

The Last



Trend

Design

3d Cad

Product
Development

Sourcing

Manufacturing

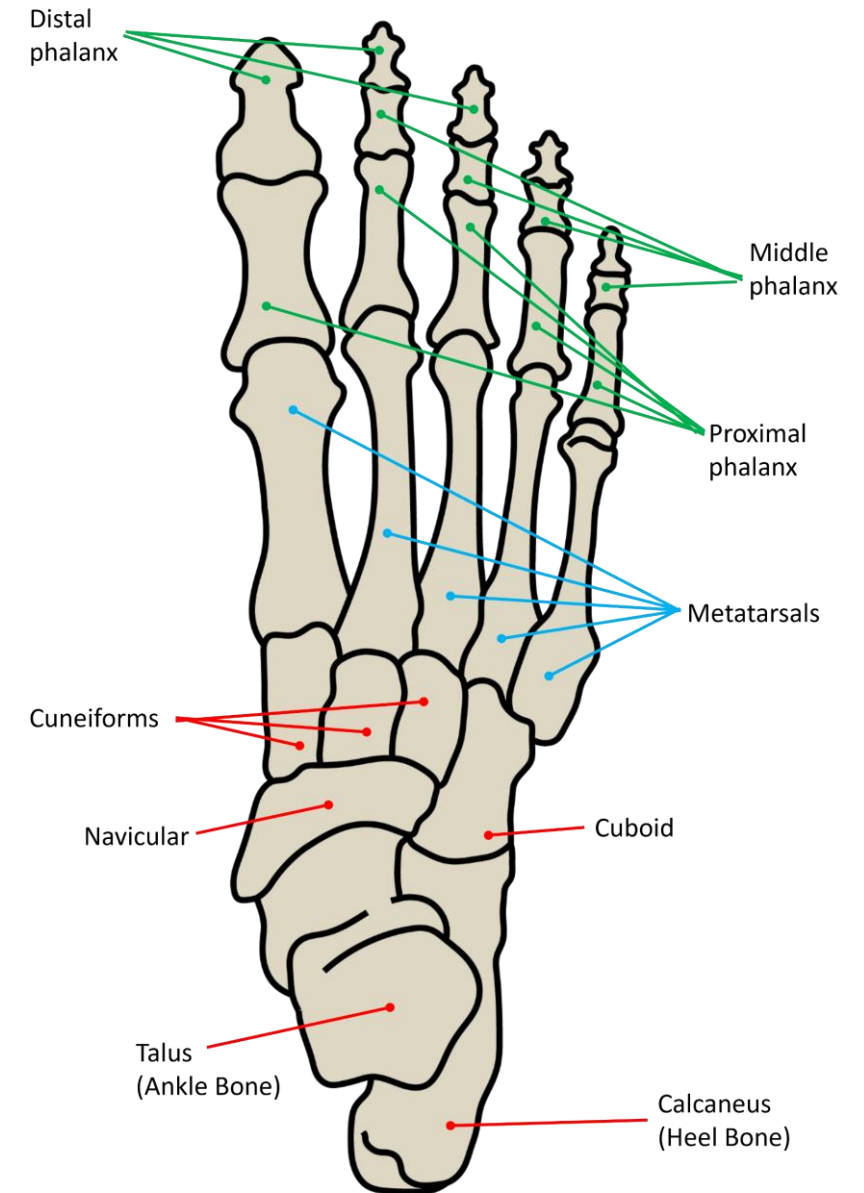
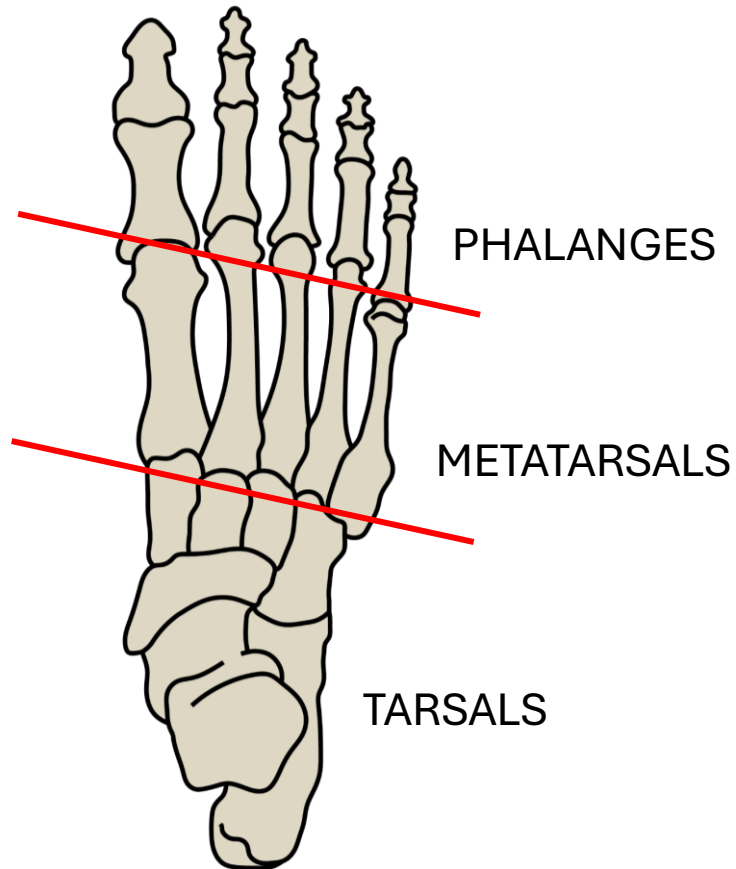


