



WCF Equipment Regulations

Version 6.4
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Table of Contents

1. Introduction	2
2. Seeking approval	2
3. The approval process	2
4. Duration of approval	3
5. Guidance on seeking approval for balls	4
6. Ball purchasers	4
Revisions	4
Appendix 1 – WCF Equipment Officer	5
Appendix 2 – Championship ball specifications	6
Appendix 3 – Championship hoop specifications	8



1. Introduction

1.1 These Regulations apply to balls and hoops to be used in all WCF Licensed events. They are intended to ensure that Event Hosts provide appropriate balls and hoops for a WCF event and to guide equipment manufacturers and suppliers.

1.2 Balls and hoops that have Championship Approval are listed on the WCF Website at the bottom of page: "[Statutes and Regulations](#)". The WCF Sports Regulations require Event Hosts to provide balls with current Championship Approval whereas any hoops that meet the specifications in Appendix 3 may be used in WCF events.

1.3 The WCF Equipment Specification and Approval system is based upon the testing system endorsed and operated by Croquet England. The equipment tests are carried out by the WCF Equipment Officer (see Appendix 1).

2. Seeking approval

2.1 It is WCF policy to encourage the development of consistent and high quality equipment for championship play.

2.2 All manufacturers of balls and hoops seeking Championship Approval for their equipment are encouraged to make early contact with the WCF Equipment Officer to discuss the testing process and the specifications required. The WCF wishes to be as helpful as reasonably possible in any application for Championship Approval.

3. The approval process

3.1 Ball Testing

3.1.1 New Brands: A manufacturer who wishes to obtain Championship Approval for balls is required to deliver at its expense a non-returnable set of balls to the Equipment Laboratory at the address given in Appendix 1.

3.1.2 Existing Brands: To avoid costly international shipping, a manufacturer who wishes to renew Championship Approval for balls may request that checks are made using recently manufactured balls in stock at the Croquet England shop, charged at cost plus any delivery. If the balls are not in stock, 3.1.1 applies.

3.1.3 An examination fee of £100 GBP, plus any delivery costs, is payable to Croquet England. This fee is subject to change without notice.

3.1.4 Balls that meet the specification set out in Appendix 2 will be awarded Championship Approval for a period of five years.



3.1.4.1 Approval will cease should there be a significant change to the manufacturing process or materials used, such that the playing characteristics appear to have changed. At such time, the Equipment Officer may request that the balls are re-tested.

3.1.4.2 Balls produced from a significantly changed process or materials should be clearly and persistently marked in a manner that distinguishes them from previous production.

3.1.5 A Test Report will be sent promptly to the manufacturer and, if the balls receive Championship Approval, a copy will be forwarded to the WCF for publication.

3.1.6 Sets of primary colours (Blue, Red, Black, Yellow) and secondary colours (Green, Pink, Brown, White) must be submitted for separate Championship Approval because some colours can perform differently from others. Sets of tertiary colours are also in use but are not used in WCF events. Such sets do not need Championship Approval but may be submitted for examination if the manufacturer wishes.

3.2 Hoops

3.2.1 A manufacturer who wishes to obtain Championship Approval for a hoop is required to deliver at its expense a non-returnable hoop to the Equipment Laboratory at the address given in Appendix 1. There is no examination fee payable in respect of hoops.

3.2.2 In addition, at least one set of six hoops must also be manufactured in order for an adequate Field Test to be conducted (see Appendix 3 paragraph 7.2).

3.2.3 The manufacturer must provide a written assurance that the manufacturing process is reproducible.

3.2.4 A Test Report will be sent promptly to the manufacturer and, if the hoop receives Championship Approval, a copy will be forwarded to the WCF for publication.

4. Duration of approval

4.1 Balls

4.1.1 A set of balls purchased during the Championship Approval period set out on the WCF Website at the bottom of page: "[Statutes and Regulations](#)" will remain approved indefinitely unless the required specification is changed, or the balls deteriorate and cease to meet the specifications set out in Appendix 2.

4.1.2 Balls are not required to be replaced if the Championship Approval for such balls lapses.

4.1.3 Individual sets of balls are not required to be re-tested during their lifetime.



4.2 Hoops

A hoop purchased after the Championship Approval date set out on the WCF Website at the bottom of page: "[Statutes and Regulations](#)" will remain approved indefinitely unless the required specification is significantly revised, such that the playing characteristics of the hoop do not comply with the revised specification.

5. Guidance on seeking approval for balls

5.1 The critical ball parameters of diameter, weight and resilience are not independent. Adjustment of the manufacturing process to improve the achievement of one parameter will normally affect the other parameters too. If a manufacturer has a prototype ball already in production, it is strongly suggested that it is sent for testing by airmail so that it can be tested using the approved laboratory equipment and the results reported back to the manufacturer with as little delay as possible. The manufacturer may then be able to decide whether to proceed further. There is no examination fee for this service. In the customs declaration the ball should be stated to be for testing only and to have no commercial value.

