Echelon Range

The Original Hydraulic Ankle

Blatchford

The Echelon Range

The Echelon range sits at the heart of our pioneering prosthetic philosophy which makes our products so popular with users around the world. Created with a sharp focus on replicating a natural and safe walking experience, each product in the Echelon Range has a characteristic to suit different users and their requirements, providing confidence in every step.

Echelon

For over a decade, the award-winning Echelon hydraulic ankle has been a popular choice for clinicians and their patients around the world. Echelon is a fantastic all-rounder and excels at those everyday activities.

Echelon^{VT}

EchelonVT combines hydraulic ankle technology with a rotation and vertical shock absorption element. It is ideal for higher activity scenarios where energy return is important or where users are likely to twist or change direction quickly.

Echelon^{VAC}

EchelonVAC combines hydraulic ankle technology with an elevated vacuum system for optimal socket technology. EchelonVAC is ideal for those wanting ultimate socket comfort and connection throughout the day.

Echelon^{ER}

EchelonER is our latest hydraulic ankle and has an extended range of ankle movement. It is ideal for more active or more confident users requiring more ground compliance on steep slopes and uneven terrain.

Unique and Proven Echelon Technology

For over a decade, the Echelon range has provided users with clinically proven* technology and is a popular choice worldwide.

- **E-Carbon Foot Spring Technology**
  This not only provides excellent energy storing and release properties but also works in harmony with the range of movement in the ankle to provide a natural and comfortable walking experience.

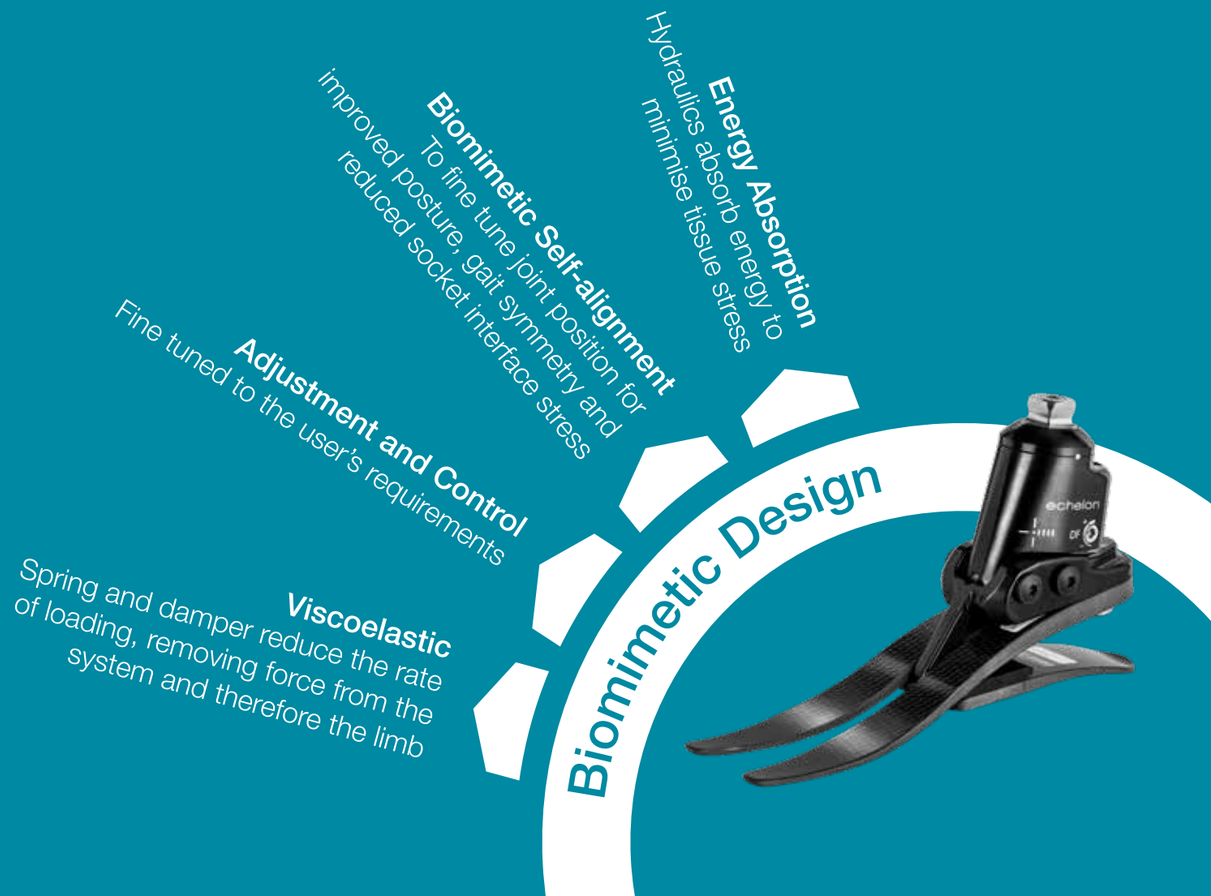
- **Natural Motion and Control**
  When walking up slopes, the additional range allows the body to move forward over the foot, reducing energy requirements by making rollover easier. When walking down slopes, the foot complies with the slope without forcing the leg forward, allowing for a more controlled descent.

