

TECHNICAL REPORT



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Our Ref: **TFBDF21666**
Date: 8 April 2008
Delivery Date: 19 March 2008
Test Dates: 19 March – 3 April 2008

For the attention of Mr Stephen Faint

SAMPLE FOR TEST:

One, mattress Ref: JADE

TEST REQUIREMENTS:

BS EN 1957: 2000 Domestic furniture beds and mattresses
Plus edge sit test

RESULT :

PASS*
PASS*

**The mattress was considered by FIRA to satisfy the durability requirements for domestic use, as the above test standard has no guidelines on testing results.*

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TEST RESULTS

BS EN 1957: 2000 – Domestic furniture beds and mattresses

The tests required were carried out in accordance with the Standard. Details of the loads applied and their positions of application are retained at FIRA and are available on request.

Item: One, mattress Ref: JADE

Plates: 1 - 4

Initial Inspection: No apparent faults

Conditioning: Carried out

DURABILITY TEST

	Mattress/ Bed Unit Height	Height Change	Hardness Value (40% indentation)	Hardness Change	Firmness Rating	Firmness Change
As received	300mm	--	--	--	--	--
Rolled for 100 cycles	296mm	4mm	998N	--	5.6	--
Rolled for 30000 cycles	285mm	11mm	998N	0N	5.4	0.2

Edge Sit Test

Height of edge as received	287mm
Height of edge after 100 cycles	284mm
Height of edge after 5,000 cycles	280mm

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COMMENTS

The results obtained indicate that there was no change in hardness after the durability test and this suggests that the mattress does not have the propensity to soften excessively during use. After recovery the mattress indentation was not visible over the area in direct contact with the durability test roller.

A slight change in firmness after the durability test is expected for mattresses. This is not considered significant for a mattress intended for domestic use, and we believe that it will not affect the item's performance.

The change in height as a result of both the edge sit and the durability tests were 2% and 5% respectively of the original height. Such a change is not considered significant, and we believe that it will not affect the item's performance.

The roller used for the mattress durability test consists of a roller 1065mm in length and 455mm in diameter, which allows the application of a 1400N load to be applied to the mattress.

See annex for the height/load and load/indent curves

CONCLUSION

The mattress Ref: JADE successfully satisfied the applicable test requirements from BS EN 1957: 2000 and is therefore considered suitable for domestic use according to the standard.

Tested, reported and approved by:

Katie Donovan
Section Leader, Physical Upholstery Testing

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Annex

BS EN 1957 requires the functional characteristics of the bed product to be ascertained before and after durability (roller) test. The measurements are based on the load/deflection curve. The thickness and hardness values, the changes in both, and the firmness ratings are measured and recorded. The height of the bed is recorded as received. The mattress/bed unit is rolled for 100 cycles and initial height, hardness and firmness rating are recorded. The mattress/bed units are then rolled for a further 29,900 cycles and are measured and the results recorded. The durability of bed edge test is carried out whereby the detailed functional characteristics are again measured and recorded. The mattress/bed unit is inspected before and after the durability (roller) test, to ensure any changes caused by the test such as damage to seams, displacement or lumpiness of fillings, damaged or broken springs etc, are detected. Internal inspection of the product is performed only after all tests and measurements are completed.

The firmness rating for the product is categorised using a scale of 1 to 10, where 1 is a firm unit and 10 is a soft unit.

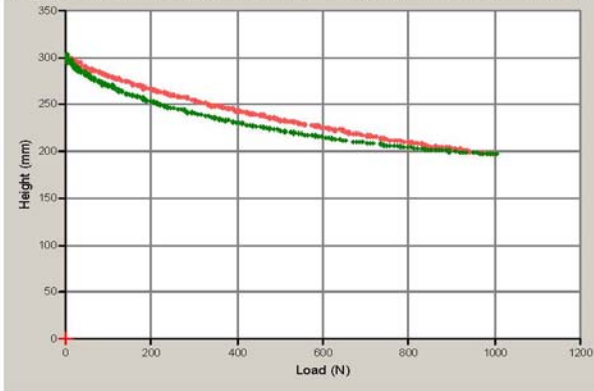
The load/deflection curves are obtained by pressing a load pad into the test unit and measuring the associated value of indentation and force simultaneously.

