exactly that armour piece has moved through manufacturing, with details of every point of contact.

This allows us to constantly keep an eye out for mistakes, and ensure we are as close to perfection as possible, with zero tolerance for sub-standard handling or errors during any production step.

### FABRICS & LAMINATES

Our fabric is sourced from within NATO exclusively, with most being manufactured in the US to adhere to the strict STANAG, TL and MIL-STD standards, with great care given to IR reflectivity profiles and durability.

### SEALING CAPABILITIES

As standard, every soft insert features a cover consisting of a black 78 Dtex polyamide fabric weighing in at 150 g/m<sup>2</sup>, with an outer DWR coating and an internal TPU laminate.

### STATE-OF-THE-ART MATERIALS

Ballistic and trauma-mitigating materials are sourced exclusively from reputable partners and brands from Europe and the US, with material manufacturing located in those same regions. Our primary ballistic material partners are Teijin and Honeywell, with anti-trauma materials produced by Rogers Corporation and Propex.



All trademarks are property of their respective owners.

## END-TO-END CAPABILITIES



### OEM/ODM SERVICES

We provide OEM/ODM cutting, sewing, sealing and labelling services for soft ballistics with no minimum order quantities for existing and new brands wishing to enter the industry, who might not be able to manufacture in-house.

### CUSTOM LAYUPS & MATERIALS

Our existing product layups are available for use if you do not wish to or cannot design your own. Alternatively, we provide ballistic consulting if you're looking to stop a specific threat or reach a particular trauma level against a given threat profile at no additional charge.

Practical testing can be carried out inexpensively thanks to our close partnerships with ranges and testing laboratories if you don't wish to be in charge of this.

Minimum order quantities will apply if we have to import or acquire non-stocked materials. Don't hesitate to get in touch with us for a complete list of our continuously stocked materials.

### LABELING CAPABILITIES

We provide black-and-white labels on the front and back of any inserts free of charge. As standard, our labels adhere to the NIJ's label requirements and resist peeling, water, as well as isopropyl and denatured alcohol.

### CUTTING CAPABILITIES

Our entire cutting and processing workflow is entirely automated.

Thanks to this, we can process complex shapes and cuts using CAD/CAM with sub-millimetre precision, guaranteeing that every manufactured product has negligible variability.

A further advantage is that we can offer these services with no minimum order quantities, allowing you to scale from a single sample for testing to full-scale production.

### SEWING CAPABILITIES

We use powerful sewing machines and made-to-order carbide needles to ensure clean material penetration for stitching operations. Depending on material type, density and lamination used, we can sew through 20-40 layers of unidirectional ballistic material with appropriate multi-step bartacking, be it for trauma reduction, layer adhesion or increasing multi-hit performance.

For all stitching operations on ballistic layups we utilise 840dTex Twaron® and Dyneema® SK75 sewing threads with respective breaking strengths at 215 and 120 newtons.

For more information, please visit [roninarmour.com/oem](https://roninarmour.com/oem) or email [oem@roninarmour.com](mailto:oem@roninarmour.com)



