



# WCF Equipment Regulations

Effective Date  
06.04.09.  
Version 5

## **0.1. Introduction**

The World Croquet Federation (WCF) Equipment Specification and Approval system is based, by joint agreement, upon the testing system endorsed and operated by The (English) Croquet Association.

The equipment tests are carried out at The Croquet Association Laboratory, based in Preston, England, United Kingdom, under the Directorship of Doctor Alan Pidcock, the WCF Equipment Officer.

## **0.2 Scope**

This will apply to all WCF Licensed events but not those that have been sanctioned.

## **0.3 Compliance**

- 0.3.1 WCF Rule 103.5
- 0.3.2 WCF Rule 105.13
- 0.3.3 Championship Approval scheme ('International Ball Standard')
- 0.3.4 Championship Hoop Specification

## **0.4 Related Documentation**

- 0.4.1 Laws of Association Croquet 6<sup>th</sup> Edition and WCF Golf Croquet Rules.
- 0.4.2 WCF Statutes
- 0.4.3 WCF Events Regulations
- 0.4.4 WCF Sports Regulations

## **0.5. Input Responsibilities**

Requests for approval	Equipment Manufacturer or Supplier
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## **0.6. Output Responsibilities**

Approval granted	WCF Equipment Officer
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## 0.7. Definitions and Revisions

Definitions	GBP WCF	Great Britain Pounds (sterling) World Croquet Federation
Revisions	Effective 10.8.05 Version 1	1. Original Version
	Effective 01.10.06 Version 2	1. Update on ball and hoop approval dates.
	Effective 06.11.06 Version 3	1. Contents page added  1. Clarification of commencement and expiry approval dates for balls and hoops.
	Effective 13.11.07 Version 4	1. Update on ball approval dates
	Effective 06.04.09 Version 5	1. Amendment to hoop specifications following 2008 amendments to AC Laws 6 <sup>th</sup> edition and ancillary matters. (Marked in red)

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## 1. Laboratory Address

Dr. A. Pidcock  
WCF Equipment Officer  
The Manor House  
1 Barn Croft  
Penwortham  
Preston PR1 0SX  
United Kingdom

## 2. Seeking Approval

It is WCF policy to encourage the development of croquet equipment and all manufacturers of croquet balls and hoops seeking approval for their equipment, are encouraged to make early contact with Dr. Pidcock to discuss the testing process and the specifications required. WCF wishes to be as helpful as reasonably possible in any application for approval of equipment.

## 3. Costs

**Balls:** Manufacturers who wish to obtain or renew Championship Approval for balls are required to submit a set (non-returnable) to Dr. Pidcock at the Laboratory Address above accompanied by a fee of £50 GBP (payable to The Croquet Association). In the event of the balls failing to meet the required specification, £20 GBP will be returned; balls that meet the specification will be awarded Championship Approval valid for a period of three years. Test Reports will be sent promptly to the Manufacturer and those for Approved balls will be forwarded to the WCF.

### **Hoops:**

No charge is made for the tests but a single example of any Approved hoop will be retained and transportation costs borne by the submitter. Note that a set of six hoops must also be provided for the duration of the playing tests, which will be returned at the conclusion of the tests if required.

**Note:** These fees are subject to change without any prior warning.



## BALLS

### 4. Guidance on seeking ball approval

Experience of the efforts of ball manufacturers to date leads WCF to caution those seeking approval about the difficulty and length of time required to develop a ball of the appropriate standard. WCF suggests that the effort may not be cost-effective unless a manufacturer expects to have a market for balls that extends internationally. It is essential to understand that the critical ball parameters: diameter, weight and resilience are not independent, so that adjustment of the manufacturing process to better fit one criterion 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. A manufacturer may then be able to decide whether to proceed further. There would be no charge for this service. In the customs declaration it is advised that the ball is stated to be for testing only and that it has no commercial value.

### 7. Approved Balls

Balls that have current WCF Championship Approval are as follows:

Barlow GT Mark II 1<sup>st</sup> Colours (Approved to July 2006)

Barlow GT Mark II 2<sup>nd</sup> Colours (Approved to July 2006)

Dawson 2000 International 1<sup>st</sup> Colours (Approved to November 2010)

Dawson 2000 International 2<sup>nd</sup> Colours (Approved to November 2010)

Sunshiny (CB16) 1<sup>st</sup> Colours (Approved to October 2010)

Sunshiny (CB16) 2<sup>nd</sup> Colours (Approved to October 2008)

Willhoite Xtreme 1<sup>st</sup> Colours (Approved to October 2009)\*

\*Blue ball very pale: unsuitable for use alongside white of a second colour set.