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Indentometer Measurements



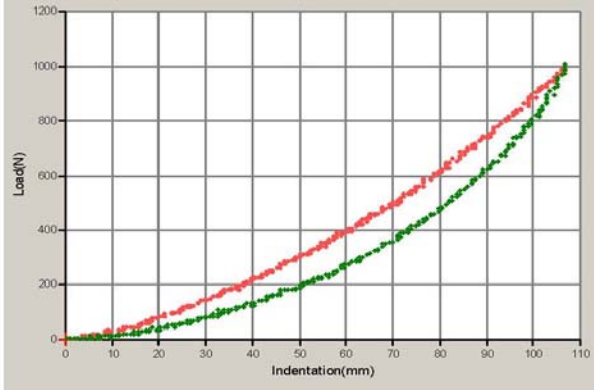
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Header	
detail 1	
detail 2	
detail 3	
weight	
head diam	355

initial height (mm)	304		
density (kg/cubM)	0.0		
Max load (N)	1006		
indent speed (mm/min)			
load range(mv)	20000	hgt range(mv)	20000
load factor	820	hgt factor	82
load offset	-3	hgt offset	0
count	808	interval(msec)	

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BED MATTRESS FIRMNESS RATING	
gradient @ 210N.	5.26
gradient @ 275N.	5.82
gradient @ 340 N.	6.19
Area under curve - 0 to 450N.	11762
K value	2044
Firmness rating	5.5

PILLOW FIRMNESS RATING	
Support Value	288 mm
Hardness value	2.8
Pillow Firmness Rating	30.9

Load(N)	10	20	30	40	50	60	70	80	90	100
Support(mm)	300	298	295	291	288	287	284	283	283	281
Indentation(mm)	4	6	9	12	16	16	20	20	21	23
Firmness(S/l)	85.2	50.3	32.3	23.6	18.6	17.6	14.5	13.9	13.4	12.4
gdt(dI/dL)	2.6	2.4	1.3	3.2	2.8	3.0	3.4	3.7	4.0	4.2
Support/Kg(mm)										

% indent	20	25	30	35	40	45	50	55	60	65
Support(mm)	243	227	212	197						
Indentation(mm)	61	76	92	107						
Firmness(S/l)	4.0	3.0	2.3	1.8						
gdt(dI/dL)	6.6	7.4	8.3	9.2						
Load(N)	397	558	758	990						

ILD
83 lbs

SAG
1.8

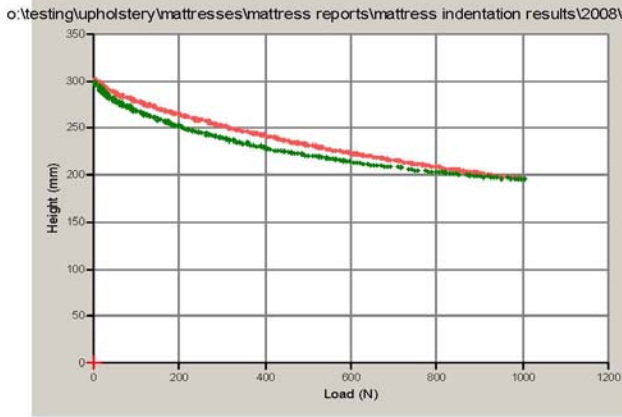
40% Indentation Hardness
998 N.

work done during compression	40859
work done during recovery	32078
% Resilience	79

Plate 1: Indentometer results after initial measurement

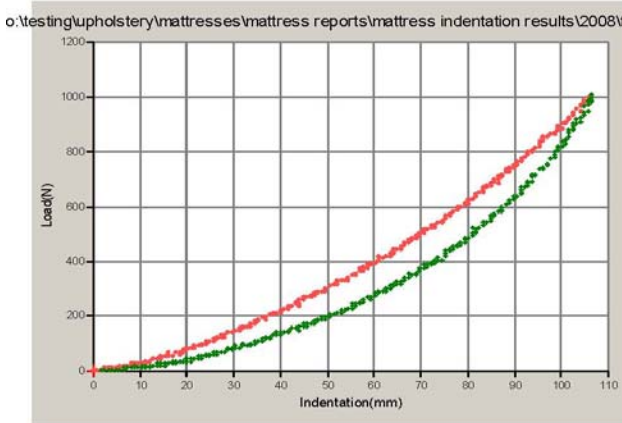
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Indentometer Measurements



Header	
detail 1	
detail 2	
detail 3	
weight	
head diam	355

initial height (mm)	302		
density (kg/cubM)	0.0		
Max load (N)	1006		
indent speed (mm/min)			
load range(mv)	20000	hgt range(mv)	20000
load factor	820	hgt factor	82
load offset	-3	hgt offset	0
count	790	interval(msec)	



BED MATTRESS FIRMINESS RATING	
gradient @ 210N.	5.35
gradient @ 275N.	5.84
gradient @ 340 N.	6.24
Area under curve - 0 to 450N.	12077
K value	2079
Firmness rating	5.6

PILLOW FIRMINESS RATING	
Support Value	287 mm
Hardness value	3.1
Pillow Firmness Rating	33.2

