



HELIX

Helix Combat Multi Harness
(HCMH II)

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The Helix Combat Multi Harness II (HCMH II) is a fully modular tactical harness system that has been developed over several years with significant end user input and trials. It was specifically designed for military operational use and can be used across a broad range of missions and tasks - it has been fully evaluated in a wide range of environments including both maritime and desert.

It can be either used as a standalone EN358 Riggers Belt, an EN 12277 Waist Harness or an EN 361 Full Body Harness. The harness was certified against the EN 361 standard using a 150kg mass as opposed to 100kg as outlined in the EN 361 dynamic fall test. This was done because tactical operators are often heavily loaded up and their harness needs to cope with the extra forces that this creates.

In addition, the harness was tested to the EN 361 standard using a 17.5 kN static load during MOD helicopter trials rather than the normal 15kN to ensure an adequate safety factor in situations where high G-forces are present.



The HCMH II fully integrates with other 'on the man' systems such as life jackets and plate carriers - it has been designed with an ultra-low profile using bonded vari-width webbing so that it can be run comfortably under a plate carrier. If a chest ascender is required, the innovative connection system occupies minimal area on the front of the carrier.

The system is extremely compact and yet because of the high tech materials & manufacturing processes used, loads are spread more evenly creating a harness that is comfortable to hang in either as a waist or full body harness.

Lightweight and packable: Packs down to 29cm x 19cm x 7.5cm with all components including carabiners, chest ascender and ladder hook.

The HCMH II has been designed to function well over extended periods of use - the buckles are fast to use, secure and won't seize or corrode whilst the whole system holds minimal water and dries quickly.

HCMH II Design

The HCMH II is the 2nd generation of the HCMH tactical harness system. The original system was introduced in 2018 and very soon became the default harness system for multiple specialist tactical units amongst others.

At the time it was the first tactical specific, modular, full body harness system and was the at the cutting edge of design.

Over the next three years of use as operators used the harness across various taskings in different environments, they fed back to us further design changes and improvements that they would like to see implemented in the next generation of harnesses.

These improvements included:

- Minimizing the bulk of the harness so that it could be worn under a plate carrier
- Increasing the mass of the test dummy used in EN certification to 150kg from 100kg because fully loaded operators weigh a lot more than civilians
- Increasing hanging comfort
- Plus incorporating corrosion proof, maintenance free, fail-safe buckles, a rear attachment point and a minimalist chest connect system that could be used even when the harness was under the plate carrier.

Essentially the end users wanted us to move the goal posts again to create a harness that was lighter, less bulky, more comfortable, more versatile and 50% stronger than most other harnesses.

Our product development team soon established that the first three major points of improvement required could not be achieved with standard harness manufacturing techniques.

Thus, the HCMH II was developed from the ground up using new techniques and new machinery in order for us to achieve the desired result. It took two years of development and a lot of resource, but we achieved all the desired objectives with a harness that is 100% manufactured in the UK at our sister company DMM in Llanberis.

Overview



All items are interchangeable meaning when an item is damaged, it can be replaced, and the log card updated which is much more cost effective than replacing an entire system.

Anatomically shaped legs and chest pads, low profile bonded fabrics and vari-width webbing help create a comfortable and functional harness system with minimal bulk.

Fully integrates with in-service 'on the man' equipment.

Modular system provides a wide range of functionality, reduces training time and replacement cost; a single harness system that is suitable for all taskings.

