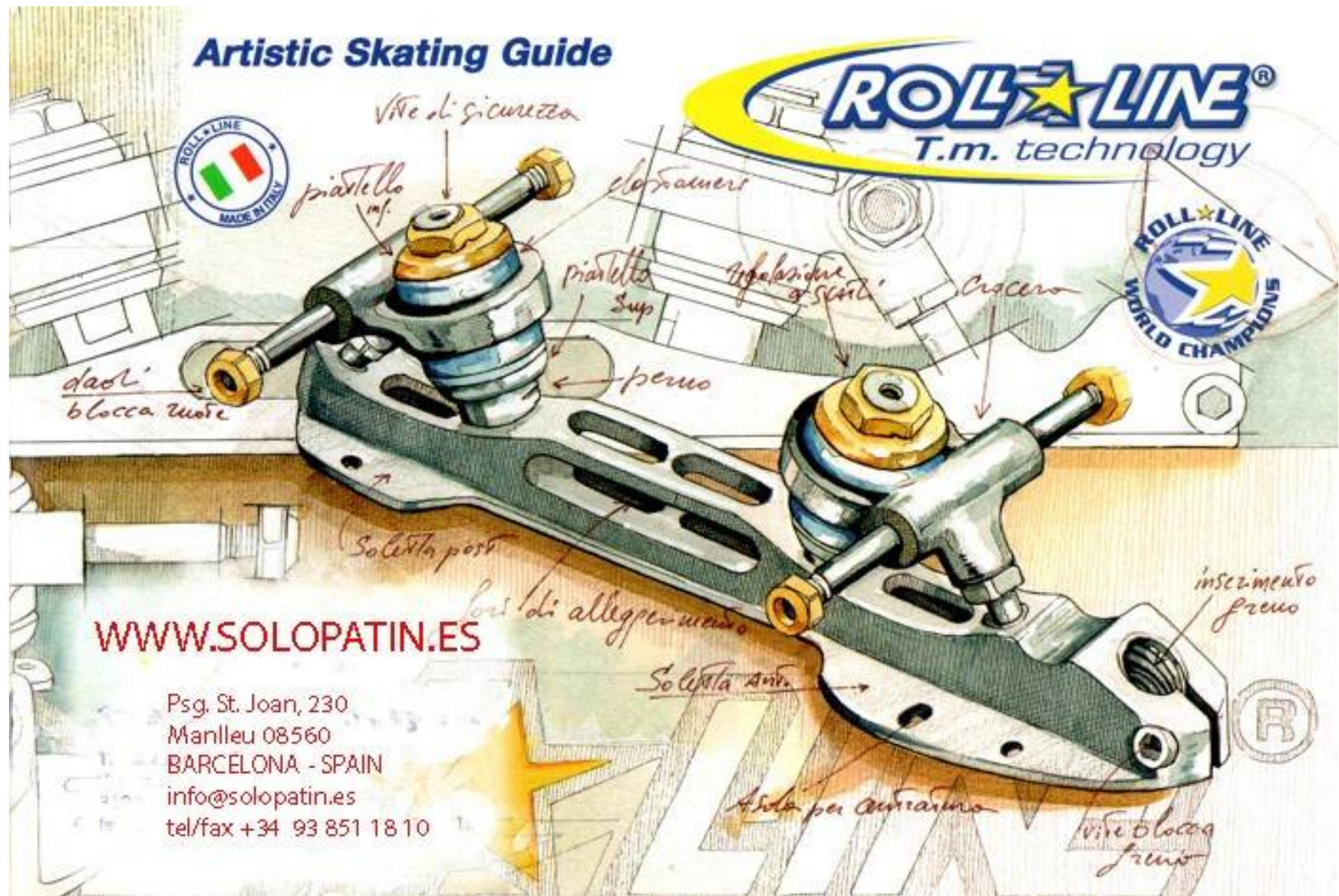


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New studies in the biomechanics of skating have been promoted with the collaborative efforts of engineers, instructors and sports physicians.