### Terms applicable only to business-to-business and OEM/ODM transactions.

1. Jurisdiction; Contract Formation. For purposes of these Terms and Conditions, the jurisdiction is Seller's location (the "Jurisdiction"). These Terms and Conditions, any Seller document attached hereto, and any other written or electronic communication of Seller that directs Buyer to or incorporates these Terms and Conditions, collectively constitute the "Contract Documents" (in the event of a conflict, these Terms and Conditions prevail) governing sale of goods and services described in the Contract Documents (the "Goods"). Buyer shall be deemed to have accepted the provisions of the Contract Documents by any of the following: (a) signing and returning the Contract Documents to Seller; (b) sending to Seller a written acknowledgement of the Contract Documents; (c) placing a purchase order or giving instructions to Seller respecting manufacture, assortment, or delivery of the Goods (including instructions to bill and hold) following receipt of the Contract Documents; (d) failing to cancel a pending purchase order within ten (10) days after receiving the Contract Documents; (e) accepting delivery of all or any part of the Goods; (f) paying for all or any part of the Goods; or (g) indicating in some other manner Buyer's acceptance of the Contract Documents. Seller may revoke its offer to sell the Goods at any time prior to Buyer's acceptance. Upon acceptance, Buyer irrevocably agrees and commits to purchase the Goods in accordance with the Contract Documents. SELLER HEREBY OBJECTS TO AND REJECTS THE PROVISIONS OF ANY PURCHASE ORDER OR OTHER DOCUMENT WHICH IS INCONSISTENT WITH OR IN ADDITION TO THE PROVISIONS OF THE CONTRACT DOCUMENTS (WHICH INCONSISTENT OR ADDITIONAL PROVISIONS ARE HEREBY EXCLUDED), AND SELLER'S OFFER AND OBLIGATIONS ARE EXPRESSLY CONDITIONED UPON BUYER'S ACCEPTANCE OF THESE TERMS AND CONDITIONS. THE CONTRACT DOCUMENTS SHALL BE THE COMPLETE AND EXCLUSIVE CONTRACT BETWEEN BUYER AND SELLER WITH RESPECT TO THE GOODS (THE "CONTRACT") AND MAY BE MODIFIED ONLY IN A WRITING SIGNED BY SELLER'S AUTHORIZED REPRESENTATIVE. NO PRIOR OR CONTEMPORANEOUS PROPOSALS, QUOTATIONS, STATEMENTS, FORECASTS, SAMPLES, MODELS, SPECIFICATIONS, COURSE OF DEALING OR USAGE OF TRADE SHALL BE PART OF THE CONTRACT. In this Contract, "including" shall be deemed to mean "including without limitation.

2. Payment. Unless specified otherwise in the Contract, all invoices are payable in full, at Seller's office in the Jurisdiction, in the official currency of the Jurisdiction, within thirty (30) days after date of invoice. All payments shall be due and payable without offset, discount (unless explicitly provided for in the Contract) or any reduction in the Contract price, without deduction for any exchange or conversion, and also without deduction for any taxes or duties levied by any governmental authority. Any payment received from or for the account of Buyer may be accepted and applied by Seller against any indebtedness owing by Buyer, as shown in the books and records of Seller, without discharge of the remainder of any such indebtedness regardless of any statement by Buyer referring to or accompanying such payment. Buyer agrees to pay late payment charges for each month or portion thereof on any payment hereunder that is not made when due. The late payment charge rate shall be the lesser of (a) 125% of the prime rate of interest quoted by Citibank, in effect on the date of invoice (or if that rate is not then available, the prime rate of another bank in the Jurisdiction selected by Seller), and (b) the maximum rate allowed by the governing law of the Jurisdiction. Seller may, at any time, in its sole discretion, limit or cancel any credit terms given to Buyer, and as a condition to Seller's obligations under the Contract (including manufacturing or delivering all or part of the Goods), Seller may, in its sole discretion, require Buyer to (i) pay in cash an amount sufficient to cover the unpaid Contract price (including all related transportation, storage and other costs to be charged to Buyer) or (ii) open and confirm an irrevocable commercial letter of credit in favor of Seller for such unpaid Contract price. Such letter of credit shall be payable on sight and be in a form and issued and confirmed by a bank or banks satisfactory to Seller, in its sole discretion. The terms of any such letter of credit shall comply with any requirements furnished by Seller to Buyer, including provisions for transferability, partial delivery, transshipment, and acceptance of stale documents. Buyer shall pay the full cost, including all banking charges, incurred in connection with the issuance, confirmation and amendment of each such letter of credit. The opening or confirmation of such letter of credit shall not discharge Buyer's direct payment obligation to Seller.

3. Default. Buyer shall be in default and fundamental and material breach of this Contract upon the occurrence of any of the following: (a) Buyer's unsecured breach or nonfulfillment of this or any other contract with Seller; (b) Buyer's failure to open a letter of credit required by Seller in accordance with the Contract; (c) Buyer's failure to make timely payment to Seller for any installment of the Goods; (d) Buyer's failure to assort, specify, or accept any installment of non-defective Goods; (e) Buyer's insolvency, calling of a meeting of its creditors, or general assignment for the benefit of its creditors; or (f) commencement of bankruptcy, insolvency, reorganization, arrangement or similar proceedings concerning Buyer (but, in the case of involuntary proceedings, only if not dismissed within thirty (30) days after commencement). In the event of any such default by Buyer, Seller may, in addition to any other rights and remedies, exercise any one or more of the following rights and remedies, which are intended to be cumulative and not mutually exclusive: (i) cancel any part of this Contract (including any warranty) or any other contract with Buyer (with Buyer liable for damages); (ii) defer any shipment under this or any other contract; (iii) declare immediately due and payable all outstanding invoices under this or any other contract; (iv) immediately repossess all or any part of the Goods in transit or in the custody or control of Buyer pursuant to this or any other contract, at the sole risk and expense of Buyer; (v) finish all or any portion of its performance of the Contract and charge Buyer up to the full Contract price and (vi) re-sell all or any part of the Goods covered by this or any other contract, or any materials supplied for the Contract, at public or private sale, with Buyer responsible for all losses and expenses incurred in such sale.

