

# SAFETY BACKED BY SCIENCE

The Next Generation of Premium  
Full Body Harnesses

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Honeywell Miller H700 Series

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**Honeywell**  
**MILLER**

# DIVING DEEP INTO THE SCIENCE OF FALL PROTECTION

- *sci-ence / noun / knowledge that explores the physical and natural world*

*Science is what allows our engineers at Honeywell to design and innovate products that help improve the lives of workers by using decades of industry experience.*

We've taken a deep dive into robust scientific research to elevate our H-Series fall protection harnesses. We've researched the medical science behind suspension trauma, as well as the science behind ergonomic design and novel materials. We've conducted tests to examine breathability, pressure, compression, thermal conductivity, and water vapor resistance. But more importantly, our scientifically based innovation helps ensure workers stay compliant, safe, and productive when working at height.

Our findings, in conjunction with state-of-the-art innovation, shape the all-new **Honeywell Miller H700 Premium Harness Series**. The Miller H700 full body harness boasts scientifically based technological advances focusing on comfort, safety, and intuitiveness.



## 1. COMFORT

The lighter-than-ever H700 harness features high-tech, multi-layered padding for enhanced shock absorption, breathability, and venting - keeping workers drier and cooler. Shoulder and leg padding are removable, allowing for easy cleaning. The webbing surface is water repellent, durable, and easy to clean. Our new Pivot Strap Adjuster allows for a variety of leg configurations for customizable comfort.



## 2. SAFETY

Fall risks are heightened by fatigue and discomfort. When a worker falls and is suspended, time is of the essence. With the H700, what's usually a complicated 3-4 step process in providing trauma relief is now one easy step with the One-Pull Trauma Relief Step, which provides a quick auto-release. Suspension trauma is alleviated, and blood flow continues to circulate.



## 3. INTUITIVENESS

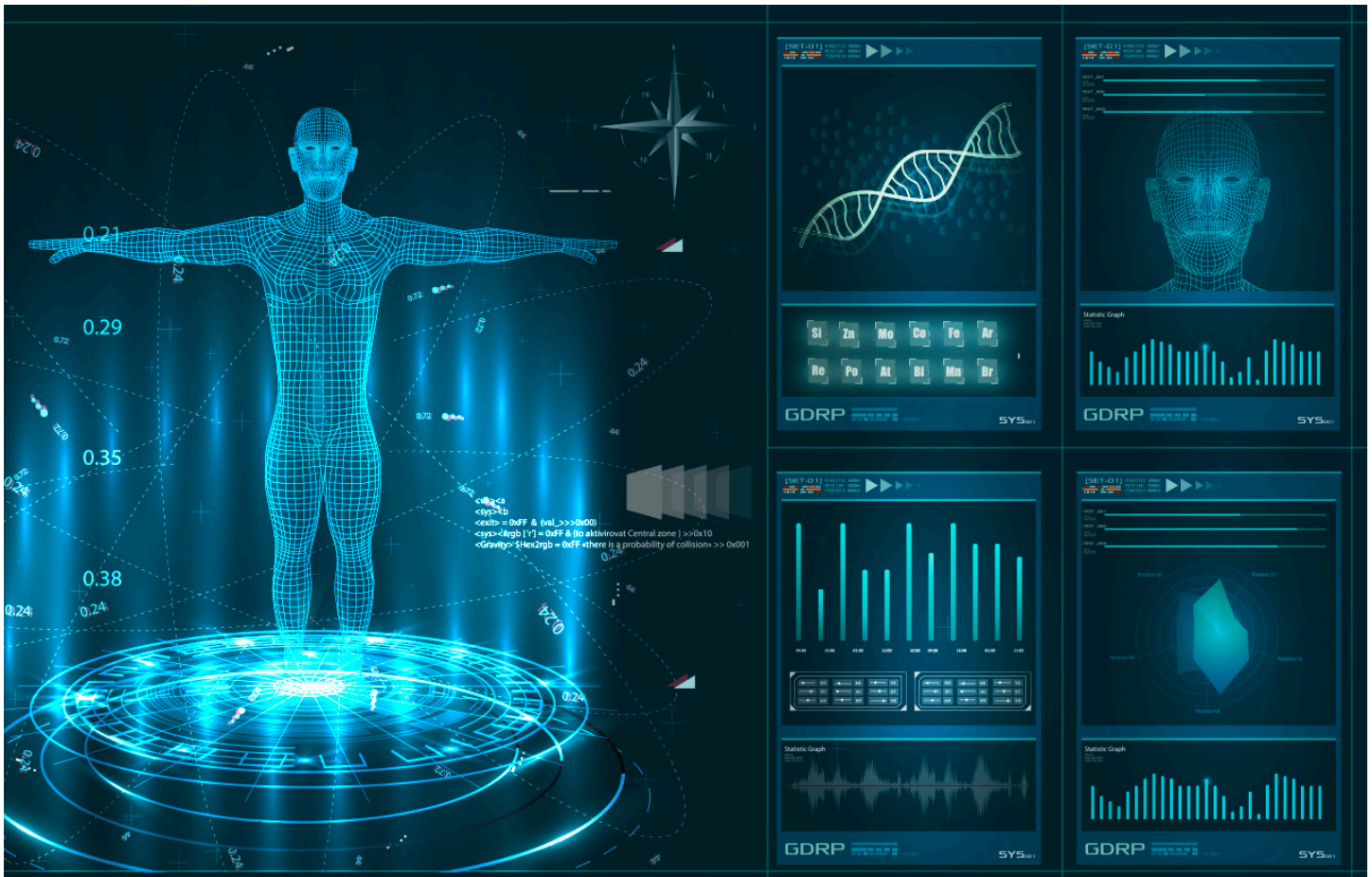
Adjustability provides customizable comfort. The low-profile textile accessory interface straps allow workers to conveniently attach and move pouches around onto the H700 harness. Tool tether anchor attachments and lanyard keepers are also positioned in several convenient locations. Our integrated SRL connector allows for easy attachment of personal single/twin SRLs and carabiners.