ANATOMY OF THE FOOT

The foot is an anatomical structure comprised of 26 bones and 36 joints.

The functions it performs are:

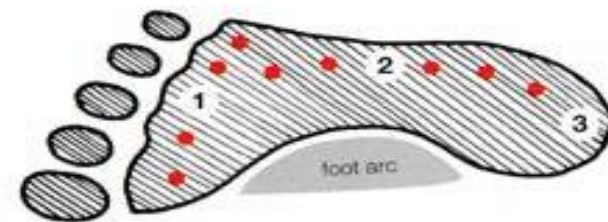
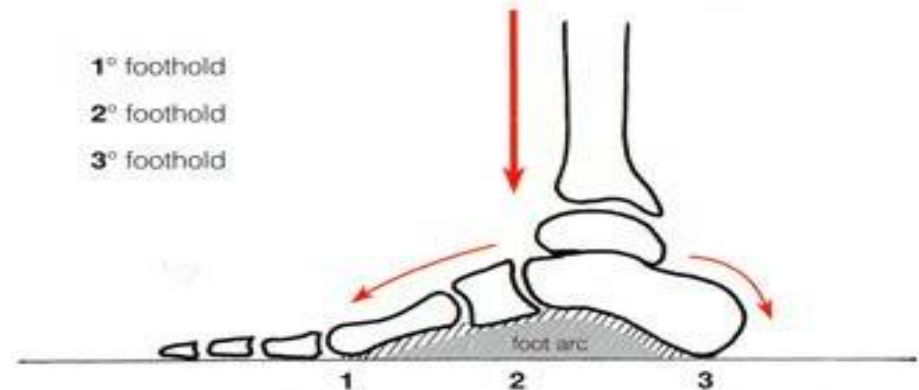
- Support
- Shock absorption
- Function of movement
- Receptive structure

The weight of the body is unloaded to the ground through the base of the foot during both the static phase (when standing) and dynamic phase such as when walking, running or jumping.

The arch of the foot, formed by the joints and capsular ligaments, performs the role of shock absorber during walking.

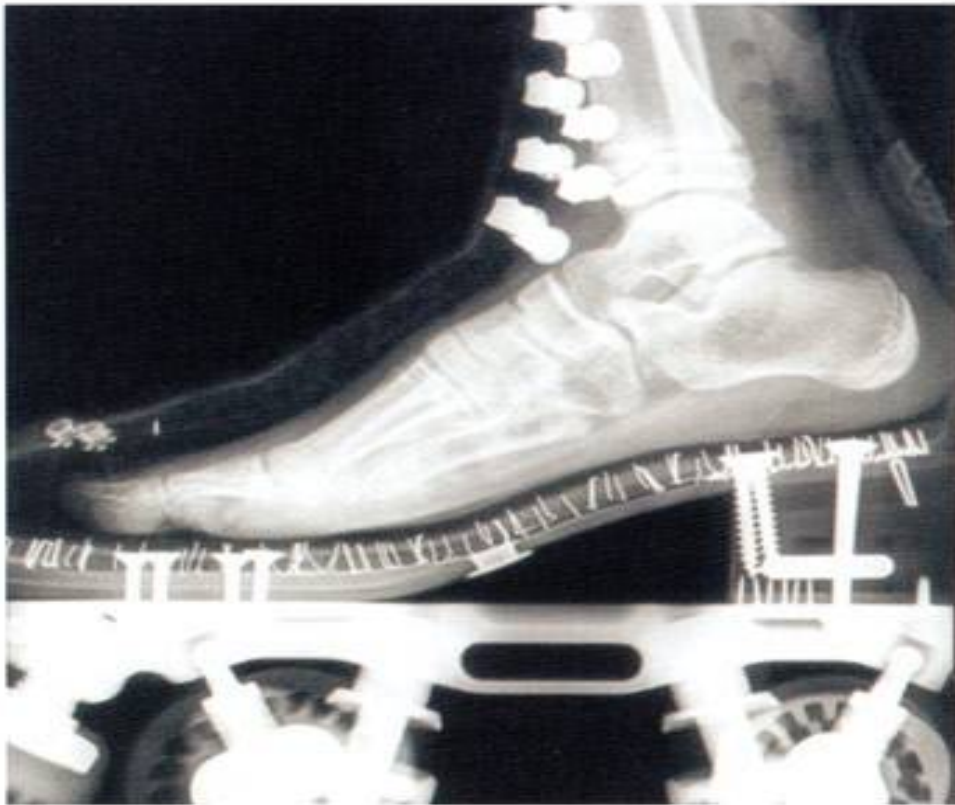
The skin and subcutaneous tissue are filled with nerve endings and, in fact, the sole of the foot has a high number of sense receptors (in terms of density, just slightly less than those of the hand). The foot may be defined as the point-of-entry of external stimuli.

