

International
Paralympic Committee

Alpine Skiing Equipment Rules and Regulations

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IPC Alpine Skiing Equipment Rulebook

2016 - 2017 season

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International Paralympic Committee

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IPC Alpine Skiing reserves the right to further interpret and/or supplement these Rules in order to help ensure that their spirit and purposes are respected.

Competition equipment

The term “competition equipment“ implies all items of equipment used by athletes/guides in competitive skiing, including clothing and implements that serve a technical function.

The entire set of competition equipment forms a functional unit.

In this connection the following points must be observed:

- the principle of safety
- the principle of fairness

Competition implements

Competition implements refer to equipment which fulfil essential functions during the competition but which can be separated from the actual competition.

Examples: skis, bindings, boots, poles, clothing, helmets, ski goggles.

Additional equipment (accessories)

Additional competition equipment (accessories) are those components or implements which exert an influence on the technical function of the competition equipment and which are attached directly to the equipment by means of recognised fastenings. Such accessories do not perform essential functions during the competition.

Example: para-blocks, plastic tip covers, additional weights, back protectors.

Athletes/Guides must use equipment appropriate for their gender.

Alpine racing skis

Definition

Skis, predominantly for use in Downhill, Slalom, Giant Slalom and Super- G, racing on suitable terrain and utilising the force of gravity. In order to allow transmission of lateral forces, the edges of the running surface of the ski are made mainly of a hard material resistant to wear and tear.

Ski length

Minimum length, "developed" length (unwound length) in accordance with ISO Norm including a measurement tolerance.

Precision for the length of Slalom Skis:

When a ski tip different from the main body of the ski is used, the measurement will only be taken into account to the extent it covers a surface corresponding to the natural shape of the ski.

The manufacturer must mark the tip showing the limit of the natural shape and thereby allow an easy measurement.

To prevent doubt, specific designs of ski tips as part of the main body of the ski are allowed.

Recommendation for children younger than 12 years:

For children younger than 12 years: Use only one pair of skis in all events if the ski length is shorter than 130 cm.

Profile width

Minimum width of the running surface under the binding and in front of the binding without any tolerance (see table).

Radius

The radius must be marked on the ski.

Radius measurement for DH skis with a preparation tolerance of -1 m.

Downhill

Skis, predominantly for use in Downhill, Slalom, Giant Slalom and Super-G, racing on suitable terrain and utilising the force of gravity. In order to allow transmission of lateral forces, the edges of the running surface of the ski are made mainly of a hard material resistant to wear and tear.

Specification for competition equipment applicable for all IPCAS sanctioned competitions.

Tables

<u>Men</u>		<u>Tolerance</u>	<u>Radius</u>	<u>Under Binding</u>	<u>In Front of Binding</u>
SL	165 cm (-10 cm U17 levels 3,4)	- 1 cm	No restriction	>= 63mm	No restriction
GS	188 cm (-5 cm U17 levels 3,4)	- 1 cm	30 m	<= 65mm	<= 103mm
SG	205 cm	- 1 cm	40 m	<= 65mm	<= 95mm
DH	205 cm	- 1 cm	40 m	<= 65mm	<= 95mm

- VI B1 athletes (men) may use 155 cm skis for SL
- 13 and 14 years old (U14) athletes, competing in regular IPCAS events (levels 3, 4) must use specifications for 15 to 17 listed for Youth Competitions, below, or adult specifications.
- 15 – 17 year old (U17) athletes, must use adult specifications for all IPCAS levels. (with tolerance for level 3 & 4)
- Ski length must be marked on the skis by manufacturer

<u>Women</u>		<u>Tolerance</u>	<u>Radius</u>	<u>Under Binding</u>	<u>In Front of Binding</u>
SL	155 cm	- 1 cm	No restriction	>= 63mm	No restriction
GS	183 cm	- 1 cm	30 m	<= 65mm	<= 103mm
SG	200 cm	- 1 cm	40 m	<= 65mm	<= 95mm
DH	200 cm	- 1 cm	40 m	<= 65mm	<= 95mm

* SG skis may be still be used in DH competitions of all levels

- VI B1 athletes may continue to use GS skis
- 13 and 14 years old (U14) athletes, competing in regular IPCAS events (levels 3,4) must use specifications for 15 to 17 listed for Youth Competitions below or adult specifications
- 15 – 17 year old (U17) athletes, must use adult specifications for all IPCAS levels.