Foot anatomy - Bones

Footwear was primarily created to protect the foot so it is essential to consider the elements of foot anatomy

The Adult human foot has **26 bones** divided into three groups:

Phalanges Metatarsals Tarsals



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Foot anatomy - Joints

Ankle Joint – Hinge

Tibia and Fibula form a socket into which the top of the Talus fits

Sub Talar Joint – Gliding - Talus glides onto the calcaneum

Mid Tarsal joint – Gliding and socket and ball

Cuboid glides against the calcaneum

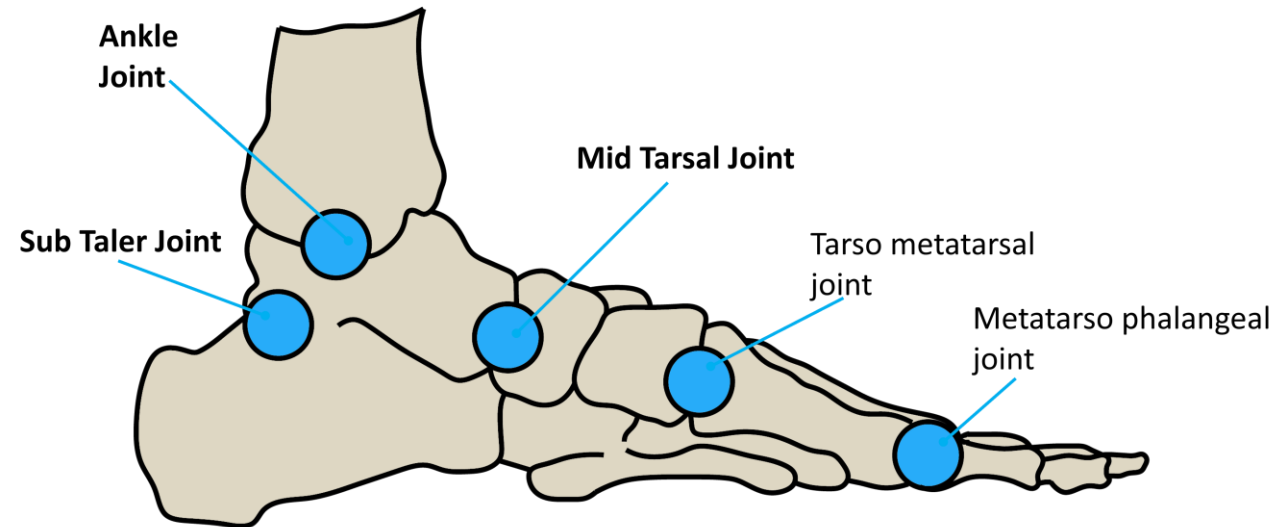
Scaphoid forms a socket for the talus

The ankle joint allows the foot to move up and down and the sub Talar and Mid tarsal joints allow it to move from side to side

Tarso metatarsal joint – Gliding

Cuboid, cuneiforms and metatarsus allows the small flexion movements and also allows the foot to turn in and out.