# ERGONOMICS AS A SCIENCE

The Honeywell Miller H700 Premium Series full body harnesses aren't just comfortable, they're ergonomically designed for optimum fall protection.

A complete ergonomic assessment is typically based on a series of scientific data:

- Anthropometric data: height, weight, waist circumference
- Human anatomy, lumbar support, weight distribution, shoulder stabilization, musculoskeletal benchmarks
- Range of motion study: rotation, extension, lateral bending and flexion, movement-focused technology
- Electromyography (EMG) sensor muscle monitoring for muscular fatigue
- Heatmapping thermal comfort: body heat radiation and evaporative cooling
- Pressure mapping: computerized clinical tool for assessing pressure distribution



## EVIDENCE-DRIVEN SAFETY FEATURES

As a global leader in fall protection, our legacy informs our future. We've learned that heavy fall protection makes it difficult to get through the day. To address that distress, we developed the following innovations, utilizing scientific findings to improve safety and comfort.

# INNOVATED TO HELP PROTECT LIVES

**1. ONE-PULL TRAUMA RELIEF STEP** provides a state-of-the-art solution for suspension trauma relief.

We've radically simplified what is usually a complicated 4-step process. By integrating a patented release mechanism for quick deployment of our two high-performance One-Pull Trauma Relief Steps (one for each foot), the suspended person conveniently stands up in the H700 harness. The pressure being applied to the arteries and veins around the top of the legs is quickly relieved, avoiding the risk of serious injury or death. See user instructions.

## DESIGNED FOR ERGONOMIC SAFETY

**2. CONFIGURABLE LEG STRAP DESIGN** for customizable comfort.

Our new Pivot Strap Adjuster offers worker mobility and comfort, allowing workers to adjust the shape of their leg straps, depending on the action that needs to be performed (crouching, bending, crawling, etc.)