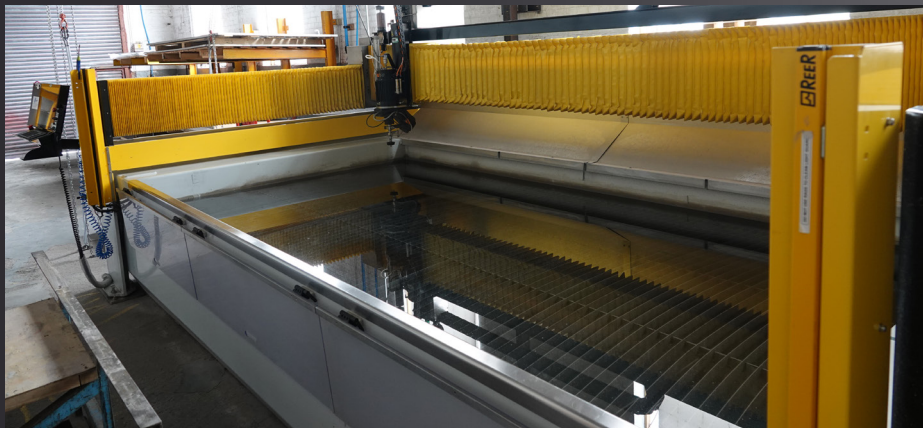
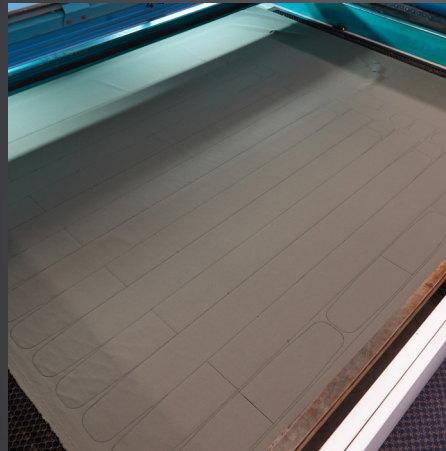


Available in:
Matt Grey
Ranger Green
Black

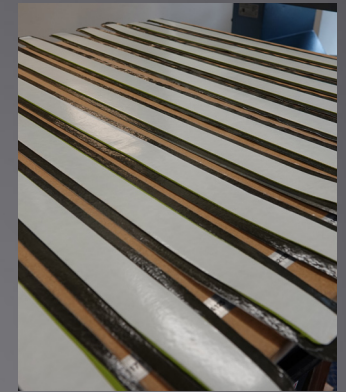
HCMH II Manufacturing

The vast majority of harnesses are created by sewing together lengths of cut webbing and foam pads. In order the HCMH II harness to meet the end user expectations we have had to totally re-look at the methods used to manufacture harnesses:

- we have had to install laser cutters and water jet cutters to allow us to create the complex outer fabric shapes that help give the harness increased comfort whilst minimizing surface area and, hence maximizing mobility.
- We developed a method of laminating materials together to create the pads for the waist, leg loops and chest harness. This process of pressure bonding the materials together allowed us to create very thin, but supportive pads.



Once the pad components are cut these fabrics then need to be layered around the structural webbing and pressure bonded in several stages; once the adhesives have fully bonded the fabric shapes are sewn together on the edges, before being turned inside out to create a very thin pad structure with no abrasion points.



Then the structural sewing takes place - joining all the elements together to create the finished harness.



This complete process takes far longer than a standard harness, is far more complex than a standard harness and has required us to learn new production techniques.

However, the result is a harness that is light years ahead of any other tactical harness on the market and achieves all the requirements requested.



