Laboratory Test Report

FIBA Approval Programme for Basketball Equipment

Handbook of Test Methods and Requirements – April 2020 Edition V1.4

Manufacturer Name: **Liaoning NB sports development company limited.**
Model Name: **NB-H600**

Zhongzheng	*Wooden Flooring*	*30/09/2020*	*PASS*

This is not a Certificate of Approval

Introduction

Test results, in accordance with the FIBA Equipment & Venue Centre Approval Programme for Basketball Equipment, are presented in full within this report. This report does not imply FIBA approval or certification regardless of its contents or compliance to the FIBA requirements. FIBA approval or certification will always be awarded to the applicant directly from FIBA. Neither FIBA, nor the Test laboratory accept responsibility to third parties to whom this report, or any part thereof, is made known.

Declaration of Conformity

We certify that the tests described in this report have been carried out in accordance with the latest publication of the FIBA Handbook of Test Methods and Requirements and this report accurately reflects the outcome of the tests conducted. We also confirm that, to the best of our knowledge, all samples submitted for certification were done so in accordance with the requirements of the handbook.

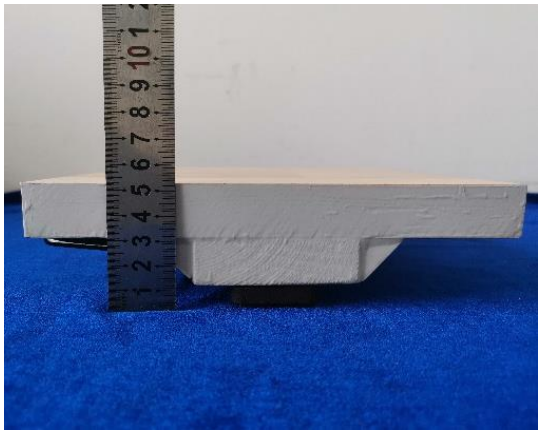
Report Written By:	**Jia Zuxiao**	**Report Checked By:**	**Liu Guochao**
Date:	**25/09/2020**	**Date:**	**30/09/2020**
Signed:		**Signed:**	

Test Laboratory

Test Laboratory Name:	**Jiangsu Zhongzheng Testing Co., Ltd**
Address:	**No.825 Room, No.108 HeFeng Road, HuaQiao Town**
City & Postal (ZIP) Code:	**KunShan City & 215300**
State or Province:	**Jiangsu**
Country:	**China**
Telephone:	**86-512-36857685**
Email:	**china.service@global-otc.com**

Product Manufacturer

Manufacturer's Name:	**Liaoning NB sports development company limited.**
Address:	**Baijia Group, Bianwai Village, Yushu Township, Xinbin Manchu Autonomous County**
City & Postal (ZIP) Code:	**Fushun City & 113207**
State or Province:	**Liaoning**
Country:	**China**
Telephone:	**86-13611052582**
Email:	**naibusports@163.com**

Product Description		
Surface Name:	**Portable Wooden Sports Flooring**	**Surface Profile Image [Plan View]:**
Surface Level:	**Level 1**	
Surface Type:	**Area-elastic**	
Installation Type:	**Portable**	
Upper Surface Thickness [mm]:	**22**	
Sample Size:	**3.5m x 3.5m**	
Sample Size Note: N/A		
FIBA Licence Number:	**N/A**	
Surface Colour:	**Wood primary color**	
FIBA Approved Equipment Logo:	**No FIBA logo present**	**Surface Profile Image [End Elevation]:**
Description of the Construction: **Floor product structure information （From top to bottom ）** **The first layer: Material: Birch, Thickness: 22mm** **The second layer: Material: Pine, Thickness: 30mm** **The third layer: Material: Aluminum film, Thickness: 0.2mm** **The fourth layer: Material: Rubber, Thickness: 12mm.** **It adopts a nailless tenon and tenon structure, and the keel is embedded in the panel by 10mm. Corresponding to the overall thickness is reduced by 10mm, the structure saw the reference photo.**		
Note: The surface image must show the below details, where this isn't possible in a single image, additional images can be submitted in the 'Additional Notes' Section of this document. • FIBA Logo, where present • Surface Laminations • Steel Rule placed to provide reference of sample thickness		

Sample Description		
Number of samples submitted for testing:		**8**
Laboratory Sample Reference No(s).	**Global Reference No.**	**191017006-02**
	Surface Sample 1	**N/A**
	Surface Sample 2, if applicable	**N/A**
	Surface Sample 3, if applicable	**N/A**

Test Laboratories are required to store a reference sample of the tested product for a period of 5-years. **By checking the box opposite, we confirm a 200x200mm sample has been placed in storage and will be retained for the minimum term of 5-years.**	☒ A sample of the tested product has been placed in storage and shall be retained for at least a 5-year period.

