STORK
Materials Technology

Stork Southwestern Laboratories

222 Cavalcade Street, 77009-3213
P.O. Box 8768, Houston, Texas 77249-3768
Tel: (713) 692-9151 Fax: (713) 696-4205

Attention: Bill Reinhardt
Rumber Materials, Inc.
621 West Division Street
Muenster, TX 76252
P: 940-759-4181 / F: 940/759-4011

W/O. No.: RUM004-12-27-01482-1
P.O. No.:
Report Date: 12/30/2005

RECEIVED JAN 11 2005

Project: Stork has been asked to perform a series of tests to determine the behavioral properties of Rumber's composite flooring (board) material, in a new condition compared to material that has been in service for approximately 10 years.

The tests selected were chosen to give representative properties for comparative purposes. There are any number of tests that could also be performed should other property behavior be desired.

Material Property	Result on 10 yr old board	Result on new board
Flame spread	6 min., 20 sec. average	7 min., 30 sec.
Tensile strength	640 psi	690 psi
Flexural modulus	13,100 psi	15,290 psi
Water absorption	0.33%	0.43%
Coefficient of thermal expansion	5.4×10^{-5}	6.1×10^{-5}
Compressive strength modulus	44,800 psi	37,225 psi
Static COF dry	0.50	0.49
Static COF wet	0.42	0.46
Sliding COF dry	0.34	0.56
Sliding COF wet	0.30	0.54

In summary, the 10 year old board exhibited values similar to those of a new board. The results do indicate that a board from 10 years of service will experience what could be considered a slight loss of polymers or some other base material due to degradation. This would account for a slightly higher burn rate for a 10 year old board, a reduction in the tensile strength, flexural modulus and coefficient of friction. The higher compressive strength modulus, yet reduced water absorption rate are also indicative of the material exhibiting some from of degradation, similar to a "drying" out theory applicable to many materials.

In conclusion, of the tests performed, the 10 year old board does not exhibit any loss of integrity, strength, or other properties that would deter continued use.

Respectfully Submitted

Terry Wilt
Manager, Product Evaluation

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Attention: Bill Reinhardt
Rumber Materials, Inc.
621 West Division Street
Muenster, TX 76252
P: 940-759-4181 / F: 512/375-1972

W/O. No.: RUM004-12-27-01483-1
P.O. No.:
Report Date: 12/27/2005

RECEIVED JAN 09 2005

Identification: Rumber Composite Board

Rumber boards received measured 5.5" wide, 12.25" long, with a nominal thickness of 2". The project was to determine if an object resting on the Rumber boards could withstand 0.5 g forces without moving. Various objects were selected for testing. The items were weighed, and a force applied of half of the objects' weight would equal a g force of 0.5. The forces were measured using a Shimpo Force Meter, SN 502543.

Object and Weight	Average Measured Force to Generate Movement (lbs)	G force value	Force requirement to meet 0.5 G's (lbs)
Cardboard box, with contents weighing 5.8 lbs.	6.1	1.1	2.9
Carbon steel flange weighing 16 lbs.	8.2	0.5 (0.51)	8.0
50 lb. weight, leather surface	27.0	0.5 (0.54)	25.0
50 lb. steel weight	24.1	0.5 (0.48)	25.0
50 lb. weight, sanded wood finish	23.8	0.5 (0.48)	25.0
9 lb. metal carrying case, with ½" diameter metal footing pads	4.3	0.5 (0.48)	4.5

The Rumber composite boards submitted for testing meet the minimum g force test requirements of 0.5

Respectfully Submitted

Terry Wilt
Manager, Product Evaluation

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Attention: *Chuck Hickey*
Rumber Materials, Inc.
621 West Division Street
Muenster, TX 76252
(512) 794-8473, 812/375-1972

W/O. No.: RUM004-03-27-25535-2
Date: 4/8/2002
P.O. No.: QUOTE# WJB030802

Project: Mechanical Testing

PROJECT INFORMATION

Material:	One (1) 31 ½" x 32" Floor Section With Supports on 15 1/4" Centers		
Identification:	N/A		
Date Received	3/27/02	*Technician:*	M. Hendricks T. Garica
Specifications:	N/A	*Date of Test:*	4/3/2002
Test Equipment:	RH605 Ram with McDaniels 0-10,000 psi gauge S/N 54429, Load Frame, Dial Indicator# 81961	*Procedure:*	See Below

TEST PROCEDURE

Stork Southwestern Laboratories was requested by Rumber Material Inc. to perform load testing of one section of trailer floor using Rumber boards. The Rumber mock-up was placed in the load frame with a section of pipe 5" wide x 13 ½" diameter that represents one wheel of a forklift. The section of pipe was placed in the middle of the center Rumber board with the ram on top of the pipe. The pressure was increased in the ram. The force output of the ram was measured at 0.100" of deflection measures by the dial indicator.