HCMH II Size Chart

Stock Code	Description	Conformance	Waist (cm)	Legs (cm)	Chest (cm)	Weight(g)
HC400	HCMH II SMALL Full Body Harness (Sit + Chest)	EN361:2002 (Fall arrest ONLY)	72-88cm	55-65cm	87-127cm	1040
HC401	HCMH II MEDIUM Full Body Harness (Sit + Chest)	EN361:2002 (Fall arrest ONLY)	83-97cm	59-69cm	87-127cm	1060
HC402	HCMH II LARGE Full Body Harness (Sit + Chest)	EN361:2002 (Fall arrest ONLY)	94-110cm	63-73cm	87-127cm	1080
HC410	HCMH II SMALL Waist Belt	EN358:2018 (Restraint ONLY)	72-88cm	N/A	N/A	240
HC411	HCMH II MEDIUM Waist Belt	EN358:2018 (Restraint ONLY)	83-97cm	N/A	N/A	250
HC412	HCMH II LARGE Waist Belt	EN358:2018 (Restraint ONLY)	94-110cm	N/A	N/A	260
HC420	HCMH II SMALL Leg Loops	N/A	N/A	55-65cm	N/A	250
HC422	HCMH II LARGE Leg Loops	N/A	N/A	63-73cm	N/A	270
HC430	HCMH II SMALL Sit Harness (Leg Loops + Waist Belt)	EN12277:2015 + A1:2018 Type C	72-88cm	55-65cm	N/A	490
HC431	HCMH II MEDIUM Sit Harness (Leg Loops + Waist Belt)	EN12277:2015 + A1:2018 Type C	83-97cm	59-69cm	N/A	510
HC432	HCMH II LARGE Sit Harness (Leg Loops + Waist Belt)	EN12277:2015 + A1:2018 Type C	94-110cm	63-73cm	N/A	530
HC440	HCMH II ONE-SIZE Chest Harness (Including Hardware)	N/A	N/A	N/A	87-127cm	550

HCMH II Harness System is approved for a user, including tools and equipment, with a maximum weight of 150kg

HCMH II Riggers Belt

The HCMH II Riggers Belt is a EN 358:2018 and UKCA certified belt for work positioning and fall restraint with connection points on both the front and rear of the belt that are rated to 15kN.

The belt will fit through standard trouser belt loops so that it can be used as a standard belt, but can be quickly transformed into a EN 12277 certified waist harness by adding the leg loops.

The belt uses 2-part 316 stainless steel buckles coated in a very tough electrophoretic paint. The buckles have an offset, angled slot that increases security - these features make the buckle system very safe and very resilient to adverse environmental conditions i.e. maritime or tropical conditions.

The belay loop is sewn from a very tough UHMWPE dyneema webbing that does not pick when in contact with velcro. The belay loop can rotate freely so that wear is not concentrated in one area.

The belt has been designed to be compatible with several DMM gear storage accessories such as the Vault carabiners and Parking Lot storage adapters.

Gear loops for racking climbing equipment when in the mountains are also available.

316 grade Stainless Steel buckles coated in black electrophoretic paint for increased corrosion resistance.

49mm laminated waist belt with a pad thickness of 2.9mm.

28mm polyamide webbing optimised together with the stainless steel buckle for maximum strength and minimum slippage.

High strength UHMWPE belay loop that rotates to minimise wear and is certified to 15kN against EN 358:2018 and UKCA

Connection point for chest harness rear restraint strap to stop the chest harness moving when loaded.

15kN rear connection point certified against EN 358:2018 and UKCA

Single leg loop elastic connection point



HCMH II Harness Bison Belt™



Helix Operations and Ferro Concepts have collaborated to create a bespoke Shooters Belt for the HCMH II harness that gives operators the ability to mount kit without compromise whilst using the HCMH II harness system.

The HCMH II Harness Bison Belt™ is based on the well-regarded Ferro Concepts Bison Belt™ which was designed to be very light and slim whilst not sacrificing any functionality.

Optimal gear stabilization is achieved by utilizing a single layer of laser cut Tegriss thermoplastic as the framework. This technology reduces overall weight and thickness drastically but retains better rigidity than traditional methods.



This composite frame is built into a 2-layer, 50mm MOLLE compatible belt with the MOLLE loops sewn under high tension to minimise the movement of pouches and equipment mounted on the belt.

This frame wraps closely around the Helix HCMH II Riggers Belt whilst having an aperture for the rear restraint so that this connection point can still be used if required.

An elasticated fabric pouch has been added so that the HCMH II Belay Loop can be tidied away when it is not required.