The base of support of the foot is scalene triangle in shape and its vertices correspond to the heel and first and fifth metatarsus. The distances between the heel and metatarsal heads ensure that body weight is distributed in these three points as follows: 3 parts on the heel, 2 parts on the first metatarsus and 1 part on the fifth metatarsus.

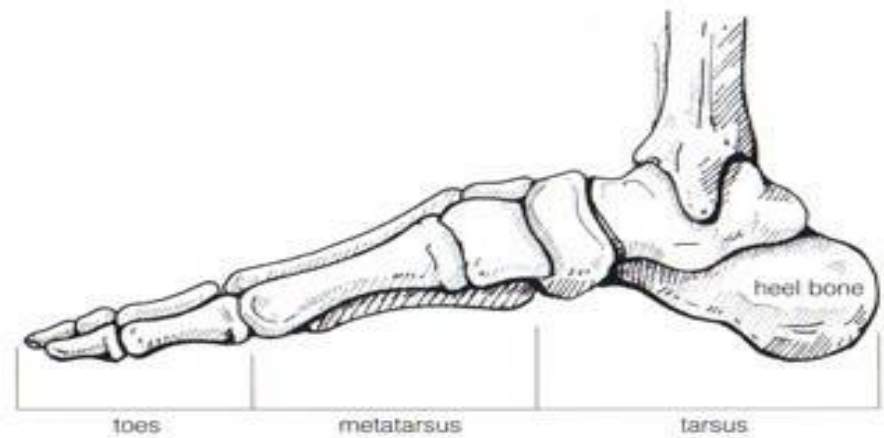


foothold (tripod)

FOOT-BOOTS-PLATE RELATION



Radiography of the foot inside of the skate - lateral view



right foot skeleton - lateral view

BOOT CHARACTERISTICS

During skating, the foot presses down on the internal and external wheels in order to perform a curve.

Therefore, a good roller skating boot must allow for this action to be transferred in a manner that is complete (without loss of energy) and precise (even minimum variation in pressure on the plate must be felt).

The sole and heel must be perfectly flat. A curved sole is not suitable for roller skating because a part of it would not rest on the plate itself.

The boot must be comfortable and of proper length (neither too long or too short). Under no circumstances must the foot slide around inside the boot. The vamp must be reinforced to avoid it giving way from the pressure of the foot, but, at the same time, it must be flexible in order to absorb the energy from the impact with the ground during jumps.

In addition, the boot must reach above the ankle and be reinforced to augment ankle stability. A lace binding must be used for individualized closure (varying degrees of tightness).

Suggestion:

Since there are many companies that produce boots and numerous models on the market, we suggest you purchase a boot that not only suits your specialty and level of training but also that best fits your foot.