**3. MODULAR LIGHTWEIGHT ACCESSORY STRAPS** for adjustability and convenience.

Low-profile, configurable accessory organizer. These straps allow workers to conveniently attach and move pouches around the MOLLE strap. They accommodate a large number of accessories. Reinforced stitching also provides safety and security for heavyweight accessories. When not in use, the webbing straps don't get tangled.

Available on Construction Comfort models.

**4. PRACTICAL INTEGRATED SRL CONNECTOR**

The convenient Self-Retracting Lifeline (SRL) integrated connector allows for easy attachment of personal single/twin SRLs and carabiners.

**5. USER-FRIENDLY LANYARD KEEPERS & TOOL TETHER ANCHORS**

Tool tether anchors and lanyard keepers are also positioned in several convenient locations, including front and waist.

**6. OPTIMIZED LABEL PROTECTION AND IDENTIFIABLE HARNESS SIZE**

New protected name plate identification and QR code.

**7. LIGHTER-THAN-EVER**

This lightweight full body harness offers workers at height less heft, more comfort, and easier movability. It reduces muscular fatigue, motion constraints and sweat, all common hazards when using a poorly designed harness.

## ENGINEERED WITH INNOVATIVE MATERIALS

**8. HIGH TECH 3D PADDING**


Innovative, multi-layered padding has been designed for enhanced breathability and venting, keeping workers drier and cooler by combining airflow channel breathability, moisture dispersion technology, and 3D knitted fabric.

Our shoulder back padding has also been designed to protect workers from the robust twin personal SRLs. Workers can also remove the shoulder back padding if needed for cleaning purposes.

**9. RATED TO 420 LB. (max. weight capacity)**



# HONEYWELL MILLER® H700 MODEL GUIDE

CORE MODELS	VARIANT	PART NUMBER	LEG BUCKLES	CHEST BUCKLE	D-RINGS						SIZING
					BACK D	FRONT D	SIDE D	SHOULDERS	ONE-PULL TRAUMA RELIEF STEPS	INTEGRATED SRL CONNECTOR	
	CC1	H7CC1A0	Tongue	QC	Alum	Alum	Alum	-	2	1	XS
		H7CC1A1	Tongue	QC	Alum	Alum	Alum	-	2	1	S/M
		H7CC1A2	Tongue	QC	Alum	Alum	Alum	-	2	1	UNIV
		H7CC1A3	Tongue	QC	Alum	Alum	Alum	-	2	1	XXL
		H7CC1A4	Tongue	QC	Alum	Alum	Alum	-	2	1	3/4XL
	CC2	H7CC2A0	Tongue	QC	Alum	-	Alum	-	2	1	XS
		H7CC2A1	Tongue	QC	Alum	-	Alum	-	2	1	S/M
		H7CC2A2	Tongue	QC	Alum	-	Alum	-	2	1	UNIV
		H7CC2A3	Tongue	QC	Alum	-	Alum	-	2	1	XXL
		H7CC2A4	Tongue	QC	Alum	-	Alum	-	2	1	3/4XL
	CC3	H7CC3A0	QC	QC	Alum	Alum	Alum	-	2	1	XS
		H7CC3A1	QC	QC	Alum	Alum	Alum	-	2	1	S/M
		H7CC3A2	QC	QC	Alum	Alum	Alum	-	2	1	UNIV
		H7CC3A3	QC	QC	Alum	Alum	Alum	-	2	1	XXL
		H7CC3A4	QC	QC	Alum	Alum	Alum	-	2	1	3/4XL
	CC4	H7CC3AS0	QC	QC	Alum	Alum	Alum	Alum	2	1	XS
		H7CC3AS1	QC	QC	Alum	Alum	Alum	Alum	2	1	S/M
		H7CC3AS2	QC	QC	Alum	Alum	Alum	Alum	2	1	UNIV
		H7CC3AS3	QC	QC	Alum	Alum	Alum	Alum	2	1	XXL
		H7CC3AS4	QC	QC	Alum	Alum	Alum	Alum	2	1	3/4XL
IC1	H7IC1A0	QC	QC	Alum	-	-	-	2	1	XS	
	H7IC1A1	QC	QC	Alum	-	-	-	2	1	S/M	
	H7IC1A2	QC	QC	Alum	-	-	-	2	1	UNIV	
	H7IC1A3	QC	QC	Alum	-	-	-	2	1	XXL	
	H7IC1A4	QC	QC	Alum	-	-	-	2	1	3/4XL	
IC2	H7IC2A0	QC	QC	Alum	Alum	-	-	2	1	XS	
	H7IC2A1	QC	QC	Alum	Alum	-	-	2	1	S/M	
	H7IC2A2	QC	QC	Alum	Alum	-	-	2	1	UNIV	
	H7IC2A3	QC	QC	Alum	Alum	-	-	2	1	XXL	
	H7IC2A4	QC	QC	Alum	Alum	-	-	2	1	3/4XL	
IC3	H7IC3A0	QC	QC	Alum	Alum	Alum	-	2	1	XS	
	H7IC3A1	QC	QC	Alum	Alum	Alum	-	2	1	S/M	
	H7IC3A2	QC	QC	Alum	Alum	Alum	-	2	1	UNIV	
	H7IC3A3	QC	QC	Alum	Alum	Alum	-	2	1	XXL	
	H7IC3A4	QC	QC	Alum	Alum	Alum	-	2	1	3/4XL	
IC4	H7IC2AS0	QC	QC	Alum	Alum	-	Alum	2	1	XS	
	H7IC2AS1	QC	QC	Alum	Alum	-	Alum	2	1	S/M	
	H7IC2AS2	QC	QC	Alum	Alum	-	Alum	2	1	UNIV	
	H7IC2AS3	QC	QC	Alum	Alum	-	Alum	2	1	XXL	
	H7IC2AS4	QC	QC	Alum	Alum	-	Alum	2	1	3/4XL	