The inside of the belt is lined with hook Velcro for quick and secure don/doff capability when used with the 38mm, soft Velcro, inner pant belt that is included as part of the system. The HCMH II - Ferro system also includes a soft Velcro fabric cover for the hook Velcro on the Shooters belt so that it is protected when not in use.

There are 6 sizes of the HCMH II Harness Bison Belt™ with each of the key sizes (S, M & L) have standard and long versions so that an ideal fit can be obtained.

Component	Small	Small Long	Medium	Medium Long	Large	Large Long
HCMH II Harness Bison Belt™ Sizing	23.8796"/ 60.65cm	26.9066"/ 68.34cm	27.5151"/ 69.88cm	30.6443"/ 77.84cm	31.7651"/ 80.68cm	34.2651"/ 87cm



Molle Compatible

Lightweight and low profile

50mm/2" height outer belt
50mm/2" height inner belt

Stiff composite Tegriss skeleton

Elasticated fabric pouch to retain belay loop



HCMH II Harness Bison Belt™



38mm/1.5" Inner Belt



Ferro Concepts- HCMH II Harness Bison Belt™ with HCMH II Riggers belt installed



Ferro Concepts- HCMH II Harness Bison Belt™



Ferro Concepts- HCMH II Harness Bison Belt™ with HCMH II Riggers belt installed. Bungee loop has been removed from pouch. Leg loops can be added.

High strength UHMWPE bungee loop



HCMH II Harness Bison Belt™ Rear Details

The HCMH II Harness Bison Belt™ not only has bespoke sizing and an added belay loop pouch, but it has been designed to allow all the rear connection points on the HCMH II Riggers belt to be used; the Tegrís composite has been laser cut to allow the rear restraint loop to be used and the MOLLE belt has exit points for the leg loop elastic buckle and the chest harness restraint strap buckle. This allows the harness to maintain full functionality when the Ferro Concepts Bison Belt™ is being used.



webbing retainer



15kN rear connection point certified against EN 358:2018 and UKCA



Connection point for chest harness has been cut specifically designed for the HCMH II design specifications.



Connection point for chest harness rear restraint strap to stop the chest harness moving when loaded.



Single leg loop elastic connection point

Dom Systems / Helix Padded Belt

We came across the DOM Padded Belt when working with some end users and were impressed by the extra comfort it added when carrying heavy loads for a long time. We asked DOM to collaborate on a custom version for the HCMH II Harness Bison Belt™ harness system and they kindly agreed.

The Padding Belt uses a layer of SharkSkin Neoprene Shark against the body to give a close, secure fit which moulds to body shape and an outer layer of soft, velour Velcro to allow the Ferro Shooters belt to be attached.

The DOM Padded Belt is the best solution we have found to add comfort when wearing thin clothing or carrying heavy load; this is done with minimal additional weight and bulk - the belt has a height of 7 cm and a thickness of approximately 4 mm. The soft Velcro outer has a width of approximately 5.5 cm for the entire length.

There are 6 sizes as per the HCMH II Harness Bison Belt™ with each core size (S, M & L) having standard and long variants. Each size of DOM Belt corresponds to the same size of HCMH II Harness Bison Belt™.



Component	Small	Medium	Large
Legs	55-65cm	59-69cm	63-73cm
Waist	72-88cm 93cm Safety Max	83-97cm 104cm Safety Max	94-110cm 115cm Safety Max
Chest	87-127cm		

Component	Small	Small Long	Medium	Medium Long	Large	Large Long
Dom Systems - Helix Padded Belt	25.35" / 64.40cm	28.40" / 72.15cm	29.00" / 73.65cm	32.15" / 81.65cm	33.25" / 84.45cm	35.75" / 90.80cm

Stated sizes for the DOM HCMH II Belt are from end to end i.e. the maximum length.

HCMH II System



HCMH II Full Body Harness Bison and DOM Belt



HCMH II system with Ladder Fifi Hook and Bison Belt



HCMH II system and plate carrier. Chest harness worn underneath the plate carrier.



