Forest Products Research and Development Institute
ITTO Project PD 35/99 Rev. 4 (I)
FINAL TECHNICAL REPORT

Performance Evaluation of Export Wood Furniture in Relation to Strength and End-Use Applications Using Established Test Standards

Los Baños, Laguna, Philippines
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ABSTRACT

The project determined and evaluated the strength and performance of export wood furniture in the form of chairs, tables, stools, cabinet doors and drawers by the application of loads or forces that simulate normal functional use, as well as acceptable mis-use, according to a graded scale of severity following established test standards. The standards used in the project are the British Standard (BS), the International Organization for Standardization (ISO) and the British-European Standard (BS EN). These standards specify performance requirements for domestic and contract furniture or home and office furniture. Testing and evaluation include static, fatigue, impact and drop test. The furniture samples tested were supplied by some furniture manufacturers in the Philippines who are members of the Chamber of Furniture Industries of the Philippines.
Most of the samples successfully passed the specific load or force requirements under test level 3 of the standards for performance category of general domestic, careful contract, delicate and careful domestic. Examples of furniture under these performance categories are those used in living and dining rooms and bedroom in residential houses and hotels.

Using test level 3 of the standards, the parameters used were: (a) for chairs and stools the static load is 1,300 Newtons (N) for the seat and 560 N for backrest applied 10 times; and (b) for fatigue test, the seat load is 950 N and the back load is 330 N applied repeatedly for 50,000 times. Majority of the chairs and stools tested passed the test performance requirements. The assessment criteria in the evaluation of the test samples were: (a) the occurrence of fracture or cracking in any part and joints; (b) loosening of members, joints and underframe; (c) free movement of arms, backrest, legs and underframes; (d) deformation of any part and cracking or splitting that will adversely affect the sample furniture appearance; and (e) the development of audible noise. The moisture content of the samples ranged from 8% to 14%. The species of wood used belongs to the Philippine Mahogany Group (almon, mayapis, red and white lauan and tangile) and some *Gmelina arborea*.

The pivoted cabinet doors failed the durability test. Failure occurred at the door hinges during load application. Except for the metal hinges, the integrity of the wood portion was intact. For drawers of cabinet, the samples passed the horizontal load movements slam-shut and open. For tables, the sample tilted in stability under vertical load. The tilting was primarily due to the long overhang of the table top from the posts or legs. The tilting of the table did not affect its serviceability.

The project as planned, does not include test on furniture under performance categories of severe domestic, general contract and severe contract. In such situation, the furniture is usually used in transport terminals, students' common room, military barrack and other places where items are subjected to rough treatment and careless handling. To test furniture under these categories would require long period of time.

INTRODUCTION

The furniture industry is among the country's "export winners" counted on to help propel the Philippine economy in the next millennium. It is the fifth among the country's foreign exchange earners in the later part of 1990s. The export of furniture steadily increased from US$ 240 million in 1994 to US$ 324 million in 1998. The export target for year 2000 was US$ 500 million. The world market for furniture is US$ 38 billion annually and wooden furniture share about US$ 12 billion and the Philippines has a good prospect to capture a bigger share of the market.

The Philippines is a member of the World Trade Organization (WTO), the Asia Pacific Economic Cooperation (APEC) and the Asia Free Trade Area (AFTA). With this, it compels the country to institute measures and adopt internationally established and accepted standards for product quality, performance or serviceability set by these organizations for Mutual Recognition Agreement (MRA) through harmonization of standards and accreditation of test facilities. This aims to remove discrimination against foreign products and ensure that obstacle to trade are eliminated.

With this scenario, a project was conceived and implemented to address the problems of the furniture producers, exporters and users on the lack of technical data and information on the performance of furniture in actual service and the accompanying premature failure in some specific type/category of use. This problem can be attributed to the lack of actual test on the strength and performance of furniture sold in the market. Actual situation showed that in the Philippines and some other furniture exporting countries, furniture are marketed without passing any kind of test and evaluation on their strength, durability and stability. The manufacturers, exporters and end-users have no specific idea and information on how long and stable a chair, a sala set, a table, a cabinet door or drawer would last in service. There is no information that a piece of furniture would withstand the repeated movements and load applications that occur during daily use.

The development objective of the project entitled "Performance Evaluation of Export Wood Furniture in Relation to Strength and End-Use Applications Using Established Test Standards" was to generate data and information on the strength and performance of furniture from tropical timber using established test standards; promote the standardization of performance tests for wooden furniture to enhance their competitiveness in the world market; and recommend innovative designs or construction methods to improve their quality and performance.

Specifically, the aim was to test and evaluate the static, fatigue and impact strength of export wood furniture under specific test levels and rates of loading that occur occasionally and under repeated load applications during daily use. Secondly, it hoped to generate and recommend design modification or innovative construction methods to improve the quality and performance of wooden furniture.

The three types of test conducted were: strength, durability and stability. Under strength test, there are two sub-tests done. The first was **static test,** which consisted of heavy loads applied a few times to ensure that the furniture has sufficient strength to perform its function under the highest levels of loading that might reasonably be expected to occur. The second sub-test was **impact test,** which assessed the strength of the furniture under the rapid rates of loading that occasionally occur. The second type of test was **durability test,** which simulated the repeated movement of components occurring during long-term functional use. It also assessed the strength of the furniture under such conditions. The test is also referred to as **fatigue test.** The third type of test was the **stability test,** which simulated the application of load in different directions during actual use and it also assess the ability of furniture to maintain its balance.

The Project was conducted at the Forest Products Research and Development Institute (FPRDI) Furniture Testing Center in Los Baños, Laguna. The center is equipped with facilities required to perform testing of furniture intended for export and domestic use. Project was carried out by technical and administrative support staff with the guidance of a National Expert and an International Consultant. The efforts and cooperation exerted by everyone involved eventually led to the successful completion of the project. Other vital factors that contributed to the achievement of the development objectives were: (a) strict, careful and dynamic financial management of the ITTO and FPRDI; (b) facilitative approach to project supervision and monitoring coupled with transparent and practical leadership style of project management; (c) the cooperation and support of the organizers of Furniture Show and Trade Fair Organizations in allowing the project to participate in their show and fair; and (d) the timely production of prototype furniture of both the original and modified items used in actual testing.

Data gathered from the project will serve as the manufacturers first hand information and guide in the design and construction of furniture to help enhance product quality and serviceability. On the otherhand, consumers are assured that the product they buy met specific standards as claimed by the manufacturers; and that the products they acquired are strong, durable and would last long.

MAIN TEXT

The main goals of the project were to provide furniture manufacturers information on whether manufactured furniture items could withstand the actual loads or forces set by the standards and cope with the functional use it will encounter in actual service. Find possible solution to the problem of furniture users on the pre-mature failure or inadequate performance in service. Recommend improved designs or innovations in furniture construction particularly on joint construction to help upgrade the quality and performance. Ultimately the project will disseminate the project outputs to the furniture manufacturers, exporters, retailers and users in the Philippines. This report presents the test standards used, the test machines, the presentation of data, the interpretation and discussion of results, the conclusions and recommendations. It also included a report on the addendum project activity on the "Promotion and Dissemination of Project Outputs to the Furniture Manufacturers in the Philippines" as shown in ANNEX A.

Test Standards Used

The test standards used in the project were:

1. British Standard BS 4875 Part 1, 2001 Titled: Strength and Stability of Furniture. Part 1: Requirements for the strength and durability of the structure of domestic and contract seating.
   Test Level 3 of the standard was used for the study.

2. International Standard ISO 7173, 1989 Titled: Furniture, Chairs and Stools – Determination of Strength and Durability.
   Test level 3 of the standard was used for the study.

3. British Standard BS EN 1728: 2001 Titled: Domestic Furniture – Seating – Test Methods for the Determination of Strength and Durability.
   Test level 3 of the standard was used for the study.

4. International Standard ISO 7171, 1998 Titled: Furniture Storage Units – Determination of Stability. ISO 7172 Determination of Stability of Tables.
   Test level 3 of the standard was used.

5. British Standard BS 4875 Part 7, 1988 Titled: Furniture Strength and Stability - Part 7: Methods of Determination of Strength and Durability of Storage Furniture. Part 5: Methods of Determination of Strength and Durability of Table.
   Test level 3 of the standard was used.

Test Machines Used

The test machines used were:

1. Upright Chair Test Machine – Used for performing static test and combined seat and back fatigue test for upright chairs, small-upholstered chairs and pedestal chairs.

2. Single Cylinder General Purpose Machine – Used for performing static, seat and back fatigue test for chairs, stools, tables, beds and bunk beds.

3. Vertical Impact Machine – Used to simulate the effect of a person falling or jumping on a chair or stool.

4. Impact Pendulum Hammer – used to simulate the local impact for the chairs armrest and backrest.

5. Horizontal Impact Tester–Basketball – Used to simulate a person bumping into tables and cabinets.

6. Arm Sideways Test Rig – Used for the sideways (outward force) static load test between the armrest of the chair. It is also suitable for diagonal base static load test for chairs and stools.

7. Pivot Door Cycling Machine – Used for testing the opening and closing operations of cabinet doors.

8. Drawer Cycling/Slamming Machine – Used for testing the drawer closing/opening operation of cabinet drawers. Also capable of testing horizontal load movements.

Table 1. **Relationship of test level to use of furniture**

Test Level	Performance Category		Example of Use
1	Delicate		Seats of delicate appearance
2	Careful Domestic		Domestic bedroom
3	General Domestic	Careful Contract	Domestic living/dining room, hotel bedroom
4	Severe Domestic	General Contract	Seat where rough treatment and careless handling occur, e.g. college study, hotel reception area.
5		Severe Contract	Seating for exceptionally severe use, e.g. transport terminus, student common room and barrack room.

Table 2. **Test levels for typical applications**

Type of Use	Test Level				
	1	2	3	4	5
Garden & Camping (folding furniture)		☐	☐		
Domestic	☐	☐	☐		
Institutional					☐
Hotel			☐	☐	
Non-specialized hospital				☐	☐
Military					☐
Bar				☐	☐
Church			☐		
Police Station				☐	☐
Recreation room					☐
Common room					☐
Public hall				☐	☐

Table 3. **Summary of test description, loading and test levels**

Test Description	Loading	Test Levels				
		1	2	3	4	5
Seat static load	force, N 10 times	-	1,100	1,300	1,600	2,000
Back static load	force, N	-	410	560	760	760
Balancing load	force, N 10 times	-	1,100	1,300	1,600	2,000
Arm sideways static load	force, N	200	300	400	600	900
Wing sideways static load	force, N 10 times	-	200	300	400	500
Arm downwards static load	force, N 10 times	300	700	800	900	1,000
Seat fatigue test	cycles seat load 950 N	12,500	25,000	50,000	100,000	200,000
Back fatigue test	cycles	12,500	25,000	50,000	100,000	200,000
Balancing load	back load 330 N seat load 950 N					
Leg forward static load	force, N	300	375	500	620	760
Balancing seat load	10 times	780	780	1,000	1,250	1,800
Leg sideways static load	force, N	250	300	390	490	760
Balancing seat load	10 times	780	780	1,000	1,250	1,800
Diagonal base load	force, N 10 times	125	250	375	500	620
Seat impact test	drop height, mm 10 times	-	140	180	240	300
Back impact test	height, mm	70	120	210	330	620
	angle, degrees	20	28	38	48	68
Arm impact test	10 times					
Drop test						
➢ Stackable or special design of chairs and stools with legs or pedestal longer than 200 mm	drop height mm 10 times at 10°	150	300	450	600	900
➢ Non-stacking chairs with castors or swiveling glides with legs or pedestals longer than 200 mm	drop height, mm 10 times at 10°	-	150	200	300	450
➢ Chairs and stools with legs or pedestals shorter than 200 mm	drop height, mm 10 times at 10°	-	75	100	150	250

Presentation of Data and Interpretation of Results

Following are the data and results of tests from various prototypes furniture samples supplied by seven furniture manufacturers: Brayton Enterprises, Betis Craft Incorporated, Cabrera Manutrade Corporation, Demex Rattan Craft, Incorporated; More Than a Chair, Ed Pascua Furniture Shop, and AWECA.

Client: Brayton Enterprises

Address: Bucal, Calamba, Laguna

Sampled by: Alvin Barbastro **Species:** Red lauan

Date Sample Received: **Sample Code:** Brayton Ch-1

Reference Standard: ISO 7173, BS 4875 Part 1 & BS-EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	431 x 426	431 x 426
Height of seat from floor level, mm	454	454
Height of top back from floor level, mm	1010	1010
Distance of front legs, mm (inner)	354	354
Distance of side legs (left side, inner), mm	314	314
Distance of side legs (right side, inner), mm	307	307
Distance of rear legs, mm (inner)	304	304
Seat type :	Solid wood	
Backrest type :	Solid wood rectangular slats curved on top end arranged vertically	
Leg type :	Solid wood rectangular front and back legs	
Total weight (kg) :	5.4	

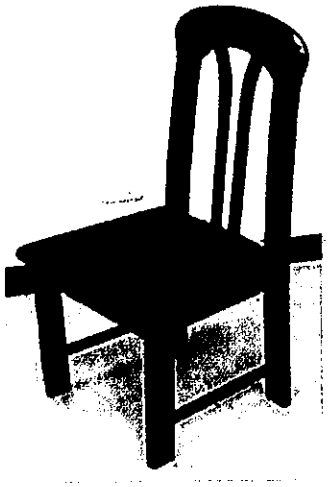
B. Construction Qualities	
Material Type	Solid wood seat and back rest with two stretches at side legs
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	15 % (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Passed
Leg sideways static load test	Passed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Passed

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking observed
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No loosening of joints and members
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe

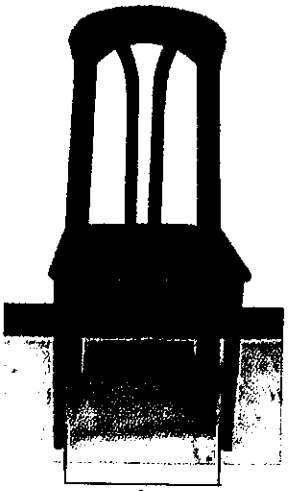
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of components noted
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No indication of deformation or cracks
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation occurred
g. clearly audible noise developed during testing.	No audible noise noted

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

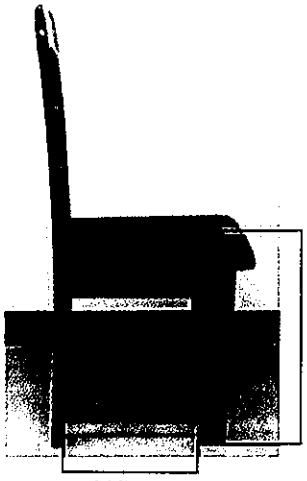
DIMENSION OF BRAYTON CHAIR 1:



ISOMETRIC VIEW

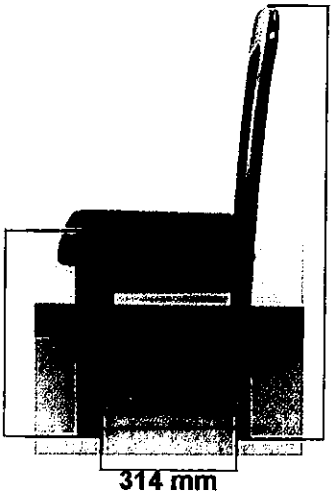


354 mm
FRONT VIEW



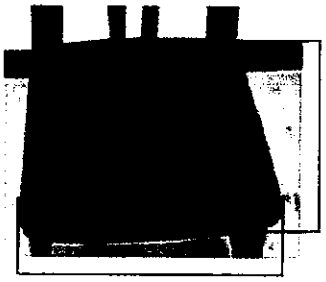
454 mm

307 mm
RIGHT SIDEVIEW



1010 mm

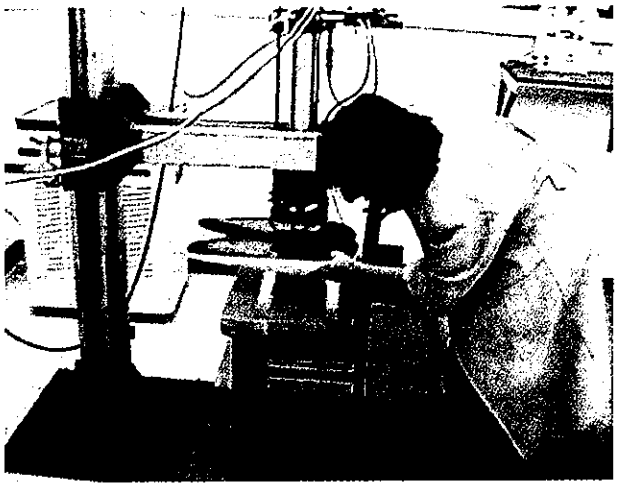
314 mm
LEFT SIDEVIEW



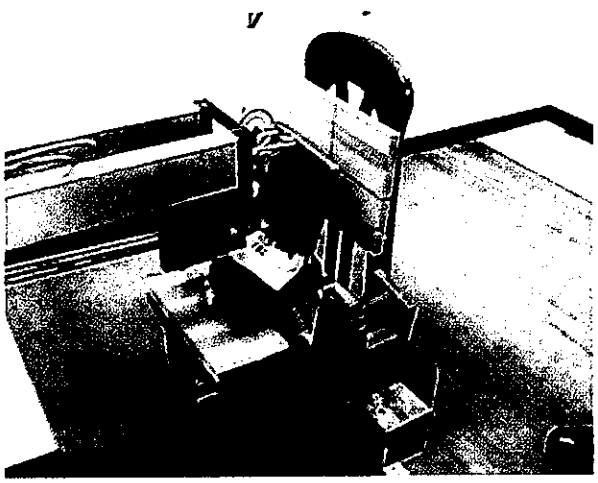
426 mm

431 mm
TOP VIEW

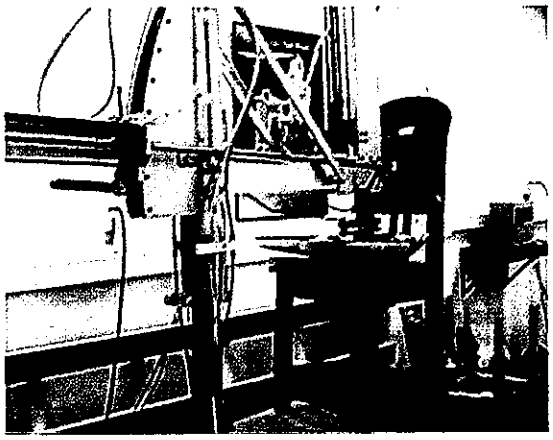
304 mm
REAR VIEW



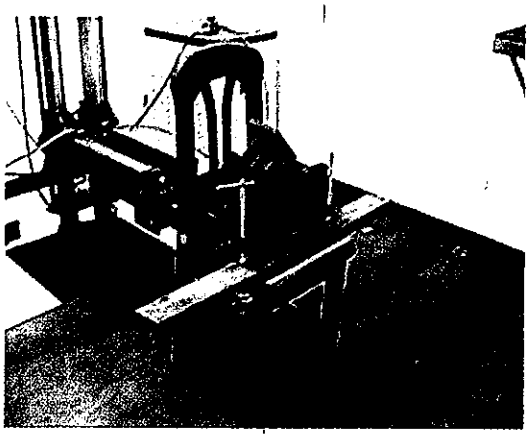
Seat static load test

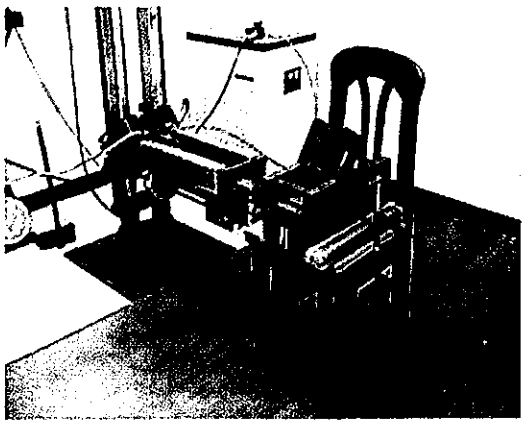


Back static load test

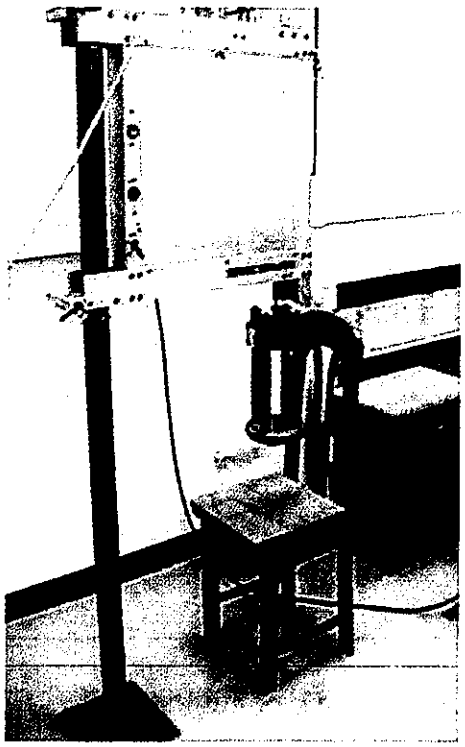


Combined seat and back fatigue test

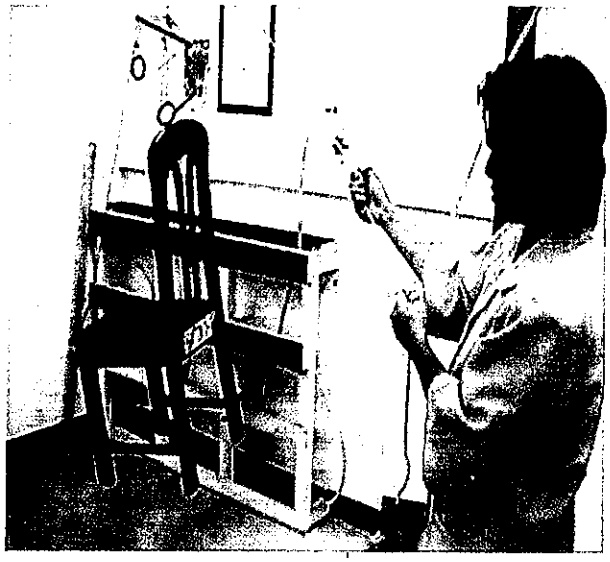


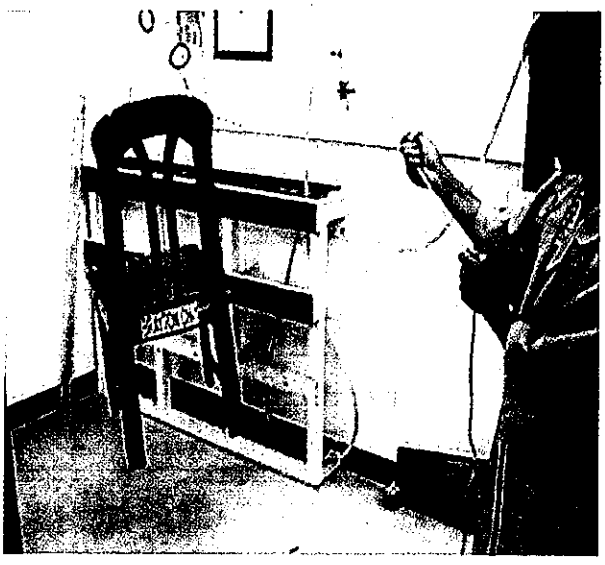


Leg forward and leg sideways static load test



Seat impact and back impact test





Front and back legs drop test

Client: Betis Craft, Inc

Address: Concepcion, Tarlac

Sampled by: Cristina Bildan **Species:** Red lauan

Date Sample Received: June 4, 2003 **Sample Code:** BCI-2002-04

Reference Standard: ISO 7173
BS 4875 Part 1 + BS EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	496 x 435	496 x 435
Height of seat from floor level, mm	457	457
Height of top back from floor level, mm	915	915
Distance of front legs, mm (inner)	415	415
Distance of side legs (left side, inner), mm	420	420
Distance of side legs (right side, inner), mm	420	420
Distance of rear legs, mm (inner)	375	375
Seat type :	Provision for upholstered seat	
Backrest type :	Solid wood with carvings	
Leg type :	Front and back legs carved solid wood	
Total weight (kg) :	8	

B. Construction Qualities	
Material Type	Solid wood backrest and legs
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	8 % (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Passed
Leg sideways static load test	Passed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Failed (Remark No. 4)

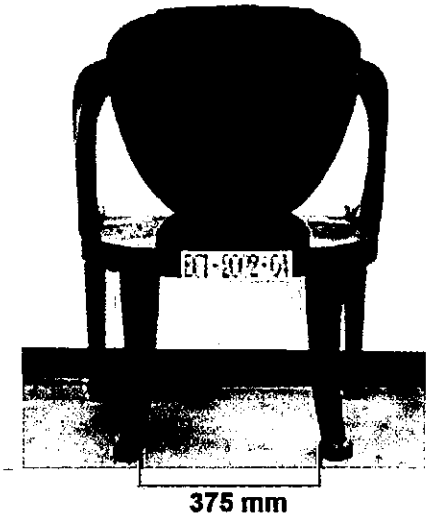
D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	Fracture of left back leg during drop test. Failure of sample at this stage
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No loosening of joints and members prior to drop test
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe prior to drop test
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of components noted prior to drop test

e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No indication of deformation or cracks prior to drop test
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation occurred prior to drop test
g. clearly audible noise developed during testing.	No audible noise noted prior to drop test

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. Fracture or breakage of left back leg during drop test
5. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

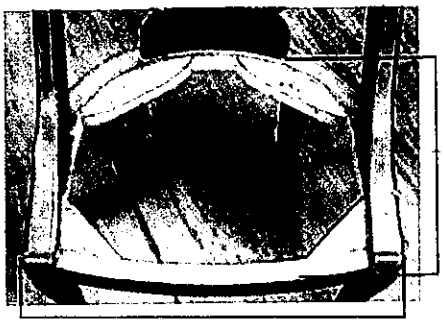
DIMENSION OF BETIS CRAFT CHAIR 2002-04:

ISOMETRIC VIEW



375 mm
REAR VIEW

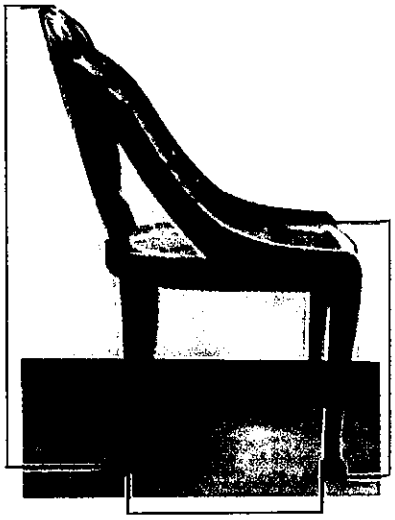
TOP VIEW



435 mm

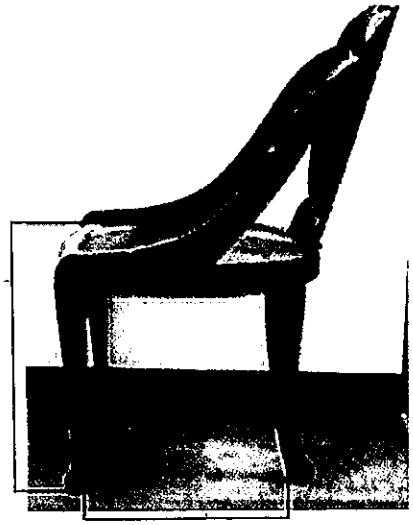
496 mm

915 mm

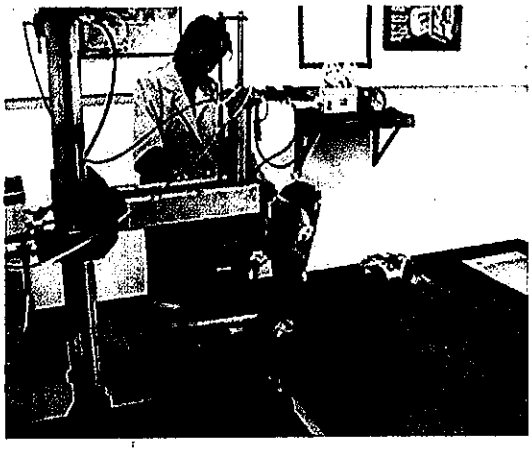


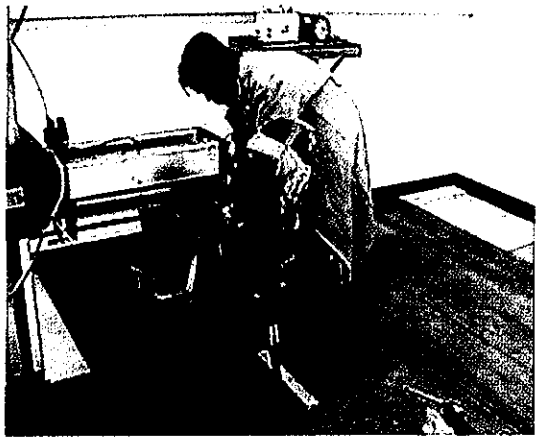
420 mm
RIGHT SIDEVIEW

457 mm

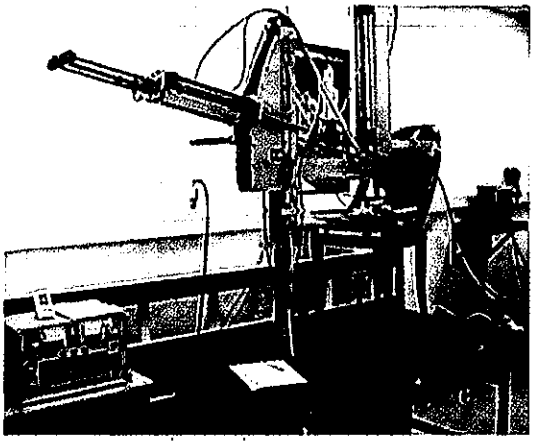


420 mm
LEFT SIDEVIEW

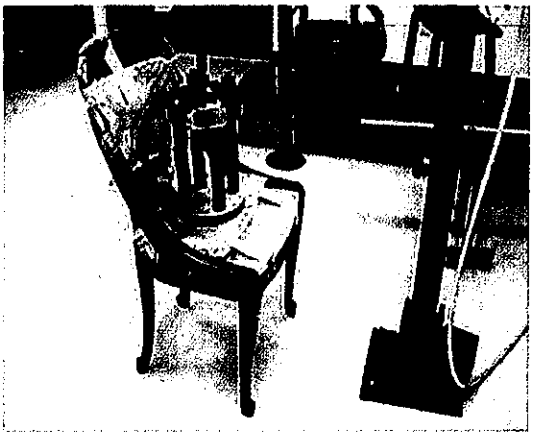




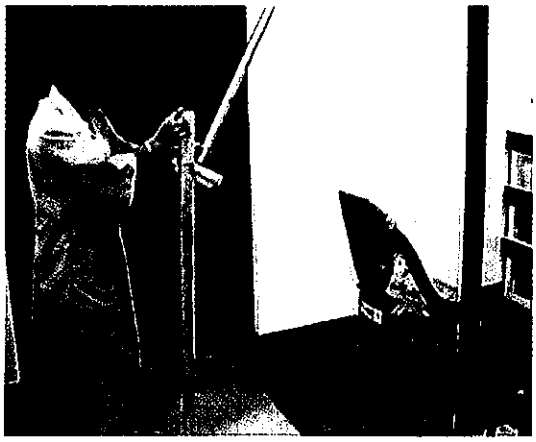
Seat and back static load test



Combined seat and back fatigue test

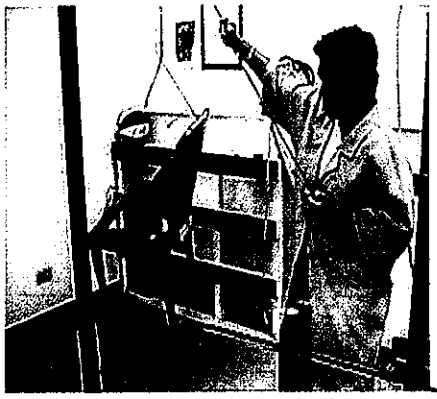


Seat impact test



Back impact test

Drop test



Breakage of left back leg during drop test

Client: Betis Craft, Inc.

Address: Concepcion, Tarlac

Sampled by: Cristina Bildan

Species: Mahogany

Date Sample Received: June 4, 2003

Sample Code: BCI-2002-05

Reference Standard: ISO 7173
BS 4875 Part 1 + EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	458 x 473	458 x 473
Height of seat from floor level, mm	420	420
Height of top back from floor level, mm	763	763
Distance of front legs, mm (inner)	510	510
Distance of side legs (left side, inner), mm	540	540
Distance of side legs (right side, inner), mm	540	540
Distance of rear legs, mm (inner)	387	387
Seat type :	Provision for upholstered seat	
Backrest type :	Solid wood with four circular rings glued together	
Leg type :	Front and back legs carved solid wood	
Total weight (kg) :	6.7	

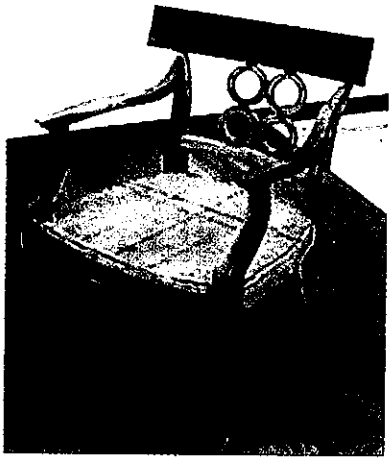
B. Construction Qualities	
Material Type	Solid wood, curved armrest attached or jointed to rails and backrest
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	10.6% (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Passed
Arm downwards static load test	Passed
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Passed
Leg sideways static load test	Passed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Failed (Remark No. 4)
Arm impact test	Not performed (Remark No. 5)
Drop test	Not performed (Remark No. 5)

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	Breakage of backrest joints during back pendulum impact test
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No loosening occurred prior to back impact test
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements in sample parts prior to back impact test

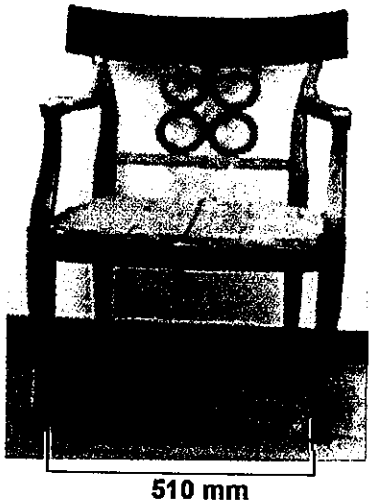
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No deformation noted prior to back impact test
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation occurred prior to back impact test
g. clearly audible noise developed during testing.	No audible noise noted prior to back impact test

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. Breakage of backrest joints occurred during the back impact test
5. Arm impact and drop test were not performed due to failure of backrest
6. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

DIMENSION OF BETIS CRAFT CHAIR 2002-05:

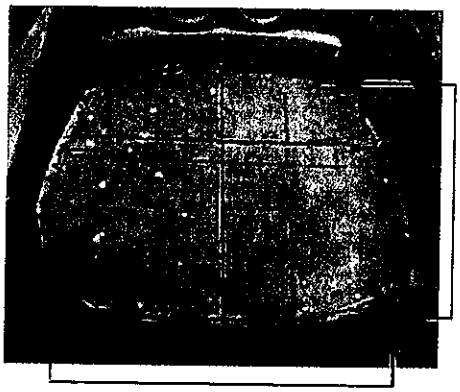


ISOMETRIC VIEW



510 mm
FRONT VIEW

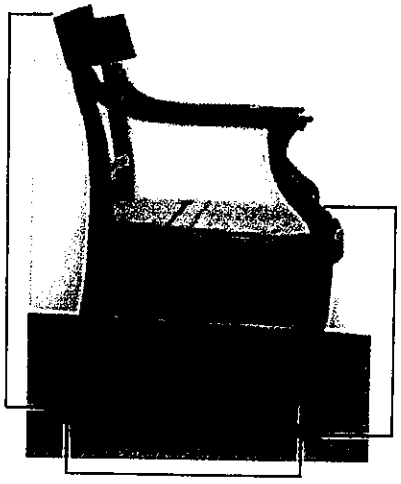
387 mm
REAR VIEW



473 mm

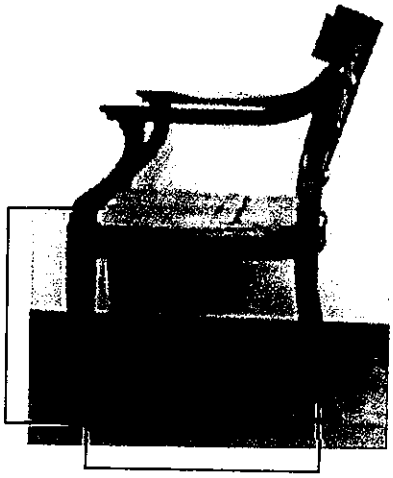
458 mm
TOP VIEW

763 mm

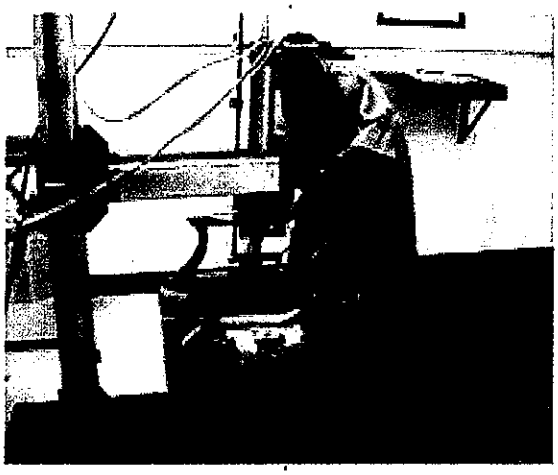


540 mm
RIGHT SIDEVIEW

420 mm

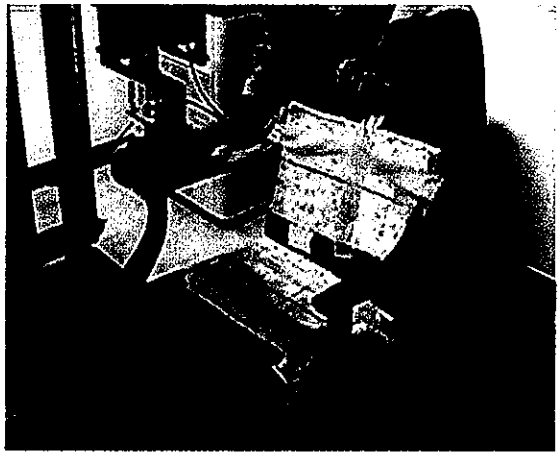


540 mm
LEFT SIDEVIEW

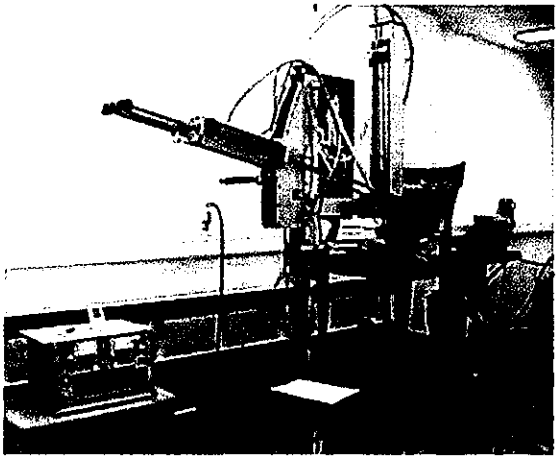


Seat static load test

Back static load test

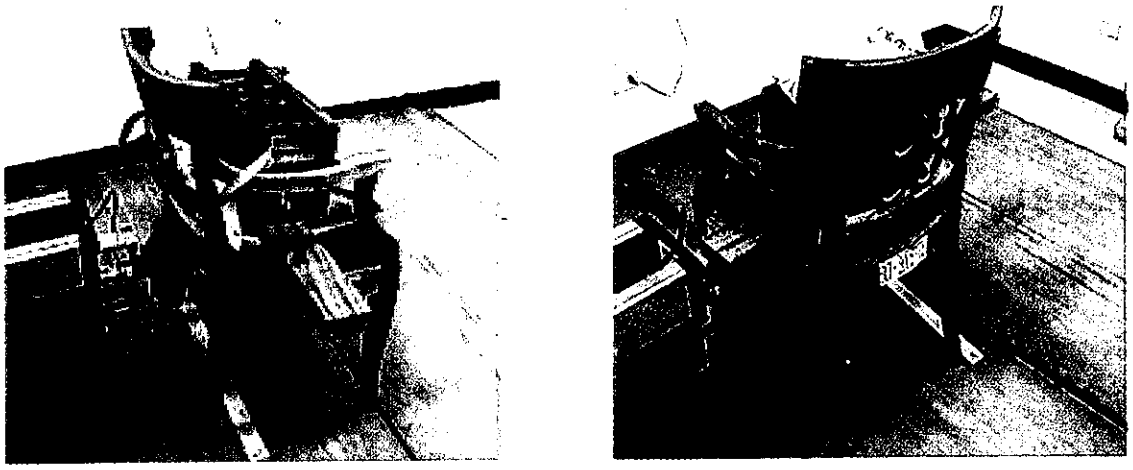


Arm sideways and arm downwards static load test

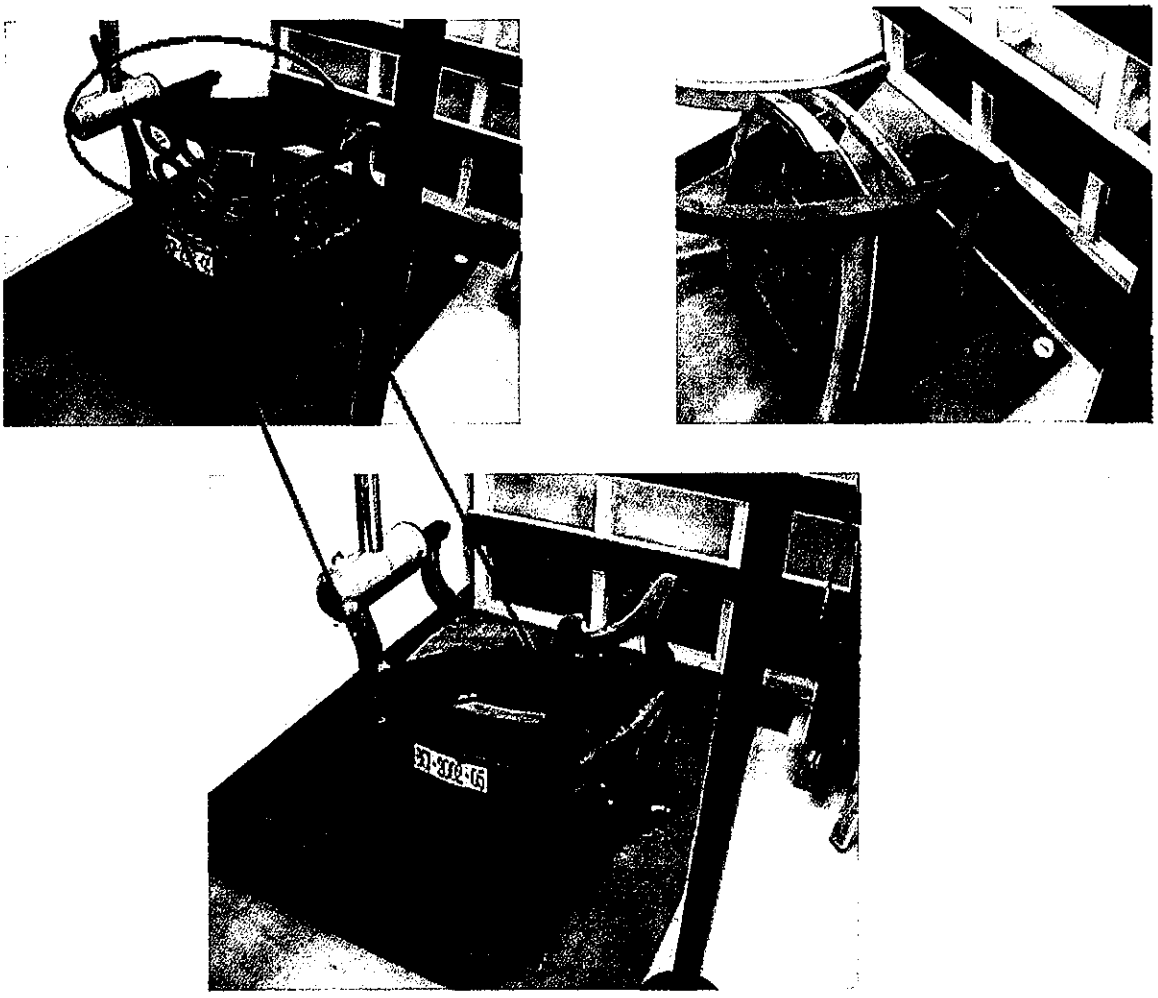


Combined seat and back fatigue test

Seat impact test



Leg forward and leg sideways static load test



Back impact test and breakage of joints at the backrest after the first impact

Client: Betis Craft, Inc.