4. Retention of Title. Unless specified otherwise in the Contract, all Goods delivered to Buyer shall remain the property of Seller, or if such retained title is not valid or enforceable under applicable law, Seller shall have and retain a security interest and lien in and against the Goods until Seller has received payment in full therefor. Buyer shall maintain all Goods which Seller has delivered but for which Seller has not been paid in full in a separate location, marked by conspicuous signage disclosing Seller's retained interest in such Goods and shall not transfer to any third party any interest in such Goods. Notwithstanding Seller's retained interest in the Goods, Buyer shall bear all risk of loss or damage with respect to the Goods and shall be responsible for maintaining full replacement cost insurance for the Goods, at Buyer's sole expense, with Seller named as a loss payee and additional insured, until Seller has been paid in full therefor. Notwithstanding Seller's retained interest in any of the Goods, Buyer shall be solely responsible and liable for any and all taxes, warehousing or storage costs, transportation costs or other costs or liabilities associated with the Goods following delivery thereof by Seller in accordance with the Contract. Buyer will execute any document deemed necessary or appropriate by Seller, in its sole discretion, to perfect or enforce the retained interest of Seller in the Goods, or in the alternative, Seller may file or record the Contract or any memorandum or statement thereof without Buyer's signature.

5. Delivery. Bill and Hold. Unless specified otherwise in the Contract, Seller's delivery of the Goods shall be Ex Works (EXW) Origin INCOTERMS® 2020, with risk of loss and damage passing to Buyer at such point, subject to Seller's rights under applicable law. For any Goods held subject to Buyer's instructions or which Seller, in its sole discretion, has determined should be held for Buyer's account, Seller may invoice before delivery, with risk of loss or damage passing to Buyer as of the date of such invoice. Buyer shall pay all insurance, freight, and delivery charges as a separate item. Unless specified otherwise in the Contract, delivery of Goods in a quantity varying not more than ten percent (10%) from the Contract amount or one (1) commercial unit of the Goods purchased, whichever is greater, shall be deemed complete delivery of the Contract amount, and payment shall be made for the actual quantity delivered. Delivery may, in Seller's discretion, be made in severable installments, and installment deliveries shall be accepted by Buyer and paid for at Contract prices and terms. Unless specified otherwise in the Contract, all delivery dates are Seller's good faith estimates of shipping and are not guaranteed. Goods invoiced and held in any location for any reason shall be held at Buyer's risk and expense, and Seller may charge for insurance and storage at prevailing rates.

6. Limited Warranties. SUBJECT TO SECTION 7, FOR ALL GOODS SOLD AS FIRST QUALITY, SELLER WARRANTS GOOD TITLE AND THAT THEY ARE OF SELLER'S STANDARD QUALITY AT THE TIME OF SUCH SALE. ALL OTHER GOODS SOLD HEREUNDER, INCLUDING GOODS SOLD AS "SECONDS," "AGED," "OFF-QUALITY," OR "DISCONTINUED LINES" ARE SOLD "AS IS." SELLER MAKES NO REPRESENTATION OR WARRANTY BEYOND ANY EXPLICIT STATEMENTS CONTAINED IN THE CONTRACT AS TO THE FLAMMABILITY CHARACTERISTICS OF THE GOODS OR THAT THE GOODS, OR ANY ITEM, ARTICLE OR PRODUCT CONTAINING OR INCORPORATING THE GOODS, CONFORM TO APPLICABLE FLAMMABILITY STANDARDS, IF ANY, OR HAVE BEEN TESTED FOR CONFORMITY THERETO. BUYER'S FAILURE TO OBTAIN AN EXPLICIT WARRANTY OF FLAMMABILITY AND TESTING IN THE CONTRACT PRIOR TO DELIVERY OF THE GOODS SHALL RELIEVE SELLER OF ANY LIABILITY ASSOCIATED WITH THE FAILURE TO PROVIDE SAID INFORMATION. BUYER ACKNOWLEDGES THAT SUBSEQUENT FINISHING TREATMENTS, USE IN COMPOSITE STRUCTURES, OR OTHER ALTERATION OF THE GOODS CAN ADVERSELY AFFECT THE GOODS' FLAMMABILITY CHARACTERISTICS AND THAT, UNDER SOME CONDITIONS, THE GOODS WILL BURN AND THEREFORE CAUTION SHOULD BE USED NEAR SOURCES OF HEAT OR FLAME. EXCEPT FOR ANY SUCH LIMITED WARRANTIES THAT SELLER MAY EXPRESSLY AND SPECIFICALLY PROVIDE, ALL OTHER EXPRESS AND IMPLIED WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, INFRINGEMENT, OR ANY WARRANTIES BASED UPON SAMPLES, MODELS, OR SPECIFICATIONS, ARE EXPRESSLY DISCLAIMED. BUYER ASSUMES ALL RISK AND LIABILITY CONCERNING THE USE OF GOODS.