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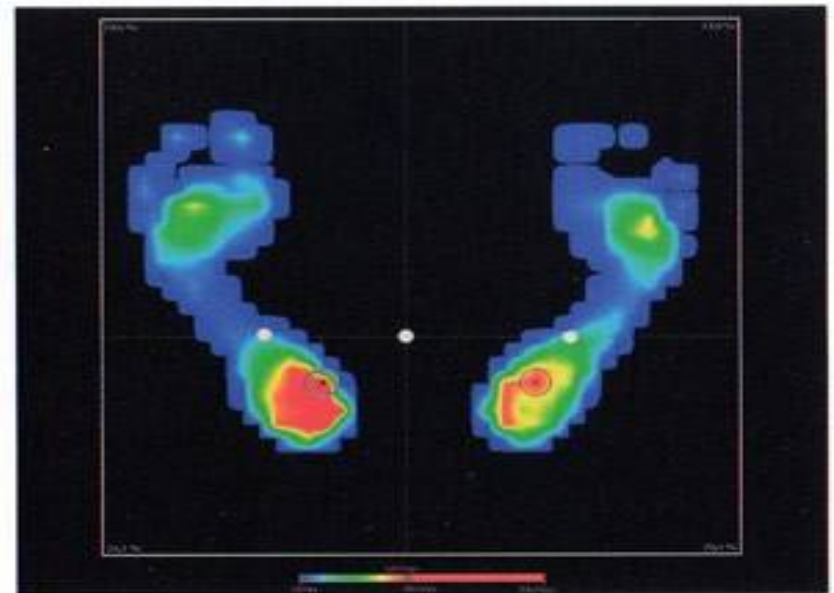
BOOT-FRAME

From a biomechanical standpoint, the foot with its triangular base of support distributes body weight in a ratio of 3 (2:1). It is clear that the resulting weight tends to be oriented medially (towards the inside) of the foot since the weight falls on the first metatarsus and more towards the inside with respect to the fifth metatarsus, thus making the support triangle a scalene triangle. This gives rise to the following question: Where must skate axels be placed in relation to the position of the weight-bearing points of the foot?

The best solution is to position the rear axel at the center of the heel and the front axel level with the first metatarsus. To better distribute the weight between the first and fifth metatarsus, the base plate position must be shifted slightly towards the outside. The positioning of the plate is an individual question and also depends on whether the right or left foot is involved. Matrix, Energy, Energy Steel, Mistral, Dance, Giotto and Ring skates models are made with two, oval-shaped fastening holes so that the base plate can be positioned correctly and easily.

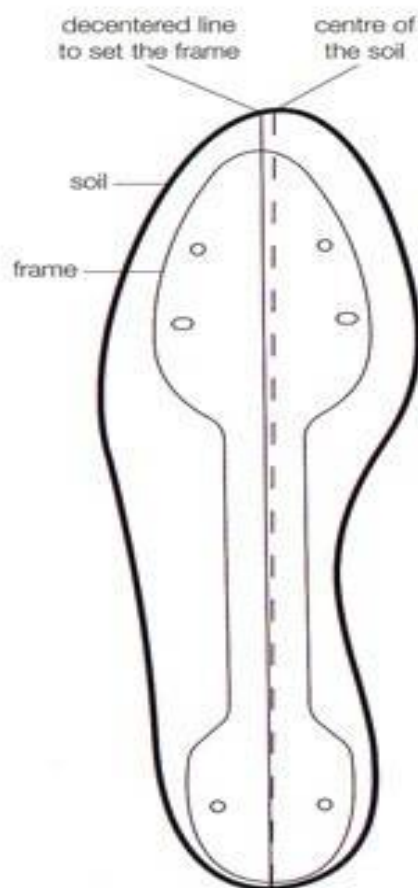


Medical foot analysys



Colored parts represent pressure points

BOOT-SLIDER PLATE ASSEMBLY



First of all it is extremely important to check that the slider plate is the correct size for the boot, see the comparison table (page 8).

Find a support and set the boot with the sole facing upward.

Remove the cross-piece from the slider plate as this will make operations easier.

Mark the exact midpoint in the length of the sole and heel.

Set the slider plate on the sole and center it on the heel while, at the front of the sole (the tip) the slider plate must be centered but shifted a few mm toward the outside of the sole; i.e. for a measurement of 38 it should be shifted approximately 3 mm.

The slider plate is to be positioned approximately 1 mm inside the end of the heel; at the front, there is no specific position requirement as long as the frame measurement is correct.

Then mark the holes. It is best to mark only the rear and central holes.