NOTE: The submitted material will be discarded after a period of 30 days unless otherwise directed.

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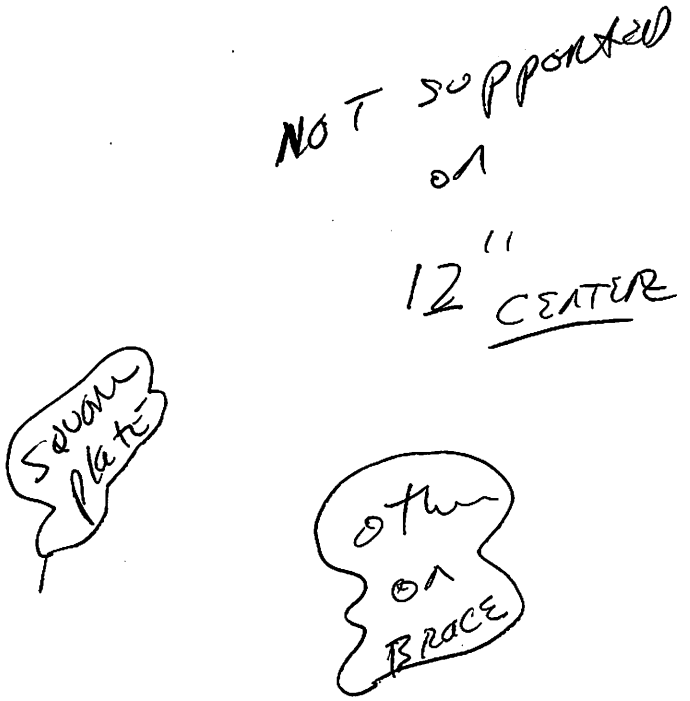
NOT SUPPORTED
ON
12" CENTER
SQUARE PLATE
OTHER ON BRACE

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W/O. No.: RUM004-03-27-25535-1
Date: 4/8/2002
P.O. No.: QUOTE# WJB030802

Load, lbf.	Deflection	Load, lbf.	Deflection
200	0.100	2,195	1.200
295	0.200	2,641	1.300
422	0.300	3,010	1.400
544	0.400	3,453	1.500
686	0.500	3,700	1.600
782	0.600	4,362	1.700
960	0.700	4,956	1.800
1,144	0.800	5,400	1.900
1,363	0.900	5,908	2.000
1,577	1.000	6,225	2.100
1,844	1.100		

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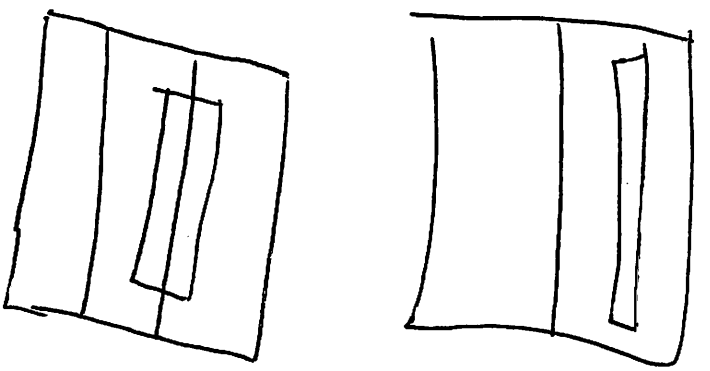

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W/O. No.: RUM004-03-27-25535-1
Date: 4/8/2002
P.O. No.: QUOTE# WJB030802

Project: Mechanical Testing

PROJECT INFORMATION

Material:	One (1) 31 ½" x 36" Floor SectionWith Supports on 12" Centers		
Identification:	N/A		
Date Received	3/27/02	*Technician:*	M. Hendricks T. Garica
Specifications:	N/A	*Date of Test:*	4/3/2002
Test Equipment:	RH605 Ram with AXHCROF 0-1000 psi gauge S/N A10002, Load Frame, Dial Indicator# 81961	*Procedure:*	See Below