Address: Concepcion, Tarlac

Sampled by: Cristina Bildan

Species: Red lauan

Date Sample Received: June 4, 2003

Sample Code: BCI-2002-06

Reference Standard: ISO 7173
BS 4875 Part 1 + BS EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	603 x 480	603 x 480
Height of seat from floor level, mm	637	637
Height of top back from floor level, mm	900	900
Distance of front legs, mm (inner)	535	535
Distance of side legs (left side, inner), mm	568	568
Distance of side legs (right side, inner), mm	568	568
Distance of rear legs, mm (inner)	450	450
Seat type :	Provision for upholstered seat	
Backrest type :	Solid wood with single circular ring glued backrest frame	
Leg type :	Curved solid wood	
Total weight (kg) :	9.8	

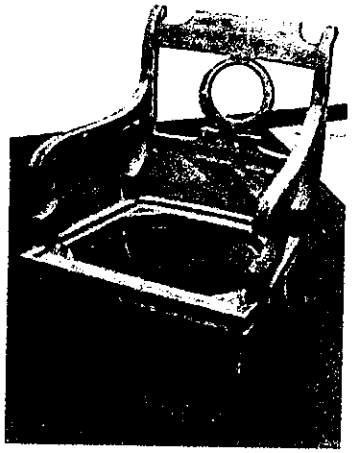
B. Construction Qualities	
Material Type	Solid wood, curved armrest doweled to front legs extension and back legs
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	12 % (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Passed
Arm downwards static load test	Passed
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Passed
Leg sideways static load test	Passed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not performed
Drop test	**Failed** (Remark No. 4)

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	Breakage and detached armrest from front right leg and back leg. Severe damage occurred during drop test
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No loosening occurred prior to drop test
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements in sample parts prior to drop test

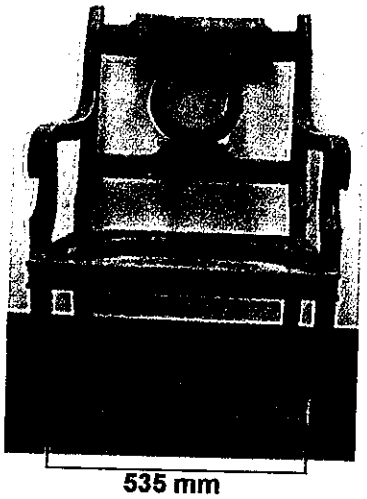
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No deformation noted prior to drop test
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation occurred prior to drop test
g. clearly audible noise developed during testing.	No audible noise noted prior to drop test

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. Damage occurred during the 7th drop cycle of the drop test
5. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

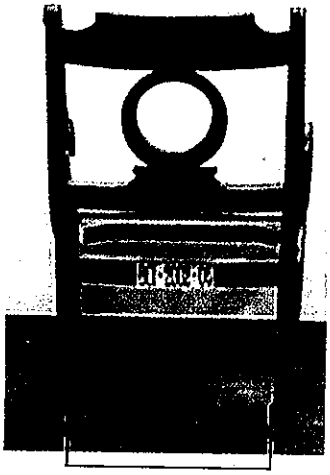
DIMENSION OF BETIS CRAFT CHAIR 2002-06:



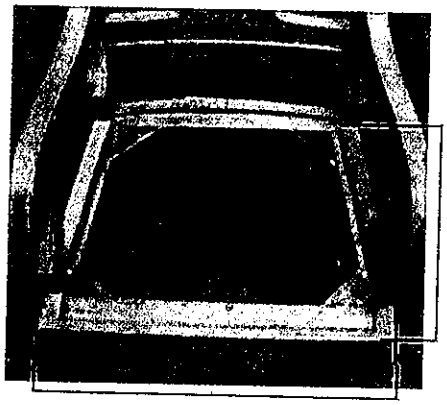
ISOMETRIC VIEW



535 mm
FRONT VIEW

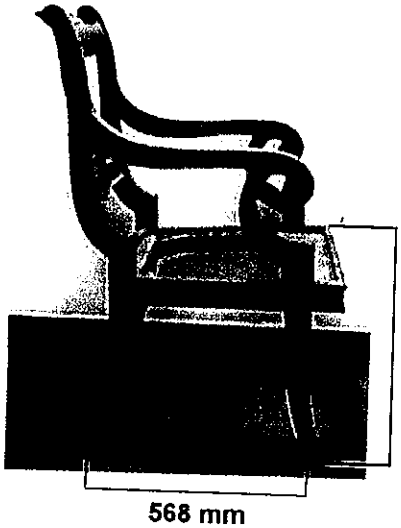


450 mm
REAR VIEW



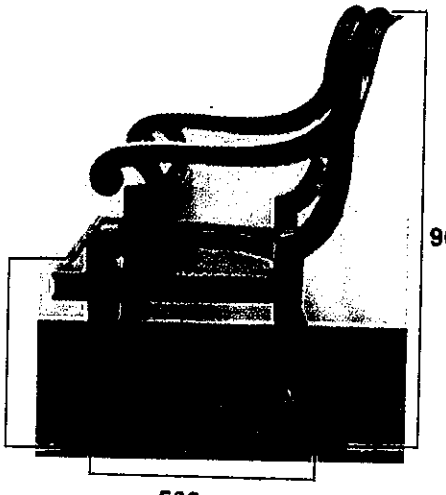
480 mm

603 mm
TOP VIEW



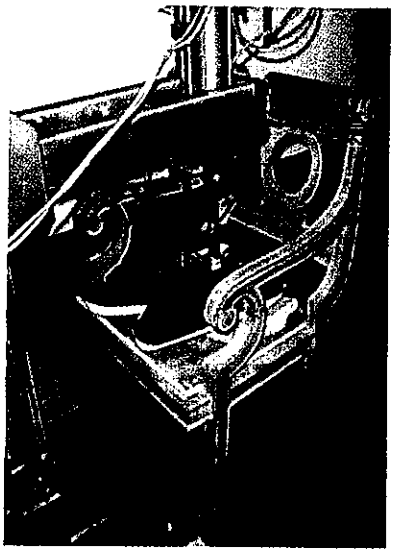
637 mm

568 mm
RIGHT SIDEVIEW



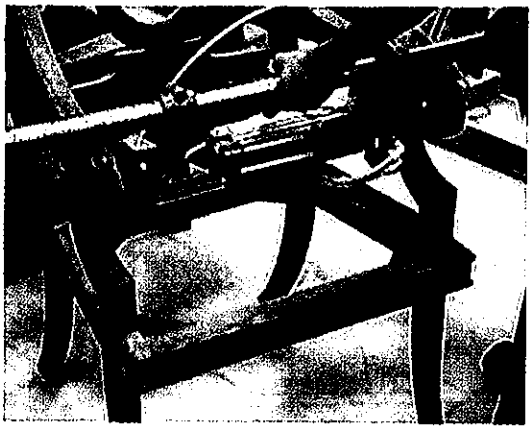
900 mm

568 mm
LEFT SIDEVIEW

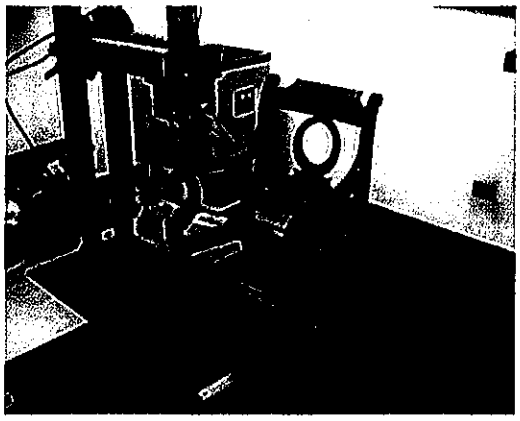


Seat static load test

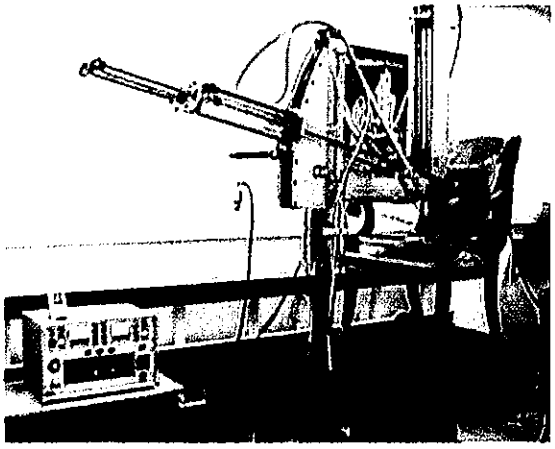
Back static load test



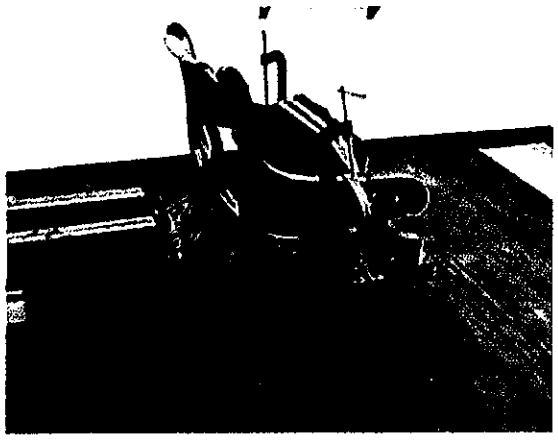
Arm sideways static load test



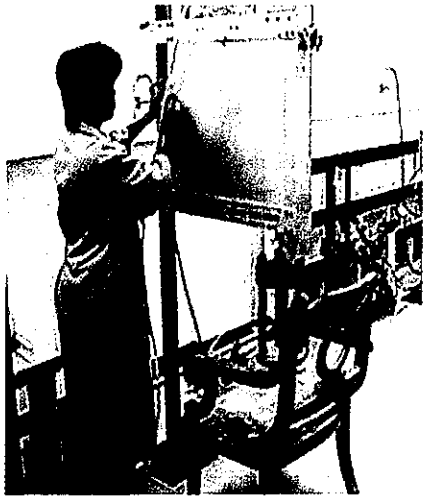
Arm downwards static load test



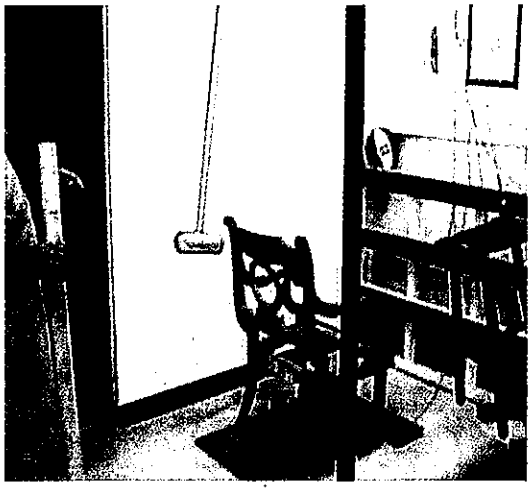
Combined seat and back fatigue test



Leg forward static load test

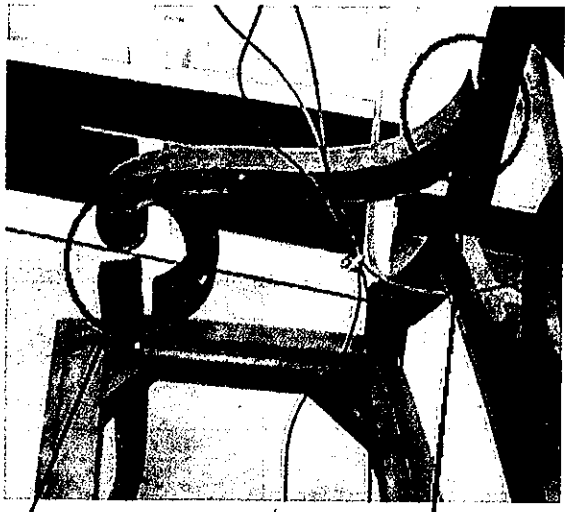


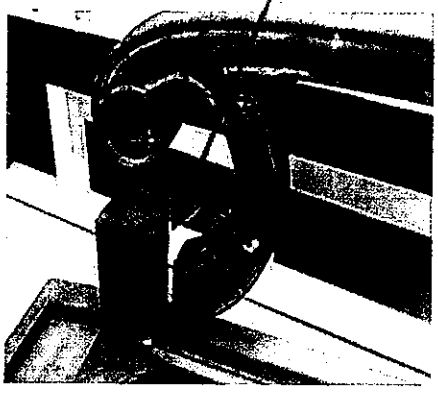
Seat impact test

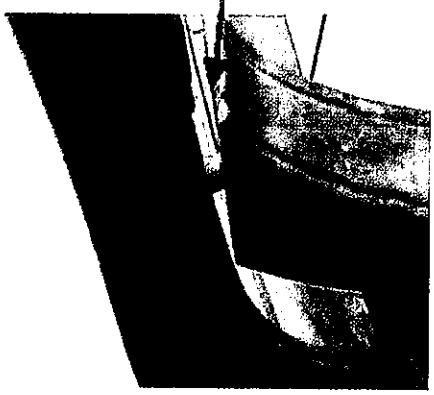


Back impact test

Drop test







Damages that occurred at the armrest during drop test

Client: Cabrera Manutrade Corporation

Address: Halang, Calamba, Laguna

Sampled by: ITTO Staff

Species: Tanguile/Red Lauan

Date Sample Received: February 10, 2004

Sample Code: Chair -01

Reference Standard: ISO 7173
BS 4875 Part 1 + BS EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	420 x 437	420 x 437
Height of seat from floor level, mm	455	455
Height of top back from floor level, mm	1035	1035
Distance of front legs, mm (inner)	346	346
Distance of side legs (left side, inner), mm	410	410
Distance of side legs (right side, inner), mm	414	414
Distance of rear legs, mm (inner)	268	268
Seat type :	Provision for upholstered seat	
Backrest type :	Rectangular solid wood arranged vertically	
Leg type :	Curved solid wood with back legs and rectangular shape front legs with side stretcher	
Total weight (kg) :	5	

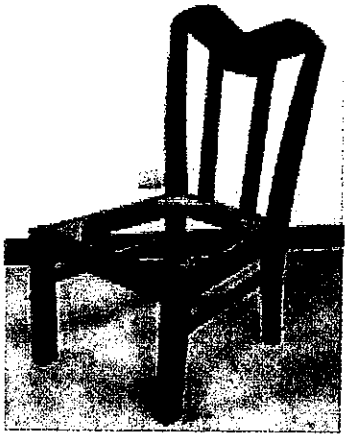
B. Construction Qualities	
Material Type	Solid wood with vertically arranged slats or strips backrest with rectangular shape front legs and curved back legs
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	8% (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Passed
Leg sideways static load test	Passed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Passed

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking of members occurred
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No loosening occurred
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements in sample parts

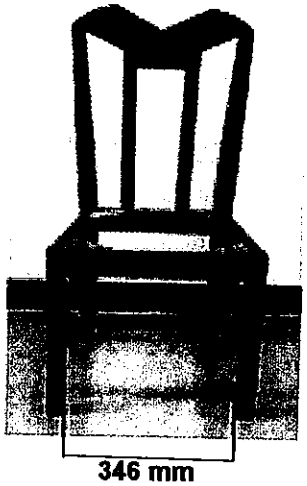
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No deformation noted
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation occurred
g. clearly audible noise developed during testing.	No audible noise noted

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

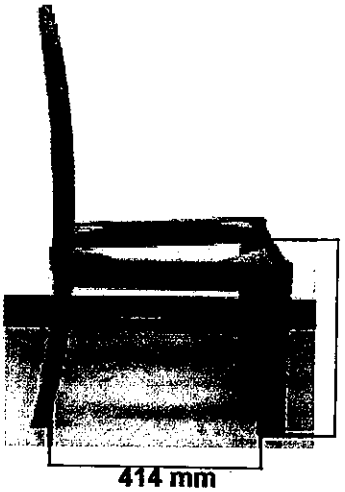
DIMENSION OF CABRERA MANUTRADE CHAIR 1 – 2004:



ISOMETRIC VIEW

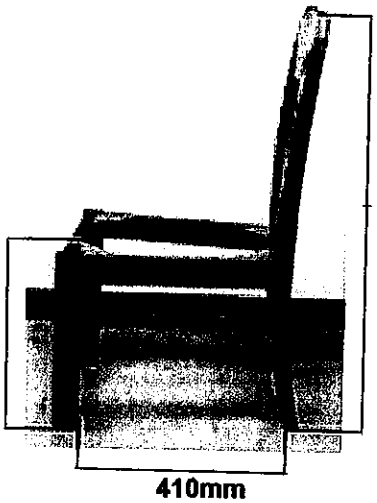


346 mm
FRONT VIEW



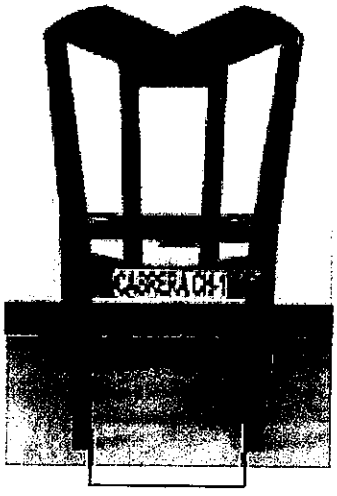
414 mm
RIGHT SIDEVIEW

455 mm

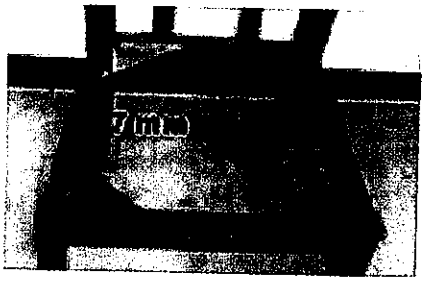


1035 mm

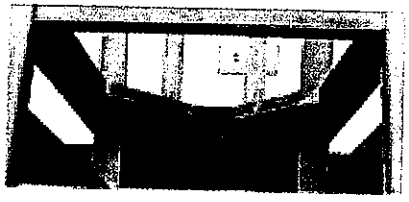
410mm
LEFT SIDEVIEW



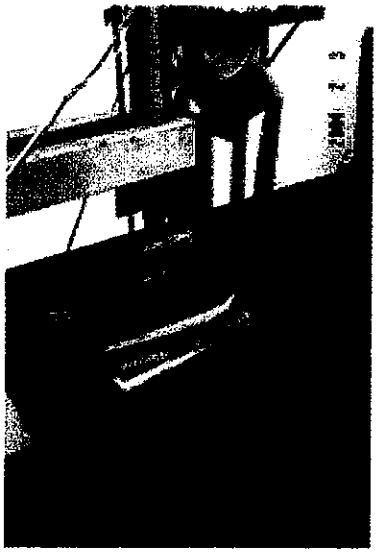
268 mm
REAR VIEW



TOP VIEW



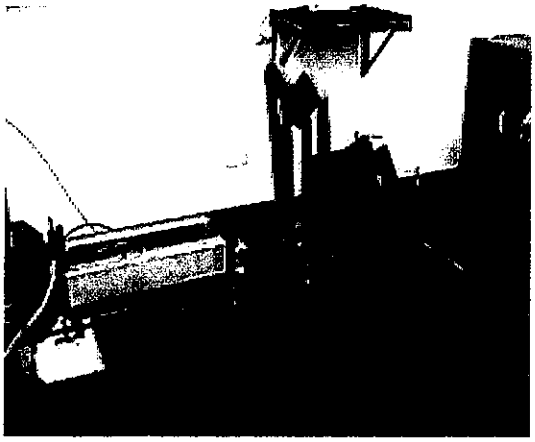
BOTTOM VIEW



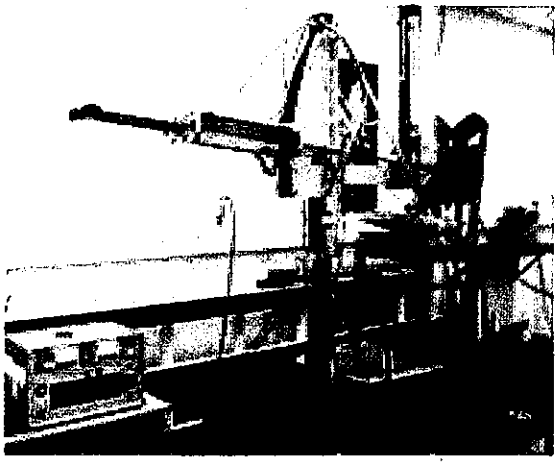
Seat static load test

Back static load test

Seat impact test

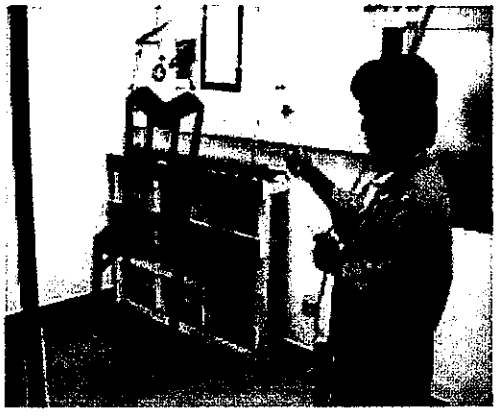


Leg forward static load test



Combined seat and back fatigue test

Back impact test



Front and back legs drop test

Client: Cabrera Manutrade Corporation

Address: Halang, Calamba, Laguna

Sampled by: ITTO Staff **Species:** Tanguile/Red Lauan

Date Sample Received: February 10, 2004 **Sample Code:** Chair -02

Reference Standard: ISO 7173
BS 4875 Part 1 + BS EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	332 x 341	332 x 341
Height of seat from floor level, mm	465	465
Height of top back from floor level, mm	1034	1034
Distance of front legs, mm (inner)	345	345
Distance of side legs (left side, inner), mm	405	405
Distance of side legs (right side, inner), mm	411	411
Distance of rear legs, mm (inner)	311	311
Seat type :	Provision for upholstered seat	
Backrest type :	Rectangular solid wood arranged vertically	
Leg type :	Curved solid wood with back legs and rectangular shape front legs with side stretcher	
Total weight (kg) :	4.8	

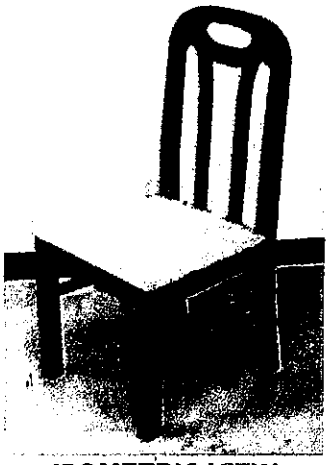
B. Construction Qualities	
Material Type	Solid wood with vertically arranged slats backrest with rectangular shape front legs and curved back legs
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	8% (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Passed
Leg sideways static load test	Passed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Passed

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking of members occurred
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No loosening occurred
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements in sample parts

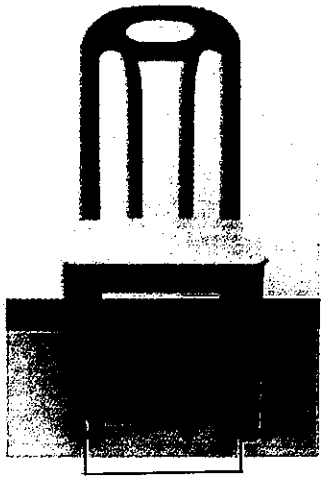
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No deformation noted
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation occurred
g. clearly audible noise developed during testing.	No audible noise noted

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

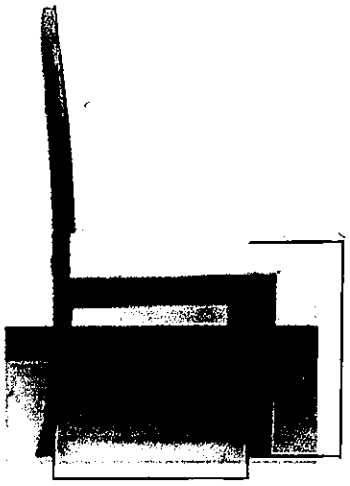
DIMENSION OF CABRERA CHAIR 02 – 2004:



ISOMETRIC VIEW

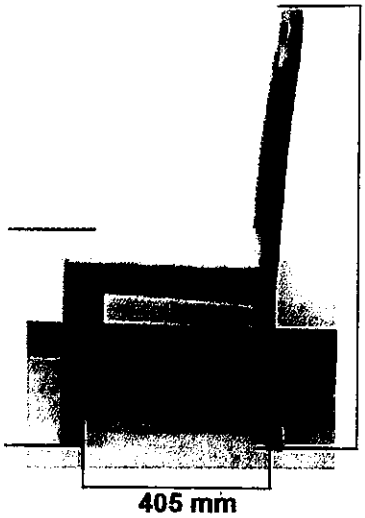


345 mm
FRONT VIEW



465 mm

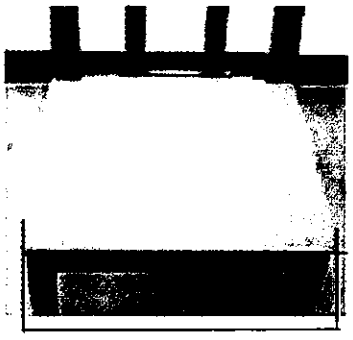
411 mm
RIGHT SIDEVIEW



1034 mm

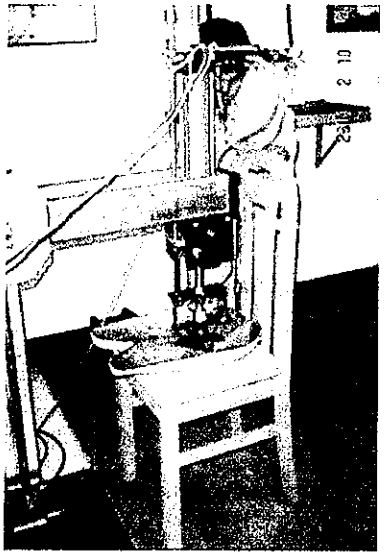
405 mm
LEFT SIDEVIEW

311 mm
REAR VIEW

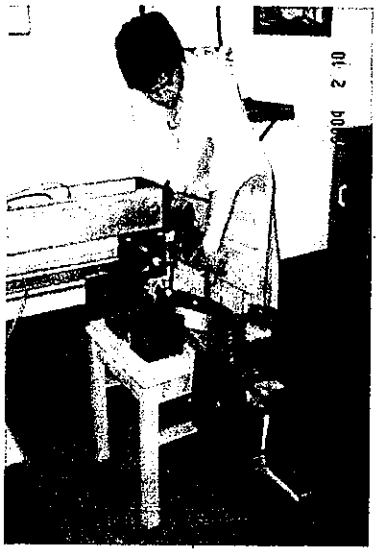


341 mm

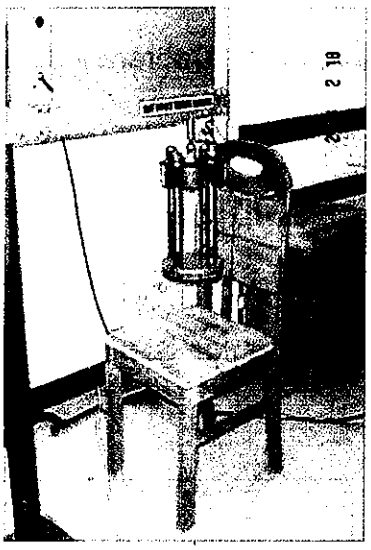
332 mm
TOP VIEW



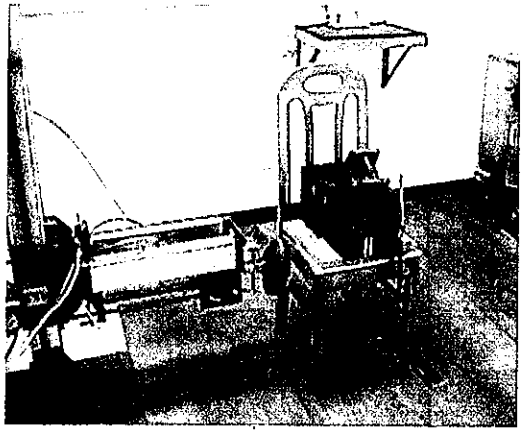
Seat static load test



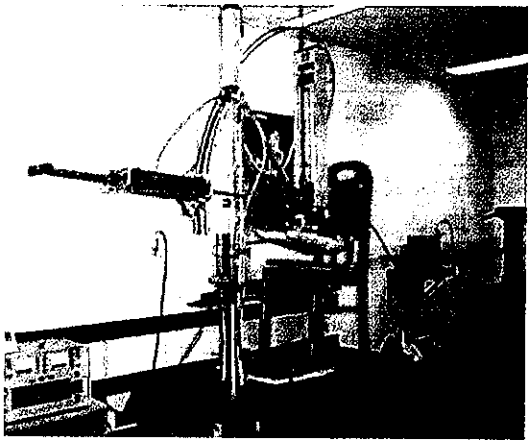
Back static load test



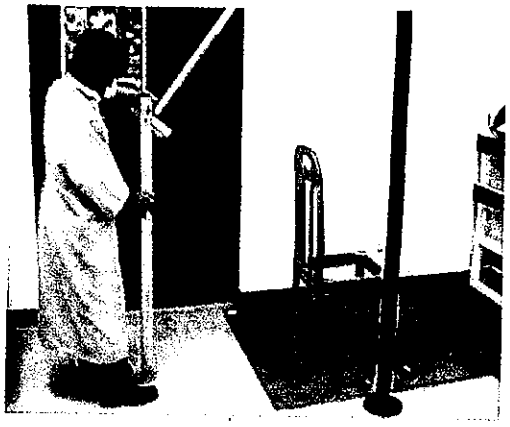
Seat impact test



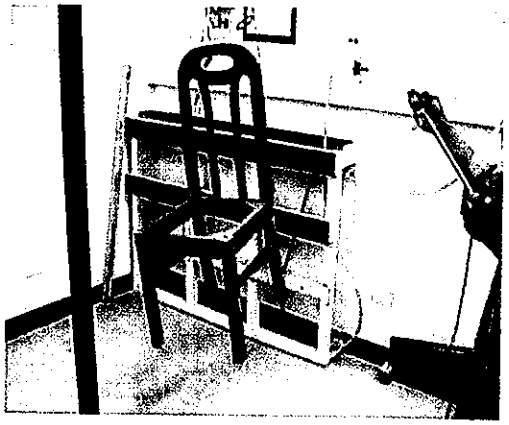
Leg sideways static load test



Combined seat and back fatigue test



Back impact test



Drop test

Client: Cabrera Manutrade Corporation

Address: Halang, Calamba, Laguna

Sampled by: ITTO Staff

Species: Tanguile/Red lauan

Date Sample Received: January 13, 2004

Sample Code: Chair 1A

Reference Standard: ISO 7173
BS 4875 Part 1 + EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	480 x 395	480 x 395
Height of seat from floor level, mm	440	440
Height of top back from floor level, mm	925	925
Distance of front legs, mm (inner)	370	370
Distance of side legs (left side, inner), mm	450	450
Distance of side legs (right side, inner), mm	450	450
Distance of rear legs, mm (inner)	370	370
Seat type : Solid wood		
Backrest type : Ladder type solid wood		
Leg type : Curved wood rectangular shape front and back legs		
Total weight (kg) : 8.2		

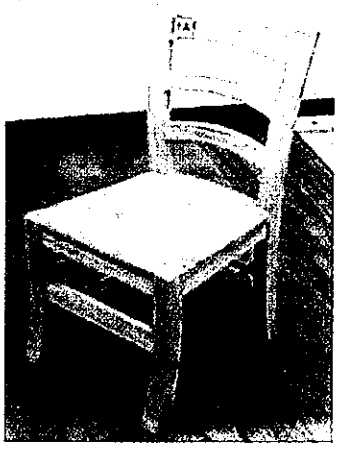
B. Construction Qualities	
Material Type	Dining chair made of solid wood
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	15 % (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Passed
Leg sideways static load test	Passed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Passed

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking observed
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No loosening of joints and members
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of components noted

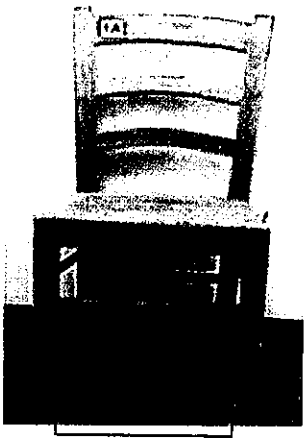
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No indication of deformation or cracks
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation occurred
g. clearly audible noise developed during testing.	No audible noise noted

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

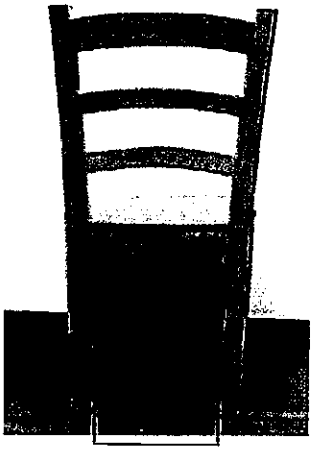
DIMENSION OF CABRERA MANUTRADE CHAIR 1A:



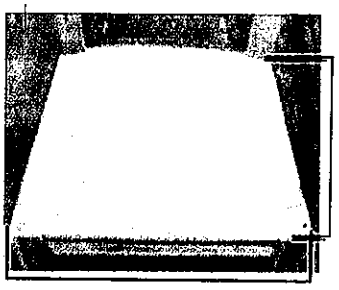
ISOMETRIC VIEW



370 mm
FRONT VIEW

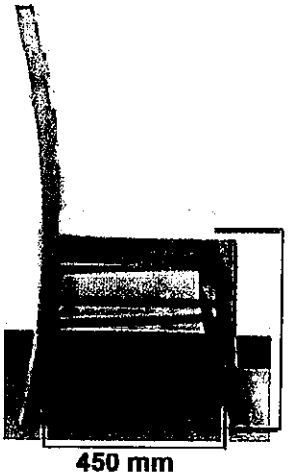


370 mm
REAR VIEW



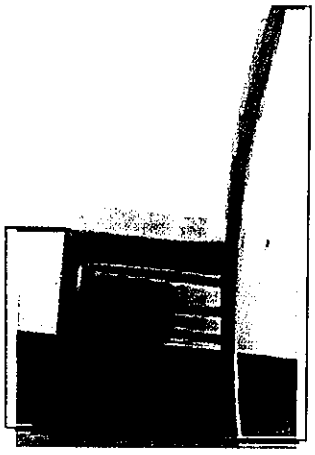
480 mm
TOP VIEW

395
mm



450 mm
RIGHT SIDEVIEW

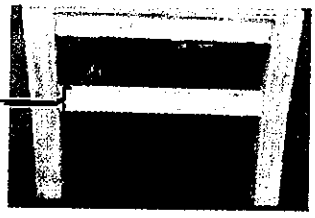
440mm



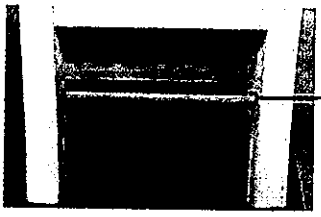
LEFT SIDEVIEW

925
mm

49.51mm



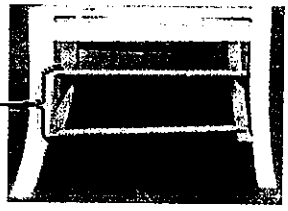
FRONT STRETCHER



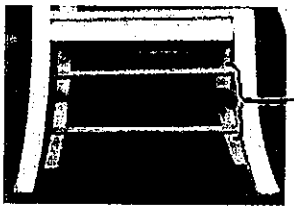
19.59 mm

REAR STRETCHER

19.13 mm
each stretcher

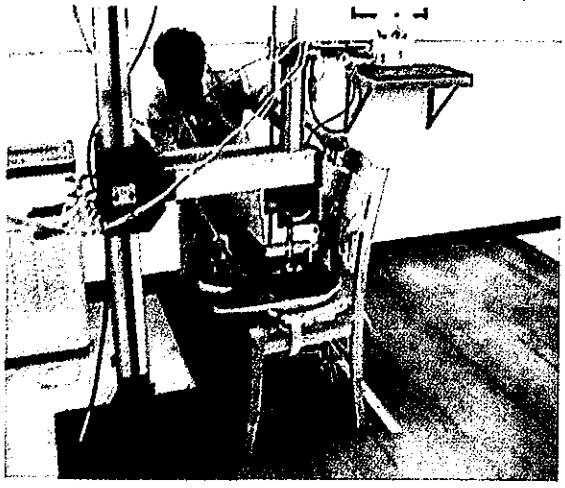


LEFT SIDE STRETCHER

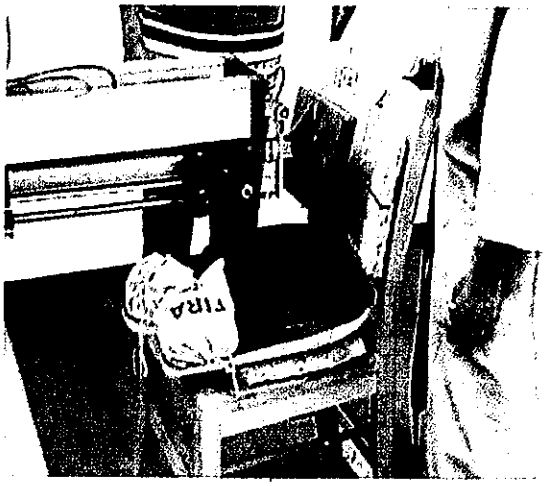


19.13 mm
each stretcher

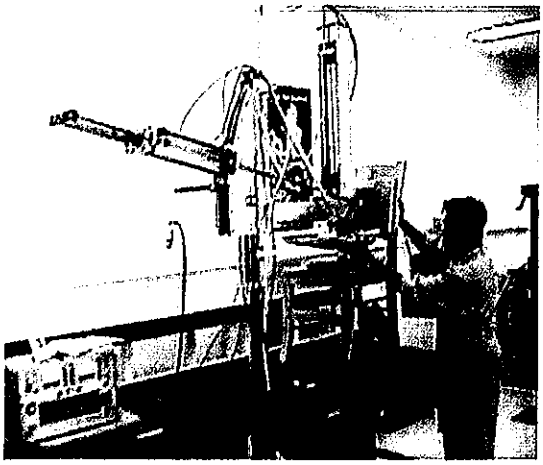
RIGHT SIDE STRETCHER



Seat static load test

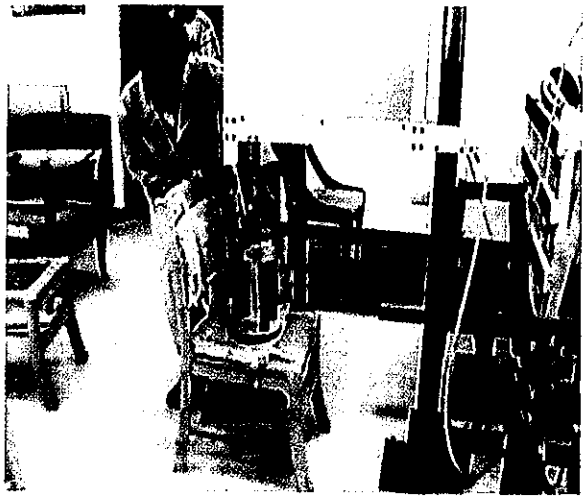


Back static load test



Combined seat and back fatigue test

Drop test



Seat impact test

Back impact test

Client: Cabrera Manutrade Corporation

Address: Halang, Calamba, Laguna

Sampled by: ITTO Staff **Species:** Mayapis/Almon

Date Sample Received: February 2003 **Sample Code:** Chair 2A

Reference Standard: ISO 7173
BS 4875 Part 1 + BS EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	474 x 406	474 x 406
Height of seat from floor level, mm	452	452
Height of top back from floor level, mm	930	930
Distance of front legs, mm (inner)	370	370
Distance of side legs (left side, inner), mm	405	405
Distance of side legs (right side, inner), mm	405	405
Distance of rear legs, mm (inner)	370	370
Seat type :	Solid wood	
Backrest type :	Solid wood slats arranged horizontally	
Leg type :	Turned solid wood front legs and curved back legs	
Total weight (kg) :	8	

