



RoboCup Junior Australia Soccer Ball Specification 2023

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Note: This document is typically intended for those who manufacture soccer balls, sensors and similar components. Competitors should refer to section 2 of the soccer rules for a list of approved soccer balls.

Pulsed Infrared Ball

1 IR light

The ball shall emit infrared (IR) light of wavelengths in the range 920nm - 960nm, pulsed at a square-wave carrier frequency of 40 KHz. The ball should have enough ultra-bright, wide angle LEDs to minimise unevenness of the IR output.

2 Diameter

The diameter of the ball is required to be 74mm. A well-balanced ball shall be used.

3 Durability

The ball must be able to resist normal game play. As an indication of its durability, it should be able to survive, undamaged, a free-fall from 1500mm onto a hardwood table or floor.

4 Modulation

The 40 kHz carrier output of the ball shall be modulated with a trapezoidal (stepped) waveform of frequency 1.2 kHz. Each 833 microsecond cycle of the modulation waveform shall comprise 8 carrier pulses at full intensity, followed (in turn) by 4 carrier pulses at 1/4 of full intensity, four pulses at 1/16 of full intensity and four pulses at 1/64 of full intensity, followed by a space (i.e. zero intensity) of about 346 microseconds. The peak current level in the LEDs shall be within the range of 45 to 55 mA. The radiant intensity of each LED shall be more than 20 mW/sr.

5 Battery Life

If the ball has an embedded rechargeable battery, when new and fully charged it should last for more than 3 hours of continuous use before the brightness of the LEDs drops to 90% of the initial value. If the ball uses replaceable batteries; a set of new high-quality alkaline batteries should last for more than 8 hours of continuous use before the brightness of the LEDs drops to 90% of the initial value.

6 Colouration

The ball shall be neutral in colour. In particular, it must not have any green, blue or yellow colouration (to avoid confusion with the colours of the field and goals).

7 Weight

The ball shall have a total mass (including all batteries and parts necessary for use in game play) of between 0.13kg and 0.15kg.





Passive Orange Ball

1 General Specifications

The ball shall be solidly coloured bright orange and will not emit infrared light.

2 Diameter

The diameter of the ball is required to be 65mm +/- 5mm. A well-balanced ball shall be used.

3 Durability

The ball must be able to resist normal game play. As an indication of its durability, it should be able to survive, undamaged, a free-fall from 1.5 meters onto a hardwood table or floor.

4 Colouration

The ball shall be of orange colour. Any colour that a human would deem to be orange and is substantially different from the other colours used on the field is acceptable.

There should be no distractive markings on the ball.

5 Surface

The surface of the ball shall be smooth. Engravings on the ball's surface are tolerated. The inside of the ball should be hollow.

6 Weight

The ball should be no heavier than 90 grams and no lighter than 60 grams.

Acknowledgements

The Soccer Ball Specifications is primarily the work of the RoboCup Junior Soccer Technical Committee and has been used with permission by RoboCup Junior Australia.