Camp Turbo Chest ascender connected to HCMH II Chest which is worn over the plate carrier.



The HCMH II system, pistol holster and tactical mountain rack.



The HCMH II, Bison Belt, and DOM Systems Belt can be configured starting from a sit harness and built up to a full-body harness system, which can be worn either under or over a plate carrier.

The integration of the Bison Belt and DOM Belt enables the attachment of essential gear such as pistol holsters, magazine pouches, and medical packs. Additionally, it provides the capacity to carry a tactical mountain rack, enhancing both functionality and versatility for a wide range of operational needs.

HCMH II System



The Helix Y-Hang Sling connection point, designed specifically for helicopter abseils on behalf of the UK MOD, allows for a higher connection point and helps keep a heavily laden operator in an upright position. It also offers a 360-degree rotation option when abseiling with the HCMH II, either underneath or over a plate carrier.



The DMM Ladder Fifi Hook connects to the HCMH II Chest Harness providing a ladder hook that breaks at over 17kN in tests and allows for a secure connection.



Helix Combat Multi Harness - Sizing Compatibility for Accessories



The HCMH II Riggers Belt comes in three sizes: Small, Medium, and Large.

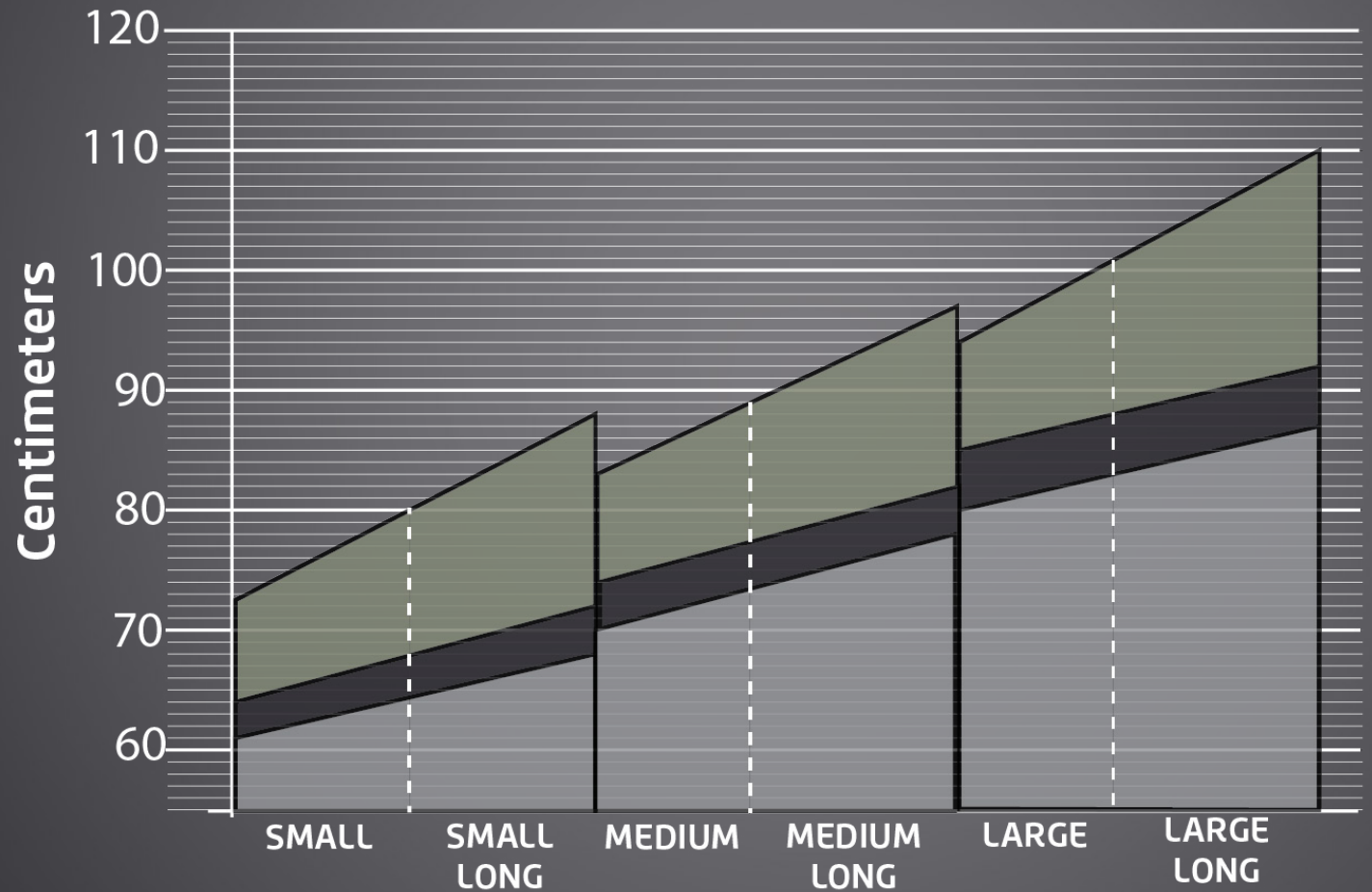
To find the perfect fit, follow these steps:

Take your waist measurement. Measure yourself above your hips and below your ribs. Compare your measurement to the size guide. You should see how your measurement correlates with the sizing of Ferro Concepts shooters belt and DOM Systems Padding belt.

The HCMH II Riggers Belt is compatible with two other belt systems:

Ferro Concepts Bison belt: These belts come in six sizes and are designed to fit together with the HCMH II Riggers Belt.

DOM SYSTEMS Belt: This belt provides additional padding and can be worn under the HCMH II Riggers Belt (scaled with Ferro Concepts Bison belt) for extra comfort.



HCMH II Sit Harness



Adding the HCMH Leg Loops turn the Riggers Belt into an EN 12277 certified Sit Harness

Stainless steel 2-part buckles coated in car bodywork grade electrophoretic paint are fast to open and close, Very secure, easy to maintain and very durable.

The belay loop rotates to minimise wear on any particular point and is manufactured from a very robust black Dyneema tape that offers exceptional tensile strength, abrasion resistance and cut resistance. The harness also has a full strength restraint connection point on the rear.

Exceedingly slim profile and ergonomic leg shape maximises freedom of movement.

Minimal water absorption and fast drying.

Compatible with DMM Parking Lot, Stowaway and Micro Vault racking system



40mm Riggers Belt compatible with both trouser belt loops and battle belts

Modular removable gear loops

Donning/doffing can be done keeping both feet on ground

Pass-Through Buckles: Fast and easy visual safety checks - Robust with no moving parts.

HCMH II Sit Harness & Leg Loops



The leg loops are anatomically shaped with a very thin profile so that they are both comfortable when hanging in the harness whilst also allowing maximum freedom of movement when running or making high steps.

The bonded construction minimises water absorption and dries quickly.

The legs loops can be kept stored on the Riggers Belt so they can be quickly added if required - the leg loops can be fitted and ready to use in 15-20 seconds.

The legs are simply passed through the belay loop and the buckle on each leg done up before the rear risers are clipped into the belt.

The buckles undo completely and so allow the user to put them safely on unstable terrain.



Chest Harness attachment point



Leg Loops attachment point



HCMH II Full Body Harness

The addition of the HCMH II Chest Harness to the Waist Harness turns the system in to an EN 361 certified Full Body Harness that is certified at 150kg rather than the normal 100kg.

The Chest Harness has a very low profile made possible by using the bonded/laminated fabrics and bespoke variable width webbing. This allows it to be used under a plate carrier better than any other harness system.