B. Construction Qualities	
Material Type	Dining chair made of solid wood
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	12% (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Failed (Remark No. 3)
Back fatigue test	Failed (Remark No. 3)
Leg forward static load test	Not performed (Remark No. 4)
Leg sideways static load test	Not performed (Remark No. 4)
Diagonal base load	Not applicable
Seat impact test	Not performed (Remark No. 4)
Back impact test	Not performed (Remark No. 4)
Arm impact test	Not applicable
Drop test	Not performed (Remark No. 4)

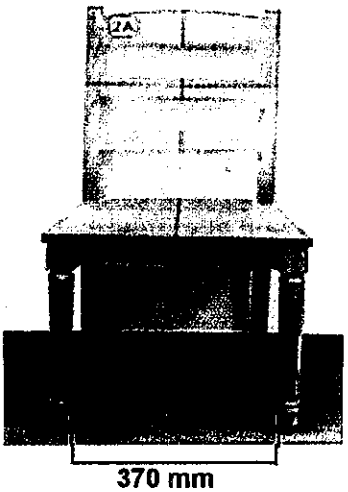
D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	Sample failed during seat and back fatigue test
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	Severe loosening of back legs and side rail joint connection. Laminated seat detached at the back portion of chair after 875 cycles during the combined seat and back fatigue test
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	Sample failed during seat and back fatigue test

d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	Sample failed during seat and back fatigue test
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	Sample failed during seat and back fatigue test
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	Sample failed during seat and back fatigue test
g. clearly audible noise developed during testing.	Sample failed during seat and back fatigue test

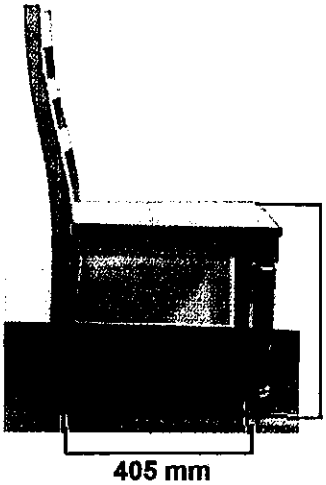
Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. The test sample failed during the combined seat and back fatigue test. The early failure of this sample is not due to its inherent construction features but due to the misadjustments of the displacement of the push rod of the machine for the backrest, which is far beyond the required displacement.
4. Succeeding tests were not performed after failure occurred during combined seat and back fatigue test.
5. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

DIMENSION OF CABRERA MANUTRADE CHAIR 2A:

ISOMETRIC VIEW

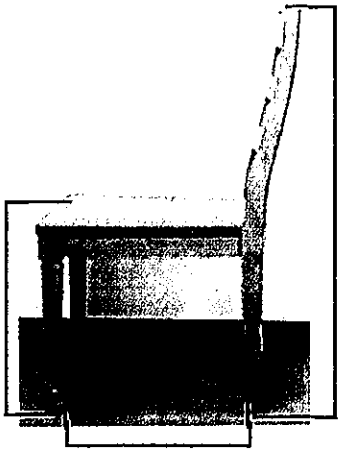


370 mm
FRONT VIEW



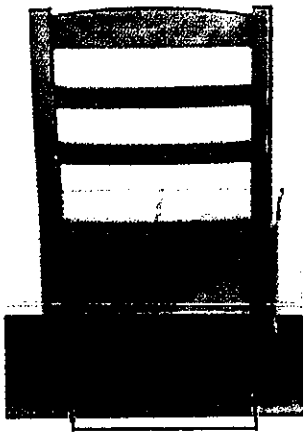
452 mm

405 mm
RIGHT SIDEVIEW

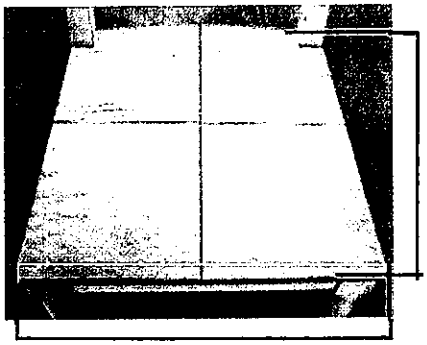


930 mm

405 mm
LEFT SIDEVIEW

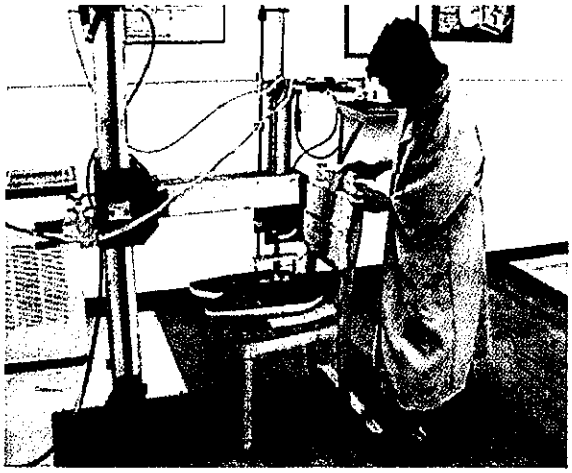


370 mm
REAR VIEW

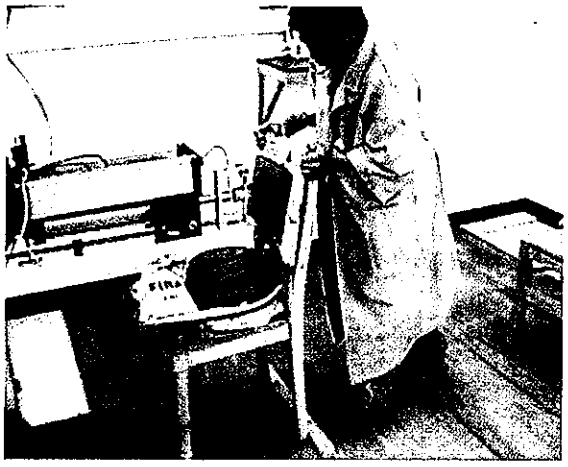


406 mm

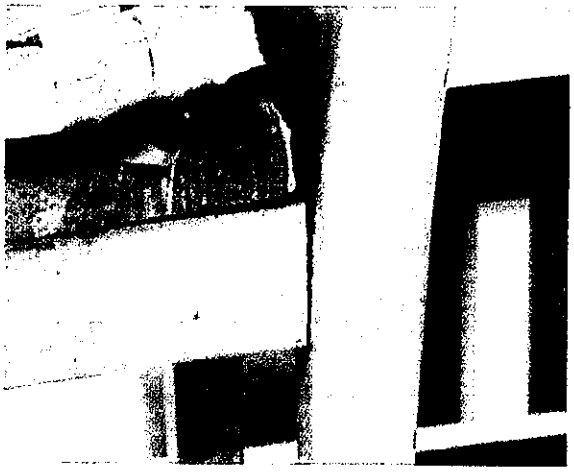
474 mm
TOP VIEW

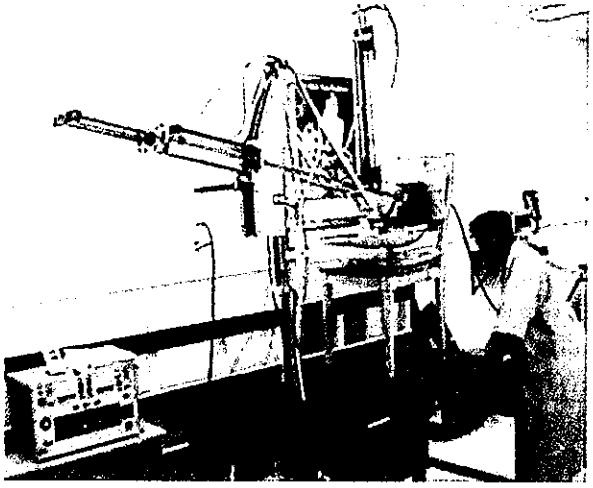


Seat static load test

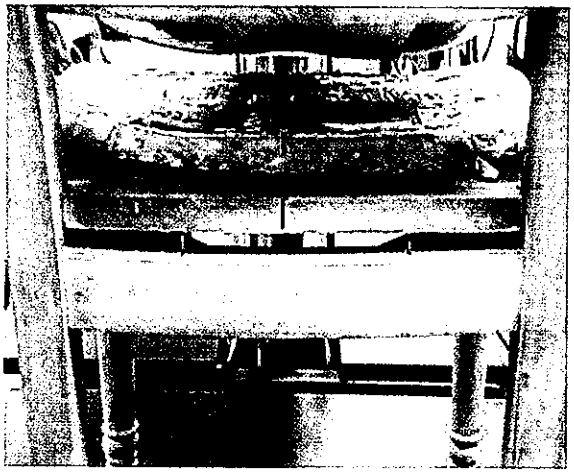


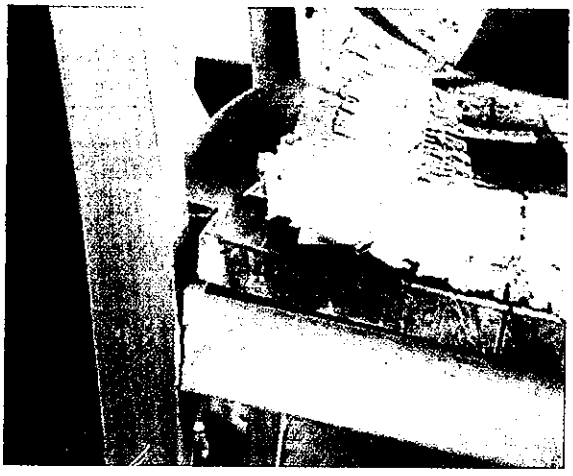
Back static load test





Combined seat and back fatigue test





Damages that occurred during combined seat and back fatigue test

Client: Cabrera Manutrade Corporation

Address: Halang, Calamba, Laguna

Sampled by: ITTO Staff

Species: Tanguile/Red lauan

Date Sample Received: February 2003

Sample Code: Chair 3A

Reference Standard: ISO 7173
BS 4875 Part 1 + BS EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	469 x 406	469 x 406
Height of seat from floor level, mm	457	457
Height of top back from floor level, mm	940	940
Distance of front legs, mm (inner)	362	362
Distance of side legs (left side, inner), mm	408	408
Distance of side legs (right side, inner), mm	408	408
Distance of rear legs, mm (inner)	246	246
Seat type :	Solid wood	
Backrest type :	Solid wood slats arranged vertically	
Leg type :	Solid wood rectangular shape front legs and curved back legs	
Total weight (kg) :	9.2	

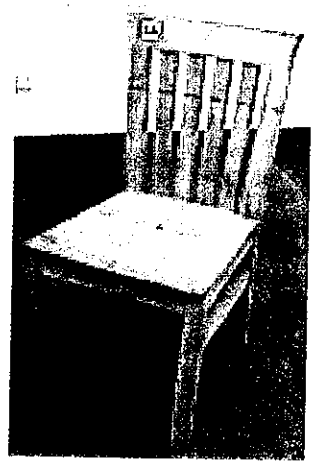
B. Construction Qualities	
Material Type	Dining chair made of solid wood legs, seat and backrest
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	13% (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Not performed
Leg sideways static load test	Not performed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Passed

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking of members
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No loosening of joints or members
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of components noted

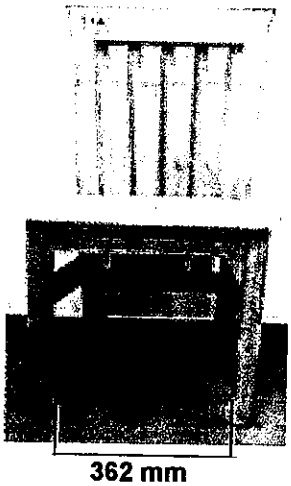
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No indication of deformation or cracks
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation occurred
g. clearly audible noise developed during testing.	No audible noise noted

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

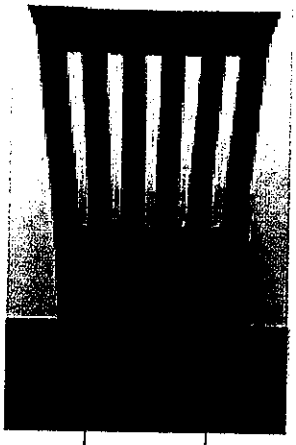
DIMENSION OF CABRERA MANUTRADE CHAIR 3A:



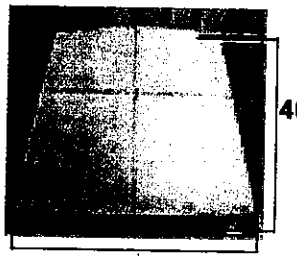
ISOMETRIC VIEW



362 mm
FRONT VIEW

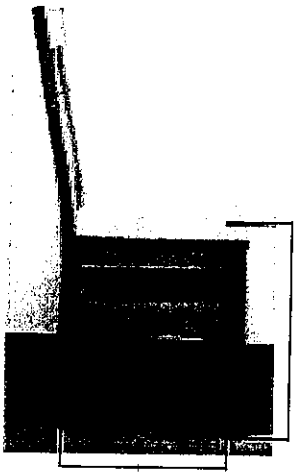


246 mm
REAR VIEW



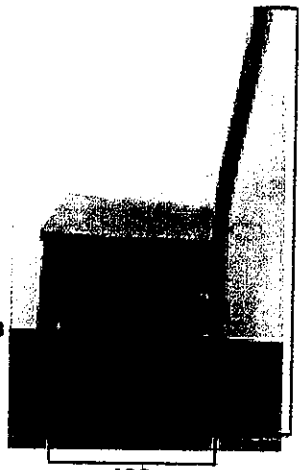
406 mm

469 mm
TOP VIEW



457 mm

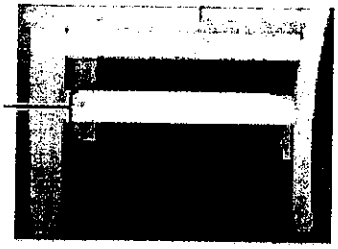
408 mm
RIGHT SIDEVIEW

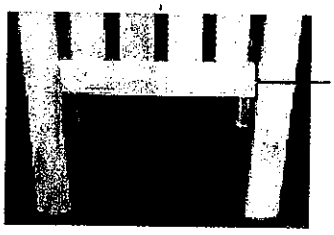


940 mm

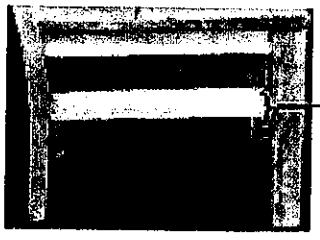
408 mm
LEFT SIDEVIEW

33.32 mm
LEFT SIDE
STRETCHER

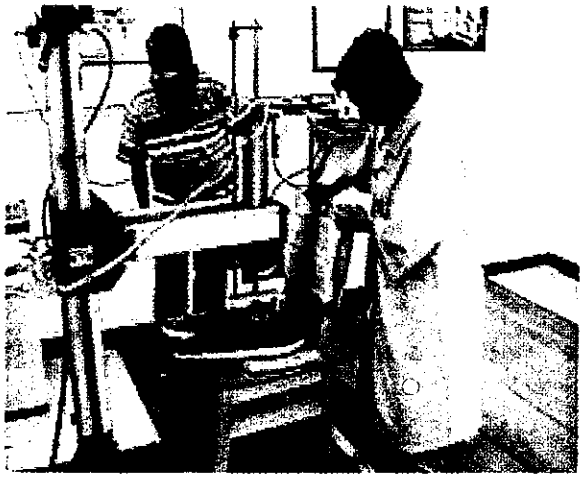




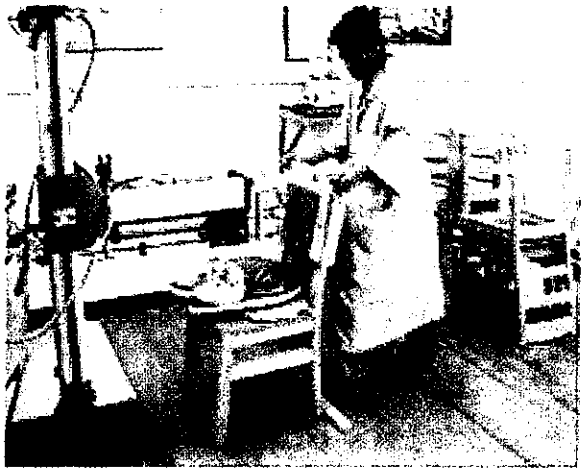
35.17 mm
REAR SIDE
STRETCHER



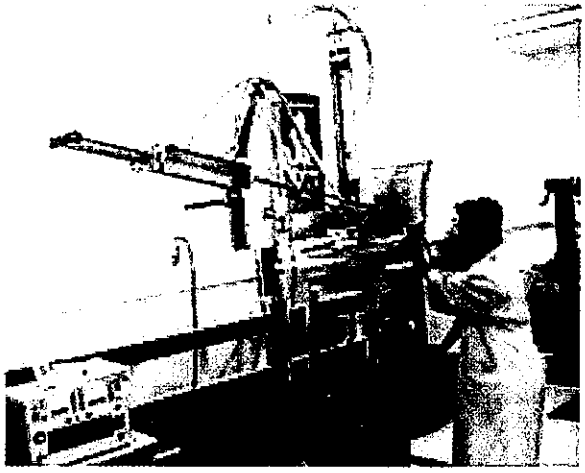
33.32 mm
RIGHT SIDE
STRETCHER



Seat static load test

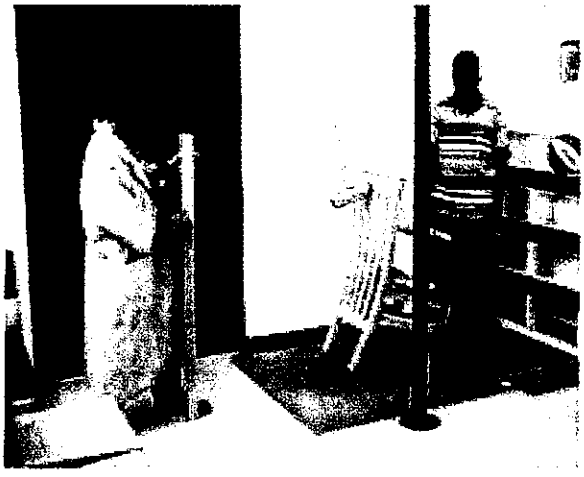


Back static load test

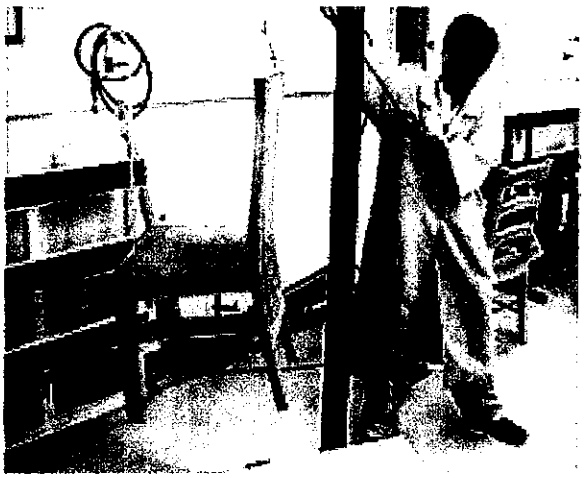


Combined seat and back fatigue test

Seat impact test



Back impact test



Drop test

Client: Cabrera Manutrade Corporation

Address: Halang, Calamba, Laguna

Sampled by: ITTO Staff

Species: Tanguile/Red lauan

Date Sample Received: January 13, 2004

Sample Code: Chair 1B

Reference Standard: ISO 7173
BS 4875 Part 1 + BS EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	479 x 389	479 x 389
Height of seat from floor level, mm	444	444
Height of top back from floor level, mm	910	910
Distance of front legs, mm (inner)	379	379
Distance of side legs (left side, inner), mm	442	442
Distance of side legs (right side, inner), mm	442	442
Distance of rear legs, mm (inner)	379	379
Seat type :	Solid wood	
Backrest type :	Ladder type solid wood	
Leg type :	Curved wood rectangular shape front and back legs	
Total weight (kg) :	8.4	

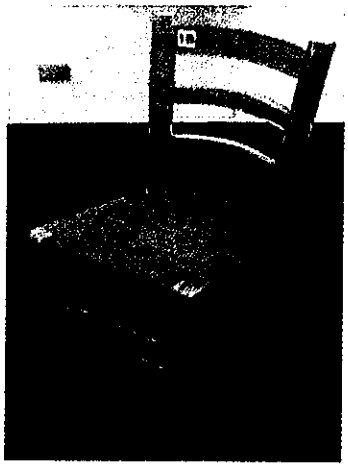
B. Construction Qualities	
Material Type	Dining chair made of solid wood with front, back and double side stretchers
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	14% (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Passed
Leg sideways static load test	Passed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Passed

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking noted
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No loosening of joints and members
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe or base
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of arms and legs observed

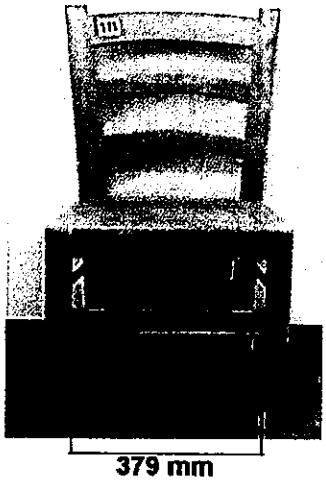
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No deformation of any part observed
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation of any part
g. clearly audible noise developed during testing.	No audible noise noted

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

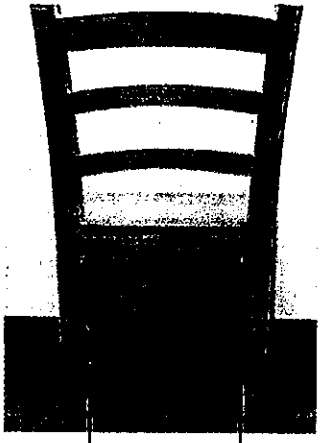
DIMENSION OF CABRERA MANUTRADE CHAIR 1B:



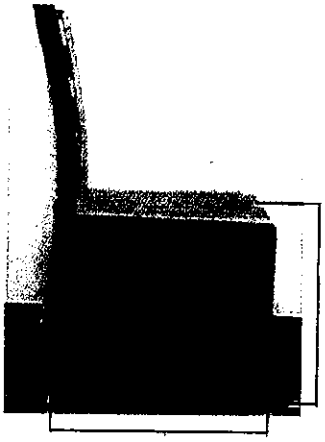
ISOMETRIC VIEW



379 mm
FRONT VIEW

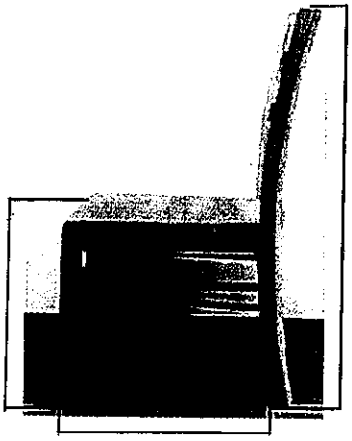


379 mm
REAR VIEW



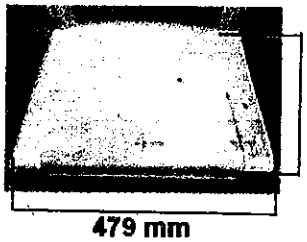
442 mm
RIGHT SIDEVIEW

444 mm



910 mm

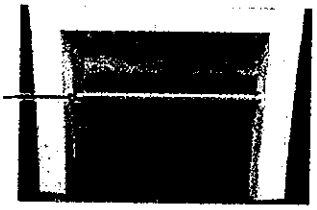
442 mm
LEFT SIDEVIEW



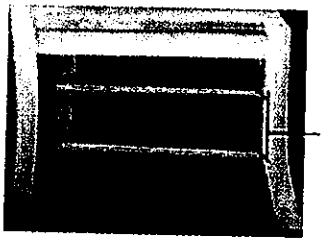
389 mm

479 mm
TOP VIEW

19.59 mm



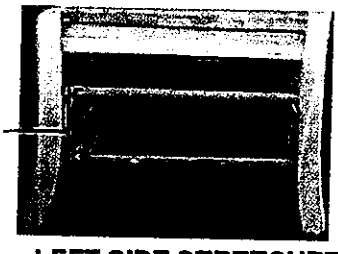
REAR SIDE STRETCHER



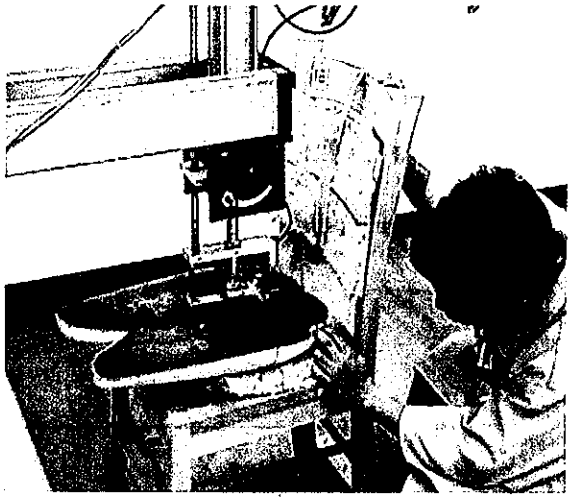
19.13 mm

RIGHT SIDE STRETCHER

19.13mm

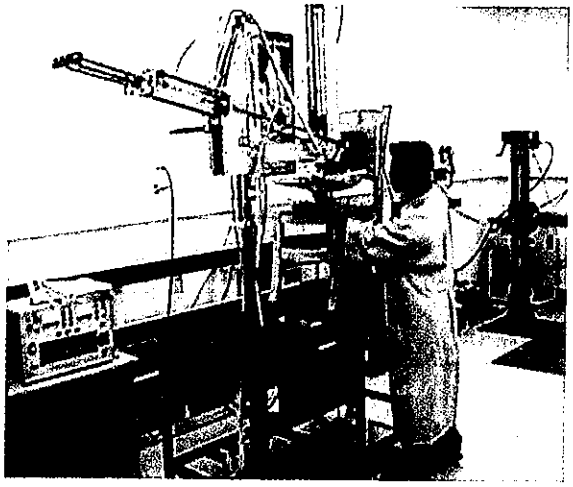


LEFT SIDE STRETCHER

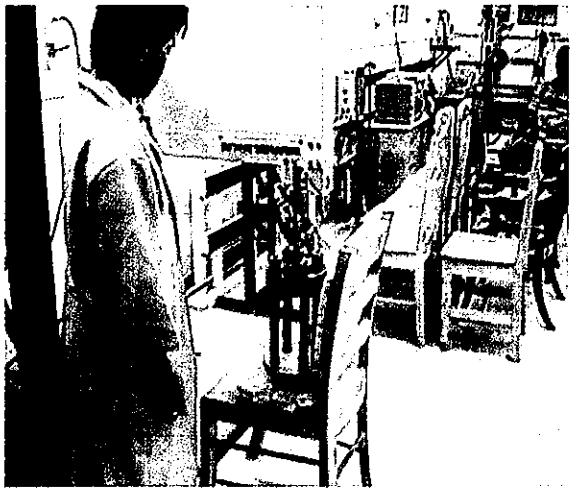


Seat static load test

Back static load test



Combined seat and back fatigue test



Seat impact test

Back impact test

Drop test

Client: Cabrera Manutrade Corporation

Address: Halang, Calamba, Laguna

Sampled by: ITTO Staff **Species:** Mayapis/Almon

Date Sample Received: February 2003 **Sample Code:** Chair 2B

Reference Standard: ISO 7173
BS 4875 Part 1 + BS EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	479 x 409	479 x 409
Height of seat from floor level, mm	450	450
Height of top back from floor level, mm	930	930
Distance of front legs, mm (inner)	364	364
Distance of side legs (left side, inner), mm	392	392
Distance of side legs (right side, inner), mm	392	392
Distance of rear legs, mm (inner)	322	322
Seat type :	Solid wood	
Backrest type :	Solid wood slats arranged horizontally	
Leg type :	Turned solid wood front legs and curved back legs with out stretchers	
Total weight (kg) :	8.2	

B. Construction Qualities	
Material Type	Dining chair made of solid wood
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	12% (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Failed (Remark No. 3)
Back fatigue test	Failed (Remark No. 3)
Leg forward static load test	Not performed (Remark No. 4)
Leg sideways static load test	Not performed (Remark No. 4)
Diagonal base load	Not applicable
Seat impact test	Not performed (Remark No. 4)
Back impact test	Not performed (Remark No. 4)
Arm impact test	Not applicable
Drop test	Not performed (Remark No. 4)

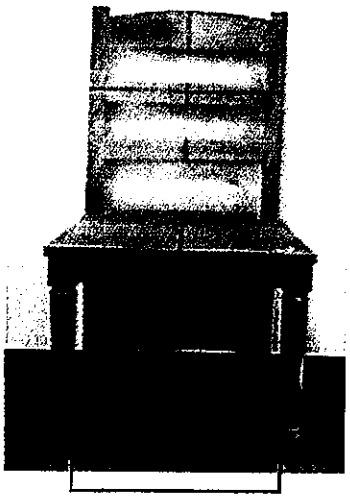
D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking of members prior to combined seat and back fatigue test
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	Loosening of back legs and side rail joint connection after 9,158 cycles during seat and back fatigue test
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe prior to seat and back fatigue test
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of components noted prior to seat and back fatigue test

e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No indication of deformation or cracks prior to seat and back fatigue test
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation occurred prior to seat and back fatigue test
g. clearly audible noise developed during testing.	No audible noise noted prior to seat and back fatigue test

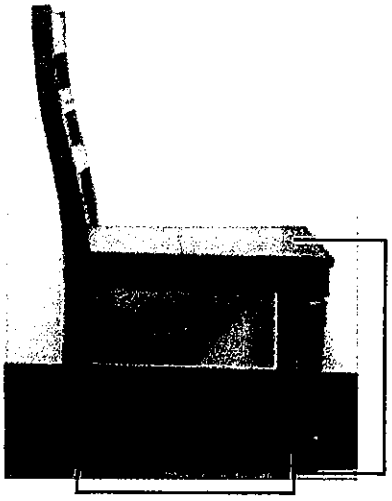
Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. The test sample failed after 9,158 cycles during the combined seat and back fatigue test.
4. Succeeding tests were not performed after failure occurred during combined seat and back fatigue test.
5. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

DIMENSION OF CABRERA MANUTRADE CHAIR 2B:

ISOMETRIC VIEW

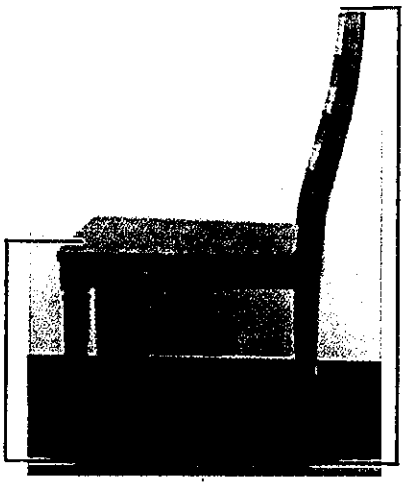


364 mm
FRONT VIEW



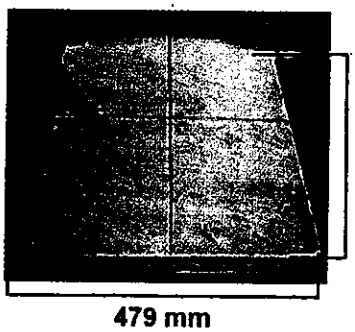
450 mm

392 mm
RIGHT SIDEVIEW



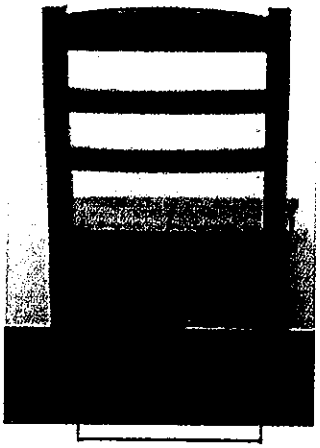
930 mm

LEFT SIDEVIEW

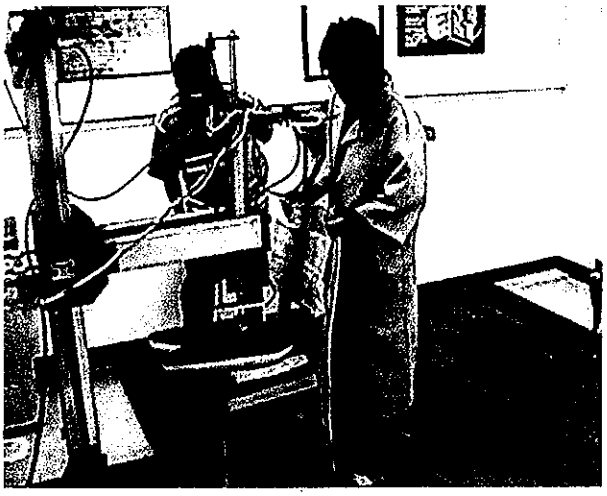


409 mm

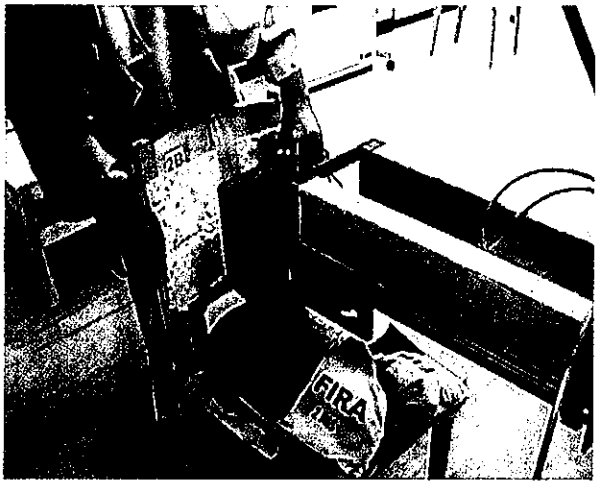
479 mm
TOP VIEW



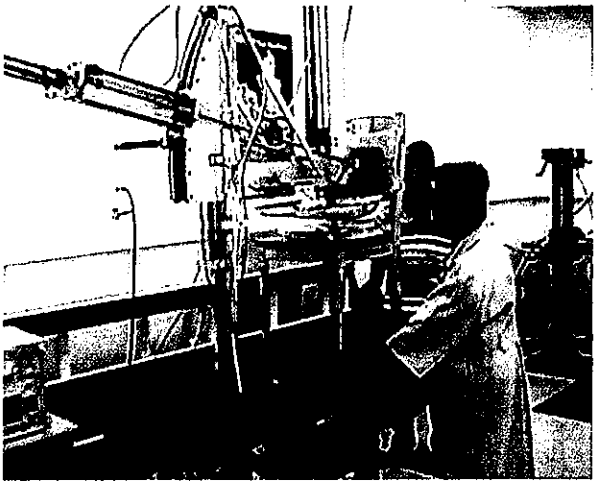
322 mm
REAR VIEW



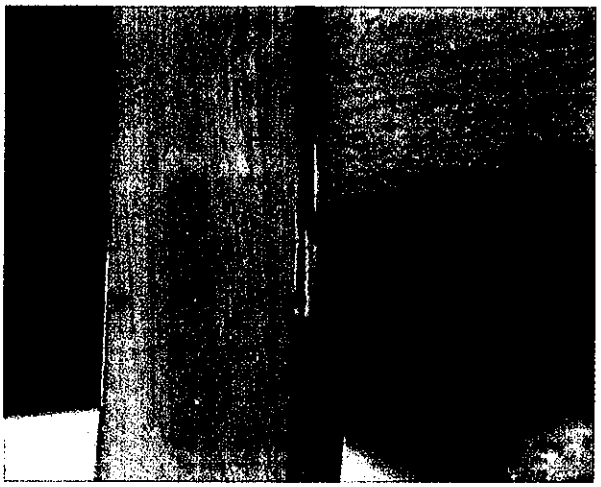
Seat static load test



Back static load test



Combined seat and back fatigue test



Damages that occurred during combined seat and back fatigue test

Client: Cabrera Manutrade Corporation

Address: Halang, Calamba, Laguna

Sampled by: ITTO Staff **Species:** Tanguile/Red lauan

Date Sample Received: February 2003 **Sample Code:** Chair 3B

Reference Standard: ISO 7173
BS 4875 Part 1 + BS EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	470 x 410	470 x 410
Height of seat from floor level, mm	452	452
Height of top back from floor level, mm	940	940
Distance of front legs, mm (inner)	360	360
Distance of side legs (left side, inner), mm	410	410
Distance of side legs (right side, inner), mm	410	410
Distance of rear legs, mm (inner)	360	360
Seat type :	Solid wood	
Backrest type :	Solid wood slats arranged vertically	
Leg type :	Solid wood rectangular shape front legs and curved back legs	
Total weight (kg) :	9	

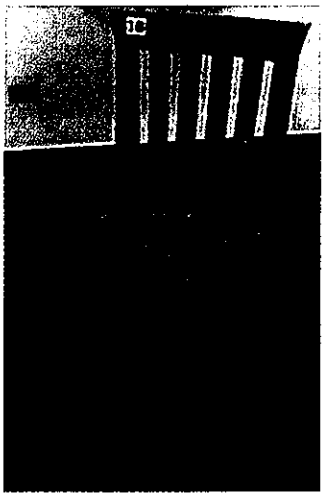
B. Construction Qualities	
Material Type	Dining chair made of solid wood legs, seat and backrest
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	11% (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Not performed
Leg sideways static load test	Not performed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Passed

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking of members observed
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	Slight loosening of the right side brace joint connection with the right back leg
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	Slight loosening of the right front and back leg and side rail joint connection
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of components noted

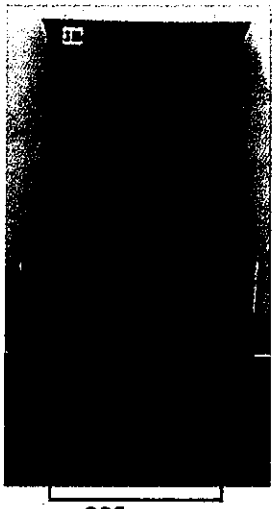
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No deformation of any part noted
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation of any part
g. clearly audible noise developed during testing.	No audible noise noted

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

DIMENSION OF CABRERA MANUTRADE CHAIR 3B:

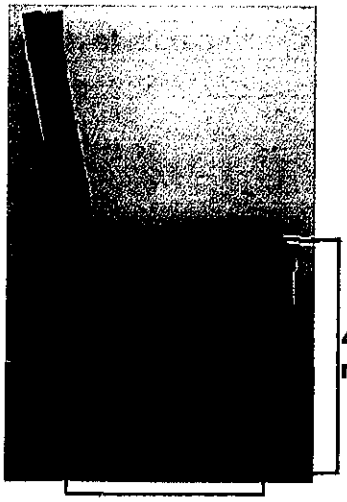


ISOMETRIC VIEW



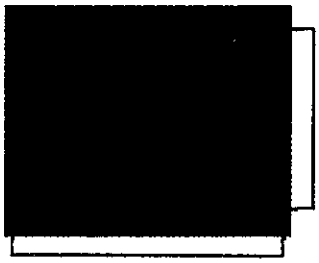
360 mm
FRONT VIEW

360 mm
REAR VIEW



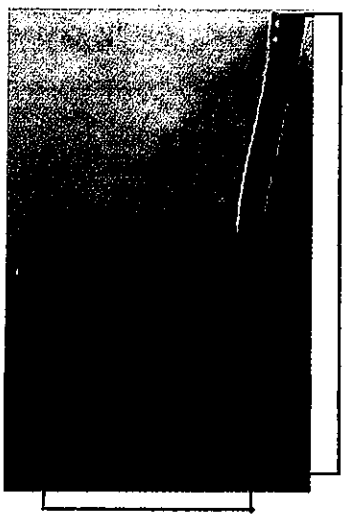
452 mm

410 mm
RIGHT SIDEVIEW



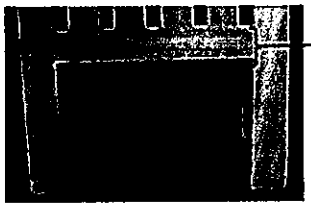
410 mm

470 mm
TOP VIEW



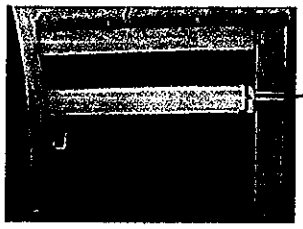
940 mm

410 mm
LEFT SIDEVIEW



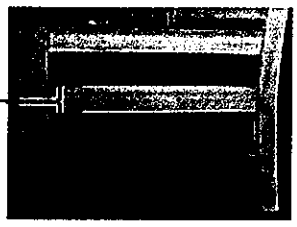
35.17 mm

REAR VIEW STRETCHER



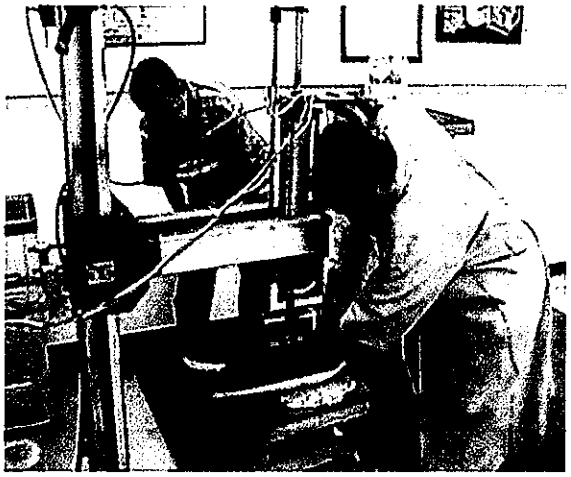
33.32 mm

RIGHT SIDE STRETCHER

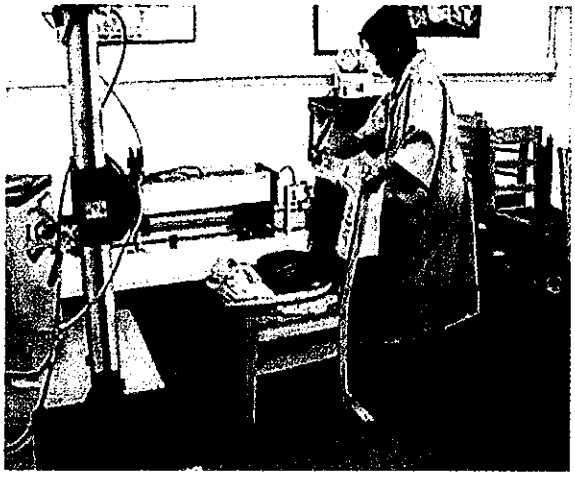


33.32 mm

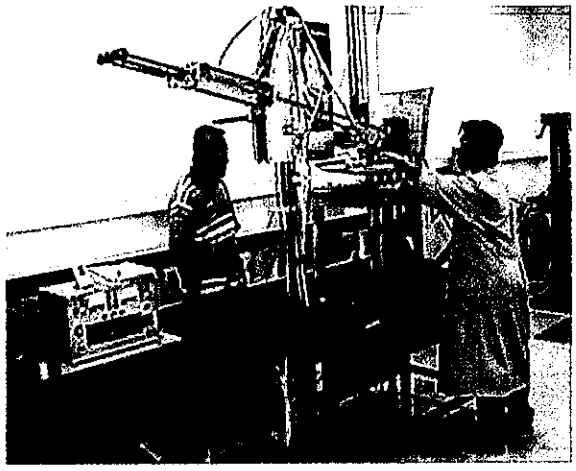
LEFT SIDE STRETCHER



Seat static load test

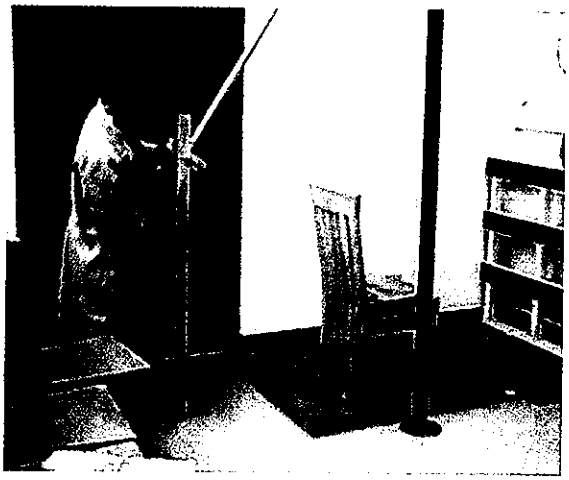


Back static load test



Combined seat and back fatigue test

Seat impact test



Back impact test

Drop test

Client: DEMEX Rattancraft, Inc.