6. Ball purchasers

6.1 It is suggested that purchasers may wish to safeguard their position by ordering only balls that comply with the specification set out in Appendix 2. Lists of the balls that have current Championship Approval and the names and contact details of their manufacturers are on the WCF Website at the bottom of page: "[Statutes and Regulations](#)".

6.2 Makers produce balls in batches and Croquet England, on behalf of the WCF, is not able to test each batch so close inspection of new purchases is always recommended. Modern plastic balls are generally produced from moulds comprising two hemispheres. It is a simple matter to check that the two hemispheres have been correctly aligned because any significant step across the joint line is capable of adversely affecting the reliability of ball to ball contact and will be unacceptable in play.

End of WCF Equipment Regulations

Revisions

Version 1 10 August 2005	Original
Version 2 1 January 2006	Update on ball and hoop approval dates.
Version 3 6 November 2011.06	Contents page added. Clarification of commencement and expiry approval dates for balls and hoops.
Version 4 13 November 2007	Update on ball approval dates.
Version 5 6 April 2009	Amendment to hoop specifications following 2008 amendments to AC Laws 6 th edition and ancillary matters



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Version 6 1 January 2012	Updated in the light of practical experience and latest approvals. Comments received from Alan Pidcock and Ian Plummer
Version 6.1 6 February 2012	V6 ratified by Council but suggested editorial reorganisation with current Approved Balls & Hoops removed to Appendix 2.
Version 6.33 21 July 2015	General update of text and addition of Atkins Quadway hoops to list of approved hoops.
Version 6.4 24/12/2023	Removal of Appendix 1 – now published on WCF website. Appendices 2 and 3 amendment to metric standard units. Other minor amends.

Appendix 1 – WCF Equipment Officer

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Appendix 2 – Championship ball specifications

1. Introduction

1.1 Metric measurements are used throughout and regarded as definitive. Equivalent imperial measurements are shown in brackets.

1.2 Note that some parameters and measurements are specified precisely (e.g. the diameter of a ball or the parameters in the resilience test) and for these exact conversions are used. Others can be less precise (e.g. the permitted variation in resilience between balls in a set) and for these, conversion factors are rounded for convenience.

2. Diameter

2.1 The diameter of a ball must be 92 mm +/- 0.8 mm ($3 \frac{5}{8}$ inches +/- $\frac{1}{32}$ inch)

2.2 The maximum and minimum diameters of a ball must not differ by more than 0.8 mm ($\frac{1}{32}$ inch).

2.3 The maximum and minimum diameters of balls in a set must not differ by more than 1.2 mm ($\frac{3}{64}$ inch).

3. Resilience

3.1 The following metric and imperial measurement tests are exactly equivalent and either may be used at the tester's convenience.

3.1.1 Metric measurement test: When dropped from a height of 1500 mm from the bottom of the ball onto a steel plate 25 mm thick and set rigidly in concrete, a ball must rebound to a height from the bottom of the ball of 850 mm +/- 75 mm.

3.1.2 Imperial measurement test: When dropped from a height of 60 inches from the bottom of the ball onto a steel plate 1 inch thick and set rigidly in concrete, a ball must rebound to a height from the bottom of the ball of 34 +/- 3 inches.

3.2 The rebound height is the average of eighteen measurements. Each ball must be dropped three times onto each of the two poles and four nodes in the milling pattern.

3.3 The rebound heights of a set of balls to be used together must not differ by more than 50 mm (2 inches).

4. Milling

4.1 All balls must have a milled surface with an identical pattern.

4.2 The pattern must consist of two orthogonal sets of grooves and the width of the grooves must be less than the width of the upstands.



4.3 With moulded balls, milling is created as part of the moulding process.

5. Weight

The weight of balls must be 454 g +/- 7 g (16 ounces +/- ¼ ounce)

6. Bias

The mass distribution in a ball should be essentially spherically symmetric so that noticeable bias is not present when the ball is rolling slowly on a flat surface. When using a brine flotation test, the weight applied to the unadjusted high point required to cause it to become the adjusted low point should not exceed 0.5 g (0.018 ounces).

7. Colour

Guidance can be provided by the WCF Equipment Officer on the preferred colours for 1st and 2nd colour sets. Comment may be added to the Approval Statement for colours outside the preferred ranges.

8. Ageing of balls

The WCF is not aware of any definitive assessment of the effects of ageing and use on the rebound characteristics of Championship Approved balls. Ideally, sets of balls should be tested when new and at annual intervals thereafter, but in clubs with several similar sets of balls it is likely to be difficult to keep track of a particular set.



Appendix 3 – Championship hoop specifications

1. Introduction

1.1 Metric measurements are used throughout and regarded as definitive. Equivalent imperial measurements are shown in brackets.

