Goalpost strength tests on lightweight aluminum 16'x7' & 21'x7' crossbars

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Football goal post innovator and long standing campaigner for improving goal post safety. Founder member of the European En748 goalpost safety committee and contributor to the PAS & BS 8462 goalpost standard.
The author of safety labelling now used on all goalpost standards. Creator of Mini Soccer and the first uPVC children's goal in a bag. Goalpost patents include the Arrowhead push in net fixing, anti- vandal steel socketed goalposts & secure lockable folding goalposts.

Introduction

These tests were undertaken to indicate the strength of 70mm lightweight aluminum tube to ascertain a suitable strength test to propose for the new European En 16579 goalpost standard. They are to show that the current 1800Newtons test is over the top and encourages heavy dangerous freestanding goalposts. These tests are to show that lighter safer goalposts can also be strong enough for use by children and adults. The tests are standard procedures at the design stage of most goalposts. The lack of any deflection at 750newtons and 950newtons and the 5mm deflection at 1470Newtons shows that the tube at the larger sixteen foot crossbar is sufficiently strong enough to support children safely. The testing on the twenty one foot two section crossbar required a much stronger insert (adding two kilos of weight to the goal and taking it to 41.6 kilos) to support 1000 newtons. With a normal insert the goal could be made under 40 kilos but this would require a lower strength test to achieve the desired maximum weight and this is why we recommend 600/800Newtons.

Testing Conditions

These tests are carried out in a basic manner to ascertain the strength of crossbars of goalposts designed at our workshops in Sheffield. We set the crossbar up from the outer point of contact from the corner and measure in the center of the crossbar with a square and long metal rule from the floor. Weights are calculated to Newtons and weighed on digital scales to conform the weight required for the test and then recorded on a digital photograph. The weights are lifted under the crossbars on a fork lift and then dropped to be freely suspended for sixty seconds whilst being videoed. Measurements are recorded before the test and after thirty minutes. The testing was carried out indoors at a temperature between six and fifteen degrees Celsius. On Independent outdoor testing the test house uses a digital measuring device calibrated to 100th of a millimeter.

Conclusion

The conclusion :-If lower testing is used lighter goalposts can be made that will not cause serious injury to children if they topple onto them. The only way to ensure the safety of children is to have a maximum weight for all children's freestanding goalposts. With lower topple testing less counterbalance weight would be required on freestanding goalposts making the goalposts much easier to use and more maneuverable. The two larger goal posts used by children in the U.K. are 16'x7' and 21'x7'. The larger youth goalposts in Spain it is 6M x 2m and in other European countries such as Germany 5 M x 2M is the normal youth size goalposts and both are within the UK goalpost sizes. 16x7 goalposts can be made below 34 kilos and 21x7 goalposts can be made to 41.6 kilos to higher 1000 Newton testing or 39.6kilos to lower testing which would be preferable.

1. 16 x 7 freestanding goal - 70 mm Dia (750 Newtons) - video
2. 16 x 7 freestanding goal - 70 mm Dia (950 Newtons) - video
3. 16 x 7 freestanding goal - 70 mm Dia (1470 Newtons) - video
4. 21 x 7 freestanding goal - 70 mm Dia (1000 Newtons) - video
5. 21 x 7 freestanding goal - 70 mm Dia (550 Newtons) - video

Figure 1 Measurement before 750 Newtons of testing.

Figure 2 Showing weight for 750 Newtons testing.

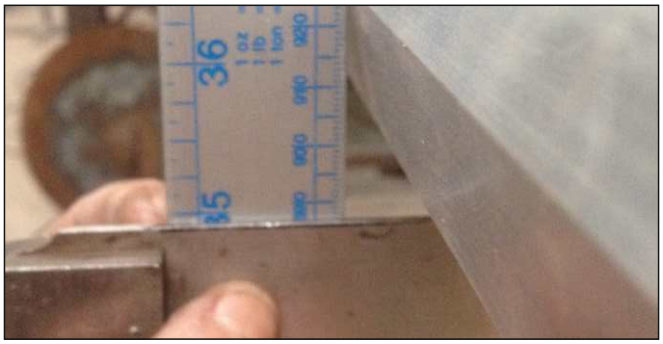

Figure 3 Showing deflection after 750 Newtons testing.