Address: 3rd Floor, Guadalupe Commercial Center, Guadalupe, Makati City

Sampled by: Jorge L. Dela Peña **Species:** Rattan and Wood

Date Sample Received: Sept. 3, 2003 **Sample Code:** DEMEX-Dianne-01

Reference Standard: ISO 7173
BS 4875 Part 1 +BS EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	495 x 365	495 x 365
Height of seat from floor level, mm	415	415
Height of top back from floor level, mm	780	780
Distance of front legs, mm (inner)	465	430
Distance of side legs (left side, inner), mm	435	430
Distance of side legs (right side, inner), mm	415	405
Distance of rear legs, mm (inner)	395	389
Seat type : Upholstered seat		
Backrest type : Continuous bent rattan pole		
Leg type : Bent rattan pole screwed to solid wood seat frame		
Total weight (kg) : 5.6		

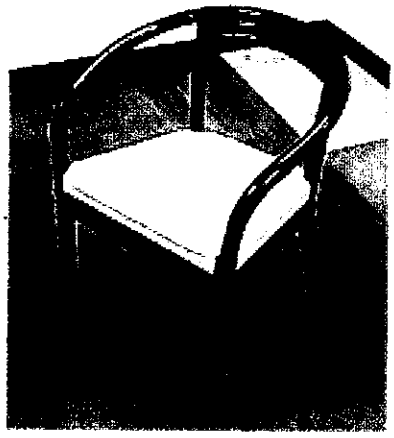
B. Construction Qualities	
Material Type	Arm chair made of bent rattan pole with solid wood seat frame and cushion seat
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	Not performed
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Passed
Arm downwards static load test	Passed
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Passed
Leg sideways static load test	Failed (Remark No. 2)
Diagonal base load	Not applicable
Seat impact test	Not performed (Remark No. 4)
Back impact test	Not performed - do -
Drop test	Not performed - do -

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	Splitting of rattan pole
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	Loosening of seat frame joint at the leftside front leg
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe prior to leg sideways static load test
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of components noted prior to leg sideways static load test

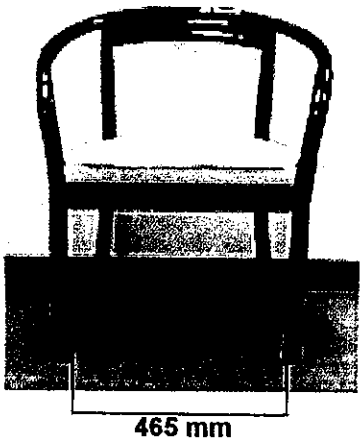
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	Deformation of left front leg
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation occurred prior to leg sideways static load test
g. clearly audible noise developed during testing.	No audible noise noted prior to leg sideways static load test

Remarks:
1. Sample was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Deformation and loosening of seat frame joint at the leftside front leg and splitting of rattan pole during the application of the load
3. Seat and back fatigue tests were done simultaneously using 50,000 cycles
4. The other tests were not performed after failure occurred during leg sideways static load test
5. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

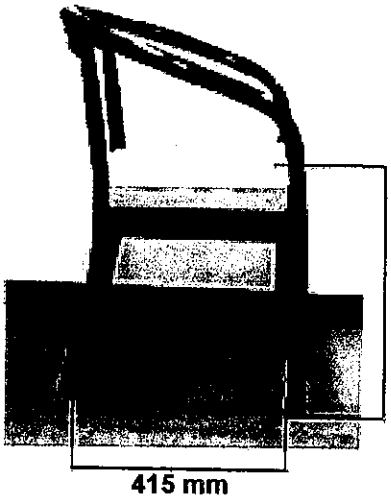
DIMENSION OF DEMEX DIANNE CHAIR 01:



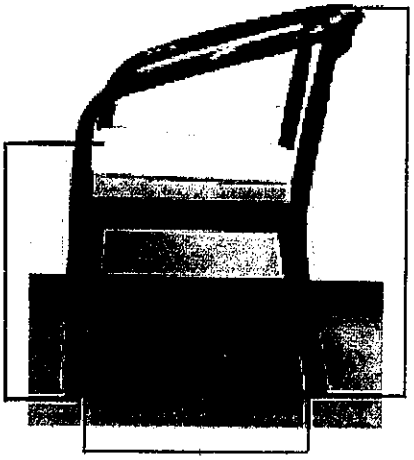
ISOMETRIC VIEW



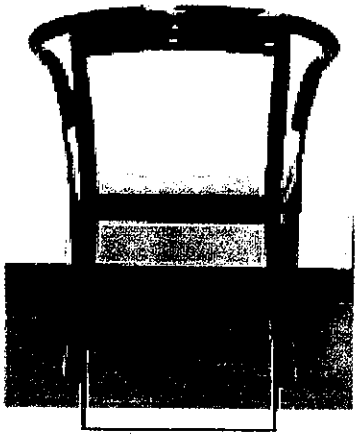
465 mm
FRONT VIEW



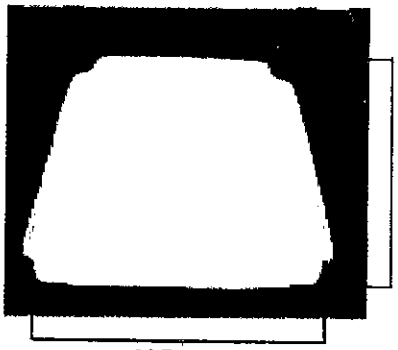
415 mm
415 mm
RIGHT SIDEVIEW



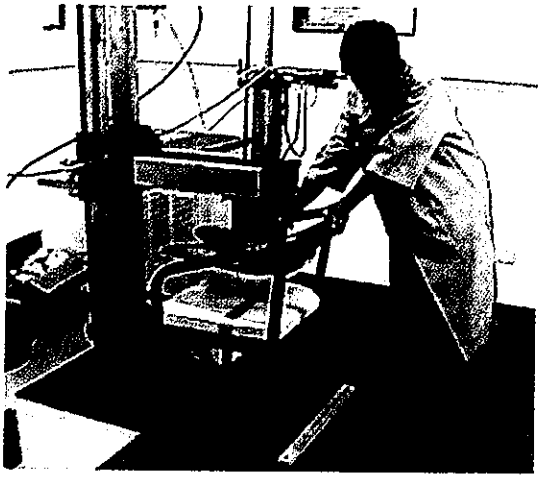
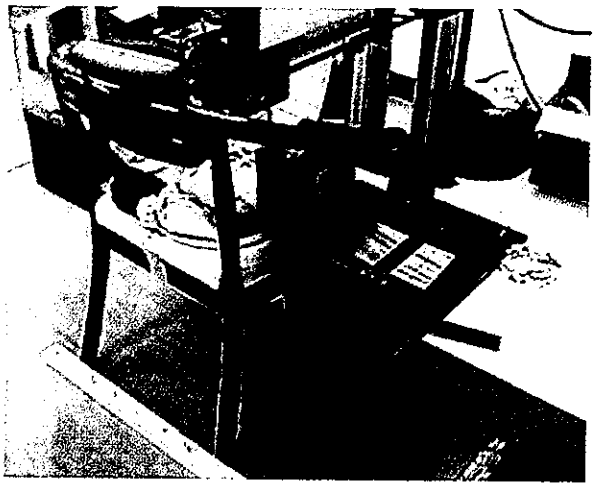
780 mm
435 mm
LEFT SIDEVIEW



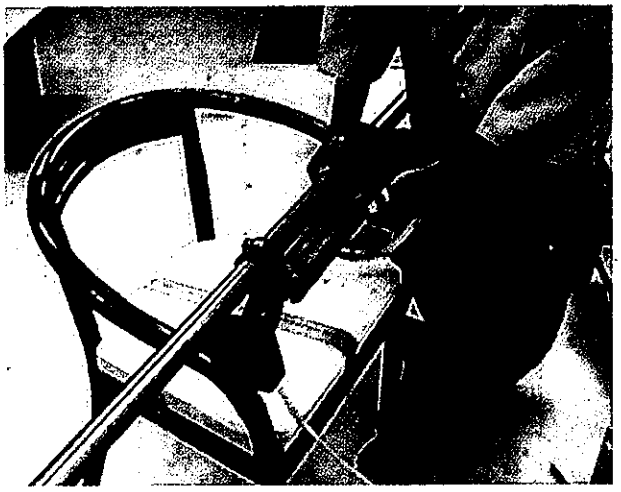
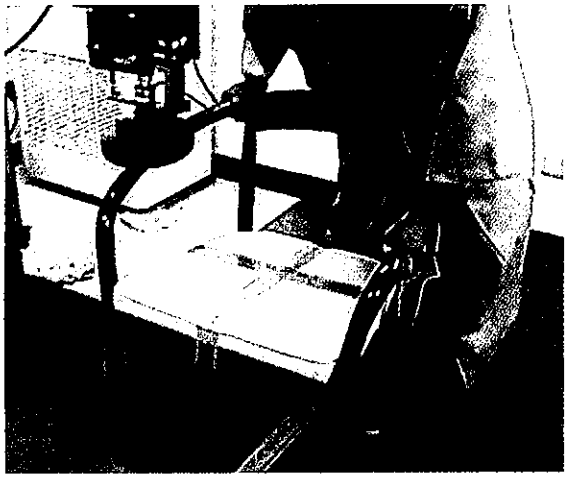
395 mm
REAR VIEW



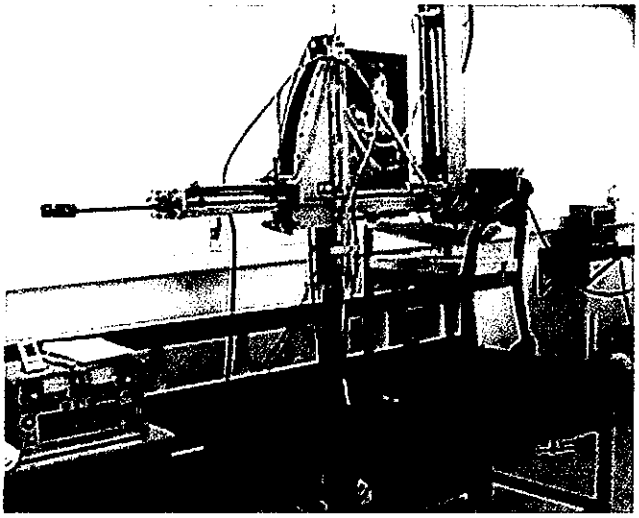
365 mm
495 mm
TOP VIEW

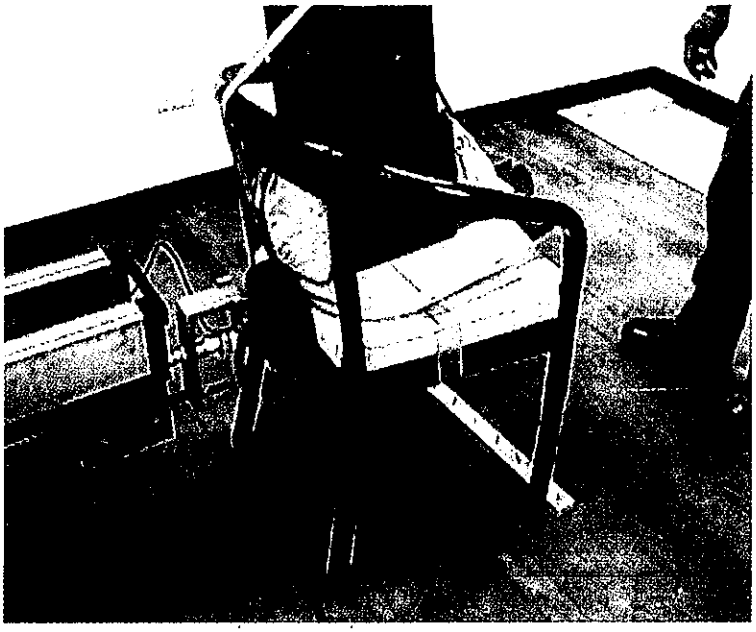
Seat and back static load test

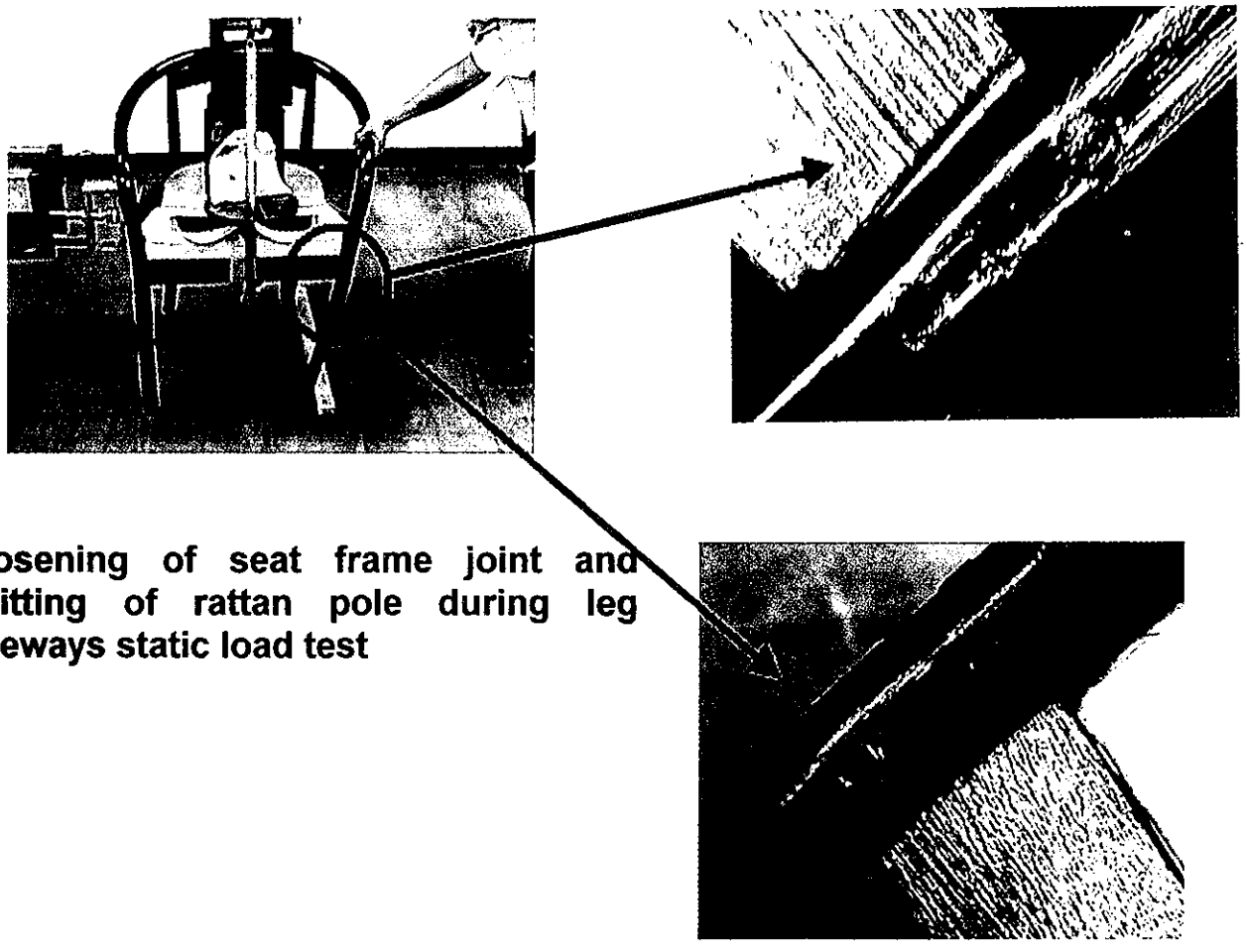
Arm sideways and arm downwards static load test



Combined seat and back fatigue test



Leg forward static load test



Loosening of seat frame joint and splitting of rattan pole during leg sideways static load test

Client: DEMEX Rattancraft, Inc.

Address: 3rd Floor, Guadalupe Commercial Center, Guadalupe, Makati City

Sampled by: Jeorge L. Dela Peña **Species:** Rattan and Wood

Date Sample Received: Dec. 30, 2003 **Sample Code:** DEMEX-Dianne 02

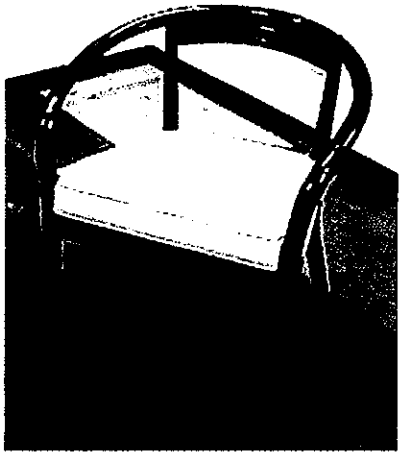
Reference Standard: ISO 7173:1989
BS 4875 Part 1 + EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	520 x 385	520 x 385
Height of seat from floor level, mm	480	480
Height of top back from floor level, mm	770	770
Distance of front legs, mm (inner)	555	555
Distance of side legs (left side, inner), mm	480	480
Distance of side legs (right side, inner), mm	490	490
Distance of rear legs, mm (inner)	400	400
Seat type : Upholstered seat		
Backrest type : Continuous bent rattan pole		
Leg type : Bent rattan pole butt screwed to solid wood seat frame		
Total weight (kg) : 5.4		

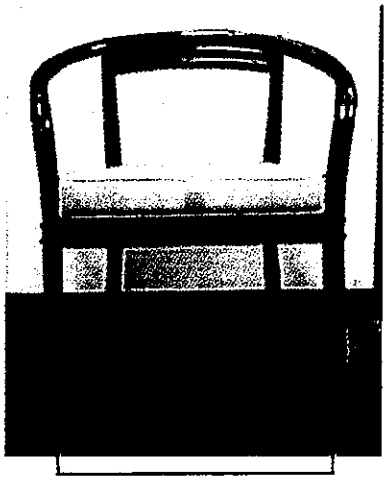
B. Construction Qualities	
Material Type	Arm chair made of bent rattan pole with solid wood seat frame and cushion seat
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	Not performed
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Passed
Arm downwards static load test	Passed
Seat fatigue test	Passed (Remark No. 2)
Back fatigue test	Passed (Remark No. 2)
Leg forward static load test	Passed
Leg sideways static load test	Passed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Passed
Drop test	Passed

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Combined seat and back fatigue tests were done simultaneously using 50,000 cycles of the standards
3. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

DIMENSION OF DEMEX DIANNE CHAIR 02:



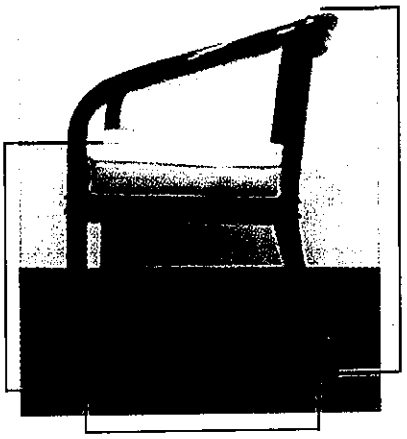
ISOMETRIC VIEW



555 mm
FRONT VIEW

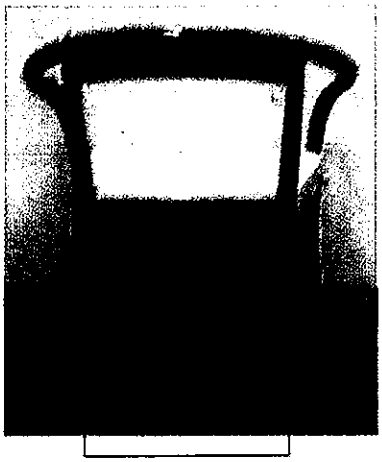
490 mm
RIGHT SIDEVIEW

480 mm

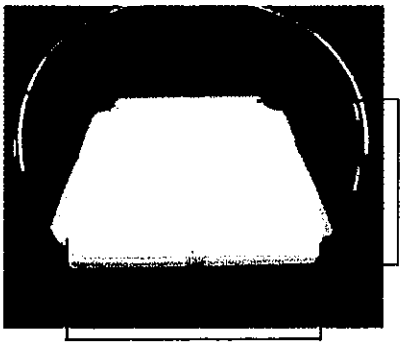


770 mm

480 mm
LEFT SIDEVIEW



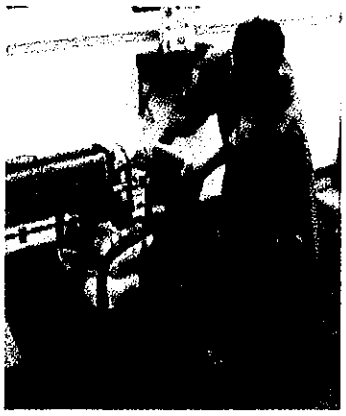
400 mm
REAR VIEW



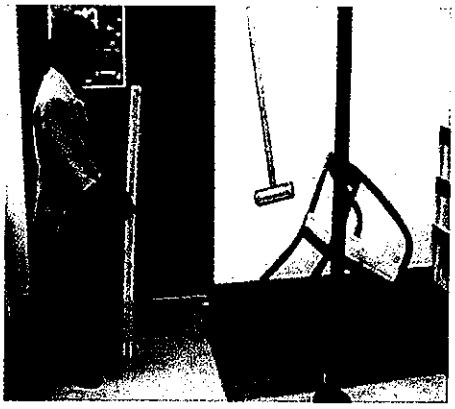
385 mm

520 mm
TOP VIEW

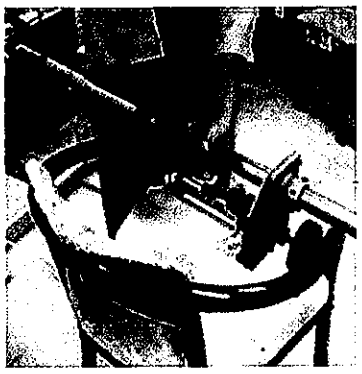
Seat static load test



Back static load test

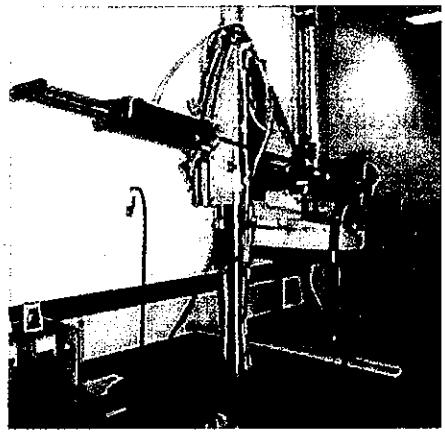


Back impact test



Arm sideways and arm downwards static load test

Leg forward static load test



Combined seat and back fatigue test

Seat impact test

Client: Ed Pascua Furniture Shop

Address: Palo Verde, Nueva Viscaya

Sampled by: ITTO Staff **Species:** *Gmelina arborea*

Date Sample Received: July 2003 **Sample Code:** Ed Pascua-CH-01A

Reference Standard: ISO 7173
BS 4875 Part 1 + EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	480 x 375	480 x 375
Height of seat from floor level, mm	460	460
Height of top back from floor level, mm	1070	1070
Distance of front legs, mm (inner)	303	303
Distance of side legs (left side, inner), mm	316	316
Distance of side legs (right side, inner), mm	316	316
Distance of rear legs, mm (inner)	308	308
Seat type : Solid wood		
Backrest type : Solid wood slats arranged vertically		
Leg type : Turned front legs and rectangular shape back legs		
Total weight (kg) : 7.1		

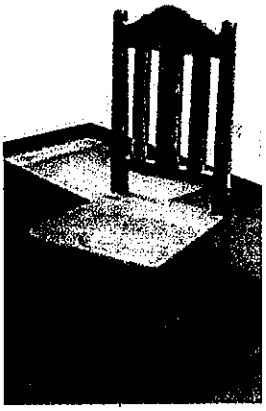
B. Construction Qualities	
Material Type	Dining chair made of solid wood
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	12% (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Passed
Leg sideways static load test	Passed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Passed

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking of components
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No loosening of joints
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of armrest, legs and back

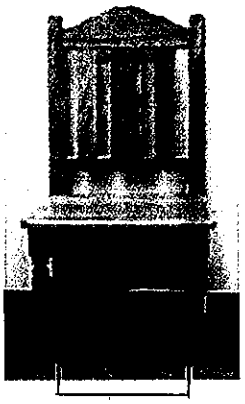
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No deformation of any part
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation of any part
g. clearly audible noise developed during testing.	No audible noise noted

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

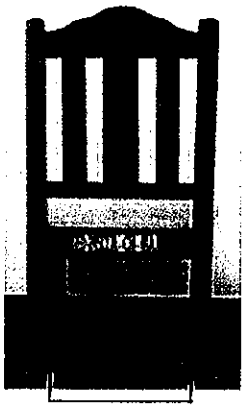
DIMENSION OF ED PASCUA CHAIR-1A:



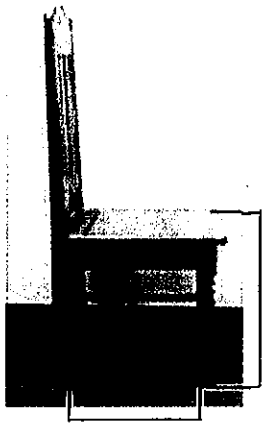
ISOMETRIC VIEW



303 mm
FRONT VIEW

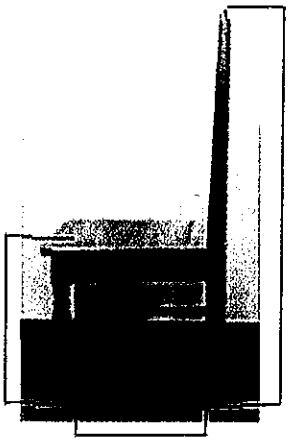


308 mm
REAR VIEW



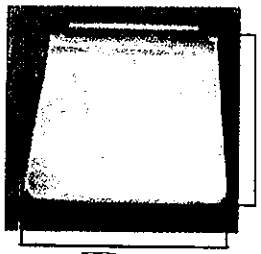
460 mm

316 mm
RIGHT SIDEVIEW



1070 mm

316 mm
LEFT SIDEVIEW

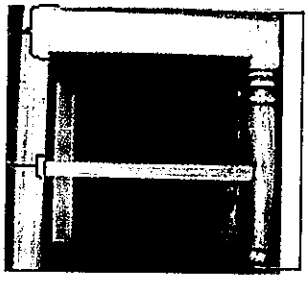


375 mm

480 mm
TOP VIEW

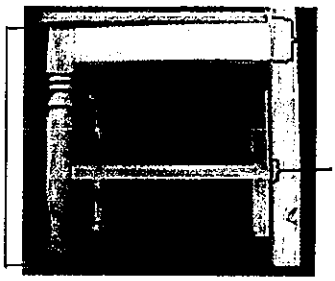
70.00 mm
(rail thickness)

40.00 mm
(rail thickness)



RIGHT SIDE STRETCHER

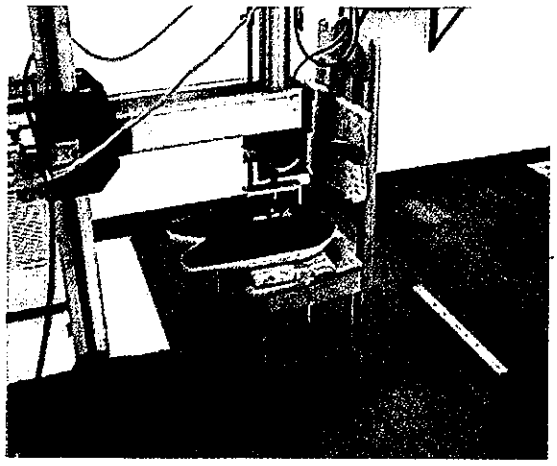
450 mm



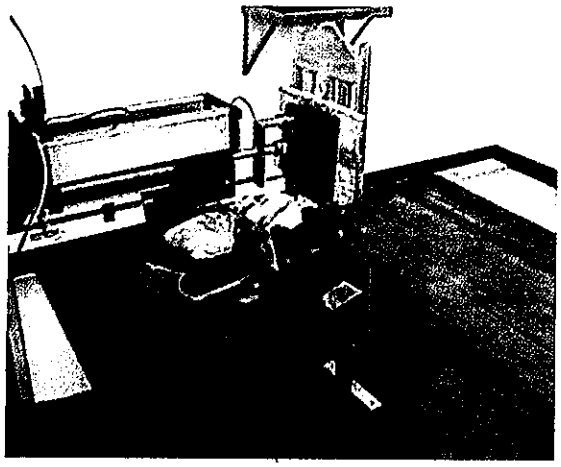
LEFT SIDE STRETCHER

70.00 mm
(rail thickness)

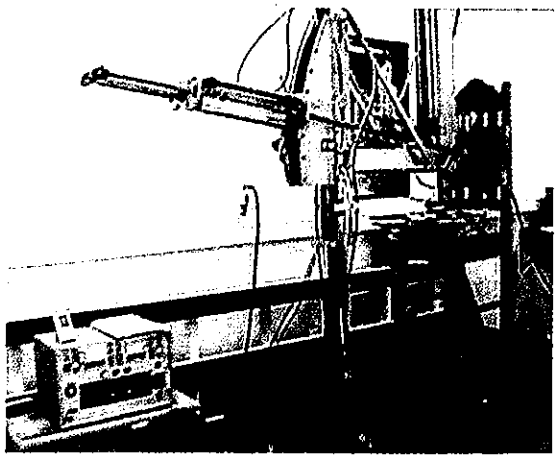
40.00 mm
(rail thickness)



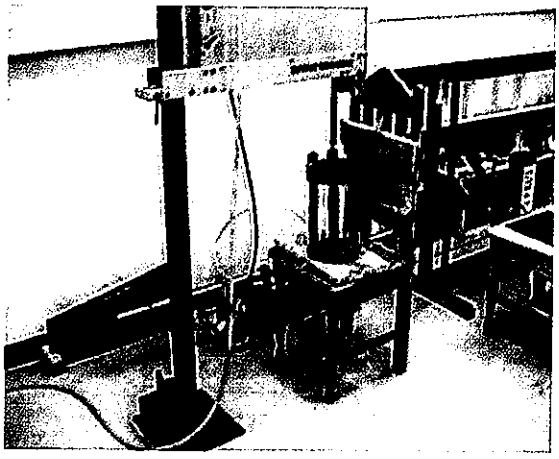
Seat static load test



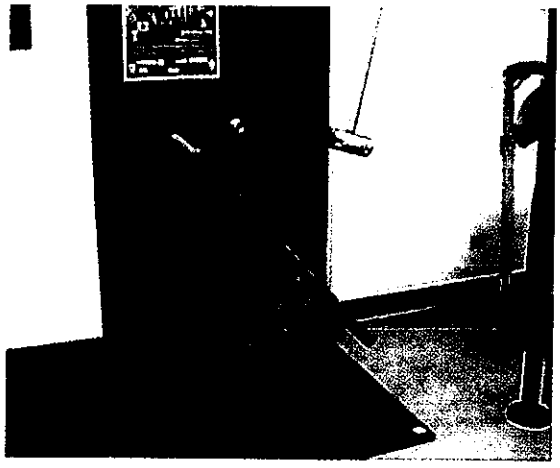
Back static load test



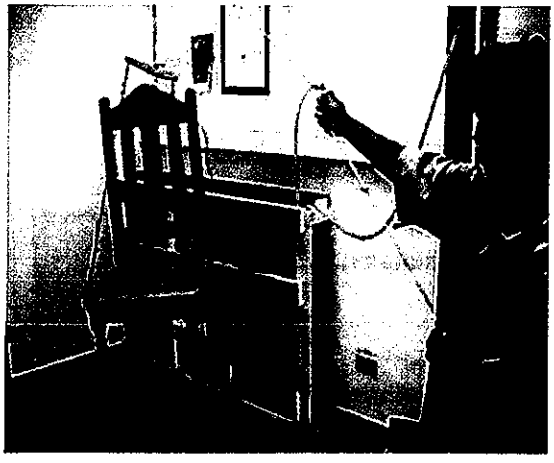
Combined seat and back fatigue test



Seat impact test



Back impact test



Drop test

Client: Ed Pascua Furniture Shop

Address: Palo Verde, Nueva Viscaya

Sampled by: ITTO Staff **Species:** *Gmelina arborea*

Date Sample Received: July 2003 **Sample Code:** Ed Pascua-CH-01B

Reference Standard: ISO 7173
BS 4875 Part 1 + EN 1728

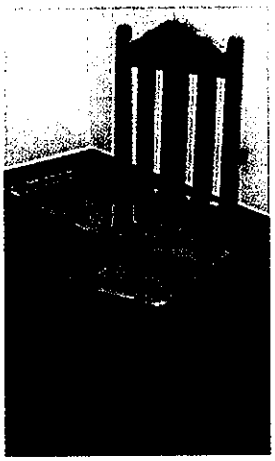
Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	480 x 375	480 x 375
Height of seat from floor level, mm	460	460
Height of top back from floor level, mm	1070	1070
Distance of front legs, mm (inner)	303	303
Distance of side legs (left side, inner), mm	316	316
Distance of side legs (right side, inner), mm	316	316
Distance of rear legs, mm (inner)	308	308
Seat type :	Solid wood	
Backrest type :	Solid wood slats arranged vertically	
Leg type :	Turned front legs and rectangular shape back legs	
Total weight (kg) :	7	

B. Construction Qualities	
Material Type	Dining chair made of solid wood
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	12% (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Passed
Leg sideways static load test	Passed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Passed

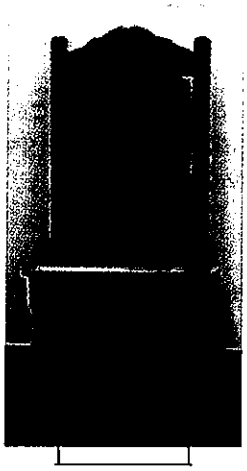
D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking of components
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No loosening of joints
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of armrest, legs and back

e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No deformation of any part
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation of any part
g. clearly audible noise developed during testing.	No audible noise noted

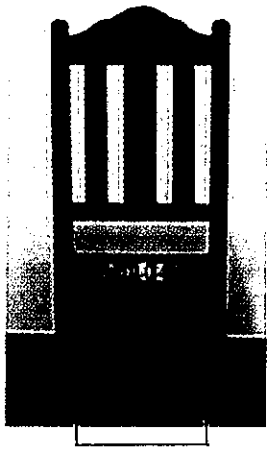
Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -



ISOMETRIC VIEW

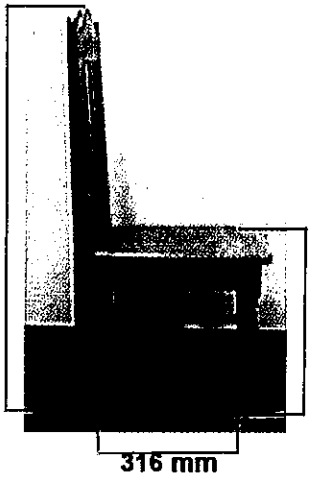


303 mm
FRONT VIEW



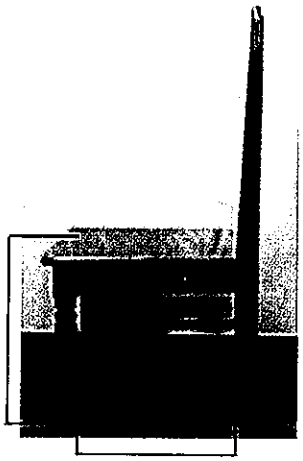
308 mm
REAR VIEW

1070 mm



316 mm
RIGHT SIDEVIEW

460 mm



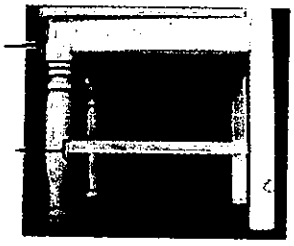
316 mm
LEFT SIDEVIEW

375 mm

480 mm
TOP VIEW

73.00 mm

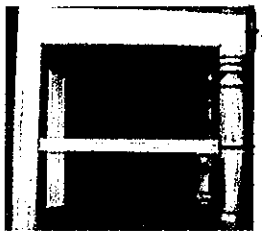
28.00 mm



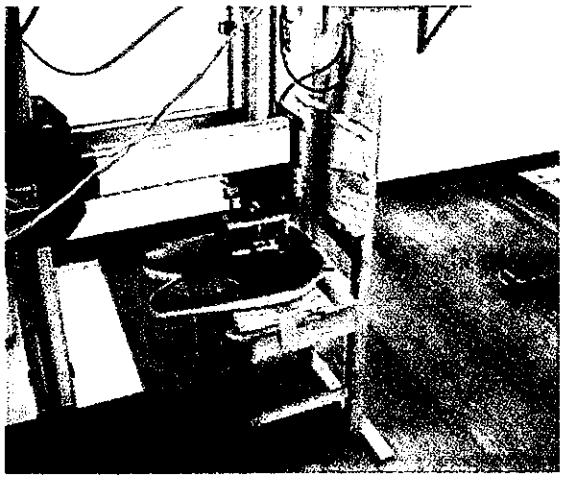
LEFT SIDE STRETCHER

72.00 mm

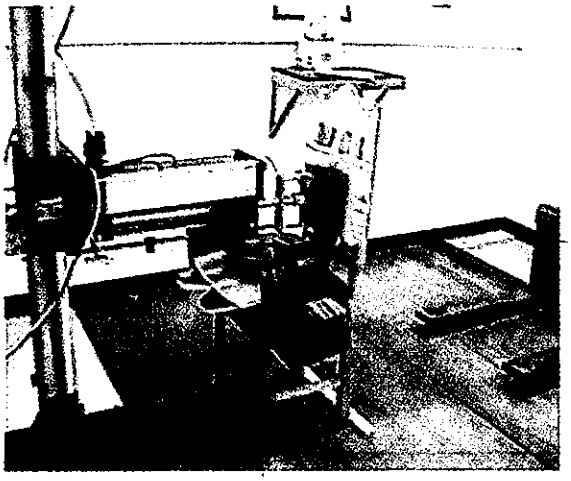
26.00 mm



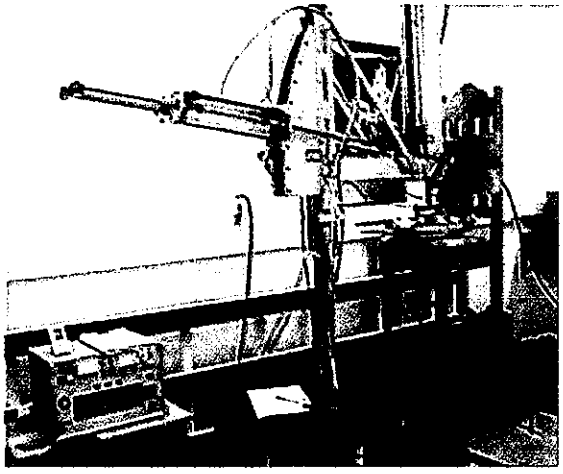
RIGHT SIDE STRETCHER



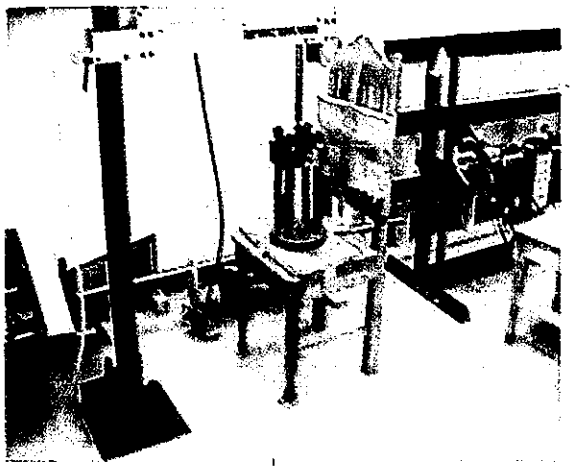
Seat static load test



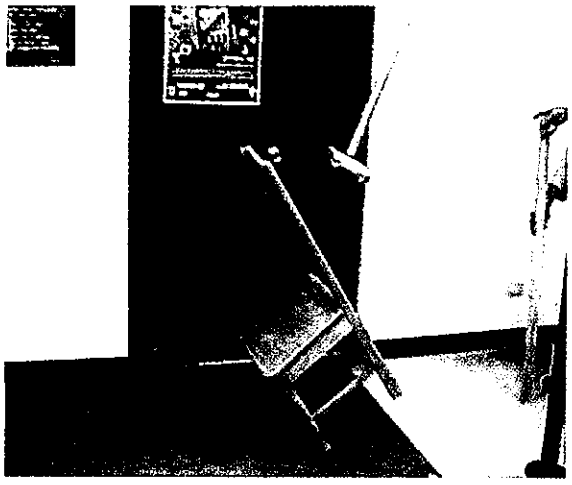
Back static load test



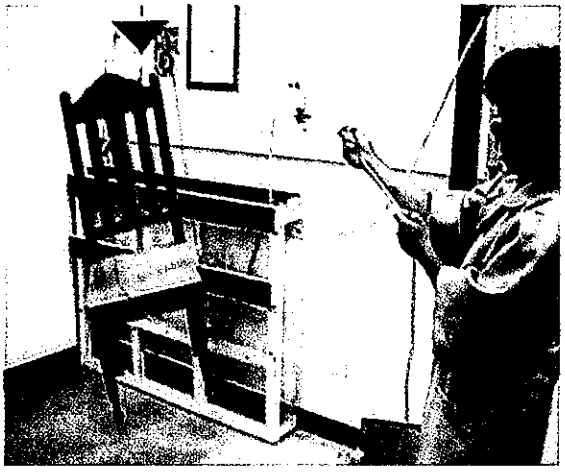
Combined seat and back fatigue test



Seat impact test



Back impact test



Drop test

Client: Ed Pascua Furniture Shop

Address: Palo Verde, Nueva Viscaya

Sampled by: ITTO Staff **Species:** *Gmelina arborea*

Date Sample Received: July 2003 **Sample Code:** Ed Pascua-CH-02A

Reference Standard: ISO 7173
BS 4875 Part 1 + EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	440 x 373	440 x 373
Height of seat from floor level, mm	424	424
Height of top back from floor level, mm	1000	1000
Distance of front legs, mm (inner)	315	315
Distance of side legs (left side, inner), mm	358	358
Distance of side legs (right side, inner), mm	358	358
Distance of rear legs, mm (inner)	315	315
Seat type :	Solid wood	
Backrest type :	Solid wood with wide single slat back rest	
Leg type :	Turned front legs and rectangular shape curved back legs	
Total weight (kg) :	6.4	

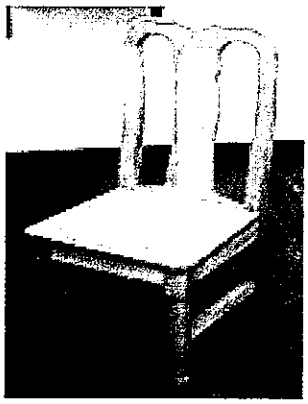
B. Construction Qualities	
Material Type	Dining chair made of solid wood
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	12.7 % (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Passed
Leg sideways static load test	Passed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Passed

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking of components
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No loosening of joints
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of armrest, legs and back

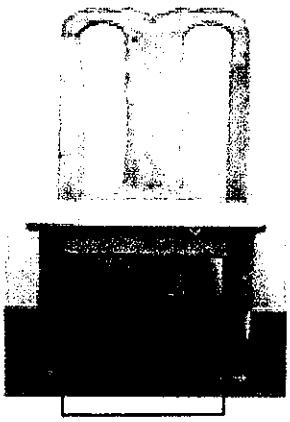
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No deformation of any part
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation of any part
g. clearly audible noise developed during testing.	No audible noise noted

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

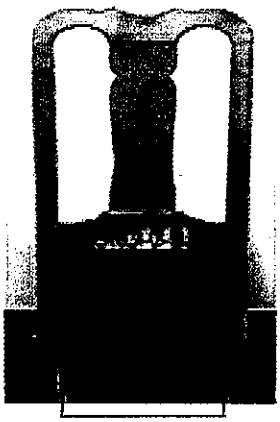
DIMENSION OF ED PASCUA CHAIR 2A:



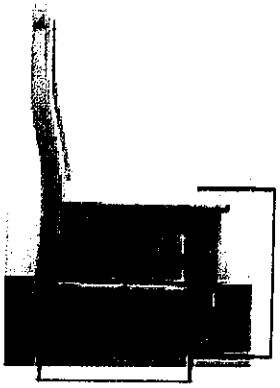
ISOMETRIC VIEW



315 mm
FRONT VIEW

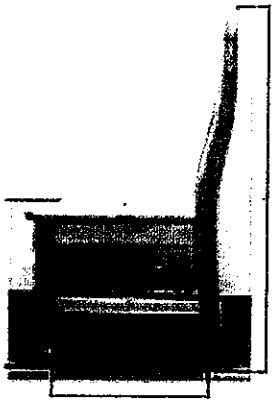


315 mm
REAR VIEW



424 mm

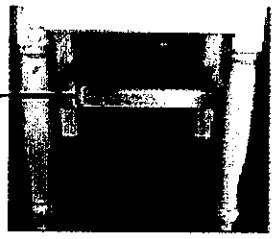
358 mm
RIGHT SIDEVIEW



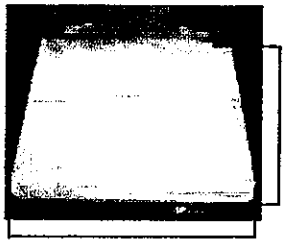
1000 mm

358 mm
LEFT SIDEVIEW

41.00 mm



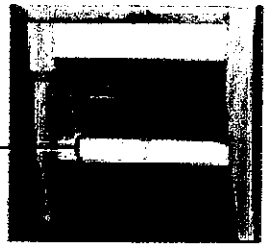
MIDDLE STRETCHER



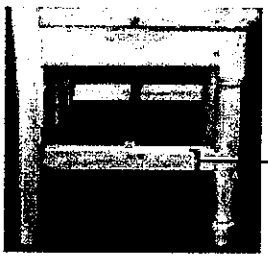
373 mm

440 mm
TOP VIEW

40.50 mm

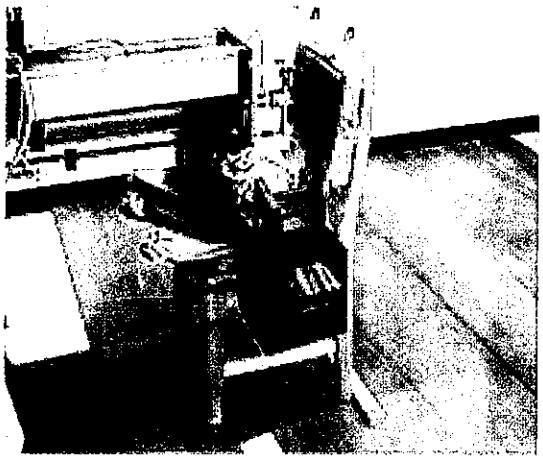


LEFT SIDE STRETCHER

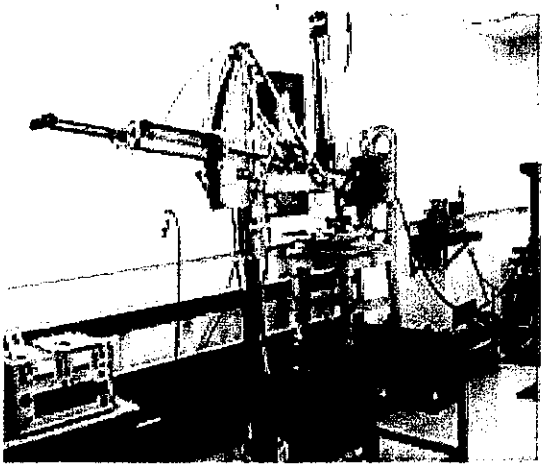


41.00 mm

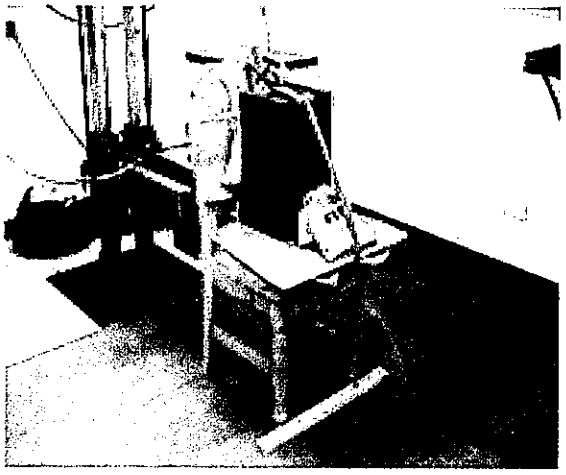
RIGHT SIDE STRETCHER



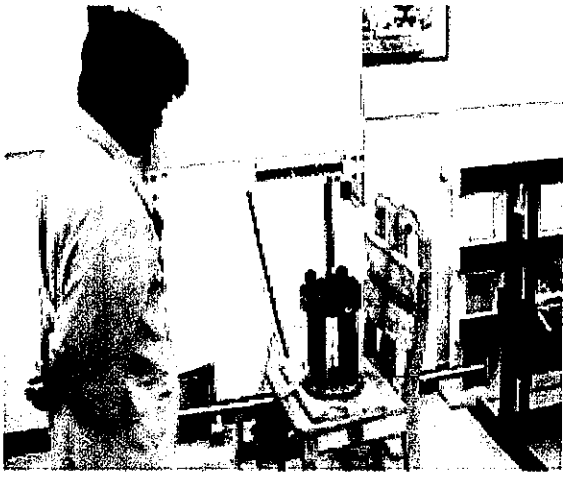
Back static load test



Combined seat and back fatigue test

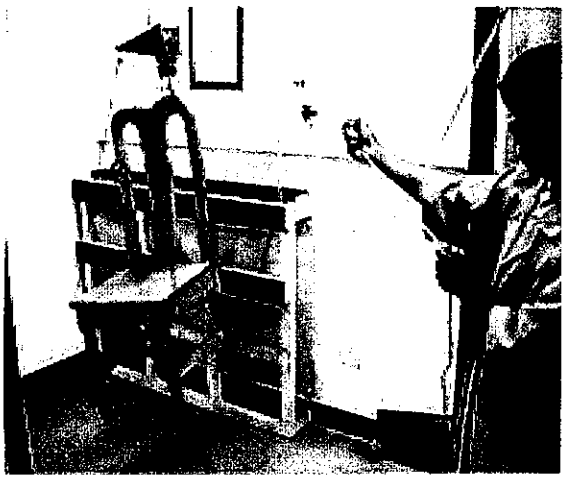


Leg forward static load



Seat impact test

Back impact test



Drop test

Client: Ed Pascua Furniture Shop

Address: Palo Verde, Nueva Viscaya

Sampled by: ITTO Staff **Species:** *Gmelina arborea*

Date Sample Received: July 2003 **Sample Code:** Ed Pascua-CH-02B

Reference Standard: ISO 7173
BS 4875 Part 1 + EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	440 x 373	440 x 373
Height of seat from floor level, mm	424	424
Height of top back from floor level, mm	1010	1010
Distance of front legs, mm (inner)	315	315
Distance of side legs (left side, inner), mm	358	358
Distance of side legs (right side, inner), mm	358	358
Distance of rear legs, mm (inner)	315	315
Seat type :	Solid wood	
Backrest type :	Solid wood with wide single slat back rest	
Leg type :	Turned front legs and rectangular shape curved back legs	
Total weight (kg) :	6.4	

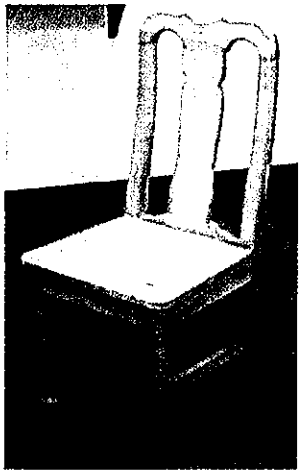
B. Construction Qualities	
Material Type	Dining chair made of solid wood
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	13 % (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Passed
Leg sideways static load test	Passed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Passed

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking of components
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No loosening of joints
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of armrest, legs and back

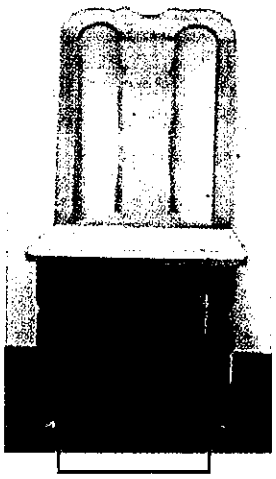
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No deformation of any part
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation of any part
g. clearly audible noise developed during testing.	No audible noise noted

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

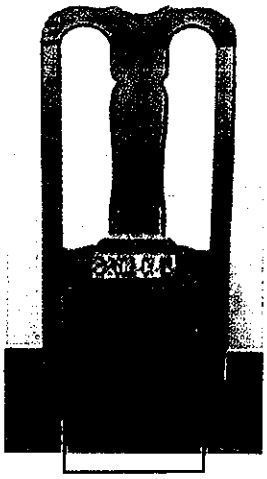
DIMENSION OF ED PASCUA CHAIR 2B:



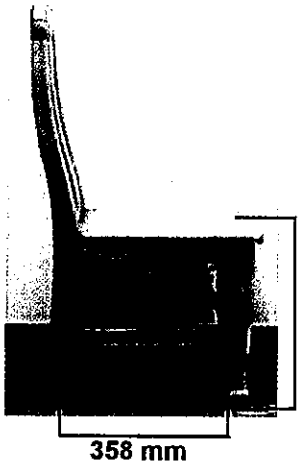
ISOMETRIC VIEW



315 mm
FRONT VIEW

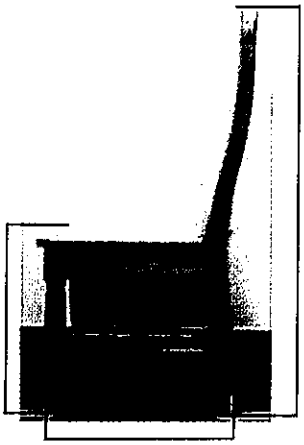


315 mm
REAR VIEW



424 mm

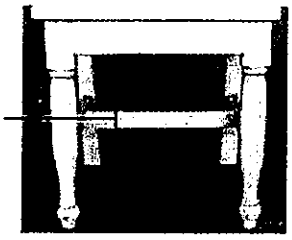
358 mm
RIGHT SIDEVIEW



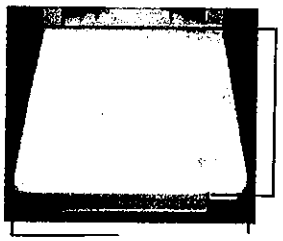
1010 mm

358 mm
LEFT SIDEVIEW

40.00 mm



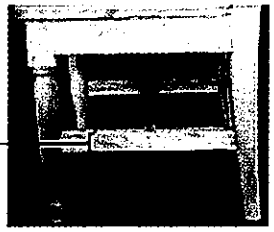
MIDDLE STRETCHER



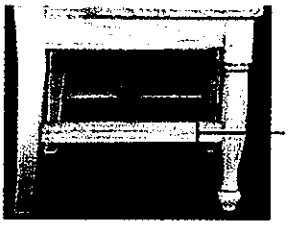
373 mm

440 mm
TOP VIEW

39.00 mm

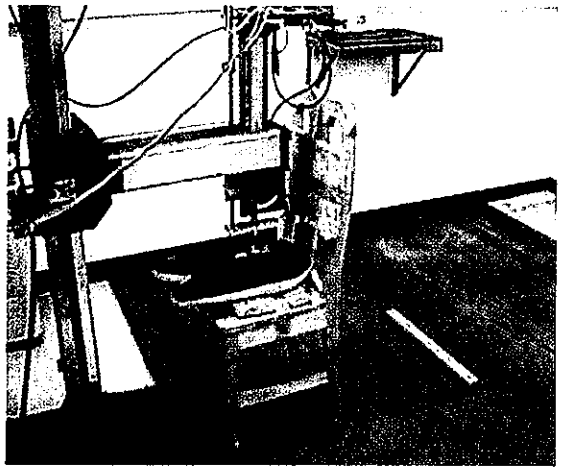


LEFT SIDE STRETCHER

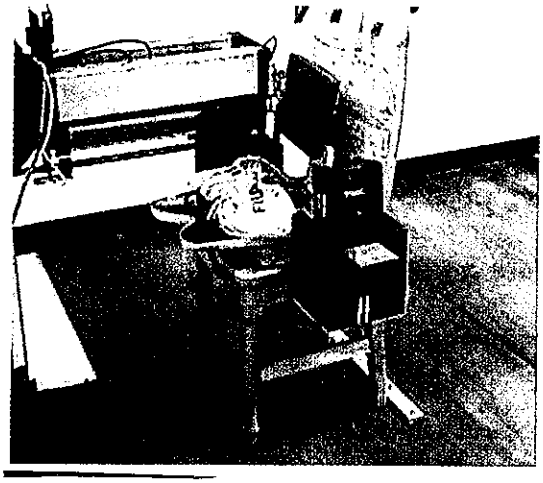


40.00 mm

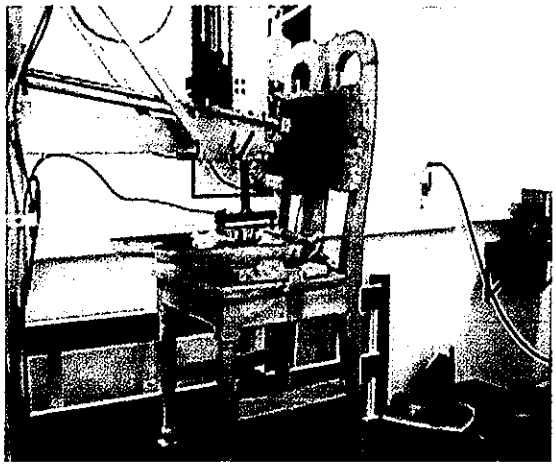
RIGHT SIDE STRETCHER



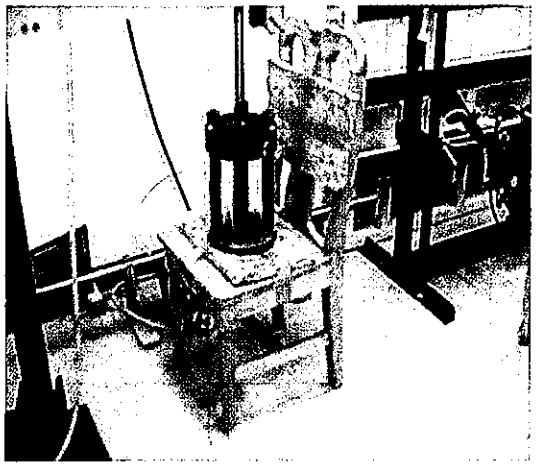
Seat static load test



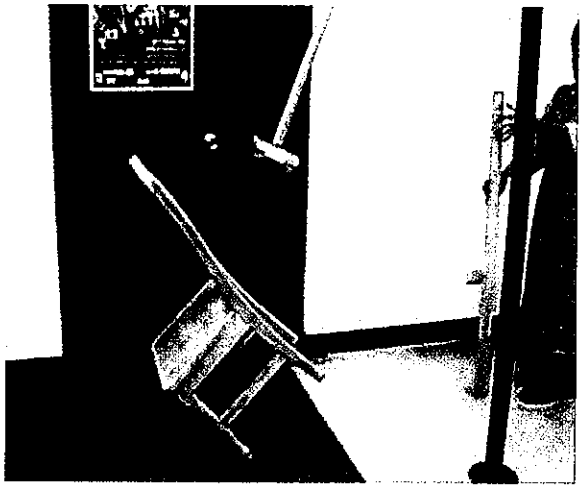
Back static load test



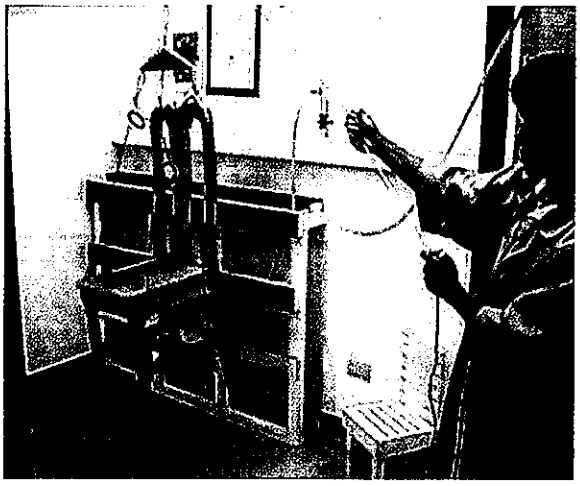
Combined seat and back fatigue test



Seat impact test



Back impact test



Drop test

Client: Ed Pascua Furniture Shop

Address: Palo Verde, Nueva Viscaya

Sampled by: ITTO Staff

Species: *Gmelina arborea*

Date Sample Received: July 2003

Sample Code: Ed Pascua-CH-03A

Reference Standard: ISO 7173
BS 4875 Part 1 + EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	403 x 379	403 x 379
Height of seat from floor level, mm	453	453
Height of top back from floor level, mm	928	928
Distance of front legs, mm (inner)	310	310
Distance of side legs (left side, inner), mm	318	318
Distance of side legs (right side, inner), mm	318	318
Distance of rear legs, mm (inner)	310	310
Seat type :	Solid wood	
Backrest type :	Solid wood with two rectangular horizontal slats	
Leg type :	Turned front legs and rectangular shape curved back legs with single stretcher at the sides and one connecting brace between the stretchers	
Total weight (kg) :	6.4	

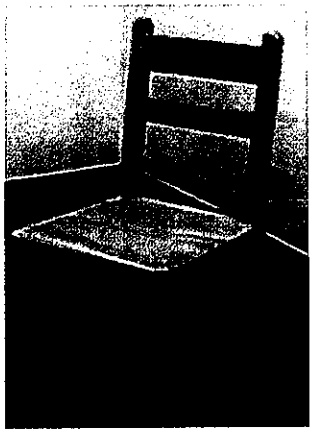
B. Construction Qualities	
Material Type	Dining chair made of solid wood
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	12 % (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Passed
Leg sideways static load test	Passed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Passed

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking of components
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No loosening of joints
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of armrest, legs and back

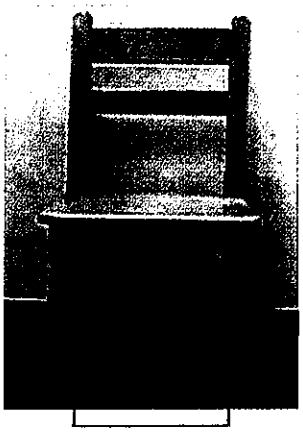
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No deformation of any part
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation of any part
g. clearly audible noise developed during testing.	No audible noise noted

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

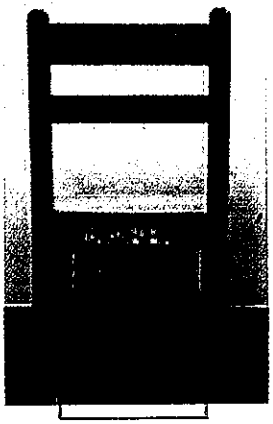
DIMENSION OF ED PASCUA CHAIR 3A:



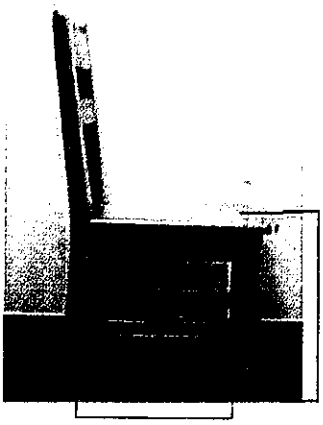
ISOMETRIC VIEW



310 mm
FRONT VIEW

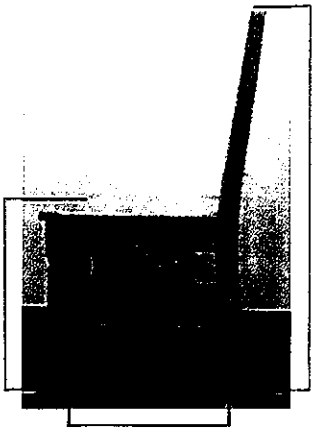


310 mm
REAR VIEW



453 mm

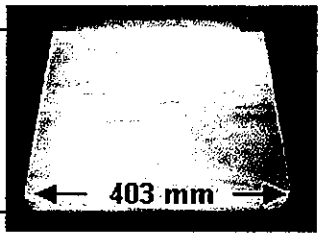
318 mm
RIGHT SIDEVIEW



928 mm

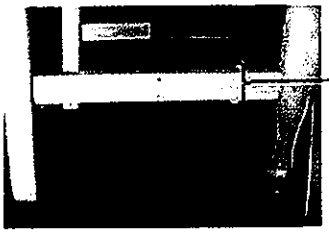
318 mm
LEFT SIDEVIEW

379 mm



403 mm

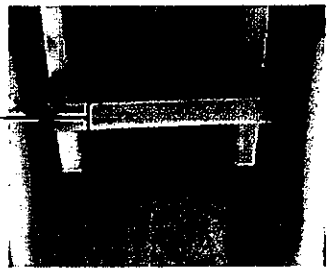
TOP VIEW



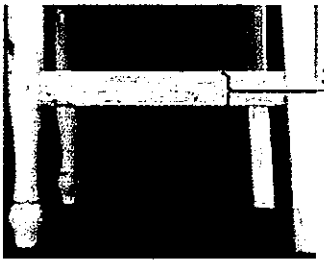
40.06 mm

RIGHT SIDE STRETCHER

39.74 mm

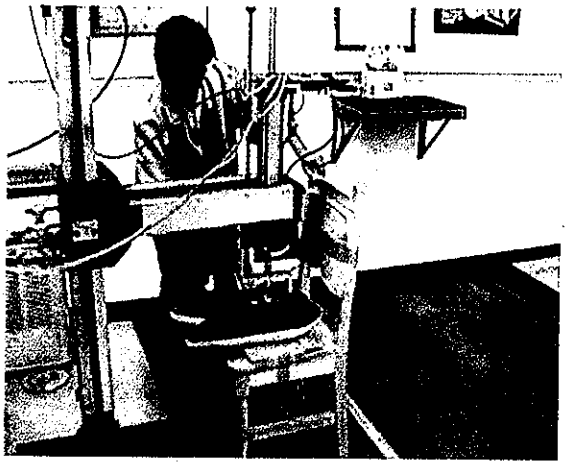


MIDDLE STRETCHER

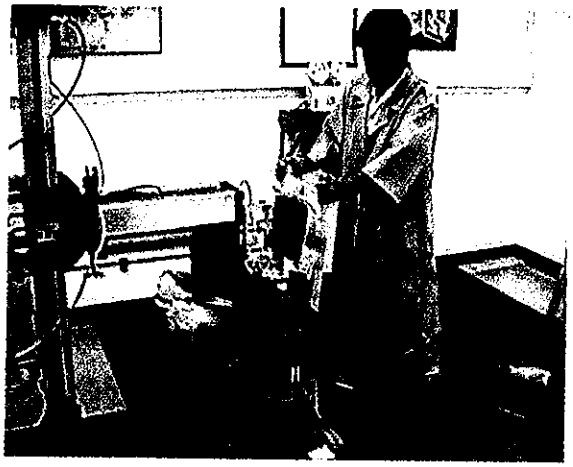


39.73 mm

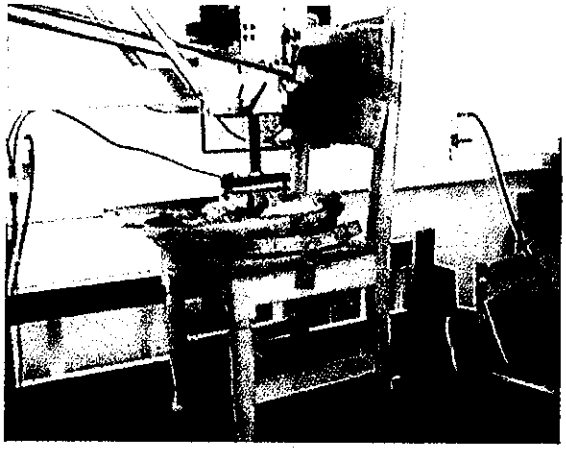
LEFT SIDE STRETCHER



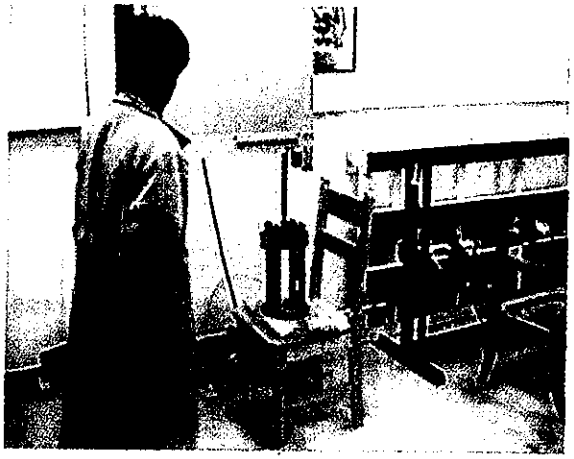
Seat static load test



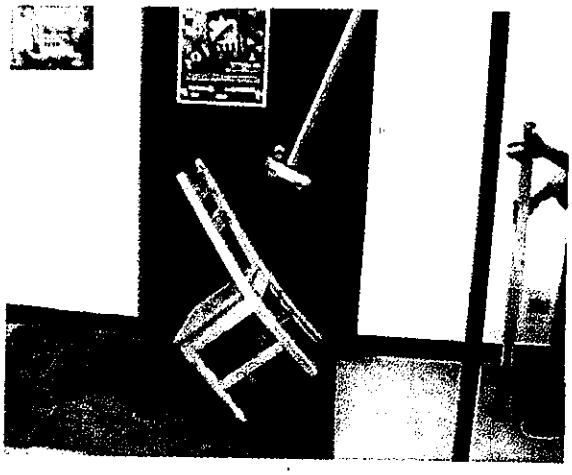
Back static load test



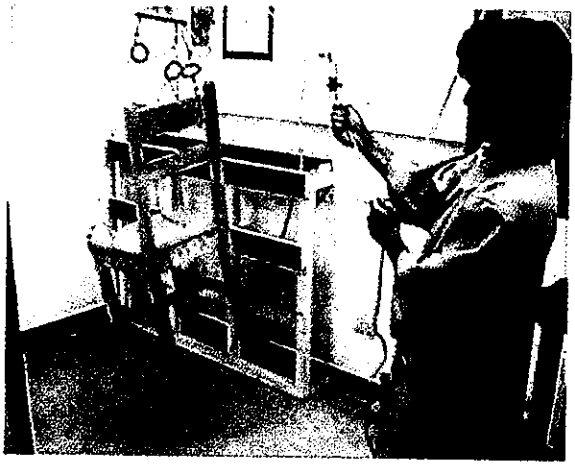
Combined seat and back fatigue test



Seat impact test



Back impact test



Drop test

Client: Ed Pascua Furniture Shop

Address: Palo Verde, Nueva Viscaya

Sampled by: ITTO Staff **Species:** *Gmelina arborea*

Date Sample Received: July 2003 **Sample Code:** Ed Pascua-CH-03B

Reference Standard: ISO 7173
BS 4875 Part 1 + EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	402 x 376	402 x 376
Height of seat from floor level, mm	455	453
Height of top back from floor level, mm	928	928
Distance of front legs, mm (inner)	310	310
Distance of side legs (left side, inner), mm	318	318
Distance of side legs (right side, inner), mm	318	318
Distance of rear legs, mm (inner)	310	310
Seat type :	Solid wood	
Backrest type :	Solid wood with two rectangular horizontal slats	
Leg type :	Turned front legs and rectangular shape curved back legs with single stretcher at the sides and one connecting brace between the stretchers	
Total weight (kg) :	6.4	

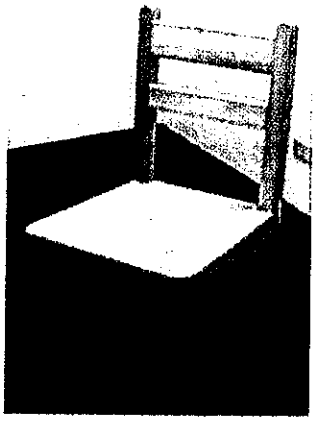
B. Construction Qualities	
Material Type	Dining chair made of solid wood
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	13 % (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Passed
Leg sideways static load test	Passed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Passed

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking of components
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No loosening of joints
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of armrest, legs and back

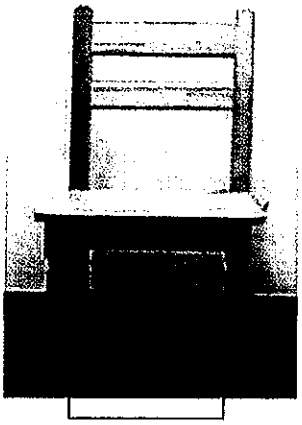
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No deformation of any part
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation of any part
g. clearly audible noise developed during testing.	No audible noise noted

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

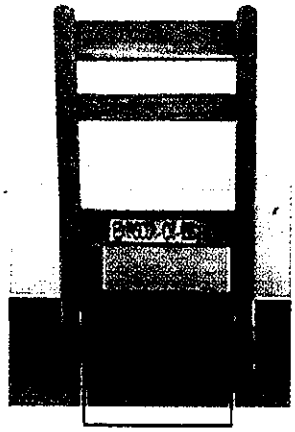
DIMENSION OF ED PASCUA CHAIR 03B:



ISOMETRIC VIEW



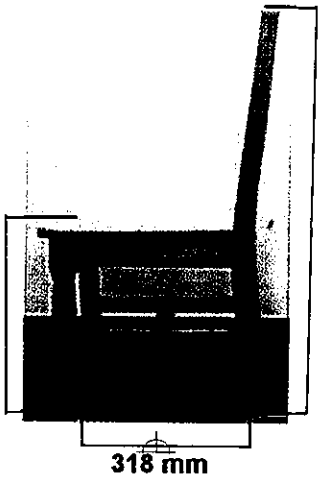
310 mm
FRONT VIEW



310 mm
REAR VIEW

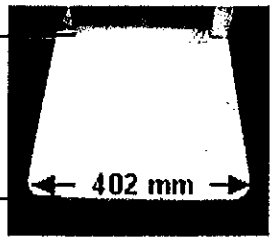
455 mm

318 mm
RIGHT SIDEVIEW



928 mm

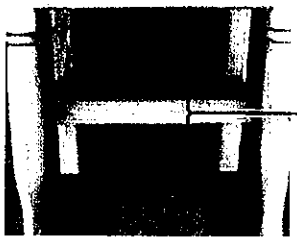
318 mm
LEFT SIDEVIEW



376 mm

402 mm

TOP VIEW

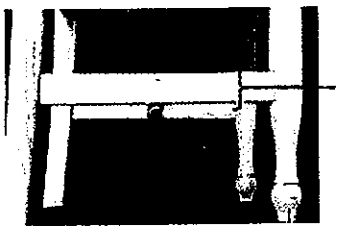


38.08 mm

MIDDLE STRETCHER

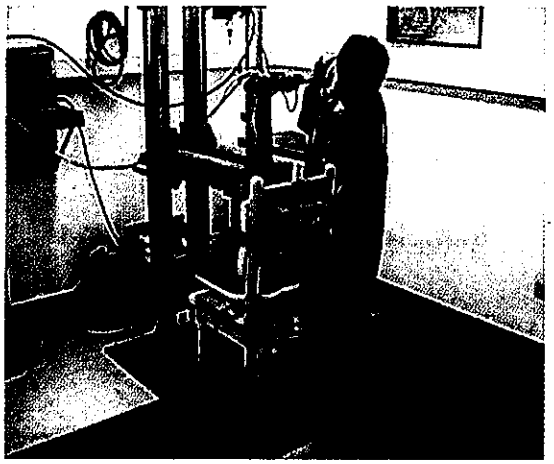
39.13 mm

LEFT SIDE STRETCHER

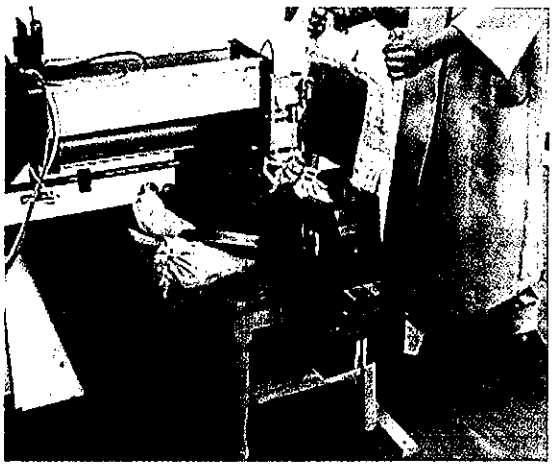


40.17 mm

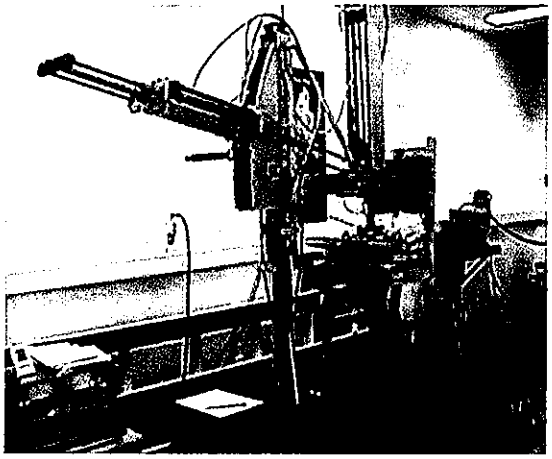
RIGHT SIDE STRETCHER



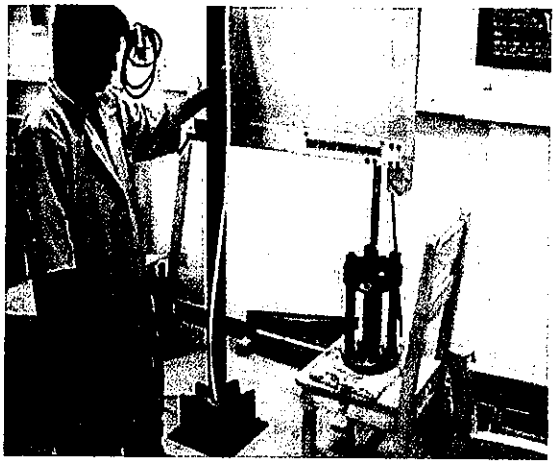
Seat static load test



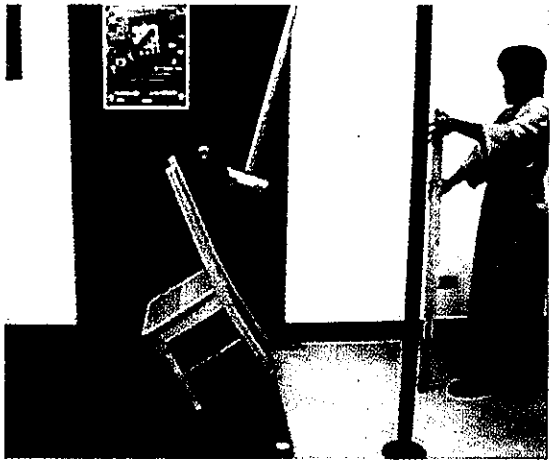
Back static load test



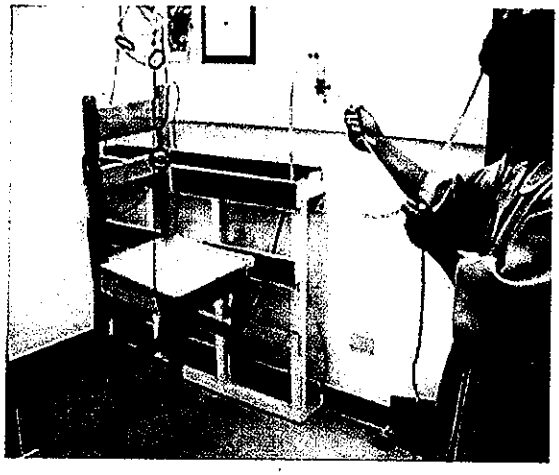
Combined seat and back fatigue test



Seat impact test



Back impact test



Drop test

Client: More Than A Chair, Inc.