- **Hydraulic Ankle Technology**
  Hydraulic damping and foot springs produce a visco-elastic response that simulates the behaviour of muscles by storing energy and releasing it at the right time. When compared to non-hydraulic ankles*, this technology is clinically proven to provide higher levels of comfort and safety, more natural walking, more balanced limb loading and overall greater patient satisfaction.

*Clinical studies, latest research papers and full references available on our website: https://www.blatchford.co.uk/prosthetics/professionals/clinical-evidence/

Echelon's biomimetic design follows the same sequence as the human foot: the hydraulics absorb and dampen energy at heel strike and, unlike elastic or fixed ankles that tend to apply unnatural forces, Echelon allows the tibia to stay in a natural position, while the foot self-aligns to the ground. Energy is then transferred through the carbon springs during tibial progression and returned at just the right time at toe-off.

The absorption of energy and the alignment of natural forces provided by Echelon can help to reduce socket interface pressures, therefore improving comfort for the user and promoting gait and postural symmetry. This can help reduce the risk of falls, preserve musculoskeletal wellbeing and enhance confidence.



Extensive studies into our biomimetic hydraulic technology have shown that Echelon can provide a number of benefits and improvements to quality of life.

Improved Safety

18% increase in toe clearance[1] reduces the chance of trips and falls.[2]
Reduction in centre-of-pressure deviation during standing, indicating better balance.[6]

Greater Control and Stability

Increased confidence in walking and negotiating variable terrain.[4–7]
Smoother motion while walking.[8-9]

Greater Comfort

60% reduction in socket stress.[10]

Balanced Limb Loading

Reduced chance of long term limb disease.[11-12]
Reduced contralateral foot plantar-pressure.[13]

Improved Energy Efficiency

11.8% reduction in energy cost on level ground.[14]
20.2% reduction in energy cost on slopes.[14]

Patient Satisfaction

33.4% increase for bilateral patients.[6]

Echelon

Suitable for submersion

The Original Hydraulic Ankle

For over a decade, the award-winning Echelon has provided users with clinically proven hydraulic technology and remains a popular choice for clinicians and their patients around the world.

Typical Activities and User Suitability

Echelon is ideal for lower and more active users wanting all the benefits of hydraulic technology in a lightweight and versatile package. Echelon would also be suitable for those wishing to progress from our AvalonK2 foot.

Echelon is a fantastic all-rounder and excels at those everyday activities such as shopping, walking the dog on varying terrains or taking public transport to work. Echelon is also there when you need it during more demanding activities or when you want to do more for longer, such as hill walking, riding a bike or gardening.

Features

- Unique and proven Echelon Technology
- Lightweight and waterproof for a versatile package
- Decade of popularity and proven performance
- Suitable for users progressing from lower activity feet

"With Echelon I don't need to worry about what terrain I'll encounter when I'm out and about, I'm confident that I can cope with anything I come across."

Elaine, Echelon wearer

Echelon^{ER}

Suitable for submersion

Extended Range of Movement

Our latest hydraulic ankle, EchelonER broadens the Echelon Range by combining all the unique features and award-winning technology of Echelon with an extended range of ankle movement. Featuring an all new robust and waterproof design, the extended range provides users with even more ground compliance on steep slopes and uneven terrain. Combined with improved accommodation of heel height, users have more flexibility with footwear choice and a seamless transition to barefoot walking is possible.

Typical Activities and User Suitability

EchelonER is ideal for more active or more confident users wanting all the benefits of hydraulic technology but requiring an extended range of movement for steeper slopes and a robust design for more demanding activities. EchelonER is therefore perfect for those that enjoy using the standard Echelon and have a good level of confidence and control but require that added range of movement.