16 x 7 freestanding goal - 70mm Dia (750 newtons)	
Weight of goal	33.04kg
Date of Test	20/01/2014
Present at Testing	Matthew Watson, Jason Hodgson, John Wilson.
Test weight/Newtons	76.76kg *(750 Newtons)*
Recorded measurement/ before test	888mm
Recorded measurement/deflection after test	888mm
Time of test	60secs
Deflection after 30 minutes	None recorded
Room Tempreture	12 degrees celsius
Crossbar deflection	0mm

16 x 7 crossbar deflection testing

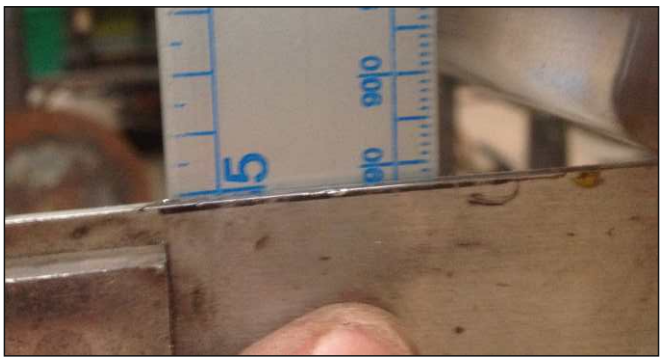

Figure 4 Measurement before 950 Newtons of testing.

Figure 5 Showing weight for 950 Newtons testing.

Figure 6 Showing deflection after 950 Newtons testing.

Figure 7 Measurement before 1470 Newtons of testing.

Figure 8 Showing weight for 1470 Newtons testing.

Figure 9 Showing deflection after 1470 Newtons testing.

16 x 7 freestanding goal - 70mm Dia (950 newtons)	
Weight of goal	33.04kg
Date of Test	**20/01/2014**
Present at Testing	Matthew Watson, Jason Hodgson, John Wilson.
Test weight/Newtons	97.22kg *(950 Newtons)*
Recorded measurement/ before test	888mm
Recorded measurement/deflection after test	888mm
Time of test	60secs
Deflection after 30 minutes	None recorded
Room Tempreture	12 degrees celsius
Crossbar deflection	**0mm**

16 x 7 freestanding goal - 70mm Dia (1470 newtons)	
Weight of goal	33.04kg
Date of Test	**20/01/2014**
Present at Testing	Matthew Watson, Jason Hodgson, John Wilson.
Test weight/Newtons	150kg *(1470 Newtons)*
Recorded measurement/ before test	888mm
Recorded measurement/deflection	883mm
Time of test	60secs
Deflection after 30 minutes	None recorded
Room Tempreture	12 degrees celsius
Crossbar deflection	**5mm**

21 x 7 crossbar deflection testing

Figure 10 Measurement before 1000 Newtons of testing.

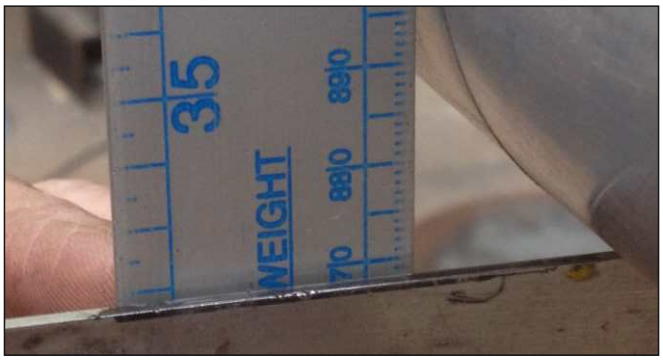

Figure 13 Measurement before 550 Newtons of testing.

Figure 11 Showing weight for 1000 Newtons testing.

Figure 14 Showing weight for 550 Newtons testing.

Figure 12 Showing deflection after 1000 Newtons testing.

Figure 15 Showing deflection after 550 Newtons testing.

21 x 7 freestanding goal - 70mm Dia (1000 newtons)	
Weight of goal	44.06kg
Date of Test	**20/01/2014**
Present at Testing	Matthew Watson, Jason Hodgson, John Wilson.
Test weight/Newtons	97.50kg *(1000 Newtons)*
Recorded measurement/ before test	888mm
Recorded measurement/deflection after test	888mm
Time of test	60secs
Deflection after 30 minutes	None recorded
Room Tempreture	12 degrees celsius
Crossbar deflection	**0mm**

21 x 7 freestanding goal - 70mm Dia (550 newtons)	
Weight of goal	44.06kg
Date of Test	**20/01/2014**
Present at Testing	Matthew Watson, Jason Hodgson, John Wilson.
Test weight/Newtons	56kg *(550 Newtons)*
Recorded measurement/ before test	888mm
Recorded measurement/deflection after test	882mm
Time of test	60secs
Deflection after 30 minutes	None recorded
Room Tempreture	12 degrees celsius
Crossbar deflection	**6mm**