Address: Mabalacat, Pampanga

Sampled by: ITTO Staff

Species: Mahogany

Date Sample Received: February 2004

Sample Code: MTAC Chair-1

Reference Standard: ISO 7173
BS 4875 Part 1 + EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	455 x 420	455 x 420
Height of seat from floor level, mm	425	425
Height of top back from floor level, mm	910	910
Distance of front legs, mm (inner)	390	390
Distance of side legs (left side, inner), mm	424	424
Distance of side legs (right side, inner), mm	424	424
Distance of rear legs, mm (inner)	324	324
Seat type : Provision for upholstered seat		
Backrest type : Bent solid wood arranged in X-like design		
Leg type : Tapered front legs and curved back legs with front, back and side stretcher		
Total weight (kg) : 5.5		

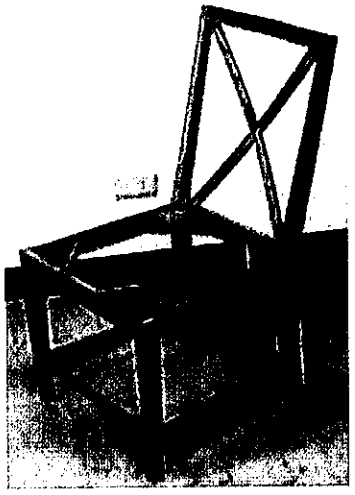
B. Construction Qualities	
Material Type	Upright chair made of solid wood
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	11.4% (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Passed
Leg sideways static load test	Passed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Passed

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking of components
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No loosening of joints
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of armrest, legs and back

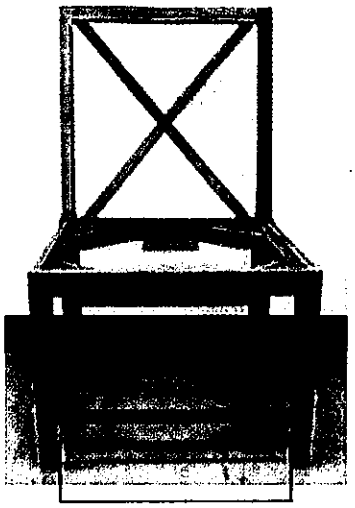
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No deformation of any part
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation of any part
g. clearly audible noise developed during testing.	No audible noise noted

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

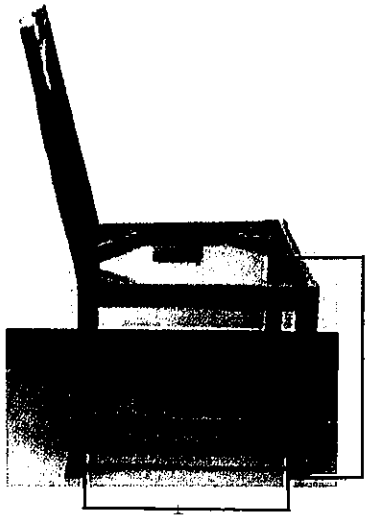
DIMENSION OF MORE THAN A CHAIR 01:



ISOMETRIC VIEW

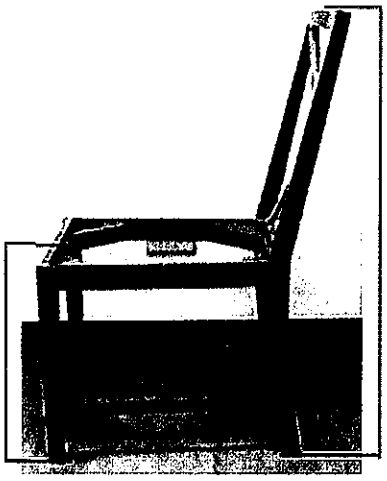


390 mm
FRONT VIEW



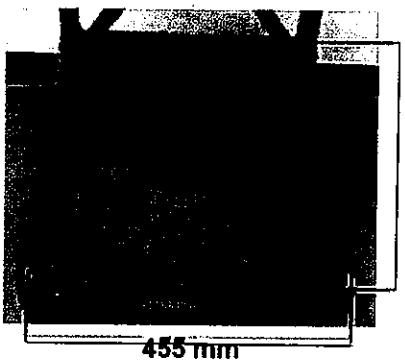
425 mm

424 mm
RIGHT SIDEVIEW



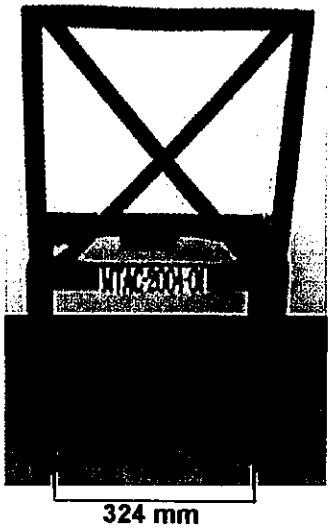
910 mm

LEFT SIDEVIEW

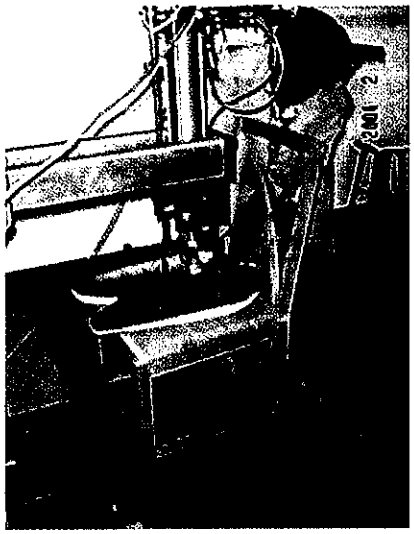


420 mm

455 mm
TOP VIEW

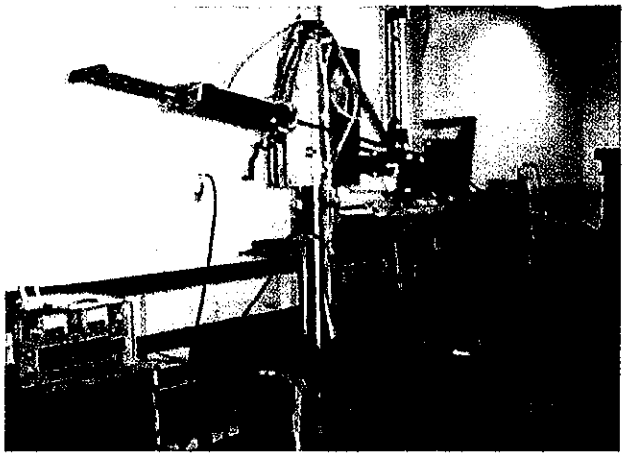


324 mm
REAR VIEW

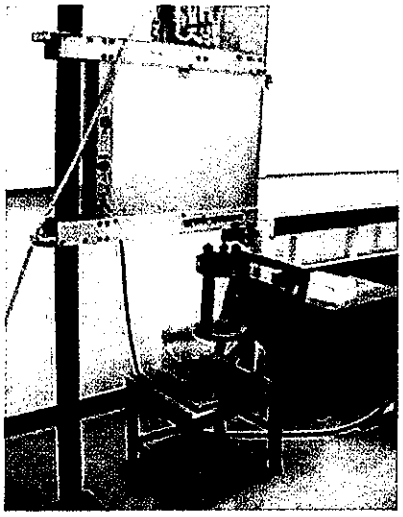


Seat static load test

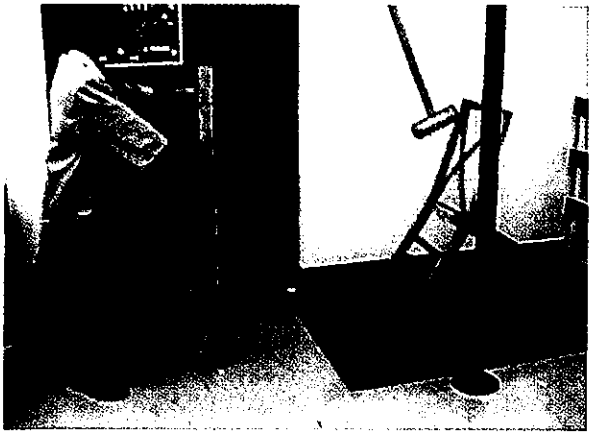
Back static load test



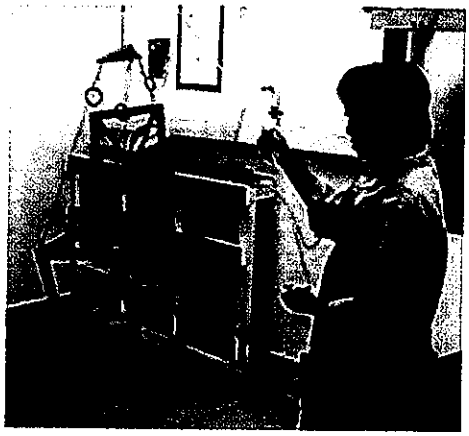
Combined seat and back fatigue test



Seat impact test



Back impact test



Drop test

Client: More Than A Chair, Inc.

Address: Mabalacat, Pampanga

Sampled by: ITTO Staff

Species: Mahogany

Date Sample Received: February 2004

Sample Code: MTAC Chair-2

Reference Standard: ISO 7173
BS 4875 Part 1 + EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	528 x 425	528 x 425
Height of seat from floor level, mm	478	478
Height of top back from floor level, mm	920	920
Distance of front legs, mm (inner)	467	467
Distance of side legs (left side, inner), mm	494	494
Distance of side legs (right side, inner), mm	494	494
Distance of rear legs, mm (inner)	338	338
Seat type : Provision for upholstered seat		
Backrest type : Solid wood circular in shape with provision for upholstered backrest		
Leg type : Tapering front legs with turned portion at the end and curved back legs		
Total weight (kg) : 5.7		

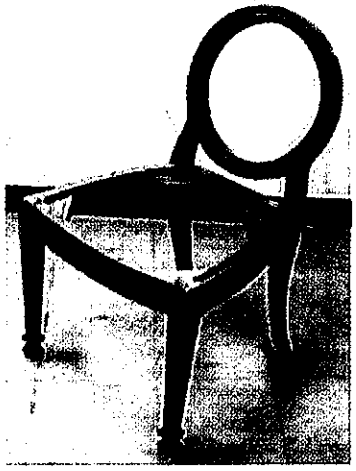
B. Construction Qualities	
Material Type	Upright chair made of solid wood
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	11.4% (Remark No. 2)
Seat static load test	Passed
Back static load test	Passed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Passed (Remark No. 3)
Leg forward static load test	Passed
Leg sideways static load test	Passed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Passed

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking of components
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No loosening of joints
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of armrest, legs and back

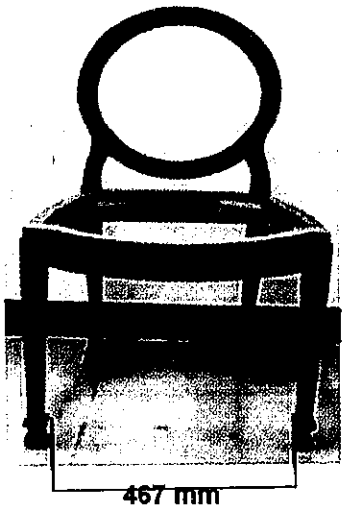
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No deformation of any part
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation of any part
g. clearly audible noise developed during testing.	No audible noise noted

Remarks:
1. The chair was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat and back fatigue test were done simultaneously using 50,000 cycles under test level 3 of the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

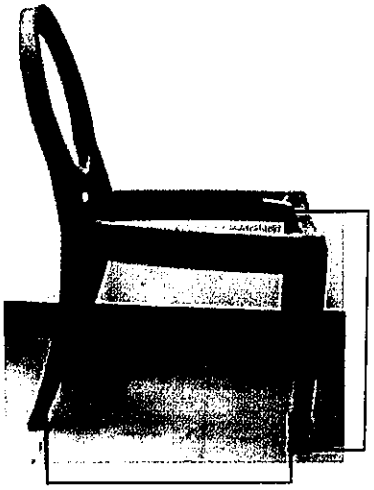
DIMENSION OF MORE THAN A CHAIR 02:



ISOMETRIC VIEW

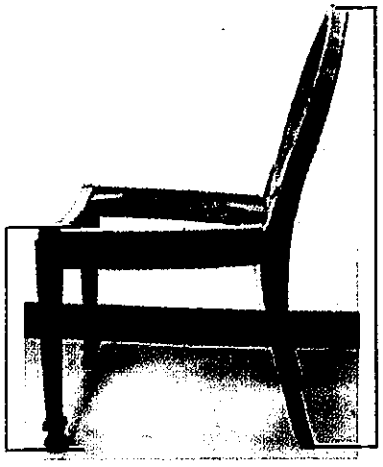


467 mm
FRONT VIEW



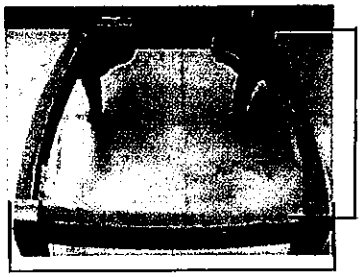
478 mm

494 mm
RIGHT SIDEVIEW



920 mm

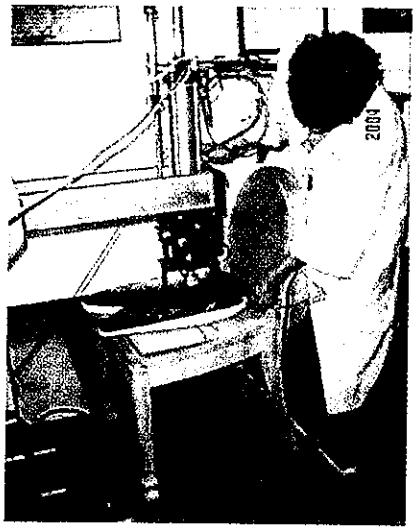
LEFT SIDEVIEW



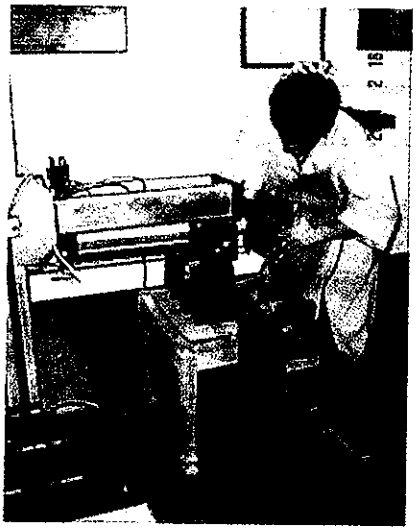
425 mm

528 mm
TOP VIEW

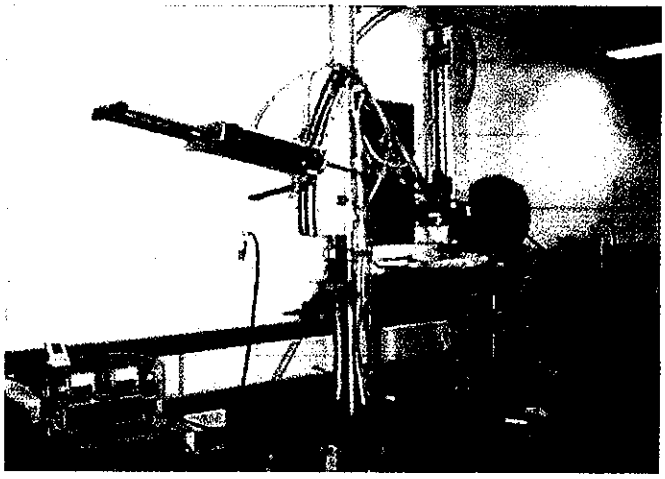
338 mm
REAR VIEW



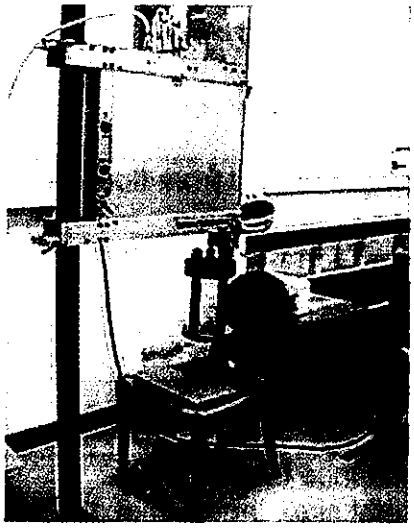
Seat static load test



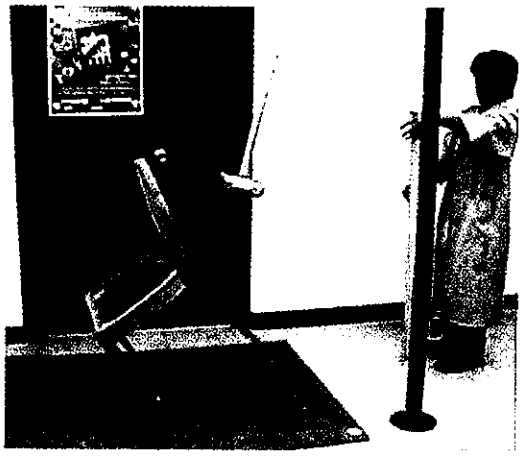
Back static load test



Combined seat and back fatigue test



Seat impact test



Back impact test

Drop test

Client: AWECA

Address: Angeles City, Pampanga

Sampled by: ITTO Staff

Species: *Gmelina arborea*

Date Sample Received: September 2002

Sample Code: Stool 1

Reference Standard: ISO 7173
BS 4875 Part 1 + EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	485 x 280	485 x 280
Height of seat from floor level, mm	658	658
Height of top back from floor level, mm	Not applicable	Not applicable
Distance of front legs, mm (inner)	330	330
Distance of side legs (left side, inner), mm	315	315
Distance of side legs (right side, inner), mm	315	315
Distance of rear legs, mm (inner)	340	340
Seat type :	Woven abaca fibers	
Backrest type :	Not applicable	
Leg type :	Turned solid wood with four doweled stretchers	
Total weight (kg) :	3.8	

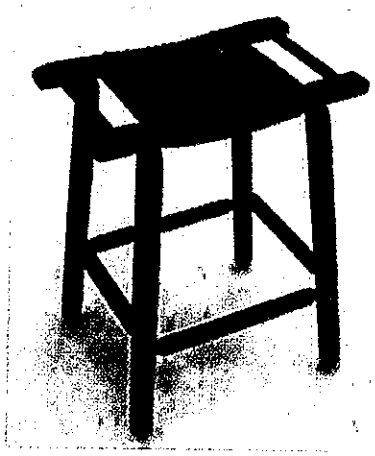
B. Construction Qualities	
Material Type	Bar stool made of solid wood legs, frames and stretchers with woven abaca fiber rope seat
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	12 % (Remark No. 2)
Seat static load test	Passed
Back static load test	Not applicable
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Not applicable
Leg forward static load test	Not performed
Leg sideways static load test	Not performed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Passed

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking of components
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No appreciable defect noted on the joint and material member
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of armrest, legs and back

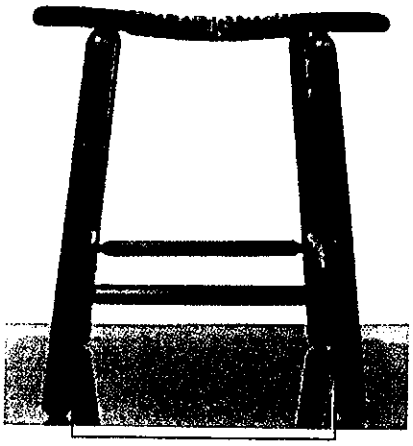
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	Very slight deformation noted on abaca fiber seat which does not change the structural integrity of the specimen
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation of any part
g. clearly audible noise developed during testing.	No audible noise noted

Remarks:
1. The stool was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat fatigue test was performed using 50,000 cycles under test level 3 of the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

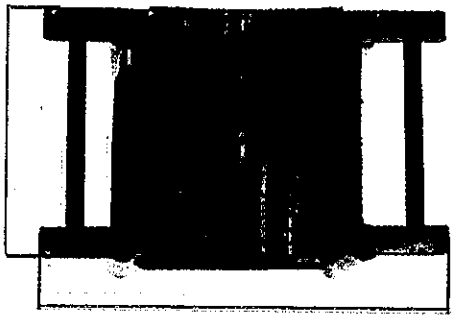
DIMENSION OF AWECA STOOL 1 (SMALL):



ISOMETRIC VIEW

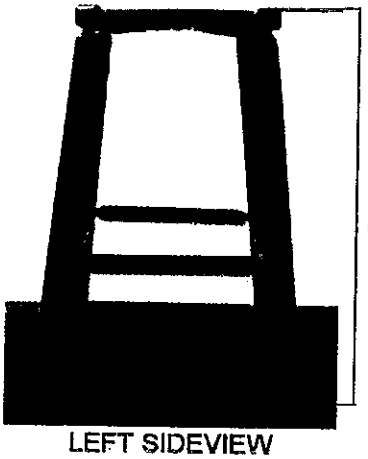


330 mm
FRONT VIEW



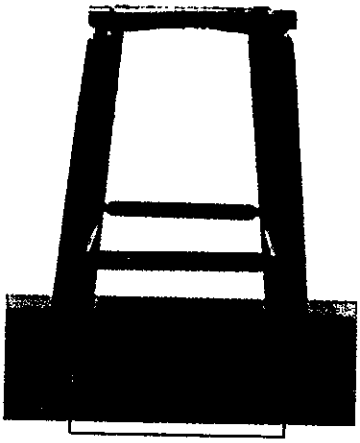
280 mm

485 mm
TOP VIEW

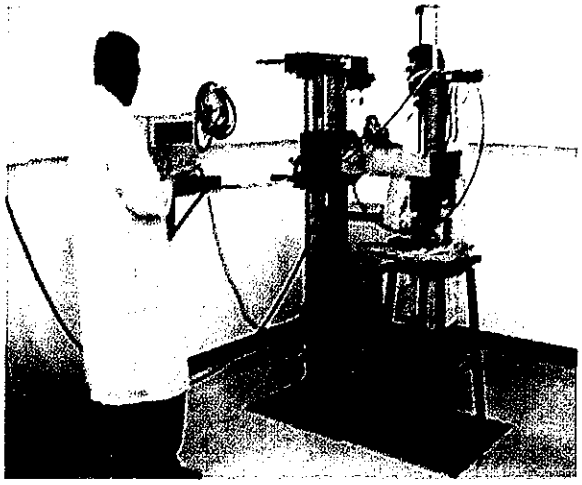


658 mm

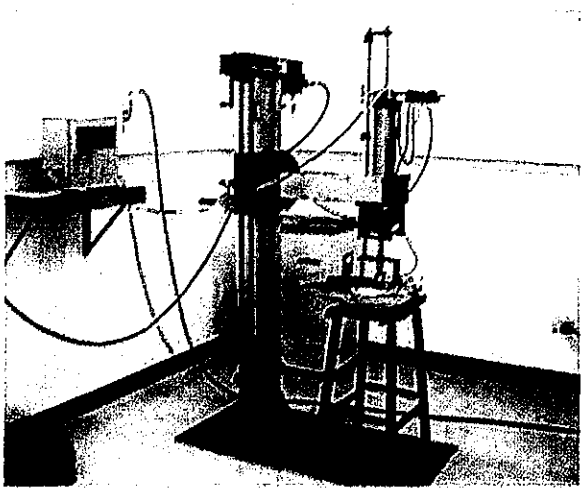
LEFT SIDEVIEW



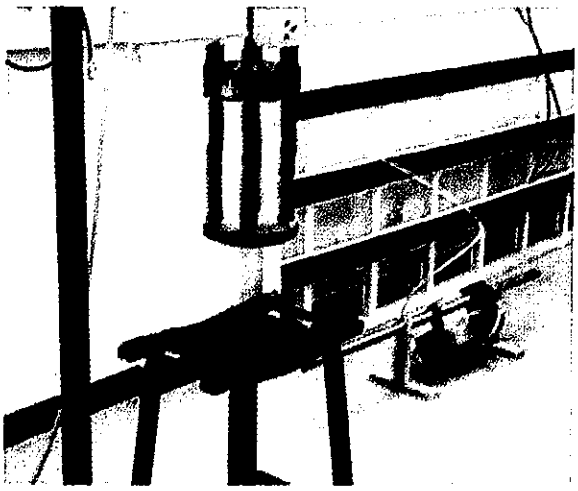
315 mm
RIGHT SIDEVIEW



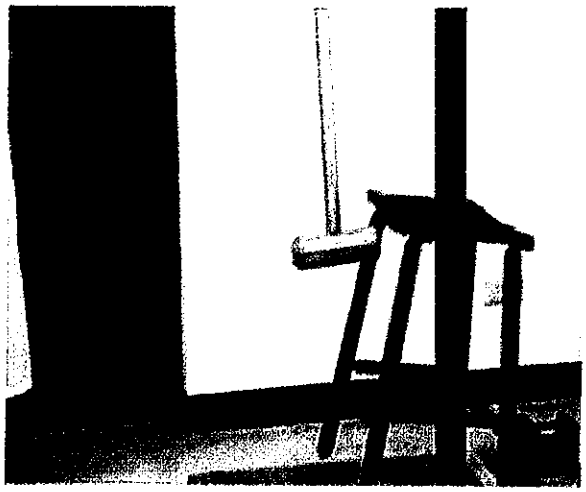
Seat static load test



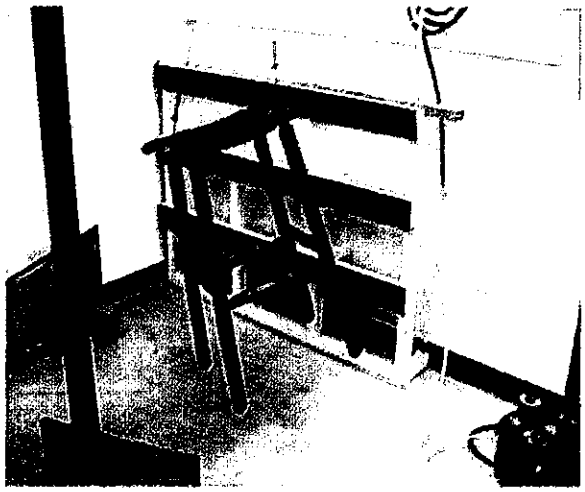
Seat fatigue load test



Seat impact test



Back impact test



Drop test

Client: AWECA

Address: Angeles City, Pampanga

Sampled by: ITTO Staff

Species: *Gmelina arborea*

Date Sample Received: September 2002

Sample Code: Stool 2

Reference Standard: ISO 7173
BS 4875 Part 1 + EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	485 x 280	485 x 280
Height of seat from floor level, mm	760	760
Height of top back from floor level, mm	Not applicable	Not applicable
Distance of front legs, mm (inner)	325	325
Distance of side legs (left side, inner), mm	268	268
Distance of side legs (right side, inner), mm	268	268
Distance of rear legs, mm (inner)	325	325
Seat type :	Woven abaca fibers	
Backrest type :	Not applicable	
Leg type :	Turned solid wood with four doweled stretchers	
Total weight (kg) :	4	

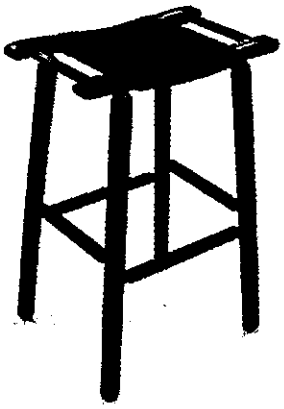
B. Construction Qualities	
Material Type	Bar stool made of solid wood legs, frames and stretchers with woven abaca fiber rope seat
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	12 % (Remark No. 2)
Seat static load test	Passed
Back static load test	Not applicable
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Passed (Remark No. 3)
Back fatigue test	Not applicable
Leg forward static load test	Not performed
Leg sideways static load test	Not performed
Diagonal base load	Not applicable
Seat impact test	Passed
Back impact test	Passed
Arm impact test	Not applicable
Drop test	Passed

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	No fracture or cracking of components
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	No appreciable defect noted on the joint and material member
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	No loosening of underframe
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	No free movements of legs and other components

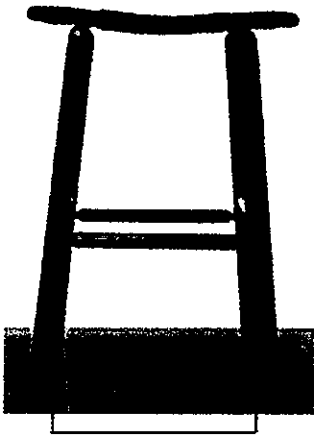
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	No deformation of any part
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	No impairment of operation of any part
g. clearly audible noise developed during testing.	No audible noise noted

Remarks:
1. The stool was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Seat fatigue test was performed using 50,000 cycles under test level 3 of the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

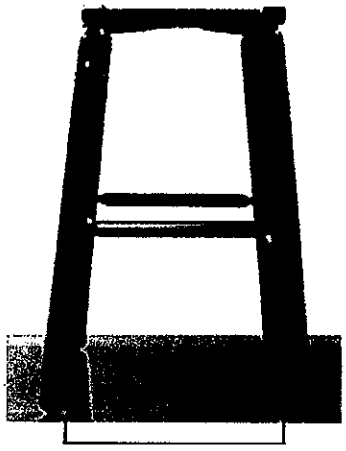
DIMENSION OF AWECA STOOL 2 (BIG):



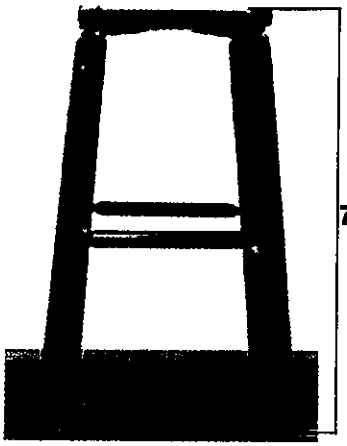
ISOMETRIC VIEW



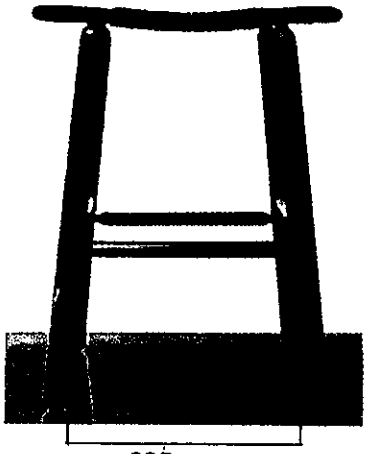
325 mm
FRONT VIEW



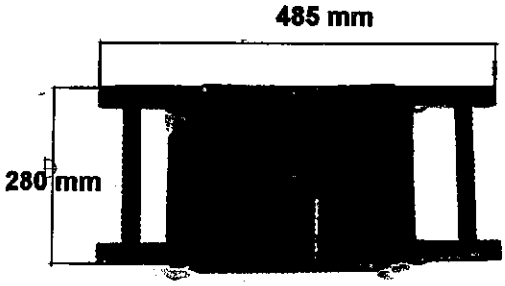
268 mm
RIGHT SIDEVIEW



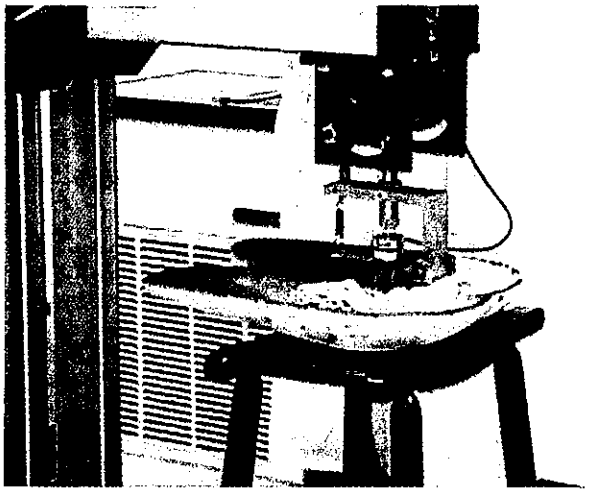
LEFT SIDE VIEW



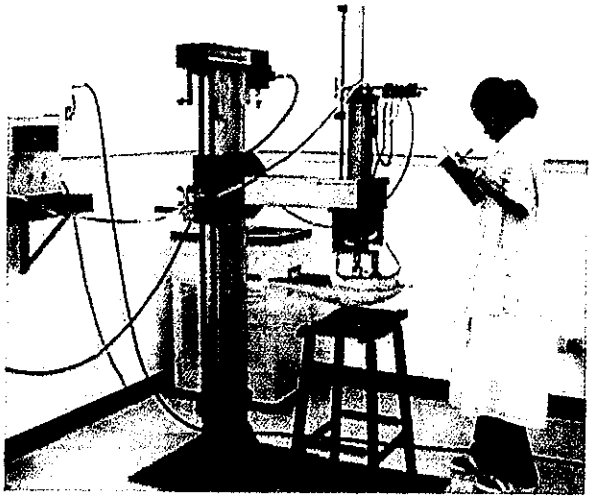
325 mm
REAR VIEW



TOP VIEW

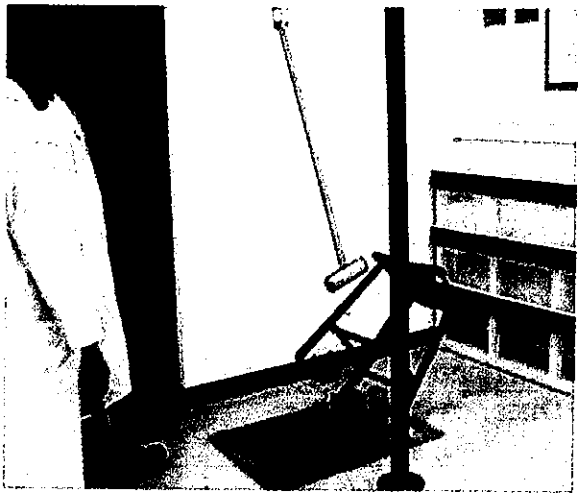


Seat static load test

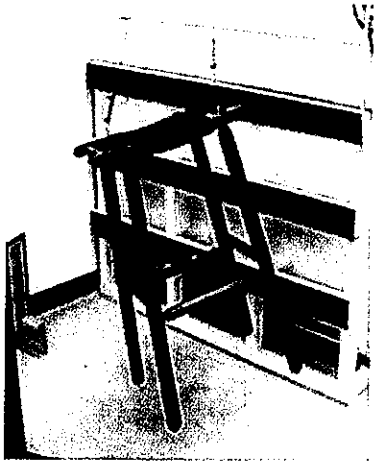


Seat fatigue load test

Seat impact test



Back impact test



Drop test

Client: Cabrera Manutrade Corporation

Address: Halang, Calamba City

Sampled by: ITTO Staff

Species: Tanguile/Red lauan

Date Sample Received: December 2003

Sample Code: Stool 1

Reference Standard: ISO 7173
BS 4875 Part 1 + EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	400 x 295	Not performed (Remark No. 3)
Height of seat from floor level, mm	455	Not performed (Remark No. 3)
Height of top back from floor level, mm	Not applicable	Not applicable
Distance of front legs, mm (inner)	315	Not performed (Remark No. 3)
Distance of side legs (left side, inner), mm	160	Not performed (Remark No. 3)
Distance of side legs (right side, inner), mm	160	Not performed (Remark No. 3)
Distance of rear legs, mm (inner)	315	Not performed (Remark No. 3)
Seat type : Solid wood		
Backrest type : Not applicable		
Leg type : Solid wood rectangular in shape, mortised to the seat		
Total weight (kg) : 4.7		

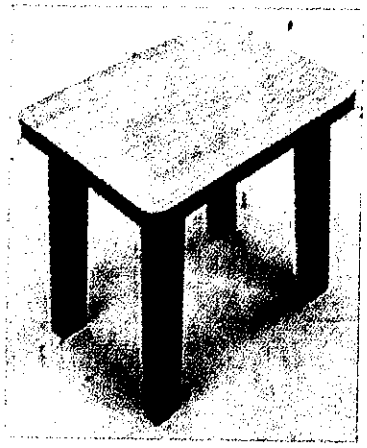
B. Construction Qualities	
Material Type	Stool made of solid wood rectangular shape legs and seat
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	12 % (Remark No. 2)
Seat static load test	Passed
Back static load test	Failed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Not performed (Remark No. 3)
Back fatigue test	Not performed (Remark No. 3)
Leg forward static load test	Not performed (Remark No. 3)
Leg sideways static load test	Not performed (Remark No. 3)
Diagonal base load	Not applicable
Seat impact test	Not performed (Remark No. 3)
Back impact test	Not performed (Remark No. 3)
Arm impact test	Not applicable
Drop test	Not performed (Remark No. 3)

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	Leg joint failed and nail attachment disconnected
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	Test sample failed
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	Joint face-glued to end grain with one small dowel. Use of nail is not adequate
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	Test sample failed

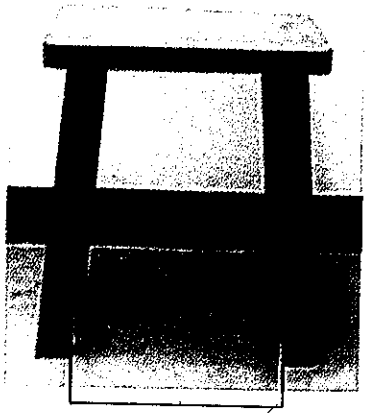
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	Test sample failed
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	Test sample failed
g. clearly audible noise developed during testing.	Test sample failed

Remarks:
1. The stool was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. The other tests were not performed after failure occurred during back static load test
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

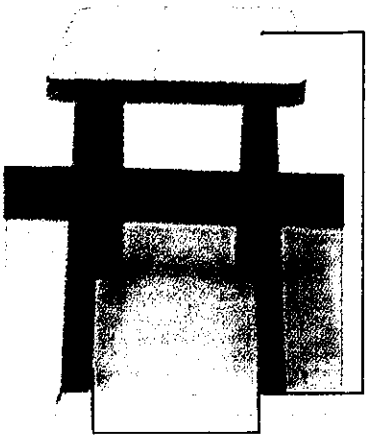
DIMENSION OF CABRERA STOOL 1:



ISOMETRIC VIEW

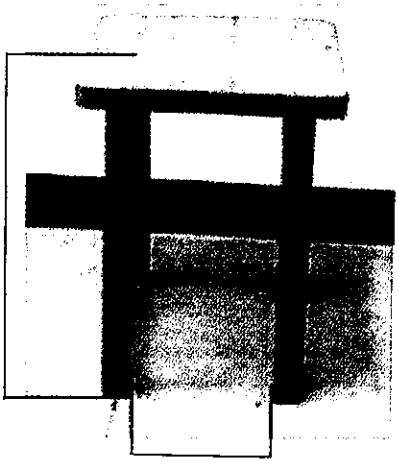


315 mm
FRONT VIEW

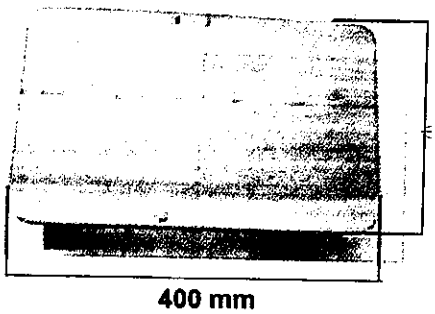


455 mm

160 mm
RIGHT SIDEVIEW

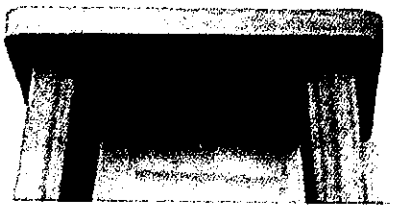


160 mm
LEFT SIDEVIEW

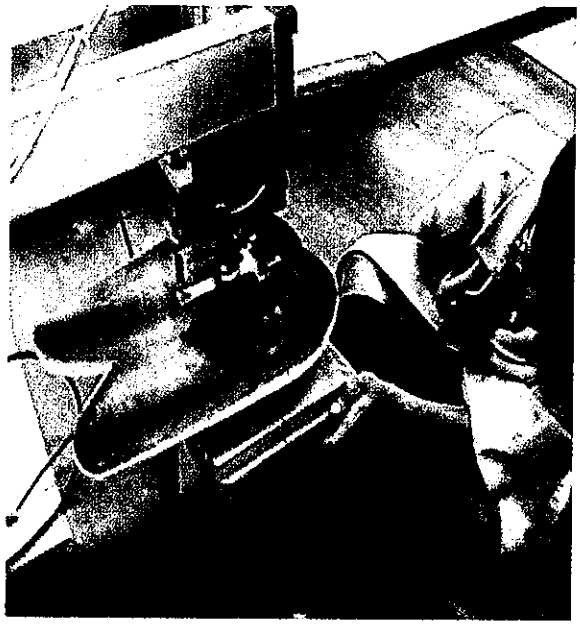


295 mm

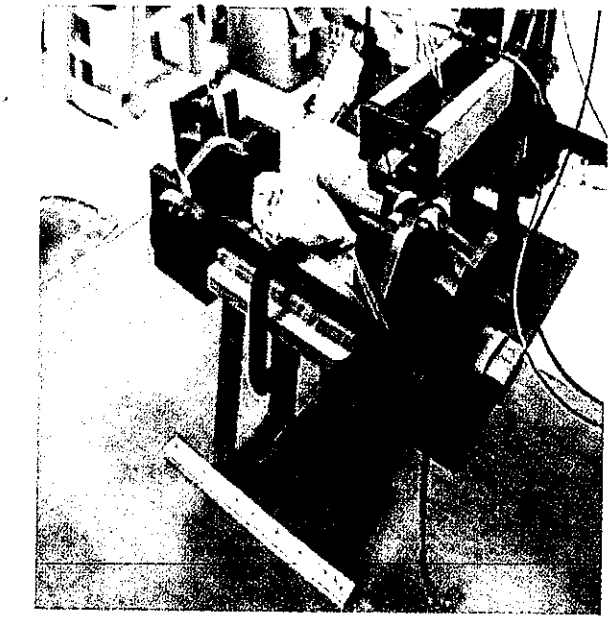
400 mm
TOP VIEW



BOTTOM VIEW



Seat static load test



Back static load test

Damage evaluation after back static load test

Client: Cabrera Manutrade Corporation

Address: Halang, Calamba City

Sampled by: ITTO Staff

Species: Tanguile/Red lauan

Date Sample Received: December 2003

Sample Code: Stool 2

Reference Standard: ISO 7173
BS 4875 Part 1 + EN 1728

Test Property		
A. Physical Characteristics	**Initial Inspection**	**Final Inspection**
Seat Dimension, (L x W), mm	300 Diameter	Not performed (Remark No. 3)
Height of seat from floor level, mm	455	Not performed (Remark No. 3)
Height of top back from floor level, mm	Not applicable	Not applicable
Distance of front legs, mm (inner)	180	Not performed (Remark No. 3)
Distance of side legs (left side, inner), mm	180	Not performed (Remark No. 3)
Distance of side legs (right side, inner), mm	180	Not performed (Remark No. 3)
Distance of rear legs, mm (inner)	180	Not performed (Remark No. 3)
Seat type :	Round solid wood	
Backrest type :	Not applicable	
Leg type :	Solid wood rectangular in shape with horizontal support	
Total weight (kg) :	2.6	