EchelonER is ideal for those everyday activities such as shopping and walking the dog but also when you need added confidence for those more demanding activities, such as hiking.

Features

- Unique and proven Echelon Technology
- Increased range of movement – 25° compared to Echelon's 9°
- Improved flexibility of footwear choice and the option of barefoot walking
- Robust and waterproof design

EchelonVT

Suitable for outdoor use

Rotation and Vertical Shock Absorption

EchelonVT combines Echelon Technology with a rotation and vertical shock absorption component which is designed to reduce the forces exerted on the residual limb. This allows the twisting forces to be absorbed by the ankle rather than be transmitted to the socket interface.

EchelonVT is ideal for higher activity users wanting all the benefits of hydraulic technology but requiring a system that provides greater energy return, shock absorption and generally a more dynamic and livelier feel.

Typical Activities and User Suitability

EchelonVT excels in higher activity scenarios where energy return is important or where users are likely to twist or change direction quickly. It is therefore ideal for those wishing to play golf, go hiking, rock climb or even for activities at work, such as painting and decorating.

Features

- Unique and proven Echelon Technology
- Rotation and vertical shock absorption
- Greater energy return
- More dynamic and livelier feel

"Throughout a busy day, EchelonVT allows me to concentrate more on my activities rather than worry about whether my foot is up to the job."

Lee, EchelonVT wearer

Echelon VAC

Suitable for outdoor use

Integrated Elevated Vacuum

EchelonVAC combines Echelon Technology with an elevated vacuum system for optimal socket connection.

With each step, the user presses their weight into the prosthesis, initially expelling air through a one-way valve. Simultaneously the ankle plantarflexes, actively drawing air out of the socket. This air is held in the vacuum chamber and expelled through a secondary one-way valve as the tibia progresses and the ankle dorsiflexes. The elevated vacuum reduces relative movement[15-16] and helps to maintain limb volume[16], improving proprioception and control of the prosthesis.

Typical Activities and User Suitability

EchelonVAC is ideal for medium to high activity users wanting all the benefits of hydraulic technology but requiring a system that provides ultimate socket comfort and connection throughout the day.

For users that may experience skin irritation, EchelonVAC offers a suitable solution and is designed to promote healthier residuum tissue[17] which allows wounds to heal on the residual limb[18].

Features

- Unique and proven Echelon Technology
- Vacuum system for ultimate socket connection throughout the day
- Designed to promote healthier residuum tissue
- No power required, quiet gentle operation

"As an amputee, I think vacuum is one of the most important things for me that helps with the feel and the comfort of the socket."

Charlie, EchelonVAC wearer

Echelon Range Guide

Product	Echelon	EchelonER	EchelonVT	EchelonVAC
Max User Weight	125kg	125kg	125kg	125kg
Activity Level	3	3	3	3
Size Range	22-30cm	22-30cm	22-30cm	22-30cm
Narrow Option	25-27cm	22-27cm	25-27cm	25-27cm
Wide Option	25-27cm	25-30cm	25-27cm	25-27cm
Component Weight†	688g	770g	855g	700g
Build Height	Sizes 22-24 -115mm Sizes 25-26 - 120mm Sizes 27-30 - 125mm	Sizes 22-24 - 142mm Sizes 25-26 - 147mm Sizes 27-30 - 152mm	Sizes 22-24 - 168mm Sizes 25-26 - 173mm Sizes 27-30 - 178mm	Sizes 22-24 - 121mm Sizes 25-26 - 126mm Sizes 27-30 - 131mm
Heel Height	10mm	10mm	10mm	10mm
Range of Movement	9° (3° DF/6° PF)	25° (6° DF/19° PF)	9° (3° DF/6° PF)	9° (3° DF/6° PF)
Waterproof	Yes	Yes	No	No
Weatherproof	Yes	Yes	Yes	Yes
Sandal Toe	Yes	Yes	Yes	Yes
Warranty*	36 Months	36 Months	36 Months	36 Months
Vacuum System	No	No	No	Yes
Rotation/Vertical Shock Absorption	No	No	Yes	No
Part Number	EC	ECER	ECVT	EVAC

†without Footshell + size 26cm. *Foot shell 12 months, glide sock 3 months.

Spring Selection Guide

Activity Level 2 and 4* users who would benefit from this foot will require softer or stiffer springs as appropriate for the individual.