CC = Construction Comfort  
 IC = Industry Comfort  
 QC = Quick-Connect

The new Miller® H700 Series meets OSHA 1926.502, ANSI Z359.11 and CSA Z259.10 standards.

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# 1 RET BREATHABILITY

To be comfortable, harnesses must stay dry and breathable when submitted to sweat.


## PURPOSE OF TEST

Test padding material against water vapor resistance. (Ret)

A lower water vapor resistance means a lower barrier to water vapor. This proves the material is breathable and more comfortable to wear.

QUALITY	PARAMETERS	
	Composition	Polyester + PET monofilament
	Thickness	0.14'
	Weight	1.15oz/ft <sup>2</sup>
	Full Width	61.02'
	Color	Pantone14-0446TCX

The H700 is made of composite 3D warp knitted fabric.

QUALITY	PARAMETERS	
	Composition	PET monofilament
	Melting point	265°C
	Thickness	0.47'
	Weight	2.79oz/ft <sup>2</sup>
	Full Width	86.61'
	Color	Black

## TEST METHOD

An electrically heated porous plate is covered by a liquid water-vapor permeable membrane. Water fed to the heated plate evaporates and passes through the membrane as vapor, so that no liquid water contacts the test specimen. With the test specimen placed on the membrane, the heat flux required to maintain a constant temperature at the plate level is a measure of the rate of water evaporation, and from this the water-vapor resistance of the test specimen is determined.

Reference - ISO 11092-2014.