**Note: All Balls manufactured up to and including the Approved Date shown above, are suitable for continued use beyond that date.**



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## 8. Ball Manufacturers

Barlow

GT:

Dawson: [auscroquetco#picknowl.com.au](mailto:auscroquetco#picknowl.com.au)

Sunshiny: Richard Wu (Taiwan) [sunshinyco@hotmail.com](mailto:sunshinyco@hotmail.com);

Willhoite: Willhoite Tool Co Inc, PO Box 1342, 157 Industry Rd, Georgetown, KY40324-1342, U.S.A. [WILLTOOL@aol.com](mailto:WILLTOOL@aol.com)

## 9. Purchasers

It is suggested that purchasers may wish to safeguard their rights by ordering balls that comply with the current Championship Specification. Makers produce balls in batches and the Croquet Association, on behalf of the WCF, is not able to test each batch, so close inspection of new purchases is recommended. Modern plastic balls appear to be produced from moulds comprising two hemispheres: it is a simple matter to check that the two hemispheres have been correctly aligned - any significant step across the joint line causes out of line rebounds and is unacceptable in play.

## 10 Championship Ball Specification

(Imperial measurements are definitive; metric equivalents are given for convenience.)

### (a) Diameter

The maximum diameter of a ball must not exceed  $3 \frac{21}{32}$  inches (92.9 mm) and the minimum diameter must not be less than  $3 \frac{19}{32}$  inches (91.3 mm).

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

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

### (b) Resilience

When dropped from a height of 60 inches (1524 mm) from the bottom of the ball onto a steel plate 1 inch (25.4 mm) thick and set rigidly in concrete, a ball must rebound to a height from the bottom of the ball of



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not less than 31 inches (787 mm) and not more than 37 inches (940 mm).

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

The rebound heights of a set of balls to be used together must not differ by more than 2 inches (50.8 mm).

### **(c) Milling**

All balls must be milled with an identical pattern.

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 left after grooving.

### **(d) Weight**

The weight of balls must be within the range  $15 \frac{3}{4}$  ounces (446.5 g) to  $16 \frac{1}{4}$  ounces (460.7 g).

## **11 Ageing of Balls**

The Croquet Association and World Croquet Federation are 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. To facilitate such performance monitoring, The Croquet Association Equipment Committee would welcome the assistance of one-court clubs which are intending to purchase one or two (e.g. 1st and 2nd colours) sets of Barlow GT or Sunshiny balls. Finance would be made available to cover costs and to provide some recognition for the effort involved.



## HOOPS

### **12. Guidance on seeking hoop approval**

Manufacturers seeking Approval are required to submit one (non-returnable) fully finished hoop for testing, to arrange a Field Test at an agreed venue and for an agreed period, and to provide written assurance that the manufacturing processes are adequately reproducible. The Croquet Association and World Croquet Federation testing laboratory will be responsible for preparing a report of performance in relation to the stated criteria and will provide a check list of items for the Field Test. The report will include a general description of the hoop system and indicate whether the hoop is suitable for fixed or adjustable setting. Approvals will be announced in an appropriate manner. A hoop system may be accorded Approval in either or both of the Standard or Championship categories. The report will be made available to the maker and for an Approved hoop and will be published by the WCF.

### **13. Approved Hoops**

Hoops that have current Standard Approval are as follows:

Omega Adjustable (stainless steel) Hoop (Approved December 2000)

This hoop was marketed with dimensions conforming to the Championship Standard from January 2001.

Jaques Championship (cast iron) Hoop (Approved July 2005)

**The design of a hoop system for use with artificial surfaces by R.H. Rawden of the Bury St Edmunds Club (Approved 2003).**

**Note: All Hoops manufactured from the Approved Date shown above, are suitable for continued use beyond that date.**

### **14. Hoop Manufacturers**

Omega Tal Golesworthy, email: [t.golesworthy@edt ltd.co.uk](mailto:t.golesworthy@edt ltd.co.uk)

Jaques Jaques, London; email: [gameon@jaques.co.uk](mailto:gameon@jaques.co.uk)



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## **15 Standard and Championship Hoop Specification**

Imperial measurements are definitive; metric equivalents are given for convenience. The criteria apply to hoops of fixed setting and to hoops whose setting may be adjusted by stress through the anchorages or otherwise.

Notes of explanation are enclosed in square brackets. The specifications for Approval are derived from the requirements for clearances of  $\frac{1}{8}$  inch ('handicap setting') or  $\frac{1}{16}$  inch ('advanced setting<sup>1</sup>') with any ball meeting the internationally recognised Championship Approval standard - ie. diam.  $3\frac{19}{32}$  -  $3\frac{21}{32}$  inches.

Standard Approval may be given to hoops of unstressed upright separation  $3\frac{11}{16}$  inches to  $3\frac{13}{16}$  inches, and both Championship and Standard Approvals to those with separation in the range  $3\frac{11}{16}$  inches to  $3\frac{3}{4}$  inches. The Championship range provides for a  $\frac{1}{16}$  inch clearance on all Championship Approved balls and the different upper limit of the Standard range accommodates a  $\frac{1}{8}$  inch clearance. By stressing the hoops in the ground it is expected that most designs will produce both  $\frac{1}{16}$  inch and  $\frac{1}{8}$  inch settings at ball half-height; the rules for Approval also aim to cover hoops of fixed width such as may be more suitable for use with artificial surfaces.