Spring set recommendations are for trans-tibial users. For trans-femoral we suggest selecting a spring set one level lower.

User Weight

Activity	44-52 / 100-115	53-59 / 116-130	60-68 / 131-150	69-77 / 151-170	78-88 / 171-195	89-100 / 196-220	101-116 / 221-255	117-125 / 256-275	kg / lbs
3	1	2	3	4	5	6	7	8	Foot spring set
	•		••		•••		••••		◀ Axial shock spring rate indicated as shown***
	1		2		3		4		◀ Axial spring***

*Maximum user weight 100 kg and always use one higher spring rate category than shown in Spring selection table. *** Applicable for EchelonVT only.
†Component weight shown is for a size 26cm without foot shell.

Specifications

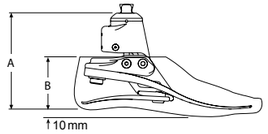
Echelon

Max. User Weight: 125kg
Activity Level: (2), 3, (4*)
Size Range: 22cm-30cm
Component Weight: 688g†

Order Example

Product Code	Size	Side	Width**	Spring Set	Sandal Toe
EC	25	L	N	3	S

**Narrow (N) and Wide (W) available for sizes 25-27 only. For dark tone add suffix D.
Example: foot size 25, left, narrow, spring rating 3, sandal toe.



Build Height

Size	A	Size	B
22–24	115mm	22–26	65mm
25–26	120mm	27–28	70mm
27–30	125mm	29–30	75mm

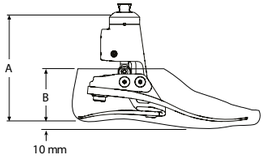
EchelonER

Max. User Weight: 125kg
Activity Level: (2), 3, (4*)
Size Range: 22cm-30cm
Component Weight: 770g†

Order Example

Product Code	Size	Side	Width**	Spring Set	Sandal Toe
ECER	25	L	N	3	S

**Narrow (N) and Wide (W) available for sizes 25-27 only. For dark tone add suffix D.
Example: foot size 25, left, narrow, spring rating 5, axial spring 3, sandal toe



Build Height

Size	A	Size	B
22–24	142mm	22–26	65mm
25–26	147mm	27–28	70mm
27–30	152 mm	29–30	75mm

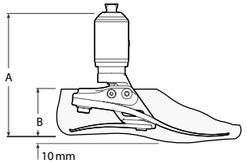
EchelonVT

Max. User Weight: 125kg
Activity Level: (2), 3, (4*)
Size Range: 22cm-30cm
Component Weight: 855g†

Order Example

Product Code	Size	Side	Width**	Spring Set	Axial Spring	Sandal Toe
ECVT	25	L	N	5	3	S

**Narrow (N) and Wide (W) available for sizes 25-27 only. For dark tone add suffix D.
Example: foot size 25, left, narrow, spring rating 5, axial spring 3, sandal toe



Build Height

Size	A	Size	B
22–24	168mm	22–26	65mm
25–26	173mm	27–28	70mm
27–30	178mm	29–30	75mm

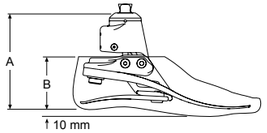
EchelonVAC

Max. User Weight: 125kg
Activity Level: (2), 3, (4*)
Size Range: 22cm-30cm
Component Weight: 700g†

Order Example

Product Code	Size	Side	Width**	Spring Set	Sandal Toe
EVAC	25	L	N	3	S

**Narrow (N) and Wide (W) available for sizes 25-27 only. For dark tone add suffix D.
Example: foot size 25, left, narrow, spring rating 3, sandal toe.



Build Height

Size	A	Size	B
22–24	121mm	22–26	65mm
25–26	126mm	27–28	70mm
27–30	131mm	29–30	75mm

References

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Clinical studies, latest research papers and full references available on our website: https://www.blatchford.co.uk/prosthetics/ professionals/clinical-evidence/

Patents: US8308815, GB2536056, EP2124843 App, EP2124842 App, US8574312, US7985265, US8740991, US8641780, JP5336386, JP5560045, WO 2007/054736, WO 2008/071975, WO 2008/103917

An annual visual inspection is recommended. Check for visual defects that may affect proper function. Maintenance must be carried out by competent personnel. Before carrying out any new activities of daily living, please check with your clinician whether specific training is required.

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