Once the points have been marked on the sole, drill the back and central parts with a 4.25 mm bit, insert the screws, and partially secure the rear and central parts. Check that the slider plate is correctly positioned and then drill the front part and secure the whole, cut off the excess portion of the screws, file down any remaining shavings and then, using a hammer and stamp, tighten the screws so that the nut does not come loose.

FREESTYLE FRAMES



MATRIX



ENERGY



ENERGY STEEL



MISTRAL



MARINER CUP



VARIANT



VARIANT F



MIRAGE

FIGURE FRAMES



RAFFAELLO



GIOTTO



RING



DANCE

DANCE AND SOLO DANCE FRAME



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FRAME CHARACTERISTICS

They must be extremely light-weight, impact resistant and with easy maneuverability. Light weight and resistance are obtained using high-quality aluminum alloy materials normally utilized in the aerospace sector (e.g., ergal). Other detailing traditionally made of steel has now been replaced by titanium alloys for enhanced lightness and safety and to reduce ballast during jumps. It should be remembered that the heavier the skate, the greater the effort required by the athlete to perform a jump. The design and construction phase of the plate is very important. The boot must rest solidly on the plate which, in turn, must respond to the impulses received in a reliable, rapid manner. The ability of the plate to execute curves depends on the force exerted by the foot on its internal or external edge.

Frame plate and trucks (steering)

The truck is the key part of the plate. It is comprised of king pins, axels, suspensions (rubber bushings), support plates and jam nuts for adjusting suspension preload. The suspensions are made of rubber or polyurethane and allow for steering modulation and control as well as the return of the axel to its neutral point when not required. Choosing the proper type and level of rigidity is of utmost importance and must be appropriate to the

skater's weight and skating style. Preload is adjusted using the corresponding jam nut and the axel pin which must not have too much play within the ball bearing and must rest under slight pressure. Correct adjustment requires a bit of time, but poor adjustment can cause a number of problems affecting handling, stability and vibration during jumps, while also inhibiting proper axel movement and, as a result, correct wheel adherence on the skating surface.

The trucks are the most important component and they should be checked each time they are used.



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Since it is strictly professional product, the Matrix - Energy - Energy Steel - Mistral - Dance - Mariner Cup - Ring - Giotto and Raffaello frames guarantee the best performance only if correctly regulated.

OPTIMAL ARRANGEMENT-REGULATION

The optimum trim can be obtained through careful selection of the most appropriate suspensions considering:

- the type of skating
- the skater's weight
- the plate size

Incorrect application of the suspension may cause abnormal wear. You should bear in mind that the elastomer suspension is extremely sensitive. The slightest turn of the adjustment nut modifies the steering.

REGULATING STEERING IN CLICKS

Using a 17 mm socket wrench, turn the steering regulation nut clockwise to tighten the steering, or counter-clockwise to ease it up.

Remember, always make certain that the pivot pin is inserted into the spherical housing exerting a slight pressure. Check the pivot pin regularly.

In this new version with click regulation, the nut locking screw is just a safety screw. It is removed only when the suspensions are to be replaced.

Steering is regulated on a scale from 1 to 8, it is not advisable to use the setting limits but rather use the central settings: 3-6. If this proves insufficient, replace it with a harder or softer suspension. With Matrix - Energy - Energy Steel - Mistral - Dance - Mariner Cup - Ring - Giotto and Raffaello skates 25 different combinations of hardness are possible.



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REGULATING THE PIVOT PIN



Using a 13 mm wrench, loosen the nut locking the pivot pin.

Tighten or loosen the pin using a 6 mm wrench until it is lightly pressed into the spherical housing.

Tighten the ferrule locking nut once more.

CONTROL AND MAINTENANCE

Always check the condition of the various components whenever you wish to use the product.