(with tolerance for level 3 & 4)

- Ski length must be marked on the skis by manufacturer.

Youth

(These specifications only apply for Youth competitions. Please see notes above for regular IPCAS events.)

<u>14 and Under</u>		<u>Radius</u>	<u>Under Binding</u>	<u>Max. Standing Height</u> (ski/plates/binding)
SL	≥ 130 mm	No restriction	No restriction	50
GS	≤ 188 mm	17 m	≤ 65 mm	

<u>15 to 17</u>		<u>Radius</u>	<u>Under Binding</u>	<u>Max. Standing Height</u> (ski/plates/binding)
SL	≥ 130 mm	No restriction	No restriction	50
GS	≤ 188 mm	17 m	≤ 65 mm	
SG/DH	≥ 183 mm	30 m	≤ 65 mm	

- In SG/DH can use GS SKIS

Safety bindings

Safety bindings function as strain limiters. That is, these devices transfer specific demands occurring during skiing to an acceptable limit, and when this limit is overstepped, they release their firm hold on the ski.

Anti-vibration plates

Anti-vibration plates can be mounted if the following conditions are taken into consideration:

Width of ski surface: The width of the plates must not exceed the width of the ski surface.

Maximum height: Maximum height (distance between the bottom of the running surface of the ski and the ski boot sole) for all categories is 50 mm (Ladies, Men and Children's).

Ski stoppers

The ski stopper is a braking apparatus for skis, the function of which following the release of the safety binding is to stop or bring to a standstill the loose ski within the immediate vicinity of the skier's fall. The use of skis without ski stoppers during competitions or official training runs is prohibited. The functioning of the release mechanism must not be compromised by the method of its mounting. It is the manufacturers' responsibility to ensure that the ski stopper functions correctly.

Ski boots

Ski boots are robust footwear developed specifically for skiing, offering protection against jolts and bumps as well as injury from ski edges and other external influences. The ski boot encloses the foot firmly, while at the same time allowing the movement necessary for skiing techniques, in that the ankle has the room it needs to flex, but at the same time facilitating the transfer of every steering movement completely to the ski. The relevant national and international guidelines and norms establish the requirements.

Thickness of ski boot soles

Distance between the ski boot sole and the base of the heel including all hard and soft parts:

Ladies, Men, Youth : maximum 43 mm

Ski poles

The ski pole is an item of equipment, the function of which is to aid the skier and facilitate balance.

National and international rules establish the minimum requirements for ski pole tips, grips, shafts, baskets, straps, length, etc. Owing to risk of injury, metal baskets are not permitted.

Racing suits

Competition suits and clothing worn underneath, such as undergarments, etc., must have a textile surface on the inside and the outside. The surfaces may not be plasticised or treated by any chemical means (gaseous, liquid or solid) and must have a minimum permeability of 30 litres per m²/sec. Seams may only exist in order to join the portions of the suit. Outer tucks and

darts are not allowed. The suits must be equally porous in all parts, both from the outside in and from the inside out. Minimum air permeability is established whereby the un-stretched fabric must show a medium air permeability of a minimum of 30 litres per m²/sec under 10 mm of water pressure.

- In Downhill, protectors may not be integrated into the competition suit itself.
- In all events these protectors must be worn underneath the racing suit. (Exception forearm protection used in SG, GS and SL and shin protection used in SL)
- Protectors must fulfil the 30 litre permeability rule with the exception of the shoulder, scapular region, chest, arms and legs. The anatomical body shape may not be changed.

Crash helmets

The use of crash helmets is compulsory for all events. Only helmets specifically designed for Alpine ski racing with the embedded FIS sticker are permitted. Helmets must have a shell and padding which cover the head and ears. Only in Slalom events soft ear helmets are allowed. Helmets with edges that protrude are not permitted. Helmets cannot be modified.

Ski goggles

Ski goggles are devices protecting the eyes against weather and rays with optically correct lenses. Their aim is to guarantee good, contrast-free visibility in all weather conditions. The use of ski goggles is recommended. It is prohibited to reshape the ski goggles in order to obtain aerodynamic advantages.