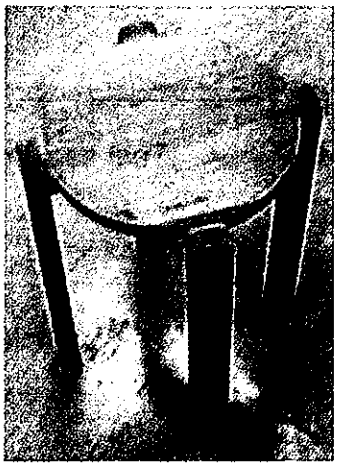
B. Construction Qualities	
Material Type	Stool made of solid wood with round seat and rectangular shape legs
C. Performance (Remark No. 1)	**Results/Observations**
Moisture content	11 % (Remark No. 2)
Seat static load test	Passed
Back static load test	Failed
Arm sideways static load test	Not applicable
Arm downwards static load test	Not applicable
Seat fatigue test	Not performed (Remark No. 3)
Back fatigue test	Not performed (Remark No. 3)
Leg forward static load test	Not performed (Remark No. 3)
Leg sideways static load test	Not performed (Remark No. 3)
Diagonal base load	Not applicable
Seat impact test	Not performed (Remark No. 3)
Back impact test	Not performed (Remark No. 3)
Arm impact test	Not applicable
Drop test	Not performed (Remark No. 3)

D. Inspection and Assessment Results	
a. fracture or cracking of any member, component or joint, including seat suspensions, castors, and structural shells.	Dowel joints between two rear legs and underframe failed
b. loosening, shown to be permanent by hand pressure applied to suitable members, or joints intended to be rigid.	Test sample failed
c. loosening of the under frame or base inserts moulded into a structural shell relative to the shell surface, shown to be permanent by hand pressure applied on the under frame or base.	Test sample failed
d. free movement in the back, arms, legs or other components of the article greater than that noted in the initial inspection.	Test sample failed

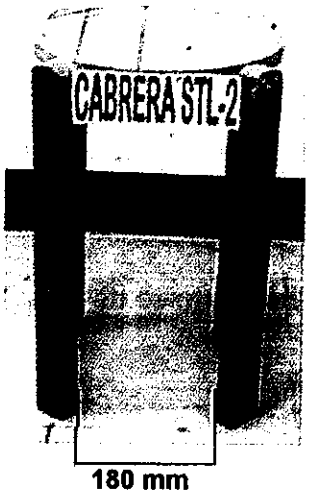
e. deformation of any part of the article or any cracks which will adversely affect its appearance.	Test sample failed
f. impairment of the operation of any mechanical part (including any significant change in the seat height during any phase of the seat height adjustment tests).	Test sample failed
g. clearly audible noise developed during testing.	Test sample failed

Remarks:
1. The stool was tested using level 3 of the Standards (Furniture – Chairs and Stools – Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. The other tests were not performed after failure occurred during back static load test
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -

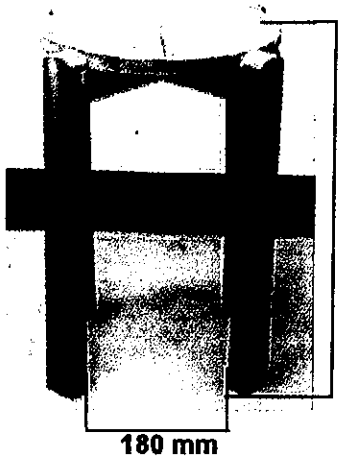
DIMENSION OF CABRERA STOOL 2:



ISOMETRIC VIEW

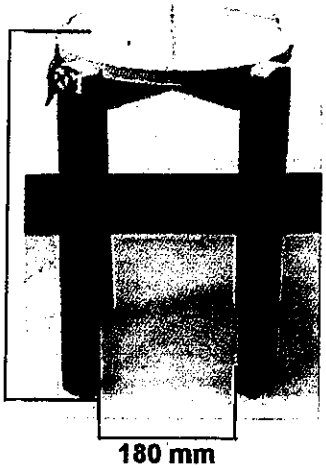


180 mm
FRONT VIEW

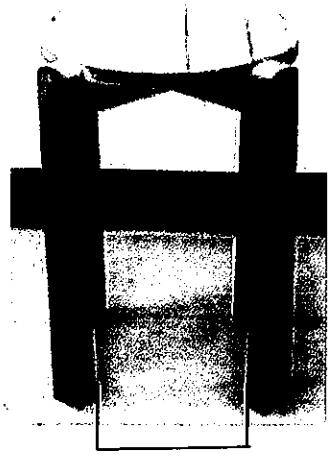


455 mm

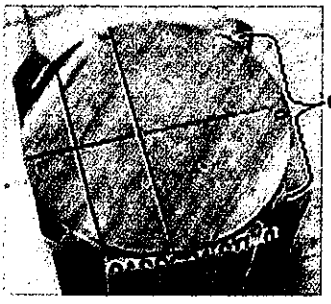
180 mm
RIGHT SIDEVIEW



180 mm
LEFT SIDEVIEW

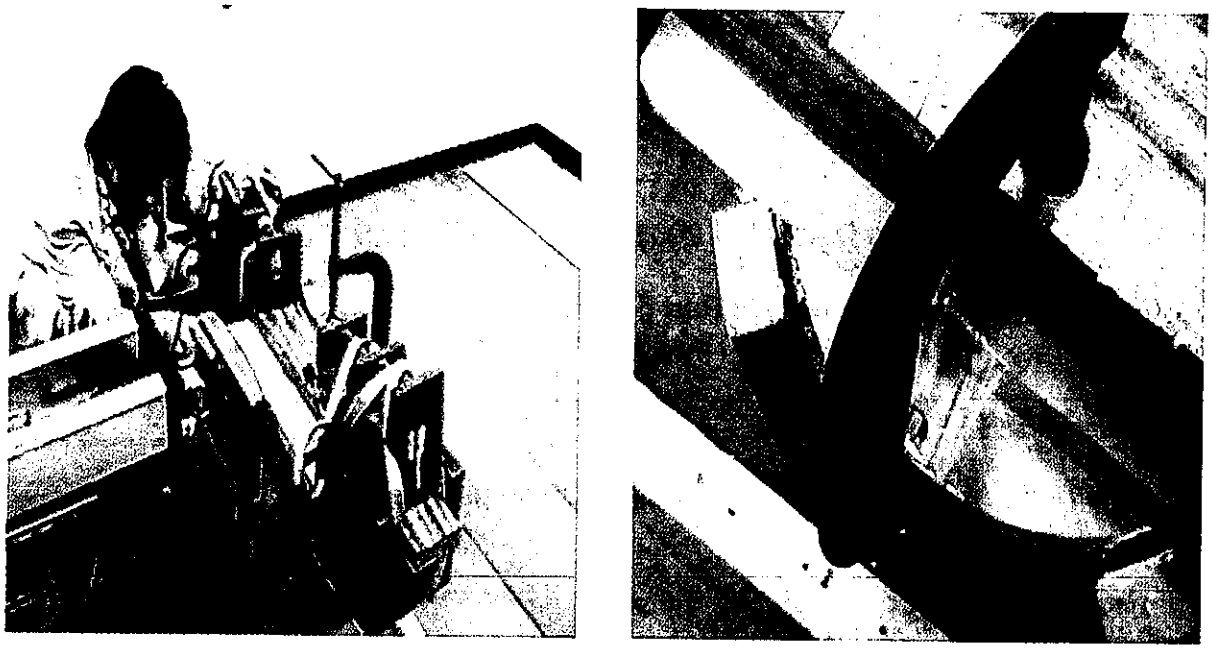


180 mm
REAR VIEW



300 mm
diameter

TOP VIEW



Extent of damage during back static load test

Damage evaluation after back static load test

Client: Cabrera Manutrade Corporation

Address: Halang, Calamba, Laguna

Sampled by: ITTO Staff

Species: Tanguile/Red lauan

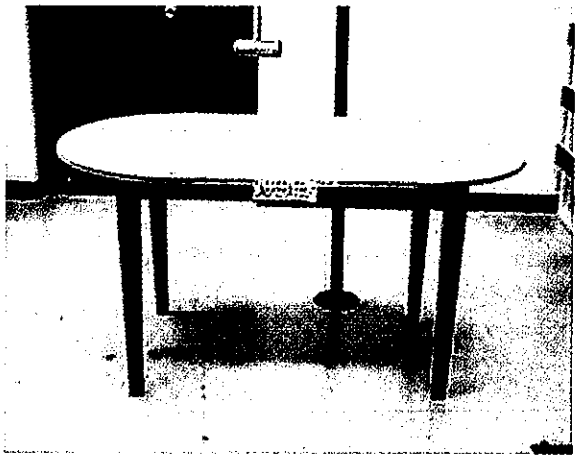
Date Sample Received: December 2003

Sample Code: Table 1

Reference Standard: BS 4875 Part 5:2001
BS EN 1730:2000

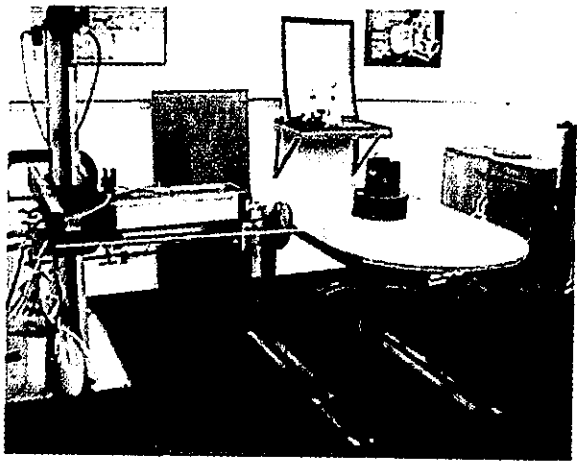
A. Construction Qualities	
Material Type	Dining table made of laminated solid wood
B. Performance (Remark No. 1)	**Results/Observations**
Moisture content	10 % (Remark No. 2)
1. Stability test	
Stability under vertical load	Failed (Remark No. 3)
Stability-horizontal impact	Passed
2. Strength and Durability Tests	
Horizontal static load	Passed
Vertical static load	Passed
Horizontal fatigue	Passed
Vertical fatigue	Passed
Vertical impact	Passed
Drop test	Passed

Remarks:
1. The table was tested using level 3 of BS 4875-5:2001 Strength and Stability of Furniture Part 5: Requirements for strength, durability and stability of tables and trolleys for domestic and contract use and BS EN 1730:2000 Domestic Furniture-Tables -Test methods for determination of strength, durability and stability
2. Moisture content was determined using moisture meter
3. The table tilted after applying a load of 53.3 kgs. The computed minimum load that the table would not tilt is 61.16 kgs.
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -



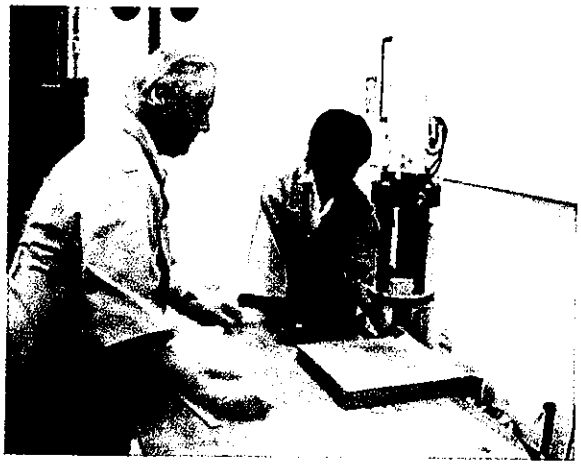
Prototype oval table ready for strength and stability test

Horizontal impact stability test



Horizontal fatigue test

Horizontal static load test



Vertical impact test

Drop test

Client: Cabrera Manutrade Corporation

Address: Halang, Calamba, Laguna

Sampled by: ITTO Staff

Species: Tanguile/Red lauan

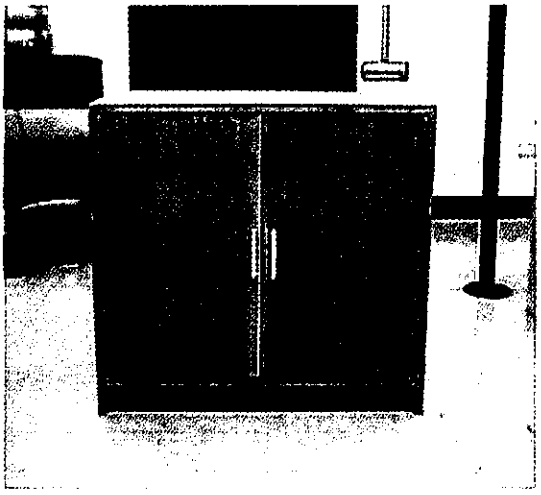
Date Sample Received: December 2003

Sample Code: Cabinet 1

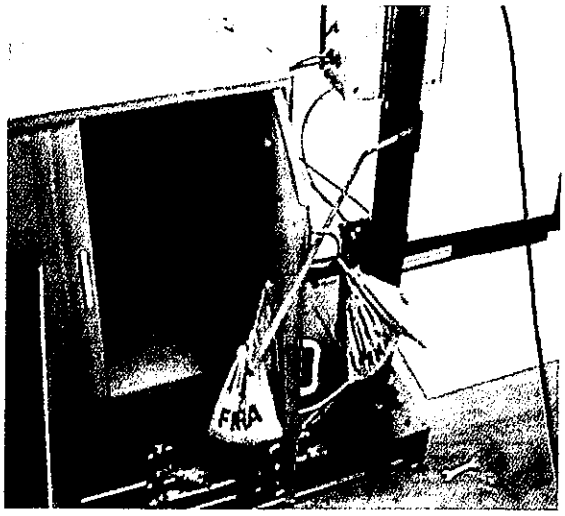
Reference Standard: ISO 7170

A. Construction Qualities	
Material Type	Cabinet made of laminated solid wood
B. Performance (Remark No. 1)	**Results/Observations**
Moisture content	10 % (Remark No. 2)
Strength and Durability Tests	
Durability of pivoted doors	Failed (Remark No. 3)

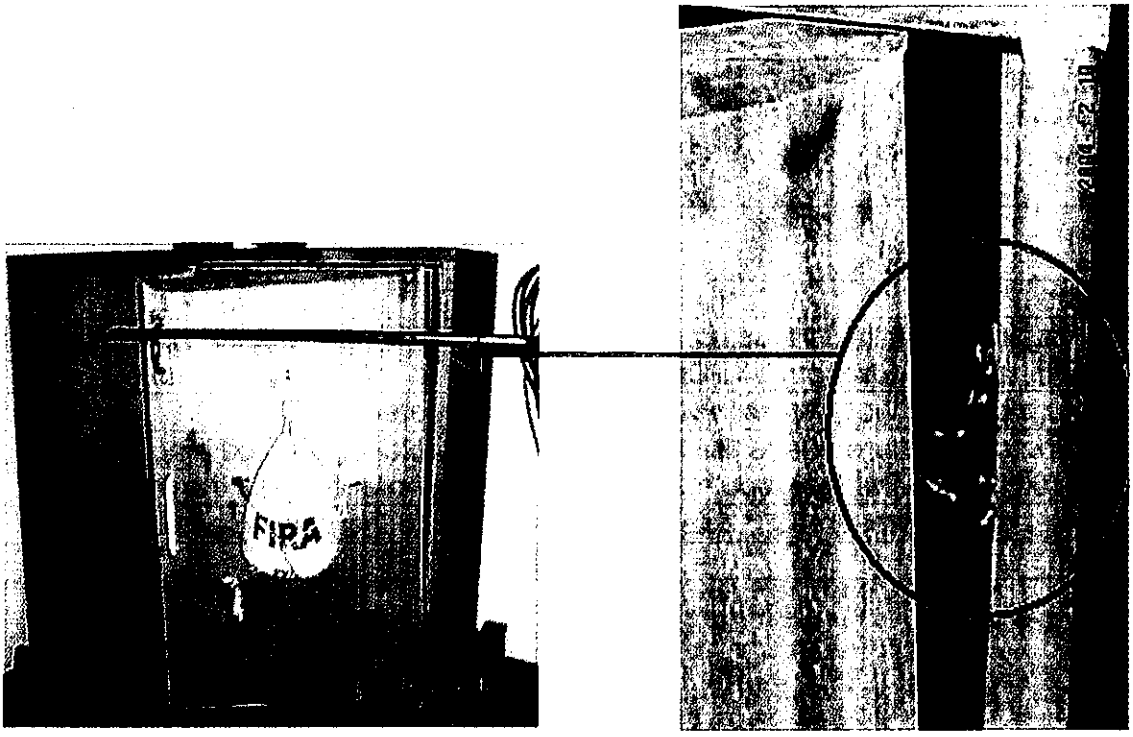
Remarks:
1. The cabinet was tested using level 3 of ISO 7170 (Furniture - Storage Units-Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Occurrence of failure due to the loosening of the metal concealed hinges after 20, 810 cycles. The test requires 40,000 cycles in order to pass the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -



Prototype cabinet ready for strength and durability test



Prototype cabinet undergoing durability test of pivoted doors



The metal concealed hinges were deformed that resulted in the loosening of the cabinet doors after 20,810 cycles

Client: Brayton Enterprises

Address: Calamba City, Laguna

Sampled by: ITTO Staff

Species: Tanguile/Red lauan

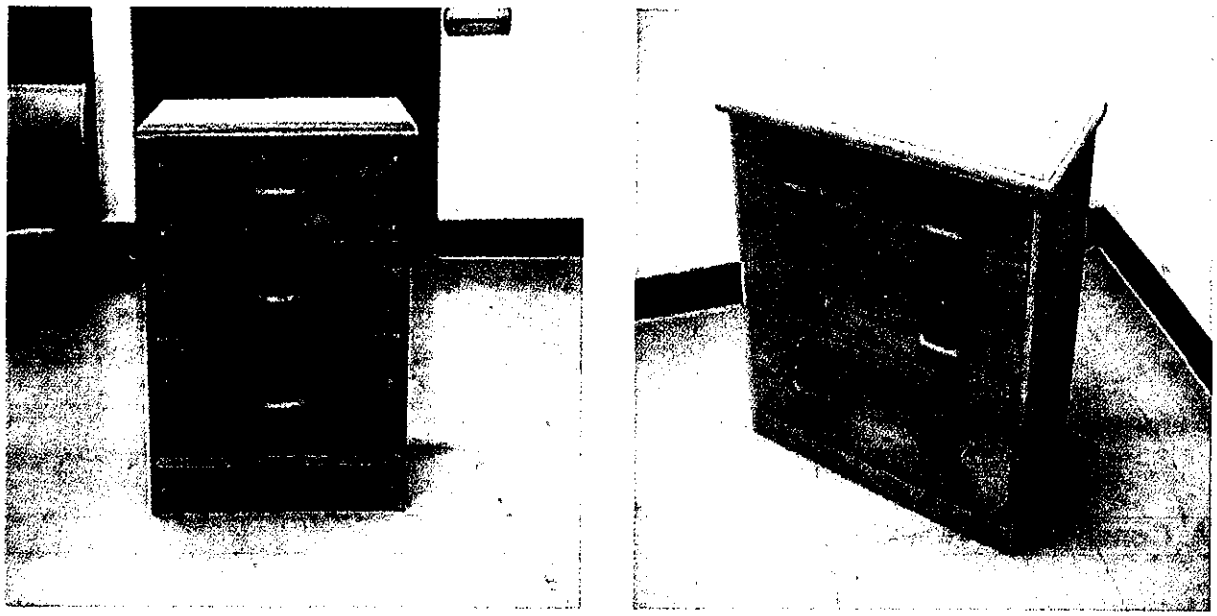
Date Sample Received: December 2003

Sample Code: Console Drawer B-1 and B-2

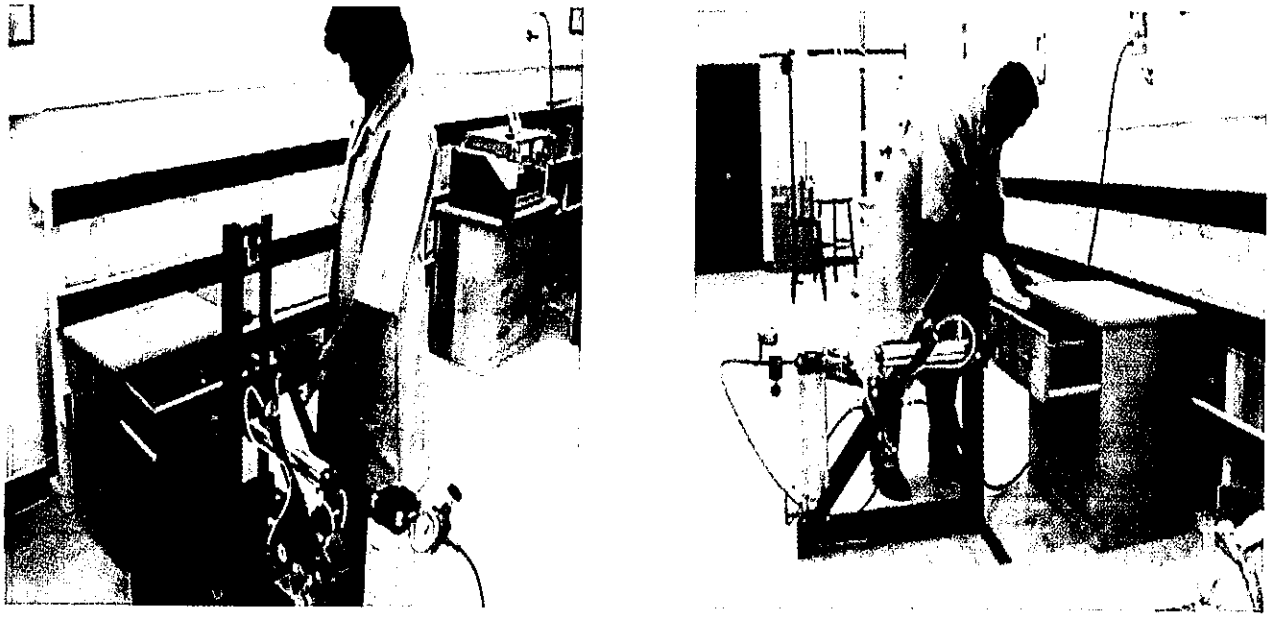
Reference Standard: ISO 7170

A. Construction Qualities	
Material Type	Chess and console drawer made of laminated solid wood
B. Performance (Remark No. 1)	**Results/Observations**
Moisture content	B-1 10 % B-2 14 (Remark No. 2)
Strength and Durability Tests	
Durability test of drawers and runners- Slam shut and open of drawers	B-1 Passed B-2 Passed

Remarks:
1. The cabinet was tested using level 3 of ISO 7170 (Furniture - Storage Units- Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Occurrence of failure due to the loosening of the metal concealed hinges after 20, 810 cycles. The test requires 40,000 cycles in order to pass the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -



Prototype chest and console drawer to be subjected to open and slam shut test



Prototype chest and console drawer being tested for cyclic open and slam-shut using drawer cycling/slamming machine

Client: Brayton Enterprises

Address: Calamba City, Laguna

Sampled by: ITTO Staff

Species: Tanguile/Red lauan

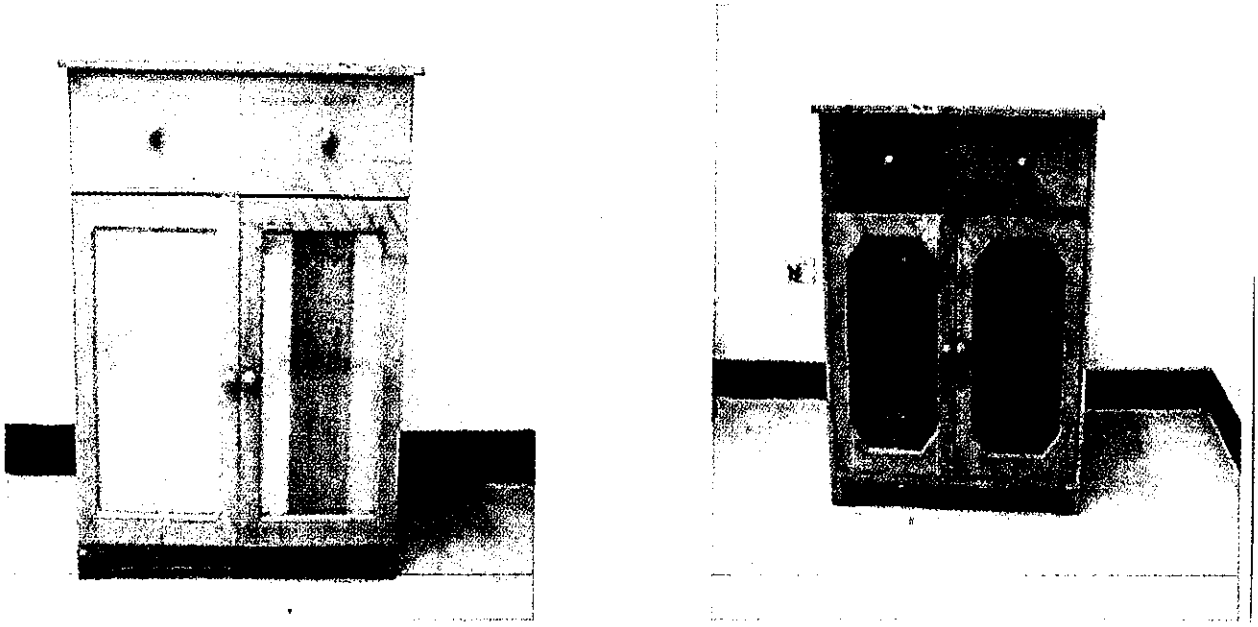
Date Sample Received: December 2003

Sample Code: Cabinet with drawers CD-1 and CD-2

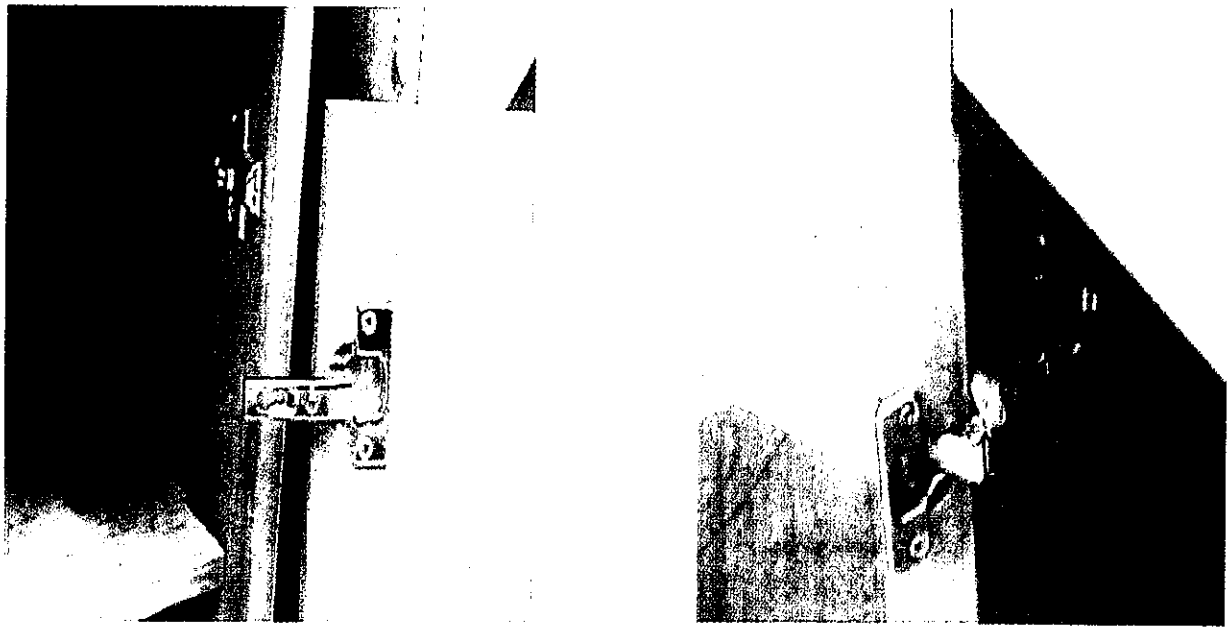
Reference Standard: ISO 7170

A. Construction Qualities	
Material Type	Chess and console drawer made of laminated solid wood
B. Performance (Remark No. 1)	**Results/Observations**
Moisture content	CD-1 11 % CD-2 12 % (Remark No. 2)
Strength and Durability Tests	
Strength of pivoted doors-vertical load	B-1 Failed (Remark No. 3) B-2 Failed (Remark No. 3)

Remarks:
1. The cabinet were tested using level 3 of ISO 7170 (Furniture - Storage Units-Determination of Strength and Durability)
2. Moisture content was determined using moisture meter
3. Occurrence of failure due to the loosening of the metal concealed hinges after 20, 810 cycles. The test requires 40,000 cycles in order to pass the standards
4. The test results presented in this report relate only to the object/sample tested
- Nothing follows -



Prototype cabinets with drawers subject to strength test of pivoted doors-vertical loading



Metal concealed hinges were deformed during the application of vertical load of 25 kgs suspended 100 mm from the edge of the door

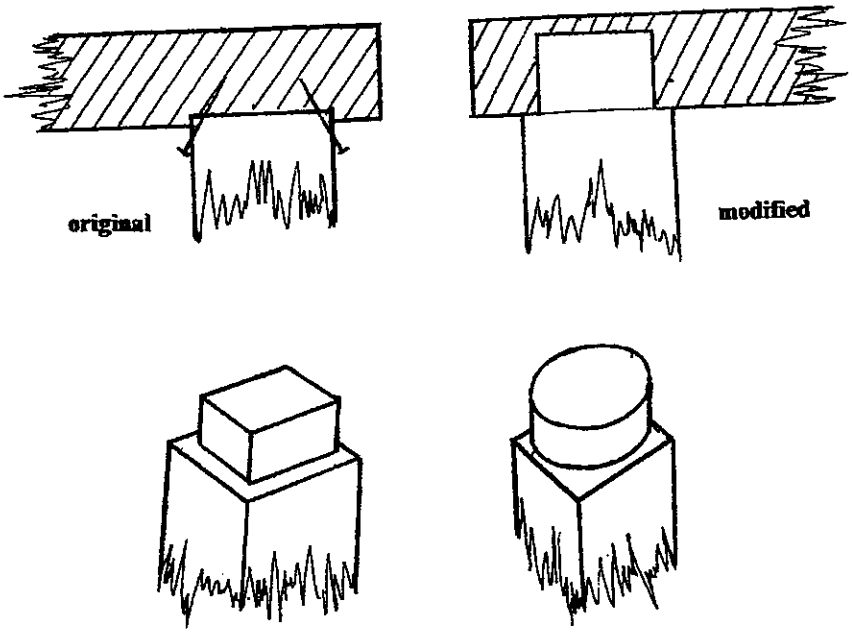


FIGURE 1 – Stool 1

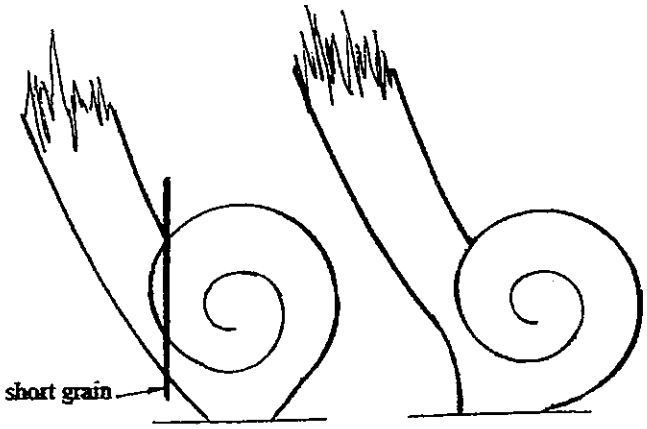


FIGURE 2 – Chair BCI 2002 04

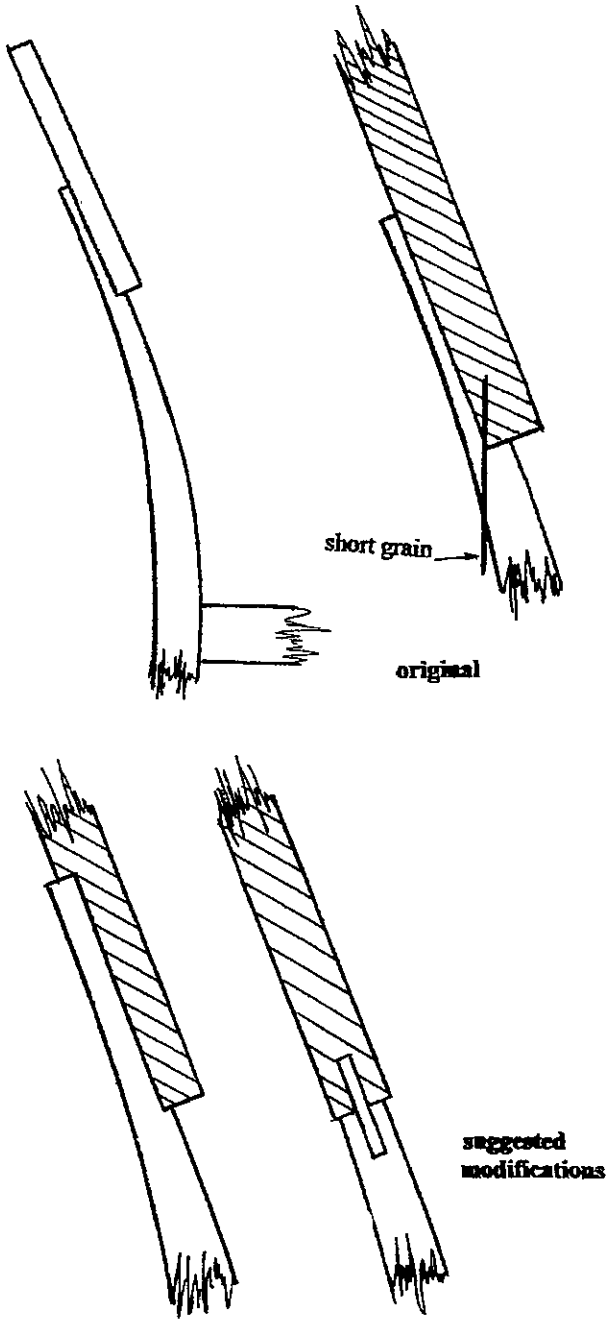


FIGURE 3 – Chair BCI 2002 05

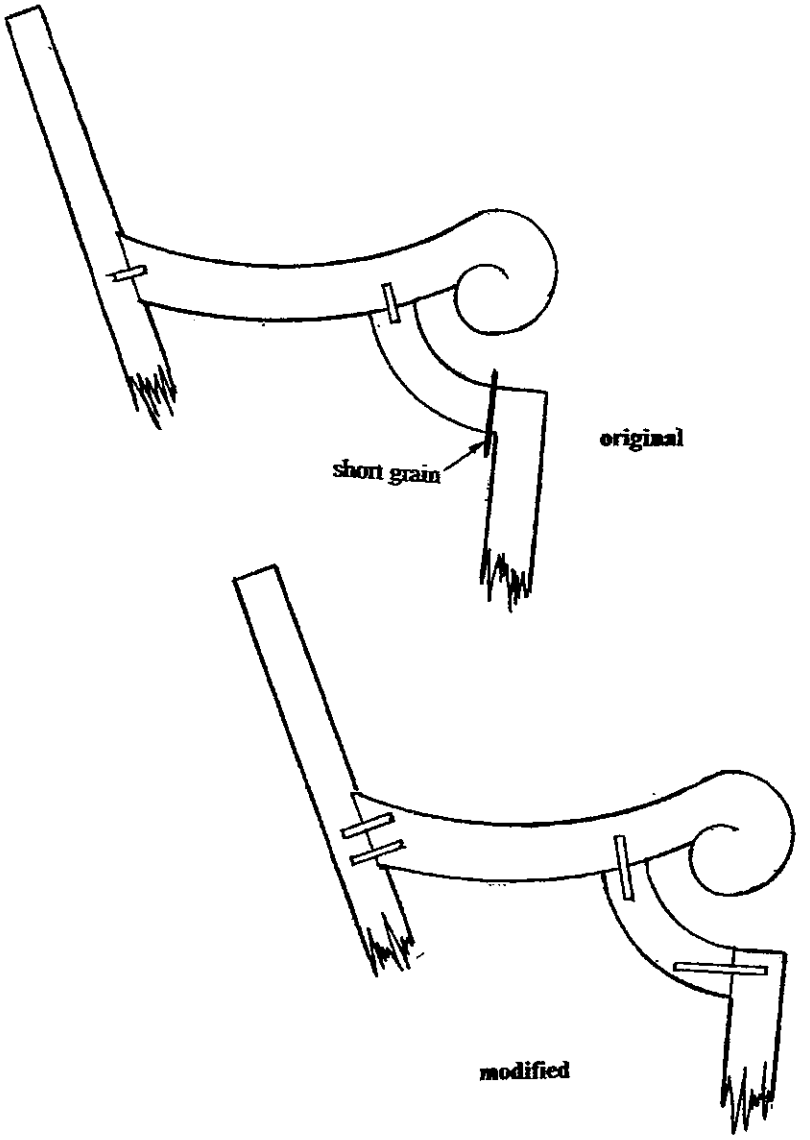


FIGURE 4 – Chair BCI 2002 06

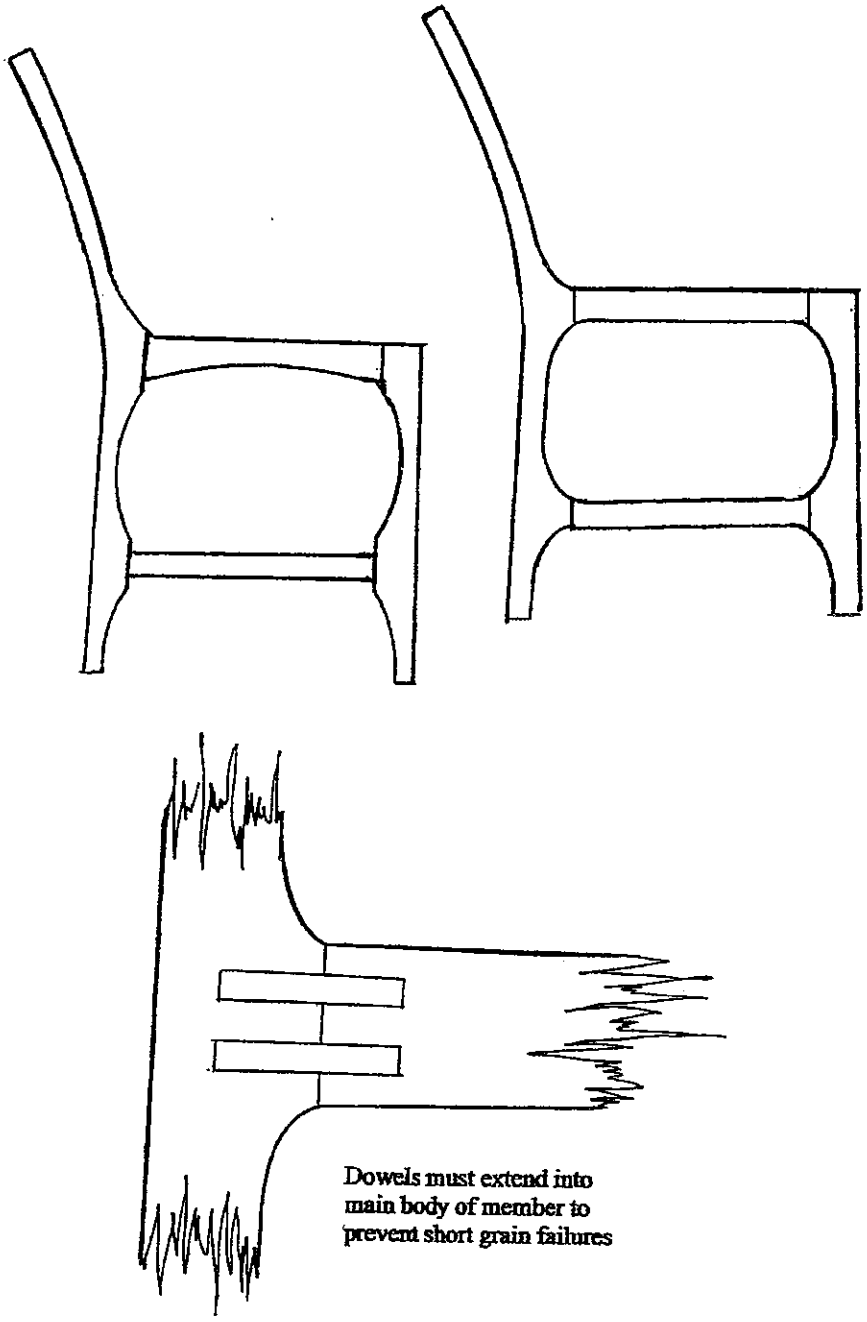


FIGURE 5 – Refining dowel joint members to improve resilience

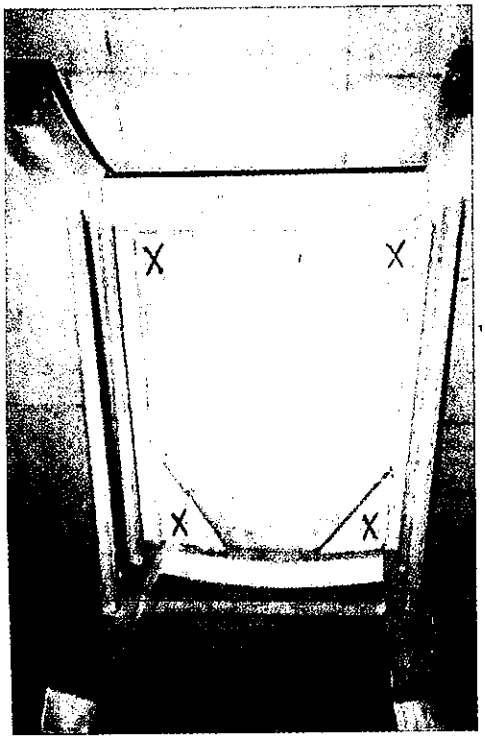


Figure 6. Bottom view of a prototype chair using four corner blocks marked "X" poorly designed and constructed using nails as joint fastener

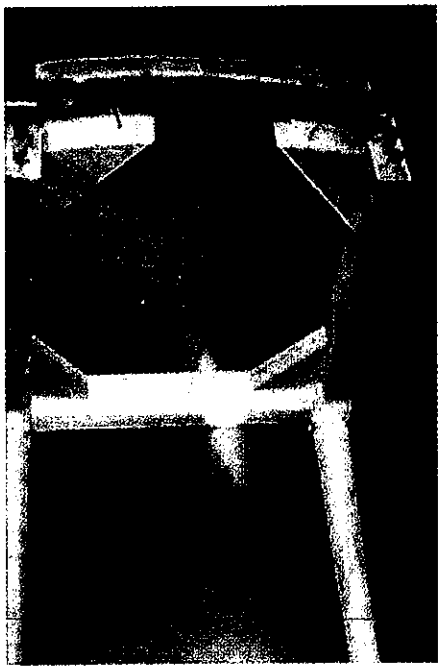


Figure 7. Bottom view of a prototype chair that failed after testing. Also shown are two nail fasteners used to fasten corner blocks to the rails. Also exposed are four dowel connectors attached in the rails.