TEST RESULTS SHOULDER PADDING	
TEST SAMPLES	Ret(M <sup>2</sup> .Pa/W)
H700	3.41
NBA 1	19.4
NBA 2	21.1

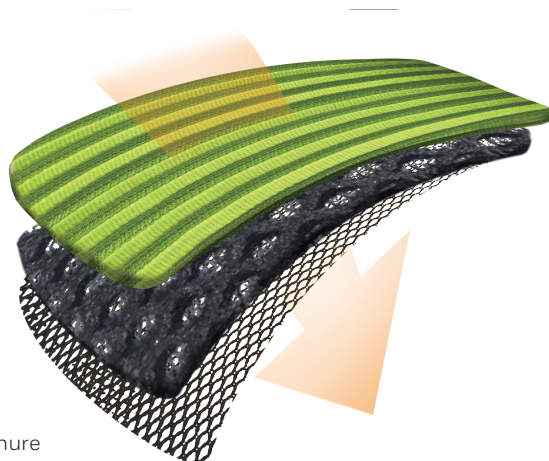
TEST RESULTS WAIST PADDING	
TEST SAMPLES	Ret(M <sup>2</sup> .Pa/W)
H700	9.51
NBA 1	74.2
NBA 2	11.4

NBA = Next Best Alternative on the market.

RET value = evaporative resistance of one unit area of a material. The lower the RET value, the cooler the material feels on the body.

## CONCLUSION

Compared with NBA 1 and NBA 2, the H700 padding material has the lowest water vapor resistance, the best breathability.



## 2 AIR FLOW

When people wear a harness, the contact area between body and padding can pose discomfort. Ergonomic design reduces body contact around the neck and lower back – reducing chaffing and irritation and improving air flow.

### PURPOSE OF TEST

Assess contact area under pressure measurement to minimize body contact area and create air flow.

### TEST METHOD

Applying pressure to a pressure measurement film positioned on top of the harness. The film turns pink when pressure is added to the contact area, simulating how people wearing the harness perceive pressure. A lower contact area ratio\* means workers will benefit from more airflow, less thermal storage (heating), and an overall cooling effect.

### TEST RESULTS

The H700 has a contact ratio of 38.7% around the shoulder, 34.7% around the waist and 51.1% around the legs.

		SHOULDER	WAIST	LEG
H700	Total Area	 891.0 cm <sup>2</sup>	 927.0 cm <sup>2</sup>	 244.2 cm <sup>2</sup>
	Contact Area	 344.7 cm <sup>2</sup>	 321.8 cm <sup>2</sup>	 124.8 cm <sup>2</sup>
	Contact Ratio	 38.7%	 34.7%	 51.1%
NBA1	Total Area	 732.9 cm <sup>2</sup>	 1254.8 cm <sup>2</sup>	 462.7 cm <sup>2</sup>
	Contact Area	 696.6 cm <sup>2</sup>	 892.2 cm <sup>2</sup>	 415.4 cm <sup>2</sup>
	Contact Ratio	 95.0%	 71.1%	 89.8%
NBA2	Total Area	 711.1 cm <sup>2</sup>	 1398.2 cm <sup>2</sup>	 195.9 cm <sup>2</sup>
	Contact Area	 400.8 cm <sup>2</sup>	 520.3 cm <sup>2</sup>	 164.8 cm <sup>2</sup>
	Contact Ratio	 56.4%	 37.2%	 84.1%

Contact area ratio = Contact Area/Total Area \* 100%

Contact area = Total surface to contact with body

NBA = Next Best Alternative on the market.

### CONCLUSION

Compared with NBA 1 and NBA 2, the H700 padding has the smallest contact area and contact ratio, allowing optimal air flow breathability.

### 3 HEAT DISPERSION

Wearing PPE for extended periods of time can lead to an increase in body temperature, heat strain, thermal discomfort, or excessive sweating.

#### PURPOSE OF TEST

Measure temperature changes under the same constant heat supply (air movement and sweat)

#### TEST METHOD (according to the ASTM F2370 standard)

Measures the harness cooling performance to evaporative heat transfer, from a heated sweating thermal mannequin to a relatively calm environment. The higher the body temperature decrease, the better the breathability of the harness.