7. Limitation of Liability. WITHOUT LIMITING THE GENERALITY OF ANY OTHER PROVISION IN THE CONTRACT LIMITING OR EXCLUDING LIABILITY OF SELLER, THE DAMAGES RECOVERABLE BY BUYER BASED ON ANY CLAIM OF ANY KIND WHATSOEVER (INCLUDING NEGLIGENCE) ARISING FROM OR IN ANY WAY CONNECTED TO THIS CONTRACT OR THE GOODS SHALL NOT BE GREATER THAN THE ACTUAL CONTRACT PRICE OF THE GOODS PAID BY BUYER WITH RESPECT TO WHICH SUCH CLAIM IS MADE, AND IN NO EVENT SHALL SELLER BE LIABLE FOR BUYER'S OR ANY THIRD PARTY'S SPECIAL, INDIRECT, INCIDENTAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES, INCLUDING DAMAGES DUE TO LOSS OF USE, LOST PROFITS, LOSS OF GOODWILL, LATE DELIVERY, NONDELIVERY, DEFECTIVE CONDITION, OR USE OF THE GOODS. Even if losses are deemed direct losses, Seller shall not be liable for loss of production, loss of profits, loss of business, loss of contracts, loss of revenues, loss of goodwill or loss of opportunity or any similar losses. Any technical advice or assistance that Seller furnishes to Buyer hereunder and the results thereof are provided at Buyer's sole risk and expense. Nothing in this Contract excludes or limits the liability of a Party for (a) fraud or

fraudulent misrepresentation; (b) death or personal injury caused by its negligence; or (c) any other liability which a Party is legally prohibited from excluding or limiting, to the extent of such prohibition.

8. Defects and Claims. Buyer shall examine and test Goods within ten (10) days after receipt and before use or resale and shall give Seller prompt notice of any alleged nonconformity. Buyer's use or resale of Goods shall be deemed acceptance as conforming to this Contract. All claims of any kind, nature, or description are barred and waived unless made in writing. Buyer shall be deemed to have accepted the Goods, and any right to cancel, reject, or claim damages shall expire, and Buyer shall lose and waive any right to rely upon or claim nonconformity of the Goods, unless Buyer's written and particularized claim is received by Seller (a) within ten (10) business days after receipt of Goods for all claims other than those for latent defects or (b) within ninety (90) days after receipt of Goods for a latent defect; provided, however, that in no case shall any claim be considered after Goods have been dyed, finished, cut, or processed in any manner. Within thirty (30) days after receipt of written notice of claimed defective Goods, Buyer shall make such Goods available without cost to Seller at a point designated by Seller (with failure to do so deemed acceptance and waiver of all claims for defect). If Seller determines a defect claim to be valid, Seller may, at its sole option and election, (i) replace any defective Goods, (ii) repair any defective Goods, (iii) accept return of any defective Goods and refund the purchase price thereof to Buyer, or (iv) pay to Buyer the difference in value of conforming Goods as of the scheduled Contract delivery date and the value of the Goods actually delivered. To the extent permitted by law, the foregoing is Buyer's exclusive remedy for any defective Goods hereunder.