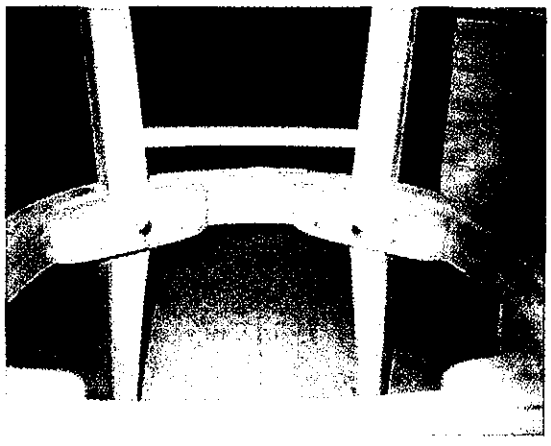


Figure 8. Modified corner blocks bolted on the rail and back legs of prototype chair

Figure 9. Modified corner blocks bolted on the rail and front legs of prototype chair

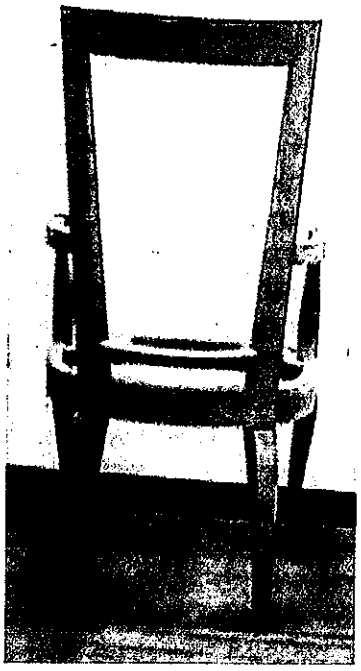


Figure 10. Rear view of modified prototype chair using modified design of joint construction

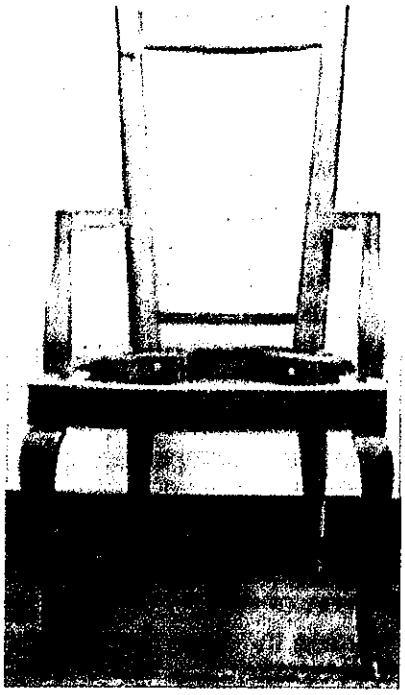
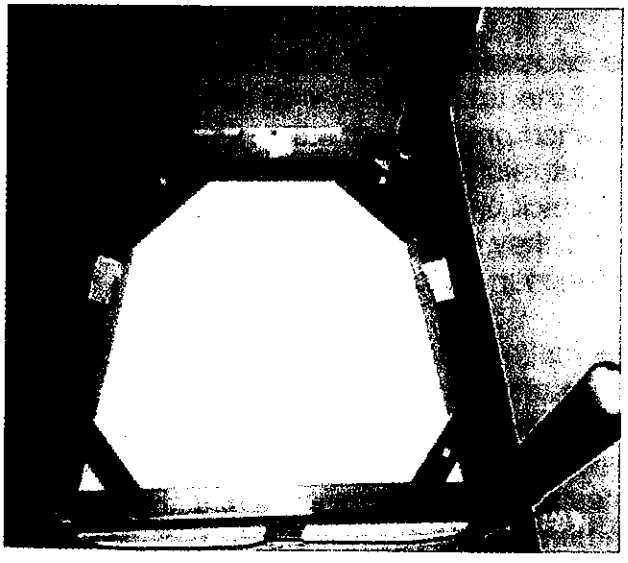
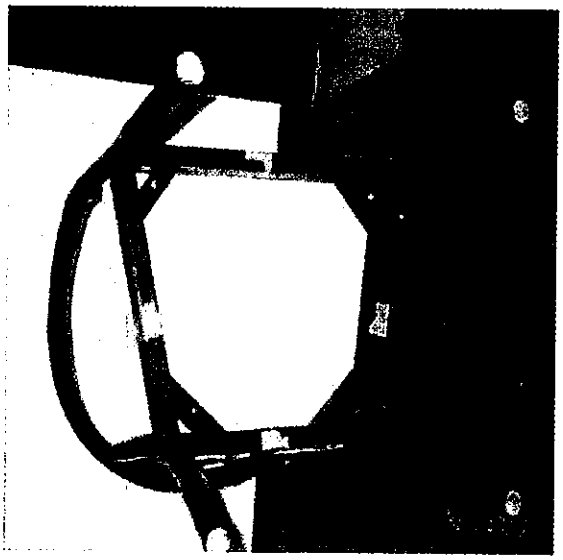


Figure 11. Front view of modified prototype chair using modified design of joint construction





Figures 12-A and 12-B. The bottom views of prototype chairs indicating specific type of design of corner blocks in furniture construction

Discussion of Results

Using test level 3 of the ISO 7173, BS 4875 Part 1 and BSEN 1728, data and information on static, fatigue and impact strength and durability of wood furniture samples were generated. These furniture are in the form of chairs, stools, tables and cabinets. Using seat static load of 1,300 Newtons (N), back static load of 560 N, and a balancing load of 1,300 N applied 10 times, the strength and performance of individual chairs and stools were obtained. Subsequently, using a seat fatigue load of 950 N and back fatigue load of 330 N and balancing load 950 N, applied 50,000 times, the strength and performance of prototype wooden chairs were obtained. Although some chair and stool samples failed during the tests, majority of the sample chairs tested satisfactorily passed the test requirements. This means that the chair tested did not fracture or crack in any member, component or joint including seat suspension. There was no loosening of components and joint connections. There was no loosening of underframe or base of the chair. There was no free movement of back, arms, legs and other components of the chair or stool greater than that noted in the initial inspection. There was no deformation or cracks of any part of the samples. There was no audible noise or sound noted during the test. For chairs with armrests, the chair passed the arm sideways and downward static load tests. Finally, the sample chair passed the drop test and back impact test using the pendulum hammer. Impact performance of the seat and back of chairs were tested and evaluated using a drop height of 180 mm of the vertical impact or applied 10 times to the seat and 210 mm height of pendulum hammer at an angle of 38^{o} applied 10 times to the backrest.

For prototype sample chairs and stools that failed during the tests, the causes and description of failure are discussed.

For chair sample 2A, the failure occurred at the backrest/rear leg assembly. This was detached from joint to seat side rails because of the unsatisfactory dowel joints and ineffective corner blocks. The dowels are oval, which prevents effective gluing. Using glue as fasteners for corner blocks is useless if not reinforced by correct size of bolts and/or screw. The corner blocks were only 38 mm thick on a 50 mm deep side member. Large diameter dowels are good but not logical if they reduce the effective distance between dowels and destroys the majority of the tenon in the other joint.

For chair sample BCI 2002-04, approximately one half of the carved scroll on the foot of one rear leg split off. This originated from one spike of the metal dome pressed into the underside of the foot. However, failure will not affect the serviceability of the chair. The cause of failure is the weight of the chair. It was heavy and had inflexible construction and therefore experiences high loads in impact tests, especially the drop test. The foot of the leg was weak due to the carved scroll and the curvature of the rear legs, which produces short grain wood portion.

For chair sample BCI 2002-05, the chair failed during the combined seat and back fatigue test and back impact test. In the fatigue test, the decorative centerpiece of the backrest split slightly between the two pairs of rings. In impact test, the top of the backrest and the decorative centerpiece were also detached. This was due to a slight movement in the dowel joints between rings of the centerpiece, which may have allowed the splitting between the rings under backpressure. There was severe short grain on the top of the back uprights because of their graceful curvature.

For chair sample BCI 2002-06, the sample failed during drop test. On the first drop, the arm assembly of the impacted side broke. This was an unusual failure for a drop test and there may have been unseen damage in the sample previous to arm impact test. The arm assembly failed at the short grain area at the top of the front leg and the dowel joints at the front and rear of the armrest. The failure was due to loose dowel in front of armrest. Single and short dowels were used. Single dowel cannot prevent rotation under severe loads.

For Stool 1, the sample failed during back static load test. The leg joint failed and nailed attachment was disconnected. The failure was due to the small dowel of joint faced-glued to end grain. The use of nail was not adequate as fastener.

For Stool 2, the sample also failed during back static load test. Dowel joints between two rear legs and underframe failed. The joint was unable to withstand the bending loads. Dowels were loose in dowel holes. One dowel was badly misshapen.

For Table 1, the sample failed in stability under vertical load. The table tilted after loading 53.3 kgf to one end of the table top. The computed minimum load that the table would not tilt is 61.16 kgf. The sample however passed the stability under horizontal impact load (basketball). It also passed the strength and durability tests under horizontal static and fatigue load and the vertical static and fatigue load. It likewise passed the vertical impact test and drop test.

For pivoted doors of cabinet, the doors failed in durability test. The metal concealed hinges loosened after 20,810 cycles. It requires 40,000 cycles to pass the standards. The cabinet doors also failed in vertical load test. The metal concealed hinges were twisted when a weight of 25 kg suspended 100 mm from the edge of the door was applied.

For drawers of cabinet, the drawers and runners passed the durability test by slam open of the drawers.

In this project, the MC of the sample chairs, stools, tables and cabinets tested ranged from 8% to 14%.

Conclusions

Based on the results of the various tests conducted, the following conclusions were derived:

- Majority of the chairs tested passed the required strength and durability tests covering static, fatigue, impact and drop test and the subsequent stability test using established test standards.

- For chairs and stools that failed during the test, failure occurred at the short grain area of the armrest assembly on the top of the chair's front legs and the joints at the front and rear of the armrest. The failure was due to loose dowels in its dowel holes. The failure occurred during the drop test.

- The use of inadequate size and poor preparation of fastened corner blocks are contributory factors in the failure of chairs and stools tested. The use of glue, reinforced with ordinary common wire nails as fasteners of corner blocks is not advisable in manufacturing high quality, durable and stable chairs and stools.

- Using properly designed and modified corner blocks adequately fastened by suitable screw and/or bolt significantly improved the strength and performance of furniture. It also enhances the quality of the product.

- The weight of the furniture is a contributory factor in the failure of some products during the drop test. Subsequently, the preponderance or presence of more short grain area or section in the furniture contributed to the premature failure of the products tested.

- The failure of the cabinet pivot door metal hinges during vertical load application of 25 kg was due to the metal part used and not on the wood portion. For the drawers, the unit or item passed the durability test of the drawers and runners-slam shut and open.

- The table tilted in vertical loading at one end of the table top but it passed the horizontal impact (basketball) test and the strength and durability tests (static, fatigue and drop test).

- Following established test procedures and using technically equipped and appropriate testing machines, the strength, durability and stability of wood furniture can be determined. The modification of the design, construction methods and the strengthening/upgrading of the structure of furniture particularly on joint fastenings and on the proper attachment of corner blocks and stretchers greatly improved the strength and overall performance of furniture.

  The research project has been successful in showing that furniture testing is capable of providing information required for quality, strength and performance so that competitiveness of furniture from tropical timbers maybe assured in the global market.

Recommendations

- In manufacturing wood furniture items for export, the MC of the wood should be from 8% to 12%. For furniture intended for domestic/local use, should be from 14% to 16%.

- When using dowels for furniture joint, the dowels and dowel holes must be perfectly round and surfaces should be properly cleaned or polished. Wood species with high toughness value and good turning property must be used for dowels and it should be of right size and space in the joint connection.

- As much as possible, avoid or minimize the use of short grain section/areas in furniture parts particularly in armrest and backrest and other curved components to avoid splitting during impact and drop test.

- Avoid using low-density wood for corner blocks and leg stretchers. Wood species that have straight grain, fine textured and having a specific gravity of 0.500 to 0.650 are recommended for corner blocks. These blocks must be of proper design and shape, adequate size and fastened rigidly to adjacent rails and legs using screws, bolts and pins. The use of ordinary common wire nails as fasteners for corner blocks is discouraged.

- For wood furniture intended for indoor use, polyvinyl acetate (PVA) glue generally perform satisfactorily for furniture joints, provided the joint tolerances are maintained. Urea formaldehyde (UF) glue have good filling properties and are resistant to moisture below 40°C, can also be used for furniture joints. For outdoor furniture, it is advisable and safer to use mechanical fastenings instead of glue.

- For tables, reducing overhang and making the shape of the ends elliptical are recommended. This would positively counteract the vertical load that maybe applied on the top.

- Majority of the chairs tested had thick, solid flat seats. This can be made less cumbersome in appearance by rebating the edge so that some of the thickness is hidden inside the seat frame. For comfort in sitting, the upper surface of the seat may be contoured or use thinner plywood seat plate lightly upholstered and supplied with a cushion. For future studies, it is quite important to conduct tests and evaluation of upholstered furniture particularly chairs, stools and sofa. This would generate first hand data and information on the strength, durability and overall performance of upholstered furniture. It is highly recommended that tests be conducted on outdoor furniture - seating and tables for camping, domestic and for general contract and severe contract furniture using test levels 4 and 5 of the test standards.

ANNEX A

"Promotion and Dissemination of the Outputs of **ITTO Project PD 35/99 Rev. 4 (I) Performance Evaluation of Export Wood Furniture in Relation to Strength and End-Use Applications Using Established Test Standards** to the Furniture Manufacturers in the Philippines"

Considering the vital research outputs of the project and the need to promote and disseminate the results/outputs to the furniture manufacturers in the Philippines, Project Management in concurrence with the Project Steering Committee decided to transfer and disseminate the outputs derived from the completed project to the target clientele/beneficiaries. The primary objective of this activity is to promote the need and importance of testing furniture prior to export and actual use.

The completed project particularly tested and evaluated the strength and performance of prototype wood furniture of various designs and joint construction using some tropical timber species and has generated valuable data and information on the static, fatigue and impact strength of chairs, stools, tables, cabinet and drawers. The project likewise determined and assessed the stability of prototype furniture when subjected to loads in different directions. The testing machines used in the project are from United Kingdom and the Standards followed in the testing are the British Standard (BS), British-European Standards (BS-EN) and the International Organization for Standardization (ISO).

The dissemination of the project outputs was done through the conduct of seminars in five furniture producing areas in the Philippines in cooperation of the Chamber of Furniture Industries of the Philippines (CFIP) National Capital Region, the Iloilo Furniture Manufacturers Association (IFMA), in Iloilo City, the CFIP Negros Chapter in Bacolod City, the CFIP Pampanga Chapter in Mabalacat Pampanga and the Cebu Furniture Industries Foundation Incorporated (CFIFI), in Cebu City. These seminars were conducted from September 22 to October 08, 2004 by Mr. Victor G. Revilleza, Project Leader, Engr. Arnaldo P. Mosteiro, National Expert and Mr. Juanito P. Jimenez, Jr. Coordinator.

A total of 138 participants, representing either as owners, managers, production supervisors, consultants, marketing staff, designers, plant superintendents, training officers, fabricators and machine operators, representing 98 furniture firms or companies attended the seminars. Majority of these firms are particularly engaged in the export of furniture. The seminar participants are particularly interested and appreciative of the outputs of the project because it will greatly enhanced and improved their competitiveness in the world market.

Considering that the Philippines is a member of the World Trade Organization (WTO), the Asia Pacific Economic Cooperation (APEC) and the Asia Free Trade Agreement (AFTA), it is compelled to institute measures and adopt internationally established and accepted standards for product quality and performance set by these organizations in order to remain competitive in the international market and likewise remove discrimination against foreign products and ensure that the obstacle to trade is

eliminated. In line with this global trend for standardized and quality assured furniture, the Philippines must produce furniture and other related products that conforms to the required international quality standards and performance.

Summary of Observations/Reactions and Recommendations from the Participants of the Seminars

The participants of the seminars on "Performance Evaluation of Export Wood Furniture in Relation to Strength and End-Use Applications Using Established Test Standards held in five (5) furniture producing areas in the Philippines (Manila, Iloilo City, Bacolod City, Cebu City and Pampanga) expressed the following reactions and recommendations on the relevance of furniture testing on their operations:

1. Furniture manufacturers from Cebu, Iloilo and Bacolod City which are situated in the Visayas region of the country and supplies 70% of the total exported furniture of the country all agree that performance testing of furniture is a very relevant action to undertake by every furniture manufacturer to enhance their growth and global competitiveness in the light of the increasing competition in the global market.

   They also share the same lament of not having a furniture testing facilities that would cater to their testing needs in their region when time comes that their buyers requires them to do so. The burden of bringing their furniture samples to a private furniture testing laboratories in Manila or at the FPRDI-Furniture Testing Center in Los Baños discourages them to have their products to undergo performance testing.

   They hope that through DOST and FPRDI with the assistance of ITTO or other funding agency, a furniture testing center similar to the one established at FPRDI will soon be established in their region in the future.

   They also recommend that at present in the absence of a furniture testing facilities in their region, if they decided to send their furniture samples to FPRDI for testing, FPRDI being a government agency should subsidies a certain percentage of the cost of testing in order to reduce their testing cost because of the huge transportation cost of bringing their samples to FPRDI.

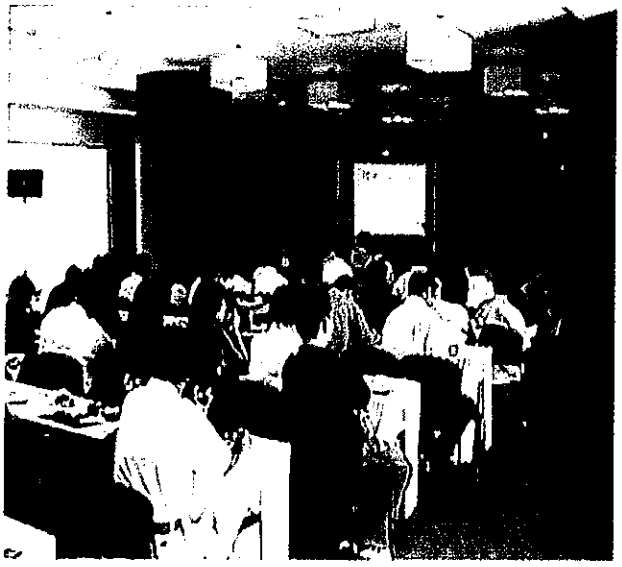
2. Other manufacturers suggested that the FPRDI-Furniture Testing Center should be a "One Stop Laboratory for Furniture Testing". It should cater not only the strength, durability and stability test for furniture but also the other tests requirements of the buyers like flammability test for upholstery materials like fabrics and foams, evaluation of finishes and adhesives etc.

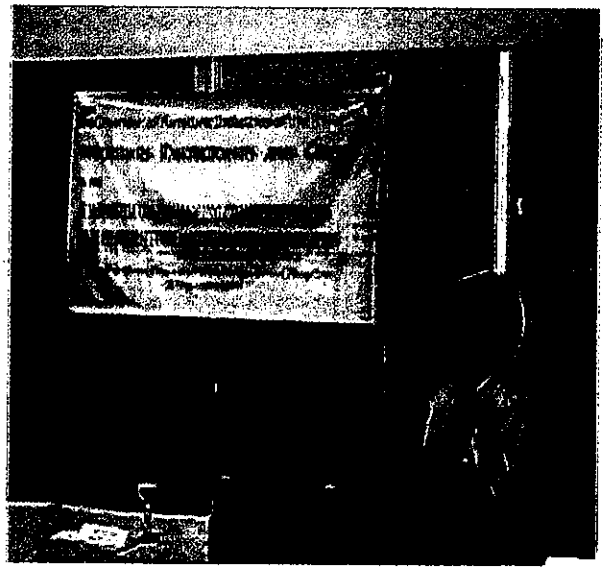
3. Copy of the FPRDI-ITTO project video that showcases the rationale, objectives and results and recommendations of the project should be provided to the different CFIP chapters for easy reference of the members.

4. To fast track the ISO 17025 testing laboratory accreditation of the FPRDI-Furniture Testing Center in anticipation of the implementation of the WTO, APEC and AFTA, which would require accredited testing laboratories to eliminate technical barriers to trade under the mutual recognition arrangement (MRA).

5. Raw materials used in the manufacture of furniture that are sourced from local hardware stores like plywood and lumber should also conform to the required standard set by the industry. Manufacturers are complaining that local materials they bought from these stores are mostly sub-standard. Accordingly, the use of these sub-standards materials will not only affect the cost and quality but also the strength and durability of the finished products. They requested for help in voicing out their complains and assistance that their complains could reached the proper authority like the Department of Trade and Industry (DTI) so that appropriate action could be undertaken. This problem should be addressed first before they can comply with the required established test standard for furniture.

PATICIPANTS OF THE SEMINAR IN CFIP NATIONAL (MANILA)





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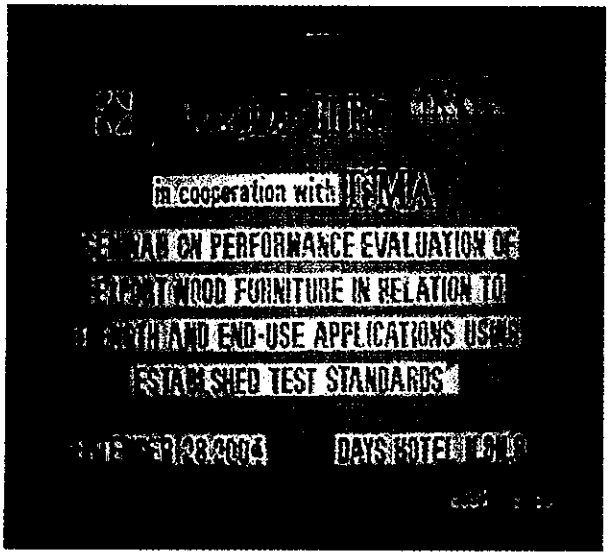

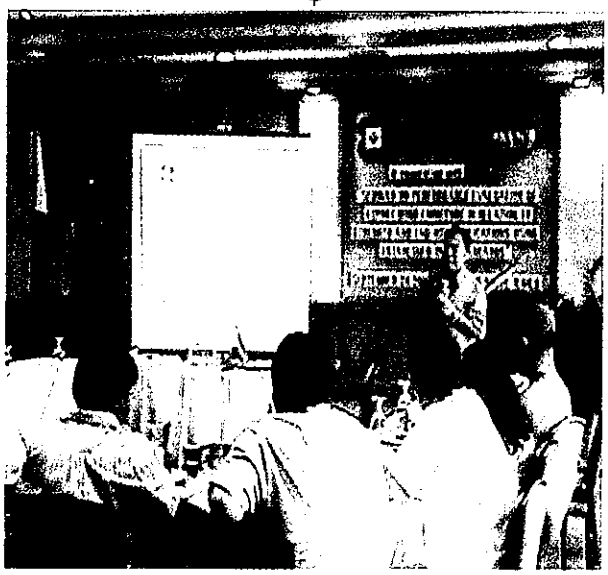

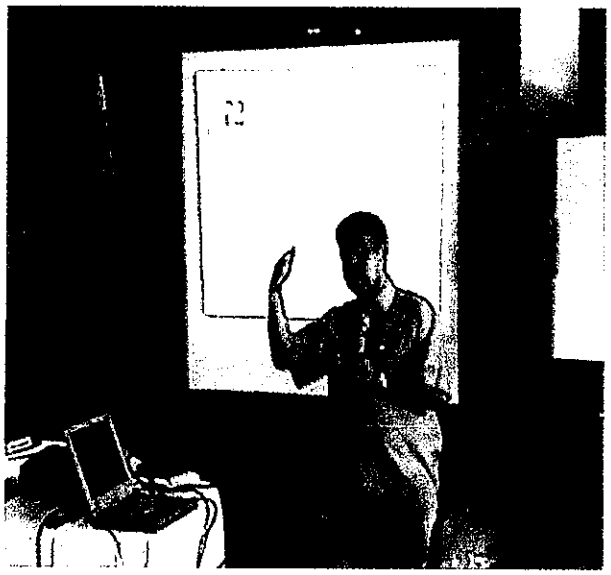

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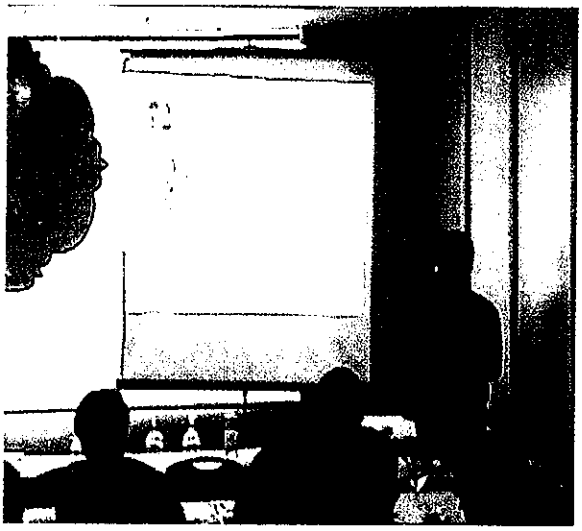
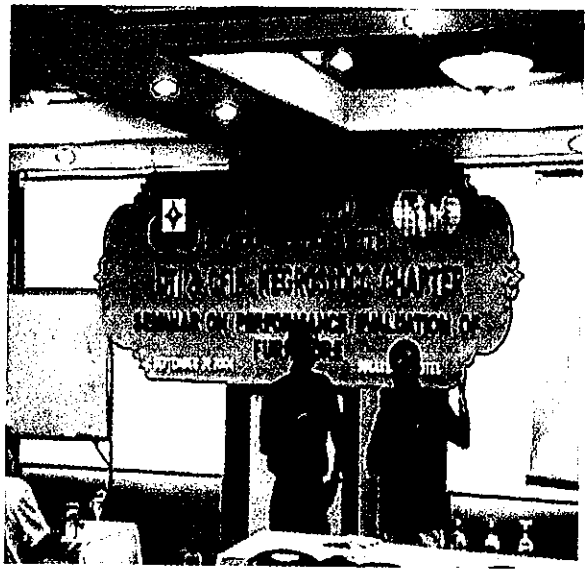
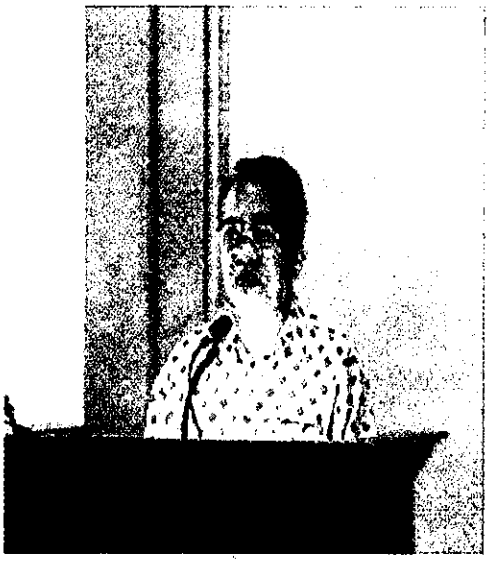


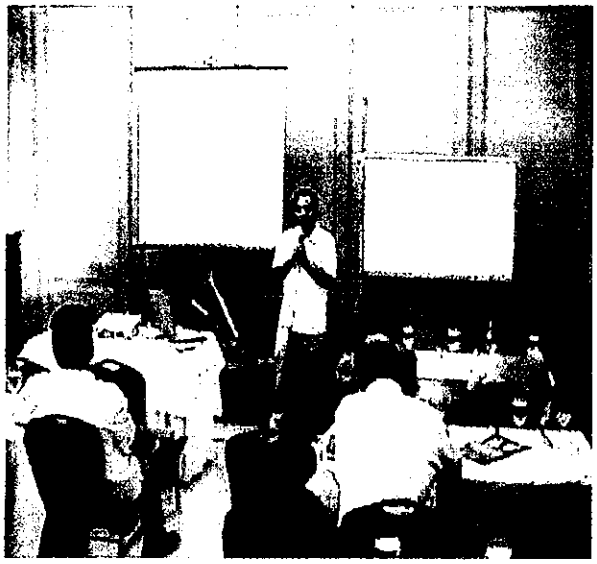

IN COOPERATION WITH
DTI & CFIP - NEGROS OCC. CHAPTER
SEMINAR ON PERFORMANCE EVALUATION OF
FURNITURE

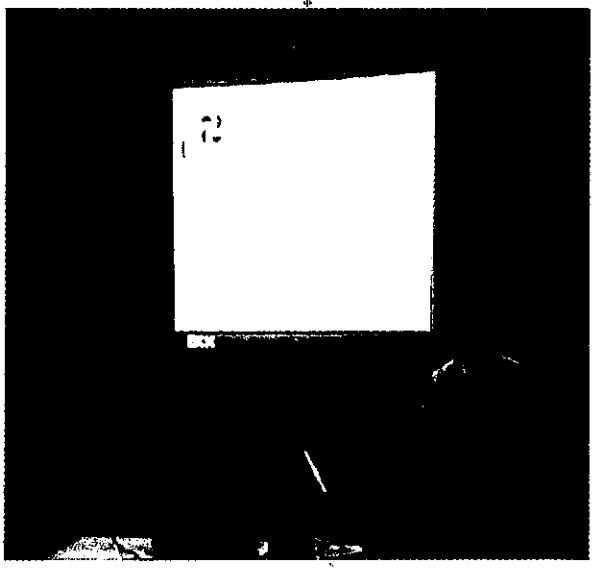

DTI & CFIP

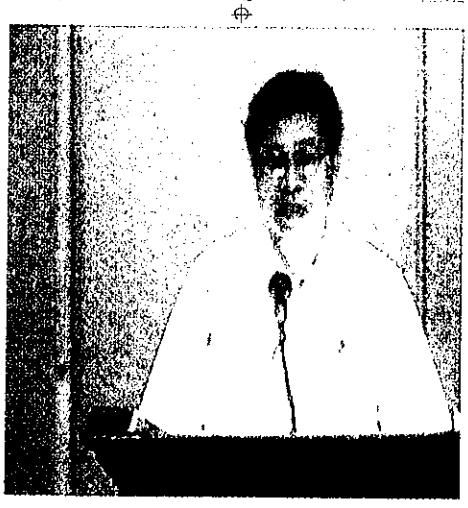


PATICIPANTS OF THE SEMINAR IN CFIFI (CEBU)









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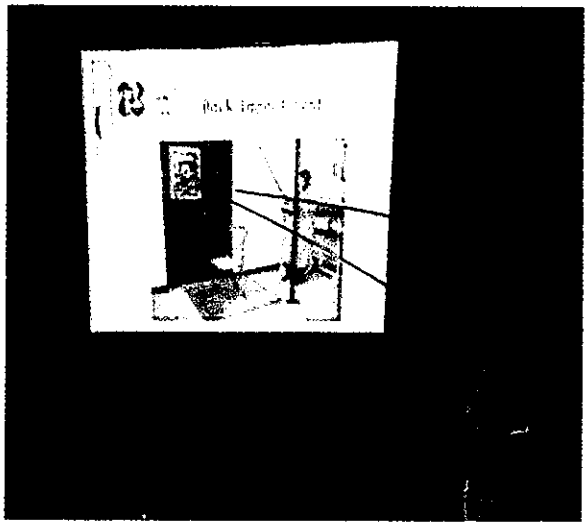
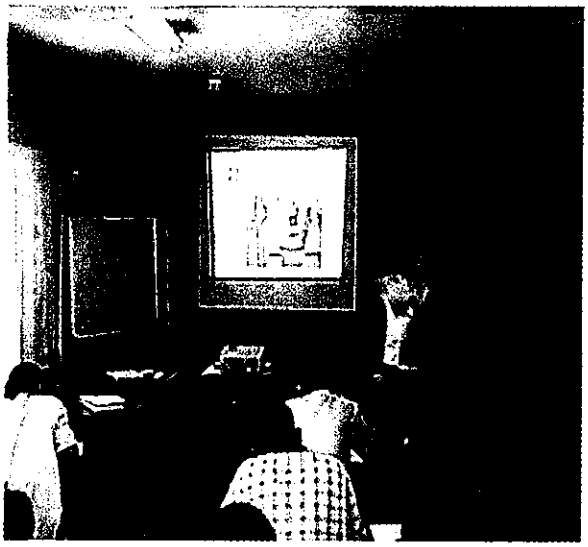
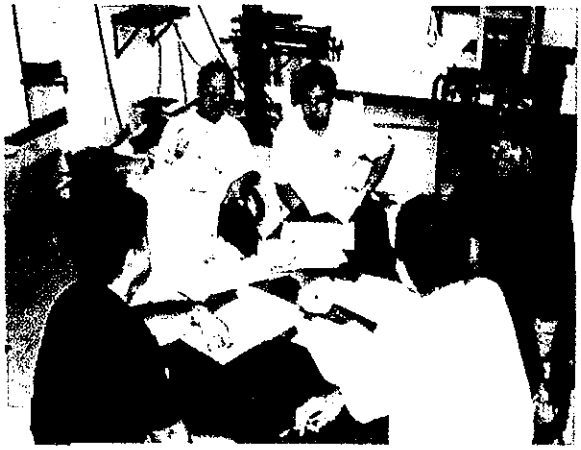
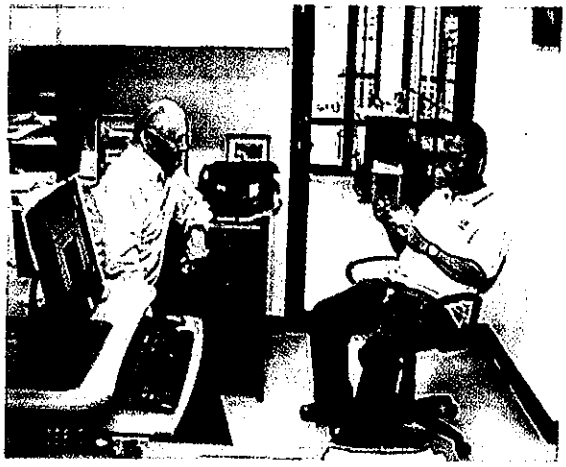




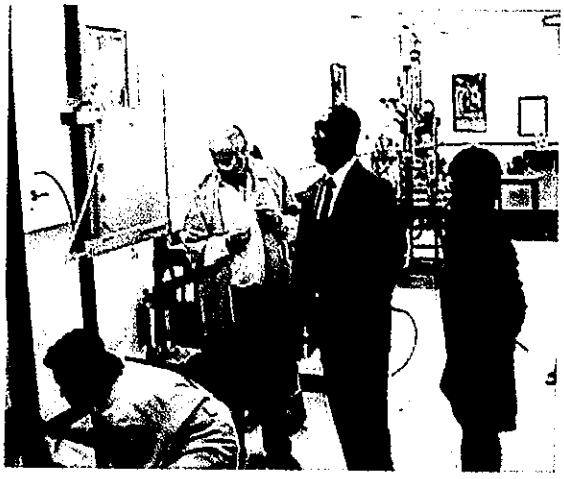
ANNEX B



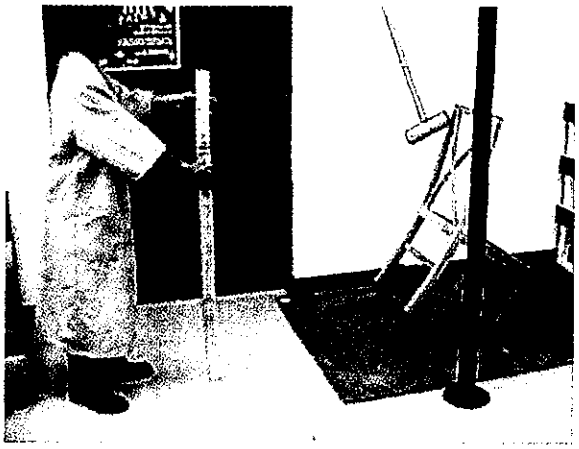
Consultative meeting of project staff with international consultant and project personnel demonstrating testing gadgets to official visitors of ITTO project



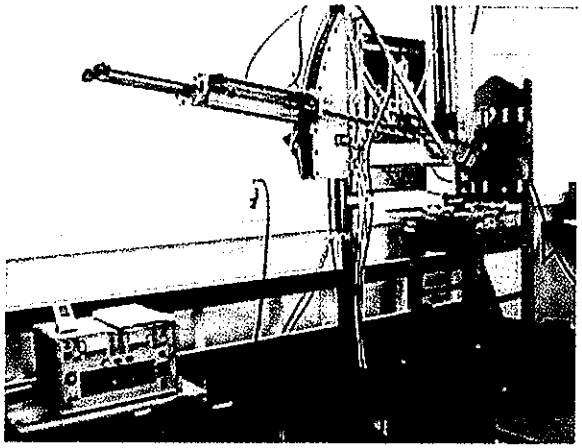
The project's International Consultant, Engr. William Gulliver assessing damages that occurred during testing and conferring with Engr. Arnaldo P. Mosteiro, the National Expert on testing activities



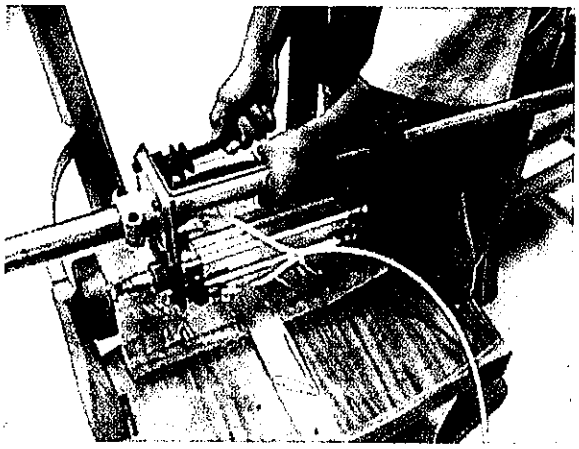
The International Consultant and FPRDI Director explaining to Dr. Emmanuel Ze Meka, Asst. Director of ITTO the different test machines and methods used in furniture testing



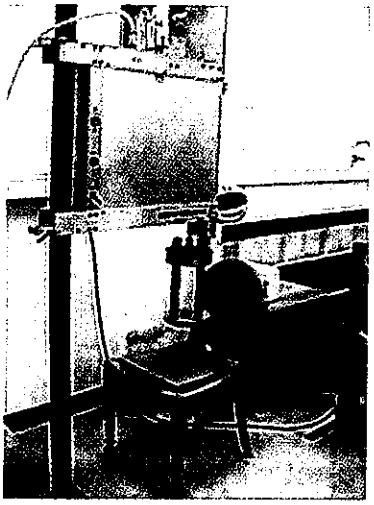
Pendulum hammer performing back impact test on backrest



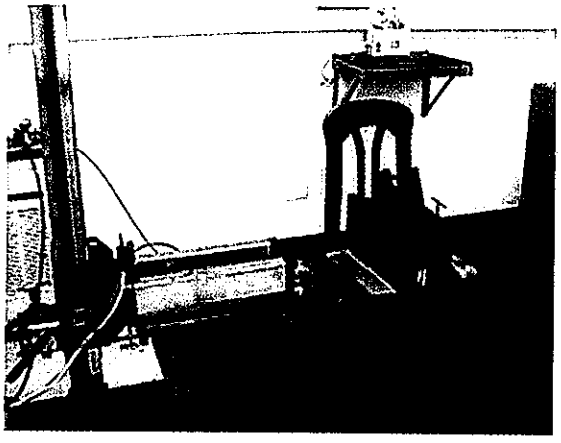
Chair testing machine performing combined seat and back fatigue test



Arm sideways test rig performing arm sideways static load test on armrest



Vertical impact test machine performing seat impact test



Single cylinder test machine performing leg sideways static load test

Horizontal impact tester-basketball performing horizontal stability test on table

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