In particular, always carefully check that:

- the plate is fully secured to the boot;
- the pins are fully secured to the sole (plate) of the skate;
- the suspensions are not worn;
- the ferrule has been inserted into the spherical housing by pressing lightly;
- the ferrule locking nut is fully closed;
- the wheels and the self-locking nuts securing the wheels are not worn
- the bearings flow easily;
- the stop pad is not worn and is in the correct position, well closed and clean.
- make sure that the screw is well inserted into the king pin

URETHANE SUSPENSION HARDNESS CHART



ENERGY, ENERGY STEEL, MISTRAL, GIOTTO, RING and DANCE urethane suspension hardness Chart

EXTRA SOFT	SOFT	MEDIUM	MEDIUM-HARD	HARD
up to 35 kg color: green	up to 45 Kg color: gray	up to 55 Kg color: blue clear	up to 70 Kg color: clear	> 70 Kg color: yellow clear



MATRIX urethane suspension hardness Chart

EXTRA SOFT	SOFT	MEDIUM	MEDIUM-HARD
up to 55 kg color: green	up to 70 Kg color: gray	up to 90 Kg color: blue clear	> 90 Kg color: clear

RUBBER SUSPENSION HARDNESS CHART



VARIANT, VARIANT F, MARINER CUP, RAFFAELLO and RING rubber suspension hardness Chart

SOFT	MEDIUM	HARD
up to 35 Kg color: green	up to 50 Kg color: brown	> 50 Kg color: yellow



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FIGURE: LOOPS AND CIRCLES

Loops and Circles are high precision exercises.

Loops

Ring plate has been created especially for loops. Thanks to a wider king pin angle, Ring is consider to be the best plate for loops. You can chose either urethane suspension or natural rubber suspensions depending on your personal skating style. Many skaters use it also for corcles.

Circles

For circles it is best to use boot suited to your foot with reinforced uppers and stiff sole to ensure that nothing is lost in transmission. The skate dimension must be precise and it must have a suitable contact plane that offers good support to the boot. Steering (the skate fulcrum) must be extremely sensitive and provide maximum possibility for regulation. For this specialty, Roll-Line has produced the **Giotto** frame that guarantee high stability and precision.

For the wheels we suggest the wheel **Magnum** or better the more manouvvable **Giotto**. The diameter is 63 mm and the hardness is the same as for free skating. For a slippery surface is reccomended a soft wheel, for a rough surface it's suitable a harder wheel (as 61 shore D).

Raffaello frame is a very good plate for beginner figure skating. It could be used for both loops and circles. This frame as the click action ajustement system, with rubber suspension.



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DANCE AND SOLO DANCE

The Dance frame has been designed expressly for dance and "solo dance". The low configuration and tight turning circle guarantee optimum trajectories at consistently high speeds.

The boots must not have extremely stiff uppers and they must be slightly lower at the back than the other disciplines. The leather sole must be stiff.

For dance it is possible to use the same skates as for free skating, but for this discipline we recommended the Dance frame.

The wheels

Roll-Line has created new wheels specifically designed for dance: **Formula**, **Forester**, **Olympic** and **Grease**, available in 3 basic hardnesses, with a diameter of 63 mm and 30 mm tread. The most important novelty is the technology that employs two mechanical hardnesses in the same wheel: stiffer on the inside and softer on the outside. This system achieves great fluidity, provides excellent grip, lightness and is extremely silent.

DANCE



FORMULA



FORESTER



OLYMPIC



GREASE



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WHEELS

The wheel is always a key factor in athletic results.

Let's try to understand the basic elements that affect this choice.

First and foremost is the specialty for which it is to be used, then there is the flooring, the athlete's weight, skating style and the size of the rink.

Roll-Line produces a full **47 models** of wheels for roller figure skating.

Wheel models

The wheels are divided into two series: the first is made of single-component material and does not have a hub; the second is made of 2 types of material and has a rigid central hub that offers excellent resistance, a perfect site for the bearings, and an external, URETHANE-lined part (TREAD). It is the latter part that permits variations in the hardness and quality of the wheel.



For example, a Fox 92 Shore A wheel is a soft wheel and is to be used on a slippery surface. The Panther 95 Shore A is of average hardness and thus suited to a surface of average slipperiness, and so on. One must also consider, for example, that a child weighing 25 Kg could use a Fox on an average surface because he/she does not exert excessive pressure on the wheel as would be the case with a much heavier person.