Results Summary			
Performance Property	**Results**	**Requirement**	**Pass/ Fail**
Force Reduction	**56%**	L1 Wooden 50-75%	**PASS**
Force Reduction Uniformity	**±4%**	±5% from average	**PASS**
Vertical Deformation	**1.9mm**	L1 Mobile 1.5-5.0mm	**PASS**
Vertical Deformation Uniformity	**-0.2mm**	±0.7mm from average	**PASS**
Ball Rebound	**95%**	L1 ≥93%	**PASS**
Ball Rebound Uniformity	**2%**	±3% from average	**PASS**
Slip Resistance	**99**	Average ≥80 ≤110	**PASS**
Resistance to Wear	**42mg**	L1 ≤80mg	**PASS**
Specular Gloss	**42%**	Recommended ≤45%	**PASS**
Specular Gloss Uniformity	**5**	L1 ≤10 unit variance	**PASS**
Rolling Load	**0.4mm**	≤ 0.5mm permanent indentation	**PASS**
Rolling Load Visual Inspection	**No Excessive Damage**	No Excessive Damage	**PASS**

Summary notes:
Force Reduction, Vertical Deformation and Ball Rebound were tested in the applicant's factory; other test items were tested in the laboratory.

Force Reduction - Overview

Force reduction is the ability of the surface to provide cushioning to the athlete during landing from a jump or during running. Higher force reduction values indicate a softer sports surface which absorbs the energy from impacts. A low force reduction value indicates a stiffer surface.

Force Reduction – Requirements

Test	Level 1 wooden Permanent	Level 1 Wooden Mobile	Level 2 Wooden Permanent & Mobile
Force Reduction	≥50% ≤75%		≥40% ≤75%
Uniformity	±5% from average		

Force Reduction – Results

Date:	**24/10/2019**	**Air Temperature (°C):**	**17.8**
Operator:	**Jia Zuxiao**	**Relative Humidity (%):**	**54.6**

Location	Measurement No.			Average of Drops No. 2 and 3
	D1	D2	D3	
1	**53%**	**53%**	**53%**	**53%**
2	**58%**	**58%**	**58%**	**58%**
3	**52%**	**52%**	**52%**	**52%**
4	**60%**	**60%**	**60%**	**60%**
5	**56%**	**56%**	**56%**	**56%**
6 (if applicable)	**N/A**	**N/A**	**N/A**	**N/A**
7 (if applicable)	**N/A**	**N/A**	**N/A**	**N/A**
8 (if applicable)	**N/A**	**N/A**	**N/A**	**N/A**
Calculated Uniformity from Measured Locations:				**±4%**

Vertical Deformation - Overview

Vertical Deformation is the ability of the surface to deform during landing from a jump, during running or during any foot-floor contact. The test focuses on the deformation generated at the point of impact, and it is thought that vertical deformation values that are too high decrease foot stability. It involves computing a normalized deformation, measured in millimetres, under a standard load of 1500 N (ie 2.4 mm). A higher value for vertical deformation means that the sport surface deforms more during foot-floor impacts.

Vertical Deformation – Requirements

Test	Level 1 wooden Permanent	Level 1 Wooden Mobile	Level 2 Wooden Permanent & Mobile
Vertical Deformation	≥2.3mm ≤5.0mm	≥1.5mm ≤5.0mm	
Uniformity	±0.7mm from average		

Vertical Deformation – Results

Date:	**24/10/2019**	**Air Temperature (°C):**	**17.8**
Operator:	**Jia Zuxiao**	**Relative Humidity (%):**	**54.6**