1.2 The hoop specifications are derived from the requirement that the hoop/ball clearances specified in the WCF Sports Regulations be achievable with any ball meeting the WCF Championship Approval standard for diameter 92 mm +/- 0.8 mm ($3\frac{5}{8}$ inches +/- $\frac{1}{32}$ inch) at half-ball height when the hoop is set in the ground.

1.3 Note that some parameters and measurements are specified precisely (e.g. the dimensions of a hoop) and for these exact conversions are used. Others can be less precise (e.g. the points at which the separation of the uprights should be measured) and for these, conversion factors are rounded for convenience.

2. Construction

2.1 A hoop comprises two vertical uprights joined at the top by a horizontal crown and must be provided with a means of anchorage at the base of the uprights.

2.2 The uprights and crown must be constructed of solid metal of adequate hardness and the hoop must be rigid. The uprights and crown should be straight.

2.3 A hoop may be cast in one piece or consist of separate uprights and a crown which are bolted together, or uprights and a crown that have been welded together.

2.4 The hoops used in a set must have been constructed to nominally identical specifications.

3. Height

3.1 A hoop must be constructed so that when it is set in the ground with the height from the ground to the top of the crown at the maximum of 317 mm (12.5 inches) permitted by the AC Laws and GC Rules, not more than 12 mm (0.5 inches) of the anchorage projects above the ground. Subject to 3.2 below, the minimum height between the top of the anchorage system and the top of the crown must therefore be 305 mm (12 inches).

3.2 The anchorage system must never obstruct the passage of a ball through the hoop or past the side of the hoop. Depending on the construction of the anchorage system, the minimum height specified in 3.1 above may have to be increased sufficiently to ensure that the anchorage systems cannot cause any obstruction to a ball when the hoop is set to its maximum permitted height.



3.3 The distance between the top of the anchorage system and the top of the crown should not be substantially greater than the necessary minimum, so that the hoop does not have to be set too deeply into the ground to achieve the minimum height of 279 mm (11 inches) from the ground to the top of the crown permitted by the AC Laws and GC Rules.

4. Diameter of an upright

4.1 The diameter of a hoop upright must be not less than 15.9 mm (5/8 inch) and should not exceed 19.1 mm (3/4 inch). The hoop uprights may, however, be made from cylindrical metal bar of a standard metric size that does not exceed 20 mm diameter. Minor deviations in diameter at the top and bottom of the uprights are permitted.

4.2 Three measurements are to be made for each upright and all diameters must lie within the permitted range at each measurement point:

High: 50 mm (2 inches) from the underside of the crown.

Middle: 150 mm (6 inches) above the base of the upright.

Low: 50 mm (2 inches) above the base of the upright.

The high and low measurement points avoid minor deviations at the top and bottom of the uprights and are approximately equal to a ball radius below the underside of the crown and above ground level respectively.

5. Separation of the uprights

5.1 The inner surfaces of the uprights must be approximately parallel and display a separation of 93.7 mm +/- 1.2mm (3 ^{11/16} inches +/- ^{3/64} inch)

5.2 Three measurements of the separation between the inner surfaces of the uprights of an unstressed hoop (i.e. out of the ground) are to be made at the high, low and mid length points specified in paragraph 4.2 above. All three measurements must be within the range specified in paragraph 5.1 above and the difference between the largest and smallest measurement must not exceed 0.8 mm (^{1/32} inch).

5.3 For a set of six hoops, the difference between the largest and smallest of the 18 measurements made under paragraph 5.2 above must not exceed 1.6 mm (^{1/16} inch).

5.4 The uprights of a hoop between the high and low points specified in paragraph 4.2 above will also be tested for co-planarity. When one upright is in contact with a plane surface, no point of the relevant length of the other upright may depart from the plane by more than 1.6 mm (^{1/16} inch).

6. Crown

6.1 The crown must be straight and at right angles to the uprights. It may be cylindrical with a diameter of between 15.9 mm and 20.0 mm (5/8 inch and approximately ^{3/4} inch). Alternatively, it may be square or octagonal in cross-section, with the distance between opposing faces being between 15.9 mm and 20.0 mm (5/8 inch and approximately ^{3/4} inch). If the crown is of square cross-section, its edges must be chamfered or rounded to ensure



WCF Equipment Regulations

Version 6.4
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that they will not damage the balls. For that reason, octagonal cross-section is the preferred alternative to cylindrical.

6.2 Any logo on the crown must comply with these limits.

7. Field Test

7.1 The hoop must be capable of being set firmly in suitable ground.

7.2 Evidence of satisfactory performance in setting, durability and play with Championship Approved balls must be provided by the manufacturer. In practice, this means that the manufacturer should supply a set of hoops for use by experienced players using such balls in order that they can supply testimonials that the hoops perform satisfactorily in practice.