There is a rear riser strap that stops the Chest Harness from lifting up when loaded - this is an important safety feature that helps stop the plate carrier being forced upward into the throat or face under sudden load.

The Chest Harness attachment point allows a Helix Ladder Fifi to be attached to an operator can rest / use two hands to operate equipment when climbing a ladder.

A chest ascender can be attached using a low-profile sling system that lets the ascender be run on top of the plate carrier when the harness is underneath.

We are using the Kong Futura and Camp Turbo as the main ascenders - the Kong because of its minimal size and the Camp because it is very smooth running.

Rear Riser Strap

Front Attachment Point



HCMH II Chest Ascender

A chest ascender can be added to the HCMH II system via two bespoke slings that allow it to be connected between the waist harness belay loop and the chest harness connection point - this can be done both over and under a plate carrier.

This sling system allows the chest ascender to be added and removed quickly.

Any chest ascender can be used but field use has led us to recommend the Kong Futura chest ascender as it occupies minimal space on the front of the plate carrier. Of the larger size chest ascenders, we have found the Camp Turbo runs very smoothly.

The Kong Futura Body is a lightweight and compact chest ascender, offering advantages for ascending in constricted spaces and when a high connection point is required. It is suitable for rope diameters of 9-11mm.

Weighing just 80g and occupying minimal space when run over the top of a plate carrier, the device allows users to run their chest rigs with minimal change.

The connection holes are twisted through 90 degrees so that the unit lies flat against your chest to allow movement in tight places. The cam profile and body shape has been designed to let the rope slide through the device with minimal friction.



DMM Ladder Fifi Hook

A very strong and safe ladder hook that is CNC machined from a solid block of 7075-T6 to produce a hook that breaks at over 17kN in tests.

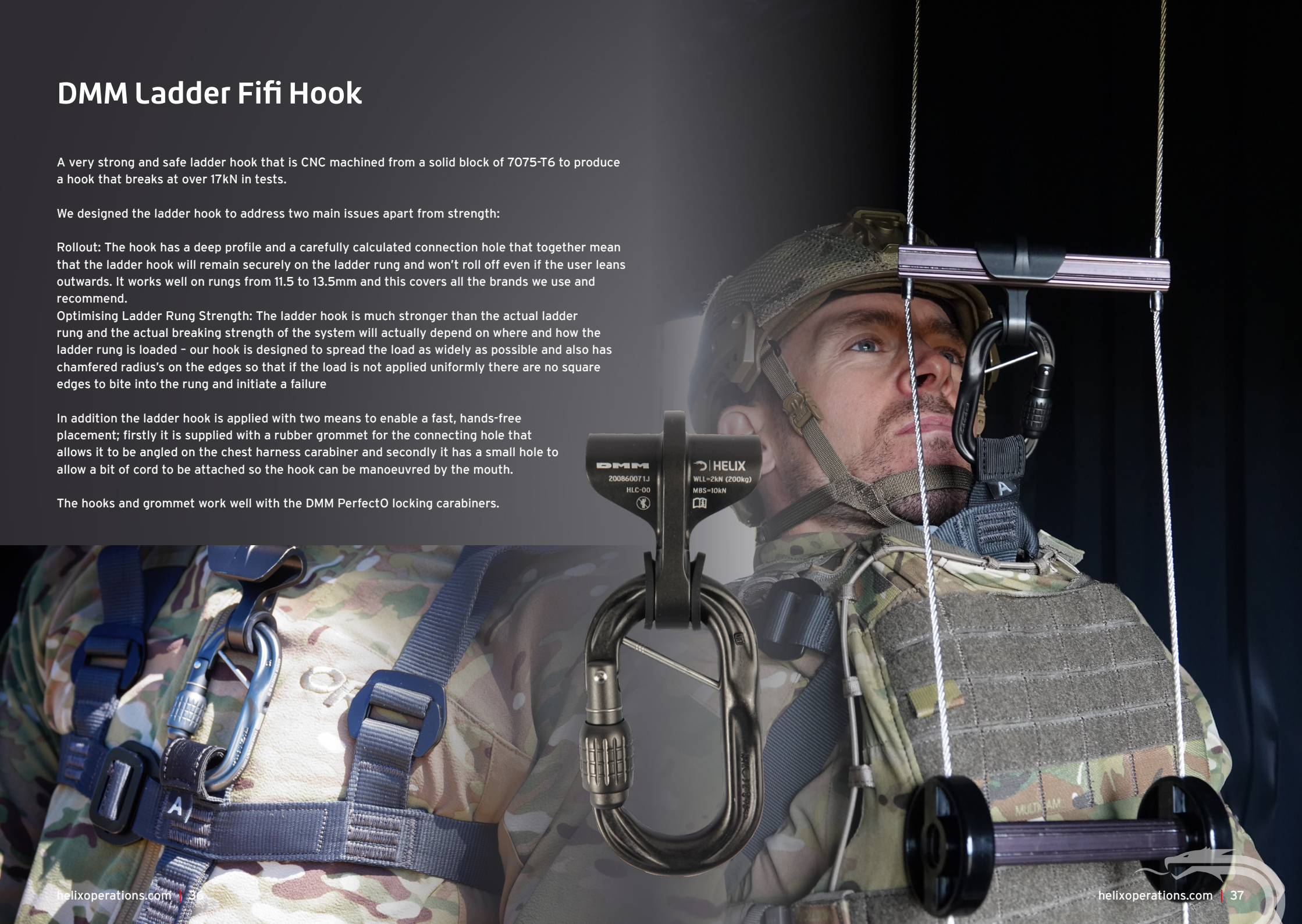
We designed the ladder hook to address two main issues apart from strength:

Rollout: The hook has a deep profile and a carefully calculated connection hole that together mean that the ladder hook will remain securely on the ladder rung and won't roll off even if the user leans outwards. It works well on rungs from 11.5 to 13.5mm and this covers all the brands we use and recommend.

Optimising Ladder Rung Strength: The ladder hook is much stronger than the actual ladder rung and the actual breaking strength of the system will actually depend on where and how the ladder rung is loaded - our hook is designed to spread the load as widely as possible and also has chamfered radius's on the edges so that if the load is not applied uniformly there are no square edges to bite into the rung and initiate a failure

In addition the ladder hook is applied with two means to enable a fast, hands-free placement; firstly it is supplied with a rubber grommet for the connecting hole that allows it to be angled on the chest harness carabiner and secondly it has a small hole to allow a bit of cord to be attached so the hook can be manoeuvred by the mouth.

The hooks and grommet work well with the DMM PerfectO locking carabiners.



HCMH II Y-Sling Connection Point

The Y-Sling was developed for rotary wing operations to ensure a heavily laden operator stayed upright during a descent and that any high forces were shared between the chest and sit harness elements for maximum safety.

Standards

- A647BSMG Director Swivel Boss - EN12275:2013 A/T, EN362:2004 A/T
- A597CBMG PerfectO Locksafe CB - EN12275:2013, EN362:2004
- SP1112ASBLK 11mm Dyneema QD Sling - EN 566:2017, EN 354:2010, EN 795:2012 (B), UIAA104

Description	Weight	Colour	Dimensions	MBS Major Axis	Weight (g)
Director Swivel Boss (BOW) Locksafe	A647BSMG	Matt Grey	64 x 130mm	26kN	105g
PerfectO Locksafe Captive Bar	A597CBMG	Matt Grey	56 x 95mm	24kN	68g
11mm Dyneema Quickdraw Sling	SP1112ASBLK	Black	11 x 120mm	22kN	9g

Director Swivel Boss (BOW) Locksafe

PerfectO Captive Bar Carabiner

11mm Dyneema Quickdraw Sling



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