Load(N)	10	20	30	40	50	60	70	80	90	100
Support(mm)	299	296	291	289	287	286	283	281	280	279
Indentation(mm)	2	6	11	13	14	16	19	21	22	23
Firmness(S/l)	124.7	52.9	25.9	22.6	19.9	17.9	14.7	13.5	13.0	12.0
gdt(dI/dL)	1.7	2.8	1.5	2.2	3.1	3.3	3.8	3.6	3.9	4.1
Support/Kg(mm)										

% indent	20	25	30	35	40	45	50	55	60	65
Support(mm)	241	226	211	196						
Indentation(mm)	61	76	91	106						
Firmness(S/l)	4.0	3.0	2.3	1.9						
gdt(dI/dL)	6.6	7.4	8.4	9.3						
Load(N)	405	566	766	982						

ILD
81 lbs

SAG
1.8

40% Indentation Hardness
998 N.

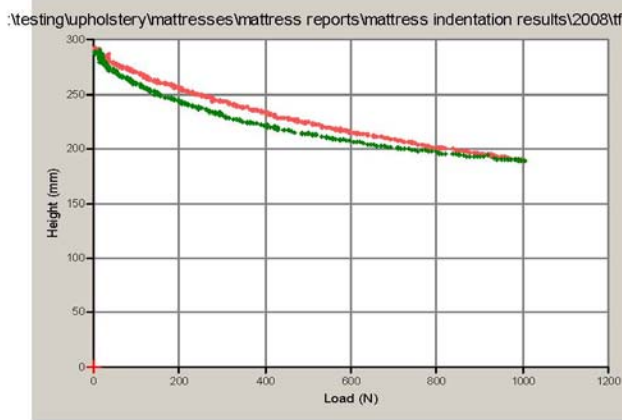
work done during compression	40913
work done during recovery	32448
% Resilience	79

Plate 2: Indentometer results after 100 cycles



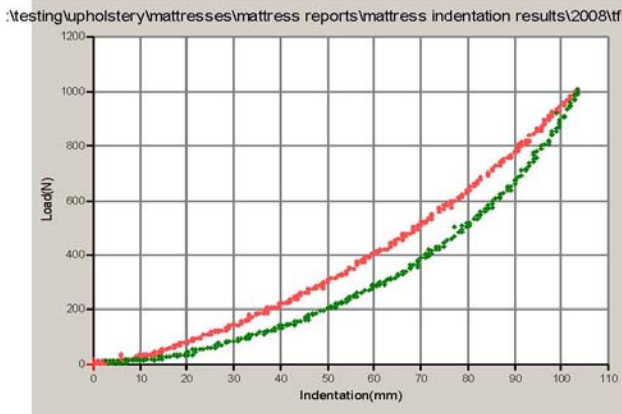
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Indentometer Measurements



Header	
detail 1	
detail 2	
detail 3	
weight	
head diam	355

initial height (mm)	293		
density (kg/cubM)	0.0		
Max load (N)	1006		
indent speed (mm/min)			
load range(mv)	20000	hgt range(mv)	20000
load factor	820	hgt factor	82
load offset	-3	hgt offset	0
count	829	interval(msec)	



BED MATTRESS FIRMINESS RATING	
gradient @ 210N.	5.36
gradient @ 275N.	5.83
gradient @ 340 N.	6.27
Area under curve - 0 to 450N.	11527
K value	1981
Firmness rating	5.4

PILLOW FIRMINESS RATING	
Support Value	278 mm
Hardness value	2.5
Pillow Firmness Rating	31.4

Load(N)	10	20	30	40	50	60	70	80	90	100
Support(mm)	291	287	287	279	278	276	274	272	271	270
Indentation(mm)	1	6	6	13	15	16	19	20	21	23
Firmness(S/l)	260.0	48.4	48.4	21.3	18.9	16.9	14.6	13.4	12.8	11.9
gdt(dI/dL)	0.5	3.4	3.1	2.5	2.5	2.9	3.6	3.8	3.8	4.1
Support/Kg(mm)										

% indent	20	25	30	35	40	45	50	55	60	65
Support(mm)	234	219	204	190						
Indentation(mm)	59	74	88	103						
Firmness(S/l)	4.0	3.0	2.3	1.8						
gdt(dI/dL)	6.6	7.5	8.5	9.6						
Load(N)	389	558	758	990						

ILD
79 lbs

SAG
1.8

40% Indentation Hardness
998 N.

work done during compression	39099
work done during recovery	31308
% Resilience	80

Plate 3: Indentometer results after 30,000 cycles



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Plate 4: One, mattress Ref: JADE