To be precise, it would also be necessary to adapt the steering to the type of wheel: for example, if 95 Shore A wheels are fitted to my skate, and the steering is regulated to 6 (on a scale from 1 to 8), I should reduce it to 5 as this would allow the wheel to rest more snugly on the surface. With hard wheels and rigid steering, the wheel may not completely adhere to the surface during some movements which explains why the right arrangement must be selected for each athlete and for each rink.



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FREESTYLE/DANCE WHEELS IN URETHANE HARDNESS CHART

Chart color is in relation to core wheels color:

slippery surfaces	FOX 57 mm	FOX LIGHT 55 mm	GREASE 92 DANCE
fairly slippery surfaces	PANTHER 57 mm	PANTHER LIGHT 55 mm	GREASE 95 DANCE
regular surfaces	MUSTANG 57 mm	MUSTANG LIGHT 55 mm	GREASE 97 DANCE
rough surfaces	LEOPARD 57 mm	LEOPARD LIGHT 55 mm	

GIOTTO-MAGNUM INJECTION WHEELS COMPARISON CHART



GIOTTO 47 special		extra slippery surfaces
GIOTTO 49/50	CS 40	slippery surfaces
GIOTTO 53/54	TL 60 HD 70	fairly slippery surfaces
GIOTTO 57/58	HD 75 HD 80	regular surfaces
GIOTTO 60/61	HD 84	rough surfaces



MAGNUM 49	CS 40	slippery surfaces
MAGNUM 53	TL 60 HD 70	fairly slippery surfaces
MAGNUM 57	HD 75 HD 80	regular surfaces
MAGNUM 60	HD 84	rough surfaces



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PROFESSIONAL FREESTYLE WHEELS IN URETHANE



FOX

Professional wheels in urethane
Profile: small
Hardness: 92A - Diameter: Ø57 mm
Extra soft - Slippery surfaces



LEOPARD

Professional wheels in urethane
Profile: small
Hardness: 99A - Diameter: Ø57 mm
Hard - Rough surfaces



PANTHER

Professional wheels in urethane
Profile: small
Hardness: 95A - Diameter: Ø57 mm
Soft - Fairly slippery surfaces



MUSTANG

Professional wheels in urethane
Profile: small
Hardness: 97A - Diameter: Ø57 mm
Medium - Medium rough surfaces

FOX LIGHT - PANTHER LIGHT - MUSTANG LIGHT - LEOPARD LIGHT

Professional wheels in urethane
Profile: small
Hardness: 92A - 95A - 97A - 99A
Diameter: Ø55 mm



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FREESTYLE AND FIGURE INJECTION WHEELS

Injection wheels do not have a hub and are produced of elastomeric material through use of an injection system.

The hardness of these wheels is expressed in Shore D, given the type of material used. Here, too, the rule holds that the higher the number, the harder the wheel. For example a **Magnum** or **Giotto 49** shore D would be suitable for slippery flooring, the 53 D for average surfaces, and so on.

The same indications regarding weight and wheel arrangement given for the two-component wheels also holds for single-component wheels.

The **Giotto** wheels differ from the **Magnum** wheels because the high quality of the material permits a narrower tread surface and this makes the wheel faster.

FREESTYLE



MAGNUM

Injection series wheels

Profile: medium

Hardness: 49D - 53D - 57D - 60D

Diameter: Ø55 mm - Ø57 mm



GIOTTO

Injection series chromed-silver tone wheels

Profile: small

Hardness: 49D - 53D - 57D - 60D

Diameter: Ø55 mm - Ø57 mm



GIOTTO 47 special

Injection series chromed-silver tone wheels

Profile: medium

Hardness: 47D

extra slippery surfaces

Diameter: Ø55 mm - Ø57 mm

FIGURE



MAGNUM

Injection series wheels

Profile: medium

Hardness: 49D - 53D - 57D - 60D

Diameter: Ø60 mm - Ø63 mm



GIOTTO

Injection series chromed-silver tone wheels

Profile: small

Hardness: 50D - 54D - 58D - 61D

Diameter: Ø60 mm - Ø63 mm



GIOTTO 47 special

Injection series chromed-silver tone wheels

Profile: medium

Hardness: 47D

extra slippery surfaces

Diameter: Ø63 mm



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WHEEL CLEANING

It is important for the outer service of the wheel to always be clean as any fouling changes the grip completely.