Location	Measurement No.			Average of Drops No. 2 and 3
	D1	D2	D3	
1	**1.8mm**	**1.8mm**	**1.8mm**	**1.8mm**
2	**1.9mm**	**1.9mm**	**1.8mm**	**1.9mm**
3	**1.7mm**	**1.6mm**	**1.7mm**	**1.7mm**
4	**2.0mm**	**2.0mm**	**2.0mm**	**2.0mm**
5	**1.9mm**	**2.0mm**	**1.9mm**	**2.0mm**
6 (if applicable)	**N/A**	**N/A**	**N/A**	**N/A**
7 (if applicable)	**N/A**	**N/A**	**N/A**	**N/A**
8 (if applicable)	**N/A**	**N/A**	**N/A**	**N/A**
			Calculated Uniformity from Measured Locations:	**-0.2mm**

Ball Rebound - Overview

A basketball is released from a height of 1.8m and the height of its rebound from the surface calculated in accordance to EN 12235 and expressed as a percentage relative to that of a rebound on a concrete surface. Higher ball rebound values rebound to levels that are closer to those generated on concrete.

Ball Rebound – Requirements

Test	Level 1 wooden Permanent	Level 1 Wooden Mobile	Level 2 Wooden Permanent & Mobile
Ball Rebound	≥93%		≥90%
Uniformity	±3% from average		

Ball Rebound – Results

Date:	**24/10/2019**	**Air Temperature (°C):**	**17.8**
Operator:	**Jia Zuxiao**	**Relative Humidity (%):**	**54.6**

Location	Measurement No					Average	Percentage Rebound %
	1	2	3	4	5		
Concrete	**1.037m**	**1.037m**	**1.037m**	**1.037m**	**1.037m**	**1.037m**	
1	**0.974m**	**0.979m**	**0.979m**	**0.976m**	**0.976m**	**0.977m**	**94**
2	**0.981m**	**0.981m**	**0.981m**	**0.981m**	**0.979m**	**0.980m**	**95**
3	**0.990m**	**0.996m**	**1.003m**	**1.003m**	**1.003m**	**0.999m**	**96**
4	**0.972m**	**0.976m**	**0.972m**	**0.976m**	**0.974m**	**0.974m**	**94**
5	**1.003m**	**1.010m**	**1.005m**	**1.007m**	**1.003m**	**1.006m**	**97**
6 (if applicable)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
7 (if applicable)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
8 (if applicable)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
					Sample Average:	**0.987m**	**95**

Slip Resistance - Overview

Slip Resistance also referred to as 'linear friction', is a measure of the surfaces ability to resist slippage and to provide adequate friction to allow players to make safe changes in direction during the game of basketball. Testing simulates the shoe-surface interface. Linear slip resistance, as detailed in EN 13036, is the indicative friction of the surface under skidding or quick stopping activities and is presented in whole number value (i.e. 100).

Slip Resistance – Requirements

Test	Level 1 wooden Permanent	Level 1 Wooden Mobile	Level 2 Wooden Permanent & Mobile
Slip Resistance	Average ≥80 ≤110		

Slip Resistance – Results

Date:	**25/11/2019**	**Air Temperature (°C):**	**23.1**
Operator:	**Jia Zuxiao**	**Relative Humidity (%):**	**52**

Direction	Measurement No					Direction Average:
	1	2	3	4	5	
0°	103	103	104	103	103	103
45°	100	100	100	100	100	100
90°	93	93	93	93	93	93

Surface Temperature at tested Location (°C):	22.2	Sample Average:	99

Resistance to Wear - Overview
This test measures the surfaces ability to resist wear and provides results indicative to the expected lifetime of the surface or its coatings. This is of particular importance in areas such as the three-point line. Weighted abrasive wheels are repeatedly passed across the surface and the respective mass loss from the surface is measured. A lower loss of mass indicates a higher resistance to wear.

Resistance to Wear – Requirements

Test	Level 1 wooden Permanent	Level 1 Wooden Mobile	Level 2 Wooden Permanent & Mobile
Resistance to Wear	≤80mg		≤100mg

Resistance to Wear – Results

Date:	**24/11/2019**	**Air Temperature (°C):**	**23.2**
Operator:	**Jia Zuxiao**	**Relative Humidity (%):**	**50**

Sample No.	Pre-Abrasion Mass (g)	Post-Abrasion Mass (g)	Loss of Mass (mg)
1	86.547	86.508	39
2	80.240	80.198	42
3	79.011	78.966	45
4	83.471	83.429	42
5	76.117	76.073	44
6	77.731	77.691	40
		Average Loss of Mass (mg):	42

Specular Gloss - Overview

The measurement of specular gloss indicates how much the surface reflects lights in a specular direction rather than diffusing or absorbing it. This is an important factor in the aesthetics of the surface and how it reflects arena lighting. The apparatus measures the ratio of incident to reflected light relative to a black glass datum and is expressed in Gloss Units (GU). The higher the Gloss Unit measurement, the high the specular reflectance of the surface.