Ski gloves

Gloves offer protective covering against weather and external forces. The wearing of gloves is urgently recommended. Reshaping the glove, the application of a plastic coating on the outer surface, or the use of skai (imitation leather) with the aim of attaining more aerodynamic features, are not allowed. The glove must not reach beyond the elbow. Protective padding along the entire length of the glove is permitted. The use of protective guards in the form of shields, which are pulled over the glove, is permitted.

Protectors

Protectors are an additional item of equipment, which protects the athlete's back against weather and external forces.

Back protectors must adapt to the anatomical bend of the athlete's spine and lie flat against the body. The top edge of the back protector must be situated in the area of the spinal column and may not go above the 7th cervical vertebrae (C7). The maximum thickness must be in the middle part and may not exceed 45 mm; the thickness reduces at the edges of the back protector. Designs with the view to improve aerodynamic properties are forbidden. The back protector must be worn underneath the competition suit.

Any additional protectors such as chest and shoulder protectors must be designed for alpine ski racing and worn under the racing suit.

Adaptive Equipment

The term "Adaptive Equipment" refers to all the implements and apparatus adapted to the special needs of Paralympic athletes and used by athletes during competition on the field of play (e.g. sit-ski, protections, prostheses and orthoses) that is specified in the IPCAS Equipment Rulebook.

General rules for (adaptive) equipment:

- a. Safety (should not harm the athlete, spectators or environment)
- b. Fairness (regulated in our rules)
- c. Universality (the principal components must be commercially available and affordable)
- d. Physical prowess (no motor, computer, robotically components)

(For exact text, see [IPC Handbook, section 2, chapter 3.10](#))

Sit ski

A sit-ski consists of a moulded seat mounted on a metal frame. A suspension system beneath the seat eases riding on uneven terrain and helps in turning by maximizing ski-snow contact. A metal or plastic block in the shape of a boot sole is the base that clicks into the ski's binding.

A sit-ski can be used in Uni-Ski or Dual-Ski.

A sit-ski needs a braking device on both sides of the seat. This device creates friction to prevent sliding.

Outriggers

Arm crutches with ski tips attached. The system can flip out to allow the ski attachment to rise vertically to be used as a normal crutch.

Hand/Forearm protectors

Hand/forearm protectors are permitted.

The hand protector cannot be designed to create additional length to the hand.

No extensions perpendicular to the long axis of the forearm are permitted.

The forearm cannot exceed the skier's anatomical length as defined in the section under unilateral upper limb prosthesis.

Orthosis; orthotic device

Externally applied device used to modify the structural and functional characteristics of the neuro-muscular and skeletal systems. (For stabilizing, support, compensation, protection, prevention)

Prosthesis; prosthetic device

Externally applied device used to replace wholly, or in part, an absent or deficient limb segment.

Athletes with an upper limb impairment/amputation:

1. Unilateral

The overall length of the limb, including the prosthesis, cannot exceed the length of the unaffected limb with the fist closed as if gripping a pole.

2. Bilateral

The overall arm measurement from the tip of the acromion to the distal end of the prosthetic should be no longer than $0.399 \times \text{height}$ (centimetres), with the arm in the anatomical position.

In the event that the arm can't rest in the anatomical position, then limb segments should be taken.

The Upper Arm measurement:

Tip of acromion to lateral epicondyle = $0.191 \times \text{height (cm)}$

The Forearm measurement:

Lateral epicondyle to radial styloid = $0.1485 \times \text{height (cm)}$

The Hand measurement:

Radial styloid to distal end of second metacarpal = $0.119/2 \times \text{height (cm)}^*$

* If this data is to be used for snowboarding then there would be no division by 2.

The double below elbow amputee that will be wearing prosthesis, calculation can be simplified to:

Lateral epicondyle to the end of the prosthetic should be no longer than $0.208 \times \text{height (cm)}$

3. For those classes where the use of poles is specifically excluded (no poles), any prosthesis cannot have an extension device perpendicular to the long axis.

Athletes with a lower limb impairment /amputation:

1. Lower limb prostheses must be used with ski boots.

2. Unilateral

The overall length of the lower limb, including the prosthesis cannot exceed the overall length of the unaffected limb.