Metatarso-phalangeal joint – Socket and ball during childhood – later hinged action only



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Last creation

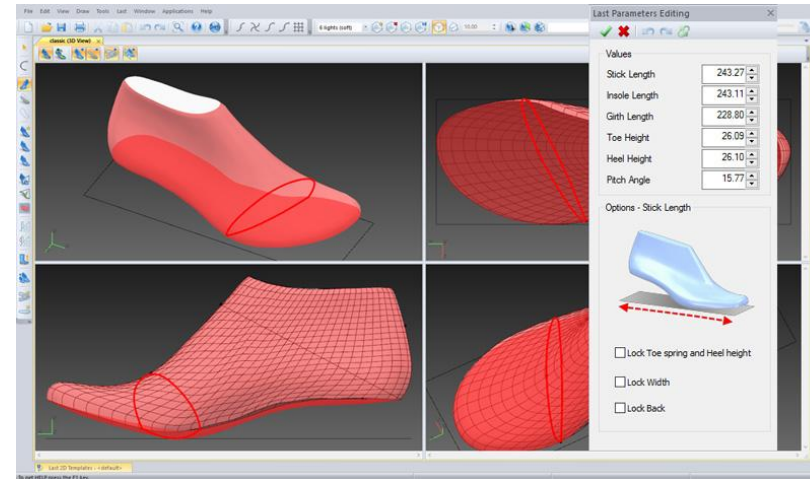
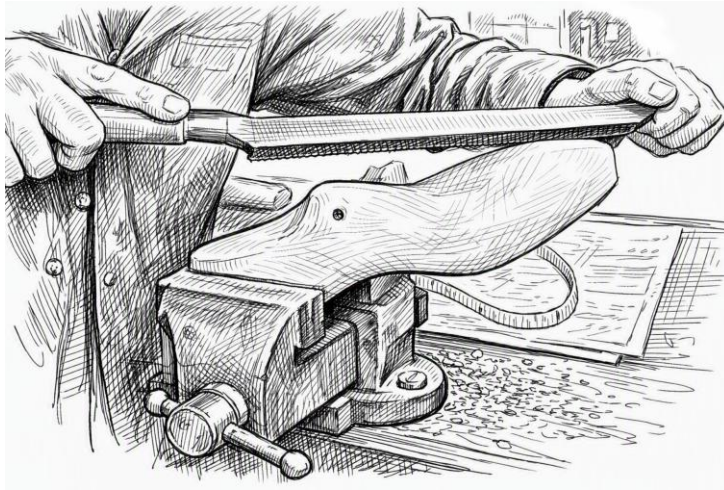
The last is the starting point of every shoe. Every part of the design and shoe making process is driven from the last.

The last determines many factors of the shoe. It creates the fit, performance, ergonomics and fashion style of a shoe.

If the last is incorrect then design and shoemaking will suffer throughout the process. This would be very costly.

Lasts are based on the human foot shape, however over the years, different functions of footwear and fashion have generated thousands of variants.

The Last making process is a very skilled profession requiring a lot of knowledge and a good eye. Traditionally the last maker starts by using rasps and sandpaper to shape the last from a block of wood. Most lasts are based on a family tree of lasts so the Last maker will choose one close to what the designer desires. The last maker can then make alterations like toe shape, heel height to the last to create a brand new one.



This image above shows the last maker shaping the toe of a men's Last. When he has the desired shape, he will use fine sandpaper to smooth the roughness.

As well as the tradition method, the last maker has digital tools as well. The software can hold all the family tree of lasts. Using the powerful 3d tools the last maker can alter the pitch, toe spring and characteristics of the last. The software can also grade the last and produce templates like the Last Bottom pattern. Many last makers combine the traditional and the modern. They may make the last by hand and then scan the last to get it into the 3d software.

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Last measurements

The last as drives all the essential measurements for a good fitting shoe.