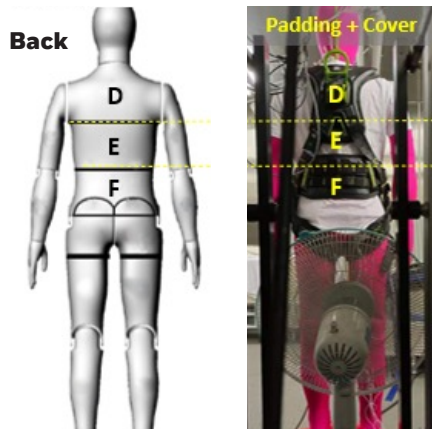
#### TEST CONDITIONS

Air speed=  $1\pm 0.3$  m/s

$T_{air} = 26^{\circ}\text{C}$

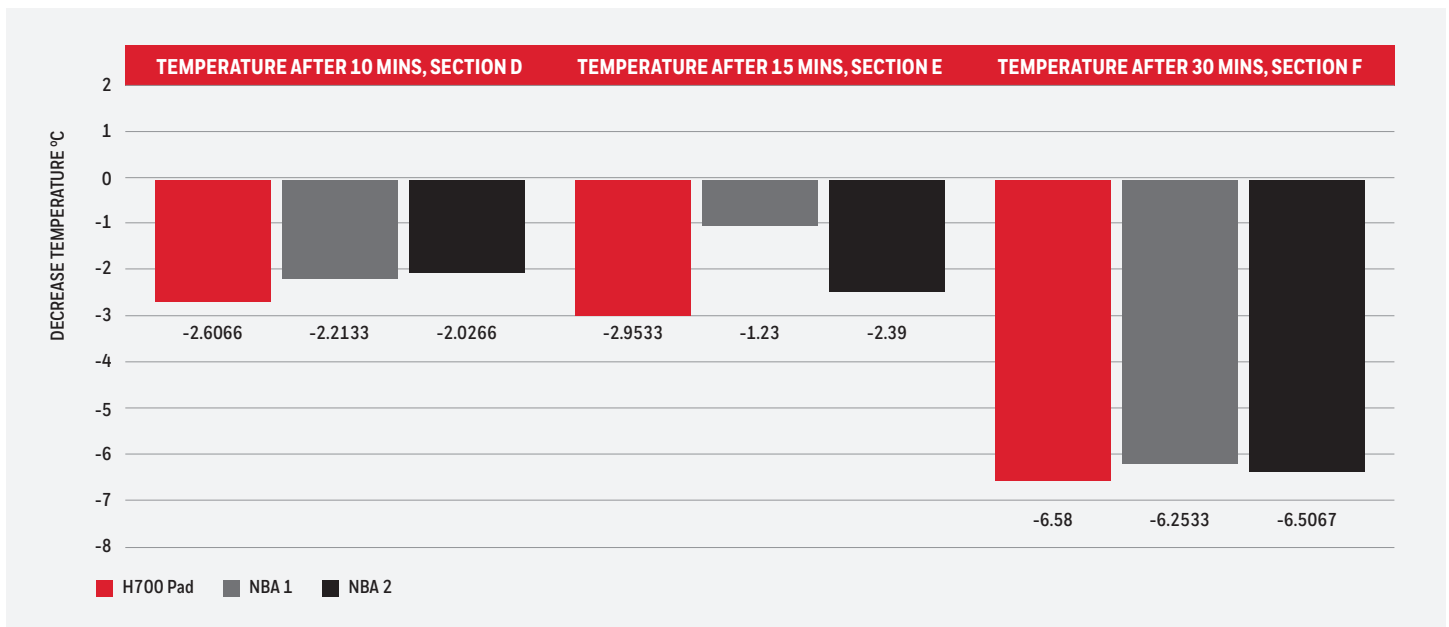
RH=50%;

#### H700



#### TEST RESULTS

After 30 mins in a room with 78.8°F (26 °C), the temperature on the back area decreases with -7.54°F (4.19°C), -7.36°F (4.09°C), -11.84°F (6.58°C), more than NBA 1 and NBA 2.



NBA = Next Best Alternative on the market.

#### CONCLUSION

Compared with NBA 1 and NBA 2, the H700 displays the best heat dispersion performance. The body temperature is lower, especially at the back D, E and F areas.