The requirements were revised in 2009 to recognise widespread use of hoops of greater upright diameter than 5/8", problems with the production of cast iron hoops with 5/8" diameter, and a strong interest in the upper reaches of the game in providing hoops of significant challenge. The revision of the Laws in 2008 to increase the upward tolerance on the 5/8" dimension to 1/8" is therefore interpreted to permit the use of 3/4" diameter uprights and crown.

### **(a) Construction**

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.

The uprights and crown should be straight and the anchorage system must not hinder free passage of the ball.

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

### **(b) Height**

The hoop must be capable of a setting in which the top of the crown is between 11.5 and 12.5 inches (292 and 317 mm) from the ground.



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## (c) Upright diameter

The diameter of each upright should lie between  $19/32$  and  $3/4$  inches (15.1 and 19.1 mm); minor deviations at the top and bottom are permitted. **Hoops with uprights formed from well-made  $3/4$  inch bar will be deemed to fulfil the requirements for Approval.**

Three measurements are to be made for each upright: high, low and mid length: all diameters must lie within the allowed range. Here and subsequently, high = approx.  $13/4$  inches from underside of crown; low = approx.  $13/4$  inches above base of upright.

The high and low points avoid minor deviations at the top and bottom of the uprights and approximate respectively to a ball radius from the underside of the crown or the ground ( $13/4$  inches = ideal ball radius minus  $1/16$  inch).

## (d) Uprights parallel

The inner surfaces of the uprights must be approximately parallel and of separation between  $3^{11}/16$  and  $3^{13}/16$  inches (93.7 and 96.8 mm) for Standard Approval or between  $3^{11}/16$  and  $3^{3}/4$  inches (93.7 and 95.25 mm) for Championship Approval. For a set of hoops the separations must not differ by more than  $1/16$  inch (1.6 mm).

Three measurements of the separation between the inner surfaces of the uprights of an unstressed hoop are to be made at high, low and mid length: all three measurements must be within the allowed range and the difference between the largest and smallest measurement shall not exceed  $1/32$  inch; for a set of hoops the difference between the largest and smallest of the 18 measurements should not exceed  $1/16$  inch.

The ranges are derived as follows.

### Standard Approval:

$$3^{19}/32 \text{ (min. ball) } + 1/8 \text{ (hcp setting) } - 1/32 \text{ (hoop tolerance) } = 3^{11}/16 \text{ inches}$$
$$3^{21}/32 \text{ (max. ball) } + 1/8 \text{ (hcp setting) } + 1/32 \text{ (hoop tolerance) } = 3^{13}/16 \text{ inches}$$

### Championship Approval:

$$3^{21}/32 \text{ (max. ball) } + 1/32 \text{ (min. clearance) } = 3^{11}/16 \text{ inches}$$
$$3^{21}/32 \text{ (max. ball) } + 1/16 \text{ (adv. setting) } + 1/32 \text{ (hoop tolerance) } = 3^{3}/4 \text{ inches}$$

The uprights between the high and low positions will be tested for coplanarity: when one upright is in contact with a plane surface, no



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point of the relevant length of the other upright may depart from the plane by more than  $\frac{1}{16}$  inch.

## **(e) Crown**

The crown must be straight, at right angles to the uprights, and have a diameter between  $\frac{19}{32}$  and  $\frac{3}{4}$  inches (15.1 and 19.1 mm).

Any logo must comply with these limits.

## **(f) Field Test**

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

Evidence of satisfactory performance in setting, durability, and play with Championship Approved balls must be available.

A check list has been prepared, to ensure that the Field Test has appropriate scope.

For further details please contact Dr. Pidcock.

End of WCF Equipment Regulations

## **Notified suppliers of approved balls:-**

Barlow  
GT: **England**  
[Croquet Association on-line shop](#);

**Canada**  
[www.croquetstore.com](http://www.croquetstore.com) . PO Box 3045, Brighton, Ontario K0K 1H0,  
Canada. Tel phone n0: +001 613 475-3541.

Dawson: **England**  
[Croquet Association on-line shop](#);



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Sunshiny: **England**

[Croquet Association on-line shop](#);

## **Canada**

[www.croquetstore.com](http://www.croquetstore.com) . PO Box 3045, Brighton, Ontario K0K 1H0, Canada. Tel phone n0: +001 613 475-3541.

## **USA**

Croquet Enterprises. The Pro Shop at the National Croquet Center, West Palm Beach Florida. 700 Florida Mango Rd., West Palm Beach, Florida 33406, USA.

Tel phone n0:- +001 561 478 2300.

<http://www.croquetnational.com/players/proshop>

## **Taiwan**

Richard Wu (Taiwan) [sunshinyco@hotmail.com](mailto:sunshinyco@hotmail.com);

Willhoite: **USA**

Willhoite Tool Co Inc, PO Box 1342, 157 Industry Rd, Georgetown, KY40324-1342, U.S.A. [WILLTOOL@aol.com](mailto:WILLTOOL@aol.com)

## **Notified suppliers of approved hoops:-**

Omega **England**

[Croquet Association on-line shop](#),

Jaques **England**

[Croquet Association on-line shop](#),