Specular Gloss – Requirements

Test	Level 1 wooden Permanent	Level 1 Wooden Mobile	Level 2 Wooden Permanent & Mobile
Specular Gloss	≤45%*		NA
Uniformity	≤10-Unit Variance		

Specular Gloss – Results

Date:	**24/11/2019**	**Air Temperature (°C):**	**23.2**
Operator:	**Jia Zuxiao**	**Relative Humidity (%):**	**50**

Specular Gloss Value (GU):	**Measurement Location**							**Sample Average (GU):**
	1	**2**	**3**	**Calibration Check**	**4**	**5**	**6**	
	37	**42**	**42**	☒	**45**	**43**	**43**	**42**

*Recommended value to minimize court glare for player's vision and TV production. High-gloss alternatives may be used when lighting is positioned as such to avoid unwanted court glare.

Rolling Load - Overview
A rolling load is repeatedly traversed across the upper surface of the flooring material to locally stress the surface and determine its ability to resist indentation. A weighted steel wheel is utilised in the application of the load representing a worst-case scenario of heavy equipment being rolled across the court.

Rolling Load – Requirements			
Test	**Level 1 wooden Permanent**	**Level 1 Wooden Mobile**	**Level 2 Wooden Permanent & Mobile**
Rolling Load	Permanent Indentation of ≤0.5mm		

Rolling Load – Results			
Date:	**26/11/2019**	**Air Temperature (°C):**	**21.3**
Operator:	**Jia Zuxiao**	**Relative Humidity (%):**	**45**

Deformation Measurement (mm):	**Initial Post-Test Measurement**	**Post- Recovery Measurement**
	0.4	**0.4**
Visual Inspection Result:	**The area under test exhibited no notable dammage following the Rolling Load test.**	

Reference Image 1	**Reference Image 2**

Note:
N/A

Conclusion

The flooring samples submitted were tested in accordance with the most recent publication of the FIBA Equipment & Venue Centre Approval Programme for Basketball Equipment. We confirm all information presented within this report is accurate and appropriately reflects the performance of the samples submitted.

Based upon the test results we the test laboratory consider the samples supplied to have:

☒ Met all requirements for FIBA product certification

☐ Failed to meet all requirements for FIBA product certification

Additional Notes

Use this section to insert any additional information or images relevant to the flooring samples submitted for assessment. Where the samples showed visible signs of deterioration following the Rolling Load test, images and a description of the damage observed may be supplied in this section. Any system with multiple, distinct layers should be recorded here, detailed the composition of each:

N/A

Reference Image A	Reference Image B
	

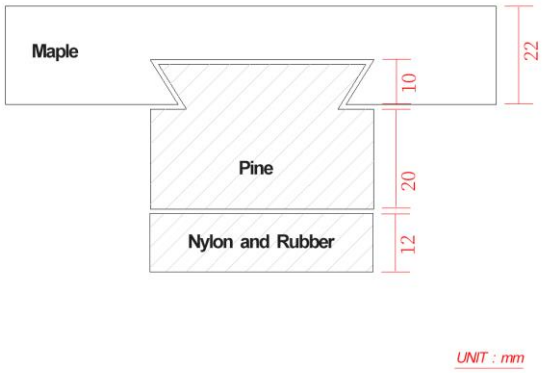
Additional Notes - Continued

Use this section to insert any additional information or images relevant to the flooring samples submitted for assessment.

N/A

Reference Image C

Reference Image D



Reference Image E

Reference Image F

END OF REPORT

Adherence to the FIBA requirements does not constitute adherence to any regional, national or international safety or trading standards. It is the responsibility of the manufacturer to ensure products are in full compliance to any mandatory safety regulations for the intended region of product sale or installation. Products holding FIBA approval which are deemed to be in breach of any mandatory safety requirements shall have their FIBA approval revoked from the date at which the breach occurred.

FIBA
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for basketball equipment