# 4 PRESSURE DISTRIBUTION

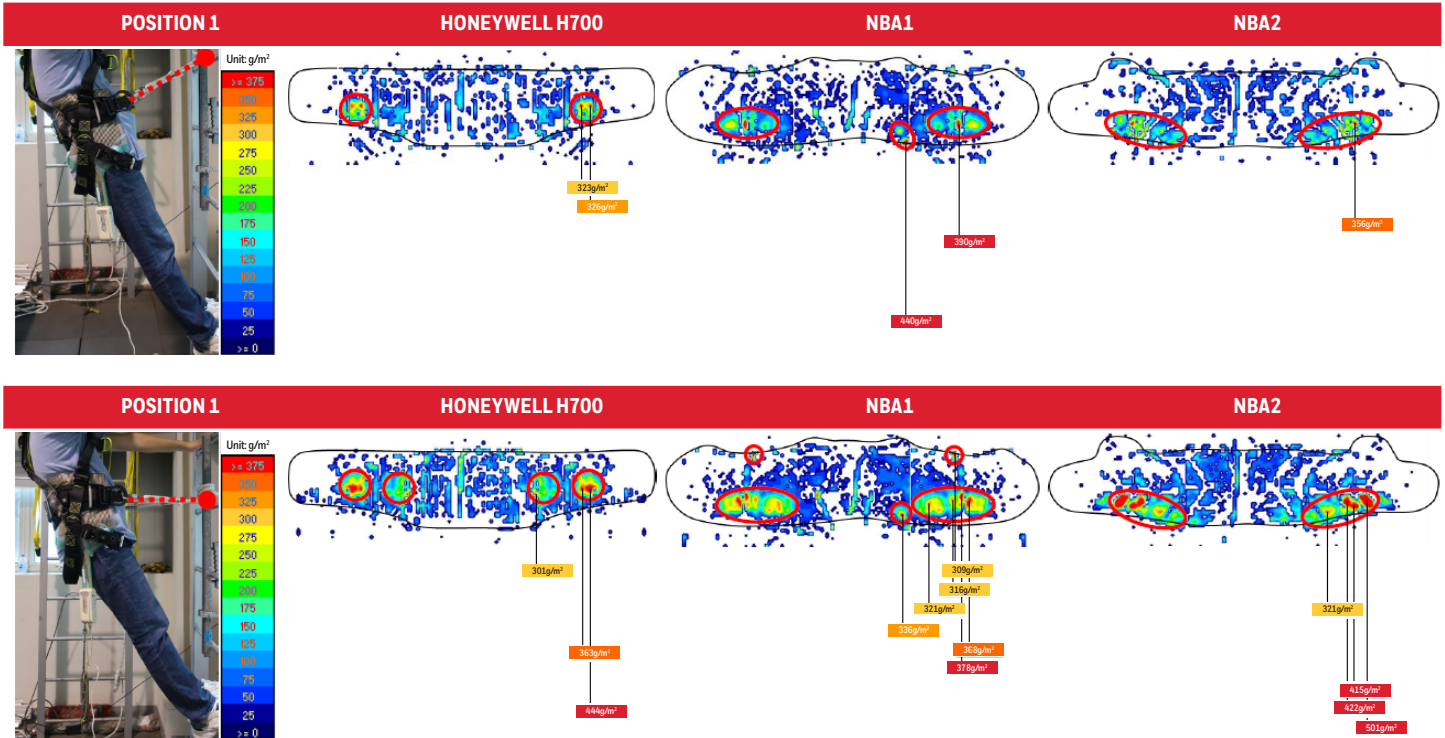
## PURPOSE OF TEST

This test measures the pressure distribution around the waist of a worker wearing a harness in various working at height positions. The more even the distribution, and the more the fabric extends, the more comfortable it feels for the wearer.

## TEST RESULTS

Working Position 1: the stressed area is smaller, and the maximum peak pressure is the lowest compared with the other 2 waist paddings.

Working Position 2: the stressed area is smaller, and the maximum peak pressure is lower is than NBA 2 and higher than NBA 1.