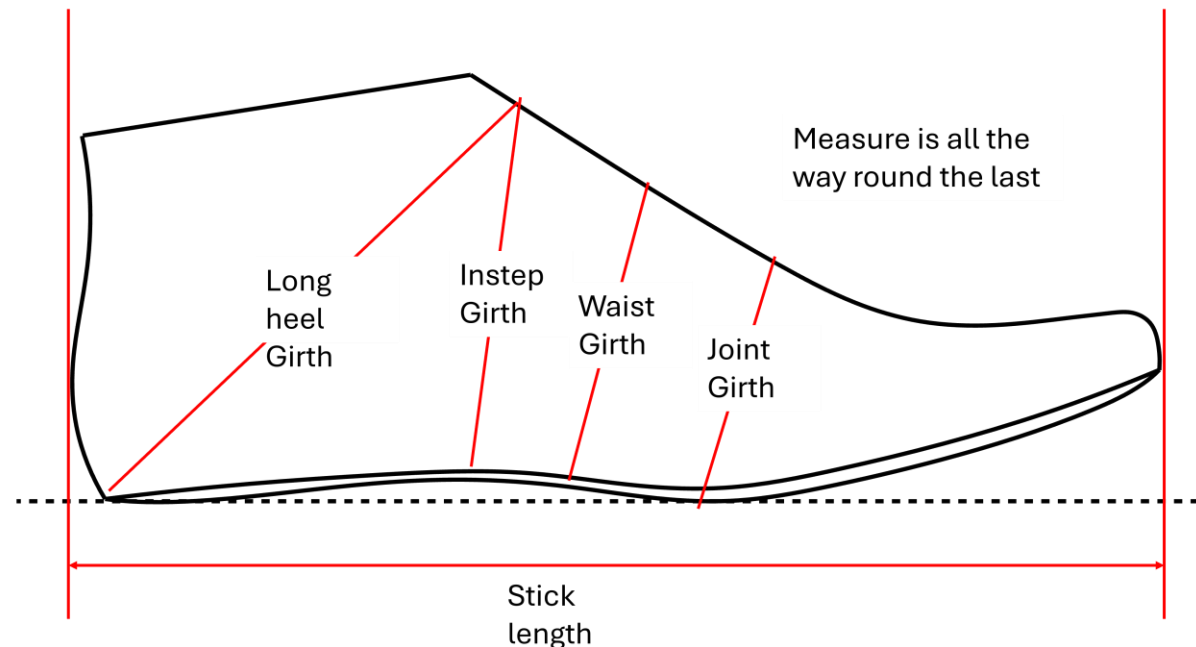
Every human foot is different but over the years standards have been created. For example, fitting lengths and widths. The most common used are UK, US and Paris Point(EU) systems.

US	UK	EU	CM
4	3	37	22.9
4.5	3.5	37-38	23.3
5	4	38	23.8
5.5	4.5	38-39	24.1
6	5	39	24.8
6.5	5.5	39-40	25.1
7	6	40	25.4
7.5	6.5	41	25.8