The skate can be cleaned with abrasive cloth-paper (grain 100/120) without having to be taken apart.

When the bearings are removed, it is best to wash the wheel with soap and water, brush it down and dry it carefully.

BEARINGS

We suggest using highly fluid bearings: Abec 3, Abec 5 or better the Speedmax Abec 9 with fiber retainer (Carbon J).

The bearings are to be mounted carefully using the special press-extractor.



BEARINGS

A 1 Shield bearings 627 Abec 1

B 1 Shield bearings 627 Abec 3

C Carbon J Bearings 627 Abec 5

D 1 Shield Speedmax Abec 9



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CLEANING THE BEARINGS



Remove the bearings from the wheels and place them in a metal or glass container and pour kerosene in so that they are completely covered. Let them soak for a while.

Take a brush with short bristles and clean them. Set the bearings on a piece of newspaper, replace the kerosene with clean kerosene and repeat the operation rolling the bearings in your hands until they slide smoothly.

Let them dry as long as possible, or better still, use a compressor if one is available.

Oil them with a great deal of fluid (Bat Oil) and use the Press-extractor tool to install them once more.

Clean the axle and cross-piece with a cloth and check the self-locking nuts for wear. On the average, a nut can be tightened 5 - 7 times.

CLEANING THE TOE STOPS

The toe stops, too, are always cleaned with water and soap. Never use other substances.

When performing this operation, use a cloth to clean the metal part and the point where they are screwed down. Grease slightly and then mount them.

TOE STOPS

This is included only on skates used for free skating and is comprised of:

- the metal part
- the rubber part

The metal part constitutes the toe stop structure, the long part of which (shank) is screwed into the dedicated seat on the plate.

The rubber part is that which comes into contact with the ground and its purpose is to deaden pressure and provide push.



SUPERJUMP

SUPERJUMP

Abrasion	★★★★★
Grip	★★★★★
Resiliency	★★★★★



AMBER

CORAL

SUPER PROFESSIONAL

Abrasion	★★★★★
Grip	★★★★
Resiliency	★★★★★



WHITE

BLUE

PROFESSIONAL

Abrasion	★★★★
Grip	★★★★
Resiliency	★★★★



GREY

STANDARD

Abrasion	★★★
Grip	★★
Resiliency	★★



MIGNON DANCE

DANCE PLUG

Abrasion	★★★★★
Grip	★★★★★
Resiliency	★★★★★



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MEDAL SHOWCASE - ALWAYS ON THE PODIUM

Between 2002 and 2010
pro skaters have won

180 **WORLD TITLES**

→ **n.168 of the 180 on our frames**
n.162 of the 180 on our wheels



Our tradition keeps on also at the 2011 World Championships in Brasilia:

Athletes	Frames	Wheels
 Debora Sbei Gold Medals Senior Free and Combined	<i>matrix giotto</i>	<i>leopard + panther giotto ø 63</i>
 Dario Betti Gold Medal Senior Free	<i>matrix</i>	<i>mustang + panther</i>
 Daniel Morandin Gold Medal Senior Solo Dance	<i>dance</i>	<i>grease</i>
 De Candido e Pontello Gold Medal Senior Dance	<i>dance</i>	<i>grease</i>
 Paola Fraschini Gold Medal Senior Solo Dance	<i>dance</i>	<i>grease</i>
 Andrea Poli Gold Medal Senior Compulsory Figures	<i>giotto</i>	<i>magnum ø 63</i>

We thank all the athletes for trusting our Roll line products