NBA = Next Best Alternative on the market.

Stressed area = Location in an object where the stress is significantly greater than the surrounding region.

Maximum peak pressure = Maximum level of resistance to airflow.

## CONCLUSION

Out of the 3 products tested, the H700 provides the most even pressure distribution.

# WHY YOU NEED THE H700

# THE DANGEROUS WORLD

# OF WORKING AT HEIGHT

## PROFESSIONS WITH SIGNIFICANT FALL FATALITIES

- Utility workers
- Construction workers
- General Industrial workers

## MAIN HAZARDS FOR WORKERS AT HEIGHT

- Worker fatigue/muscular fatigue
- Suspension trauma/slow rescue response time
- Harness not “buckled up” and/or adjusted correctly
- Not anchored (anchor point, back d-ring, lanyard with rebar hook, fall arrester)

## CAUSES OF WORKER FATIGUE

- Working at height
- Physically demanding, repetitive work
- Total weight of PPE increasing due to increased safety standards
- Non-ergonomic PPE – poor fit, constraining, non-breathable

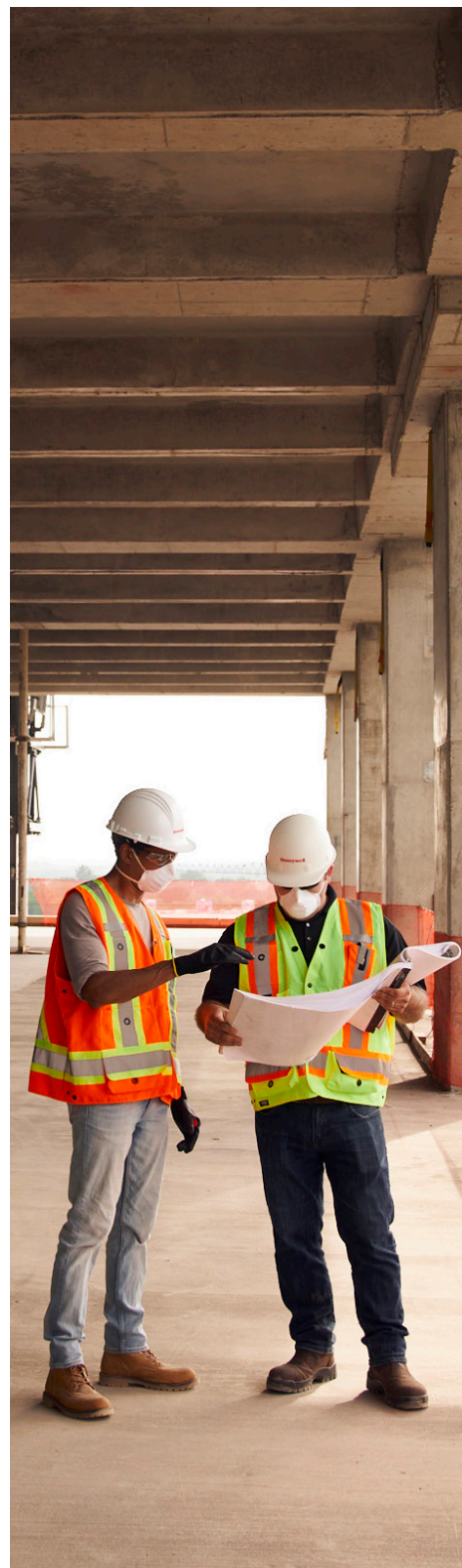
## ROOT CAUSES OF FALLS

- Not keeping eyes and mind on task
- Fall protection equipment, tools are too heavy
- Poorly designed harness is heavy and constraining
- Harness/fall protection equipment is counter-intuitive

## CHANGING THE FUTURE OF FALL PROTECTION

Innovation is central to translating scientific knowledge and technological know-how into useful products. Keeping workers safe is the driving force behind our constant innovation. It's also the foundation of future exciting features.

Learn more about **Honeywell Miller H700 Series**, scan the QR code below.



**For More Information**

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