9. Patent Infringement. Seller's delivery of Goods does not expressly, or by implication, grant Buyer any license or other right under any patent or copyright or grant authorization to infringe any patent or copyright. In the event the Goods, in the form delivered by Seller, are found by a court of competent jurisdiction to infringe a patent in Buyer's country, Buyer shall give Seller prompt written notice thereof, and Seller, at its option and discretion, shall either procure for Buyer the right to continue to use the Goods (in the form delivered by Seller) in Buyer's country, replace the allegedly infringing Goods with non-infringing Goods, or accept a return of the allegedly infringing Goods for a refund of the purchase price paid by Buyer. The foregoing states the entire liability of Seller with regard to any claim of patent infringement. Buyer shall indemnify, defend and hold Seller harmless against all damages and expenses arising from claims of infringement of patent rights on Goods specifically produced or modified at Buyer's request and against all damages or expenses arising from any infringement or from any misuse of any trade name, trademark, symbol, identification of material content, or other labeling used by Seller under Buyer's instructions.

10. Force Majeure. Neither party shall be liable for loss or damage due to nonperformance resulting from any cause beyond the affected party's reasonable control, including compliance with any regulation, order, or instruction of a governmental authority, act of God, war (declared or undeclared), terrorism, act or omission of the other party, act of civil or military authority, fire, epidemic, flood, catastrophe, strike, factory or port shut-down, lockout, riot, rationing, shortage of material, or inability of such affected party to obtain necessary labor from usual sources; provided, however, no delay in the performance of Buyer's payment obligations hereunder (including any obligation with respect to opening a confirmed letter of credit) shall be excused on account of any such cause. In the event of any excused delay due to any such cause, the affected party shall as soon as practical notify the other party thereof and shall at the same time, or the earliest practical date after such notice, specify any revised performance schedule. In the event of any such excused delay, the time of performance by the affected party shall be extended for a period equal to the time lost by the affected party by reason of the delay. If the transaction is covered by a letter of credit, the letter of credit shall provide that receipt by the confirming or issuing bank of a copy of the notice of delay from Seller shall operate as the instruction of Buyer to said banks to amend the letter of credit to extend the times for shipment and the expiration of the letter of credit to the date(s) indicated in said notice.

11. Prices. All prices are exclusive of any applicable import duties and tariffs, Customs fees, export licensing fees, or import or export taxes, federal, state, provincial or local taxes, use, property, or value added taxes or other any taxes or official charges, all of which are Buyer's sole responsibility. Prior to Buyer's acceptance of the Contract Documents, Seller may change any price without notice. After such acceptance, Seller may change any price on undelivered Goods by giving Buyer at least fifteen (15) days' prior written notice, and in the event of such change, Buyer's sole recourse shall be the right to cancel this Contract as to any Goods for which such change in price applies, by written notice given to and received by Seller prior to the date when the change is to become effective. If Seller is prevented by law, governmental decree, order, or regulation from making a change in price, or continuing a price already in effect, Seller may terminate this Contract after giving Buyer thirty (30) days' prior written notice.

12. Governing Law. For domestic sales, the law of the Jurisdiction, without regard to its conflict of laws principles, shall govern this Contract and the rights and obligations of the parties. For international sales other than those made in the People's Republic of China, the United Nations Convention on Contracts for the International Sale of Goods (the "Sales Convention") shall, to the extent applicable and as limited herein, govern this Contract and the rights and obligations of the parties. Notwithstanding the foregoing, in the event of any inconsistency or conflict between provisions of the Contract, including these Terms and Conditions, on the one hand, and the Sales Convention, on the other hand, the provisions of the Contract shall govern and prevail. To the extent of any such inconsistency or conflict, the provisions of the Contract shall be deemed to derogate from the provisions of the Sales Convention within the meaning of Article 6 thereof. Further, without limiting the generality of the foregoing, the following provisions of the Sales Convention are hereby excluded from the Contract: Articles 8(3), 9, 11, 16(2), 39(2), 44, 46, 50, and 84(1). Questions that are not expressly settled in the Contract or by application of the Sales Convention are to be settled in conformity with the internal laws of the Jurisdiction, without regard to its conflict of laws principles. For international sales not governed by the Sales Convention, the internal laws of the Jurisdiction, without regard to its conflict of laws principles, shall govern this Contract and the rights and obligations of the parties hereunder. The Convention on the Limitation Period in the International Sale of Goods is hereby excluded and shall not govern any claim arising from or relating to this Contract or the sale or purchase of the Goods.