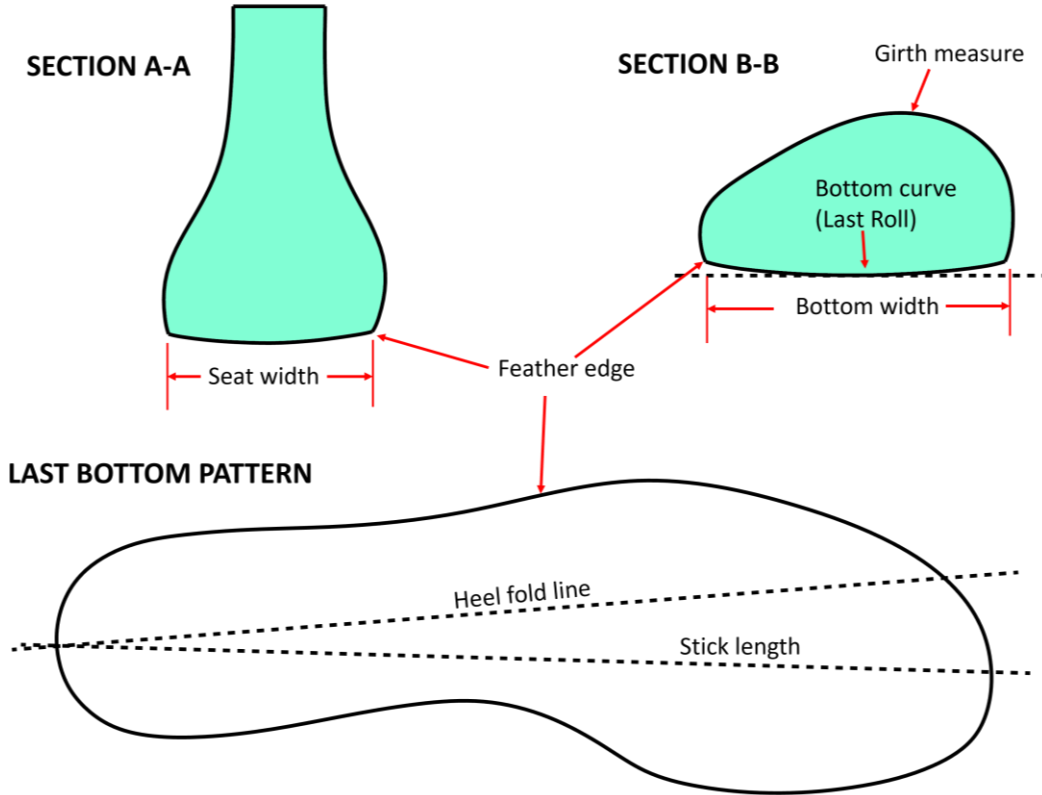
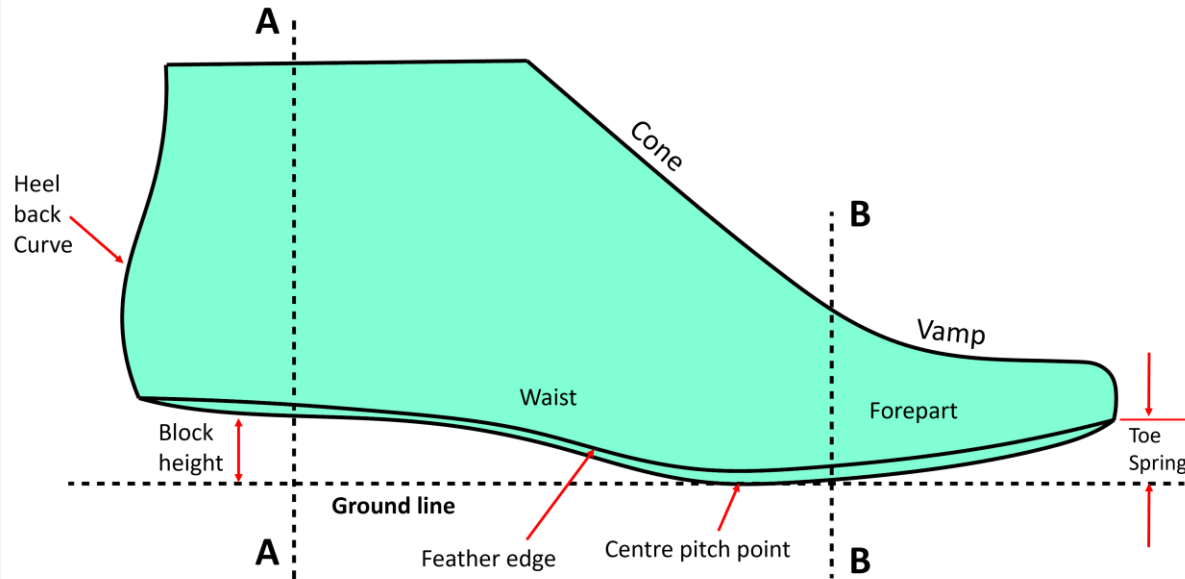
The last maker will use the international recognised measures to make sure the last will create a comfortable fitting shoe.

Each size and gender of last will have a chart of measurements. For example if the Joint girth on a women's size 4E is 210mm, then the Last maker will make sure his last is within a small tolerance of that. Increasing the joint girth to 216mm would then change the fit from a 4E to a 4F.

Below are some of the key measurement areas for a last maker to work to.



Last parts



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Last pitch

The importance of pitch

The last pitch is very important and effects both the function and the design of the shoe. Pitch too low and the wearer will feel like they are falling backwards, pitch too high and the opposite effect will be felt.

Photo 1 shows the last sitting as gravity intended. The centre pitch point is slightly further back than it should be. You can see the last is falling backwards as the block height is non existent.