3. Bilateral

Athletes with bilateral below knee amputations:

Will be limited by the following formula as to the overall length of their lower extremities, including prostheses and ski boots for IPC competition purposes:

Overall leg length (in cm)* = or $< [(\text{thigh length}-13)/0.4 + 4.3] \times 1.05$

**including prosthesis and ski boots*

The overall length of the leg including the prosthesis and ski boot equals or is less than the length of the thigh minus 13, divided by 0.4, plus a 4.3cm for the thickness of the ski boot sole with an additional 5% to the final length allowing for natural variation.

The thigh length is measured from the anterior superior iliac spine to the inferior pole of the kneecap or to the lower point of the medial femoral condyle if there is no patella. This measurement is carried out with the athlete supine.

The overall length of the leg will be measured from the anterior superior iliac spine to the heel of the ski boot placed on the prosthesis with the athlete standing.

The Maximal Allowed Standing Height (including the prosthesis and ski boots) will be measured in the standing position by using a vertical line from the top of the skull to a line connecting the base of the heels of ski boots. If there is any doubt the measurement can be taken with the athlete standing on 2 sets of scales (equal weight) with the height being the vertical distance between the top of the skull and a line joining the base of both ski boot heels. Where possible a metal tape measure should be used for measuring. When the competition prosthesis has a fixed flexion in ankle or knee, the measure should be taken along the leg axis.

Athletes with bilateral above knee amputation:

The length of prostheses used by athletes with bilateral lower limb amputations will be determined using the 3-Step process described below.

Step 1: Estimate maximum standing height from Ulna length

Measure the distance between point of the elbow (olecranon process) and the ulna styloid.

Measure between the point of the elbow and the midpoint of the prominent bone of the wrist. The height in metres is determined from the below table based on the ulna length as measured in centimetres.

Table: Ulna length and maximum standing height		
Ulna length (centimetres)	Male height (metres)	Female height (metres)
21		1.54
21.5		1.55
22		1.56
22.5		1.58
23		1.59
23.5		1.61
24	1.64	1.62
24.5	1.66	1.63
25	1.67	1.65
25.5	1.69	1.66
26	1.71	1.68
26.5	1.73	1.69
27	1.75	1.70
27.5	1.76	1.72
28	1.80	1.73
28.5	1.82	1.75
29	1.84	1.76
29.5	1.85	1.77
30	1.87	1.79
30.5	1.89	
31	1.91	
31.5	1.93	
32	1.94	

Step 2: Estimate maximum standing height based on measurement of Demi-span.

Demi-span is measured as the distance from the middle of the sternal notch to the tip of the middle finger in the coronal plane.

The measure is best obtained with the athlete standing with their back against a stable wall, right shoulder abducted to 90° with the palm of the hand facing forward. The measure is taken in centimetres.

The maximum standing height is then calculated from the following formula:

- Females: Height in cm = (1.35 x demi-span (cm)) +60.1
- Males: Height in cm = (1.40 x demi-span (cm)) +57.8

Step 3: Final estimate of maximum standing height:

Take the mean of the two estimates, maximum standing height estimated from the ulna length and maximum standing height estimated from demi-span.

The overall standing height of the Athlete with their competitive prostheses must be less than or equal to the mean estimated height, plus 4.3cm for the thickness of the ski boot sole plus an additional 2.5% to the final figure allowing for natural variation. This is demonstrated in the below formula:

Overall standing height (cm)* = or < [(result method 1 + result method 2)/ 2 + 4.3 cm] x 1.025

*including prosthesis and ski boots

The athlete's height is measured in the standing position by using a vertical line from the top of the skull to a line connecting the base of the heels of both ski boots. If there is any doubt the measurement can be taken with the athlete standing on 2 sets of scales (equal weight) with the height being the vertical distance between the top of the skull and a line joining the base of both ski boot heels. Where possible a metal tape measure should be used for measuring.

The Maximal Allowed Standing Height (including the prosthesis and ski boots) will be measured in the standing position by using a vertical line from the top of the skull to a line connecting the base of the heels of ski boots. If there is any doubt the measurement can be taken with the athlete standing on 2 sets of scales (equal weight) with the height being the vertical distance between the top of the skull and a line joining the base of both ski boot heels. Where possible a metal tape measure should be used for measuring. When the competition prosthesis has a fixed flexion in ankle or knee, the measure should be taken along the leg axis.



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