13. Dispute Resolution. Except as otherwise provided herein, any dispute arising out of or related to this Contract or the sale, use or purchase of the Goods shall be settled by binding arbitration in the Jurisdiction administered in accordance with Rules of Arbitration of the International Chamber of Commerce in effect on the date of such arbitration, and judgment on the award rendered by the arbitrator(s) may be entered in any court having jurisdiction thereof. The arbitration proceedings, and all documents, pleadings and awards related thereto shall be in the official language of the Jurisdiction. The arbitration award shall be stated in the currency specified in the Contract or, if no such currency is specified, the currency of the Jurisdiction, and the reasons for the award shall be stated therein. The arbitrator(s) shall have no power to alter or modify any provision of this Contract. The parties shall equally share the arbitrator's fees and costs. Anything to the contrary in this Contract notwithstanding: (a) any claim by Buyer of any kind, nature, or description is barred and waived, and no proceedings of any kind may be commenced by Buyer, unless Buyer institutes arbitration proceedings within one (1) year after the claimed breach occurs and (b) Seller may, in its sole discretion, apply to a court competent jurisdiction with respect to (i) any claims by Seller for amounts owed by Buyer in connection with a sale of the Goods to Buyer, (ii) any claims by Seller to enforce the agreement herein to arbitrate or to enforce the award of the arbitrator(s); (iii) Seller's enforcement of the limitation period set forth hereinabove in respect of Buyer's claims; or (iv) any claims by Seller for injunctive relief or interim measures to prevent or stop irreparable harm to Seller's rights or property. Buyer hereby irrevocably submits to the jurisdiction of the courts within the Jurisdiction with respect to any such litigation. If Seller files litigation in accordance with the foregoing, Buyer shall file no counterclaim therein that is arbitrable under this Contract.

14. Assignment and Delegation. Neither party shall transfer or assign this Contract, whether by operation of law or otherwise, without the prior express written consent of the other party. Any attempted transfer or assignment hereof without such consent shall be void and without force or effect. Except as otherwise expressly provided here-in, this Contract is not intended to be for the benefit of, and shall not be enforceable by, any person not a party to it or the permitted assignee of such party.

15. Notices. Unless specified otherwise elsewhere in the Contract, all notices and similar communications provided hereunder shall be in the English language or the language of the Jurisdiction, in writing, and delivered by first-class, prepaid, registered mail of the postal service of the jurisdiction or reputable express courier service.

16. Miscellaneous. All rights and remedies hereunder shall be in addition to all other rights and remedies under applicable law, all of which shall be nonexclusive and cumulative. No waiver by either party of any default shall be deemed a waiver of any subsequent default. If any provision of this Contract is determined to be invalid, such invalidity shall not affect the validity of the remaining portions of this Contract. Buyer's acceptance of the Contract Documents shall constitute Buyer's representation and warranty that it has obtained all necessary approvals, licenses and permits required from any governmental authority in Buyer's country with respect to the shipment, importation, delivery or use of the Goods, and the payment of the Contract price and all other amounts due to Seller in the currency of payment specified in the Contract or, if no such currency is specified, the currency of the Jurisdiction. Seller shall have the right to cancel its performance under this Contract, and may withhold or suspend performance of its responsibilities hereunder, for any failure or delay by Buyer in giving Seller assurances Seller may require, in its sole discretion, that all such approvals, licenses and permits have been obtained, in which event Buyer shall promptly reimburse and indemnify Seller for all damages, costs or losses incurred by Seller due to such failure or delay by Buyer. The parties shall maintain the confidentiality of this Contract, except to the extent disclosure is required by applicable law or information contained in this Contract is generally available to the public through no act or omission of the party receiving such information. In the event of any translation of the Contract into a language other than English, the provisions of the English-language version shall prevail and govern in the event of any conflict in interpretation. CONSUMERS: Where Buyer is a "consumer" under applicable law, any explicit written "consumer" warranty provided and any warranties or guarantees required under law shall apply instead of those provided in Sections 6 and 8 above; and in such "consumer" cases, Seller's liability is limited to fullest amount allowable under such "consumer" laws (this Contract is not intended to exclude, restrict or modify such laws).





## **EUROPE**

**RONIN ARMOUR APS**

**VAT: DK40505458**

**NCAGE: R9695**

**PETER NISSENS GANG, 6310 BROAGER**

**+45 369 881 34**

**roninarmour.com**

**contact@roninarmour.com**

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