As a result the Toe Spring looks visibly high



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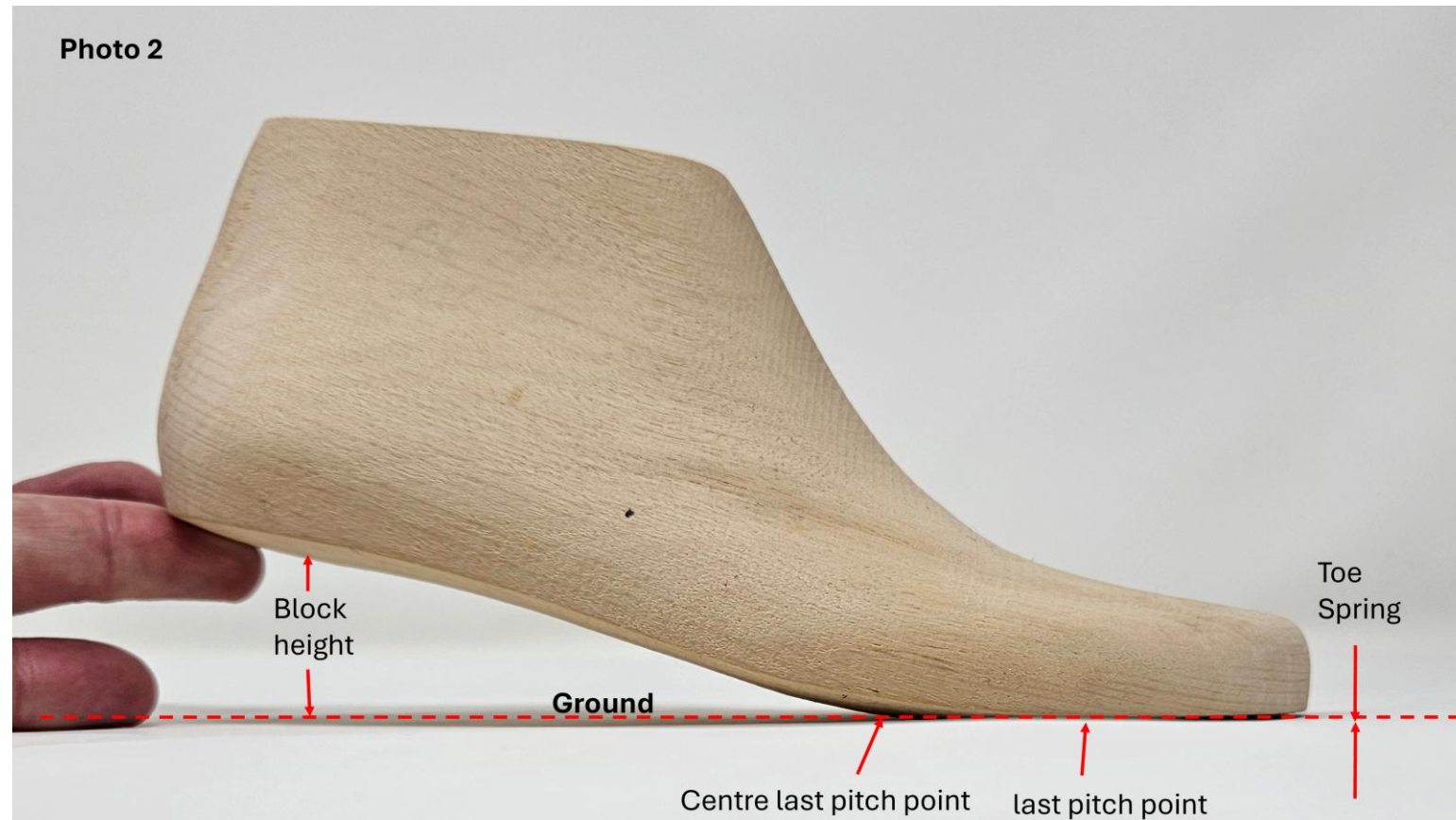


Last pitch

The importance of pitch

Photo 2 shows the last pitch is too high. The result is the last pitch point is too far forward and the toe spring is non existent. The lack of toe spring can cause the wearer to trip, especially on carpets. It also doesn't make good shelf appeal for the shoe. However in the 'Barefoot' world of brands, no toe spring is not always seen as a negative.

You can see the Block height is far too high for this particular last. The wearer will definitely feel like they are falling forward.



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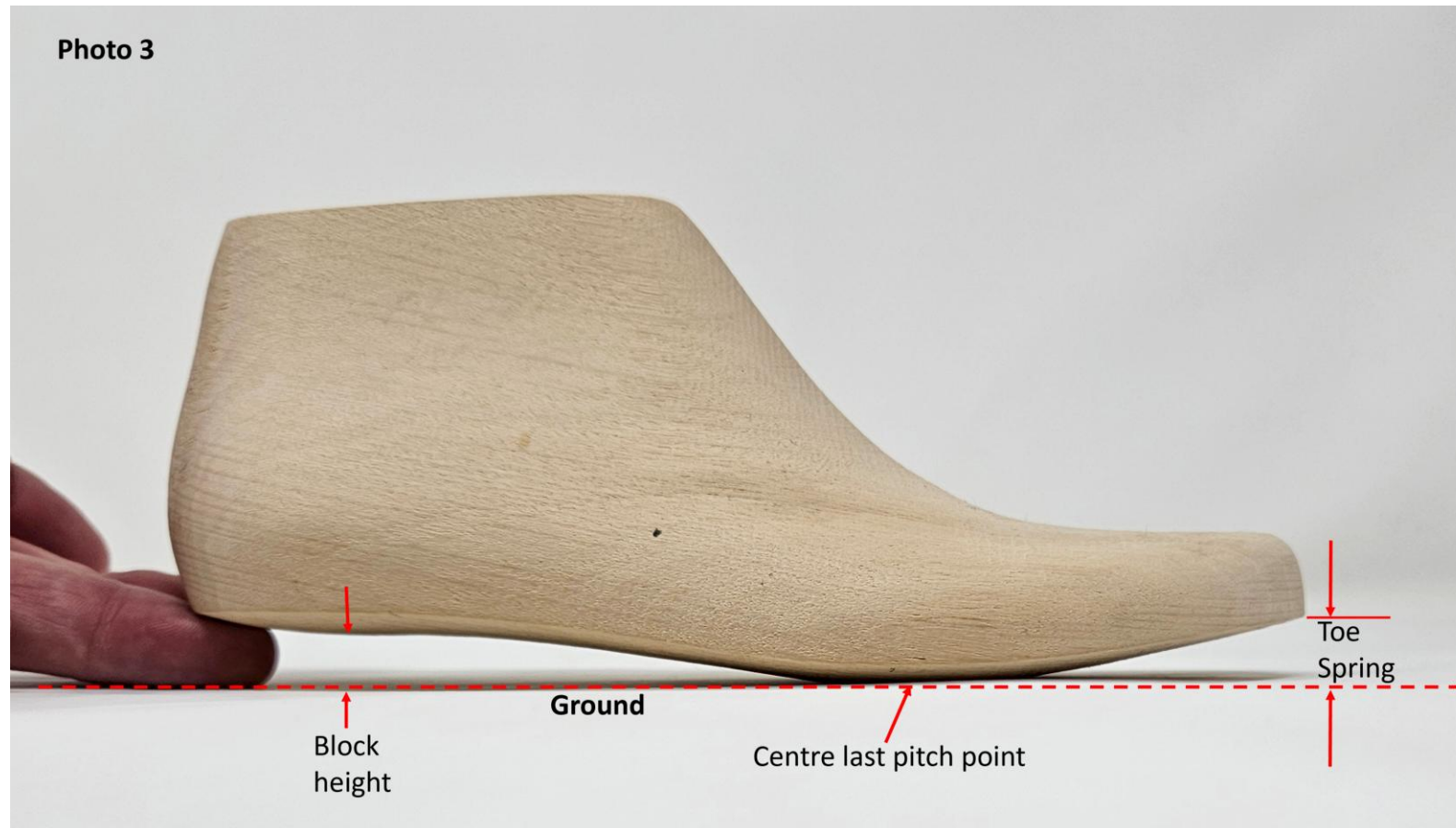
Manufacturing



Last pitch

The importance of pitch

Photo 3 shows the last in its correct pitch. The toe spring is much more pleasing to the eye and the last is pitching correctly on the ball. The Block height adjustment has the last sitting in a horizontal plane in the seat area meaning the wearer is not feeling like they are falling forwards or tipping back.



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Last production

Last for production

When the last has been signed off by the last maker and the designer it goes through the development and commercialisation phases. This includes making a shoe on the last it to check the fit.

If the shoe does not fit correctly then the last is adjusted and checked again until passed.

After passing fit, the last will be graded into the other sizes. Most companies will work on a sample size 8 men's last. Women's is normally created on a size 4 or 5.

Production lasts are often made of plastic as you can see below. These are machined on industrial Lathes.

Where the shoemaking construction requires a lot of heat like Wellie and vulcanised footwear (think Converse and Vans) or direct moulded shoes, then the production lasts will be made from aluminium.



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