TEST PROCEDURE

Stork Southwestern Laboratories was requested by Rumber Material Inc. to perform load testing of one section of trailer floor using Rumber boards. The Rumber floor section was placed in the load frame with a section of pipe 5" wide x 13 ½" diameter that represents one wheel of a forklift. The section of pipe was placed in the middle of the center Rumber board with the ram on top of the pipe. The pressure was increased in the ram. The force output of the ram was measured at 0.100" of deflection measures by the dial indicator.

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Rumber Materials, Inc.
621 West Division Street
Muenster, TX 76252
(512) 794-8473, 812/375-1972

W/O. No.: RUM004-03-27-25535-2
Date: 4/8/2002
P.O. No.: QUOTE# WJB030802

Load, lbf.	Deflection	Load, lbf.	Deflection
1,031	0.100	4,517	1.200
2,239	0.200	4,517	1.300
2,878	0.300	4,677	1.400
3,360	0.400	4,677	1.500
3,590	0.500	4,760	1.600
3,590	0.600	4,920	1.700
3,590	0.700	5,004	1.800
3,882	0.800	5,004	1.900 Center support weld broke
4,054	0.900	5,004	2.000
4,217	1.000	5,004	2.100
4,354	1.100		

NOTE: The submitted material will be discarded after a period of 30 days unless otherwise directed.

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Attention: Chuck Hickey
Rumber Materials, Inc.
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(512) 794-8473, 812/375-1972

W/O. No.: RUM004-06-21-15096
Date: 7/31/2001
P.O. No.: Chuck Hickey

Project: Mechanical Testing

PROJECT INFORMATION

Material: Trailer Mock-up with three (3) 8 1/8" x 1 ¾" 9402 boards supported on , ¼" "T" rails on 24" centers
Identification: N/A
Date Received 6/21/2001
Specifications: N/A
Test Equipment: RH605 Ram with McDaniels 0-30,000 psi gauge S/N 54429, Load Frame, Dial Indicator

Technician: Mark Hendricks
Date of Test: 7/30/2001
Procedure: See Below

TEST PROCEDURE

Stork Southwestern Laboratories was requested by Rumber Material Inc. to perform load testing of one mock-up section of trailer floor using Rumber boards. The Rumber mock-up was placed in the load frame with a section of pipe 5" wide x 13 ½" diameter that represents one wheel of a forklift. The section of pipe was placed in the middle of the center Rumber board with the ram on top of the pipe. The pressure was increased in the ram. The force output of the ram was measured at 0.100" of deflection measures by the dial indicator.

Load, lbf	Deflection	Load, lbf	Deflection
1650	0.100	7170	0.800
2200	0.200	7450	0.900
3310	0.300	7720	1.000
4970	0.400	8280	1.100
5520	0.500	8830	1.200
6070	0.600	9380	1.300
6620	0.700		

NOTE: The submitted material will be discarded after a period of 30 days unless otherwise directed.

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Mr. Chuck Hickey
Rumber Materials, Inc.
3420 Executive Center Drive, Suite 200
Austin, Texas 78731

Project No.: 460565-03-23-11834
Date: 04/02/01
P.O. No.: 2197

Project: Physical Testing of Rumber Material

PROJECT INFORMATION

Material: Three – sections of Rumber, 1.75" x 7.25" x length of material
Date Received: 03/23/2001
Specification: *none*
Test Equipment: Instron 4507, s/n H1963
Technician: Kitty Harvey
Date of Test: 03/30/2001
Procedure: ASTM D143, D198

TEST RESULTS

Modulus of Rupture (lb. per sq. in.)	Modulus of Elasticity (lb. per sq. in.)	Compression Parallel to grain (lb. per sq. in.)	Shear Strength (lb. per sq. in.)
562	5545	832	48.2

NOTE: *The submitted material will be discarded after a period of 30 days unless otherwise directed.*

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Reviewed By

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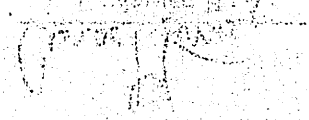

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Ultimate Tensile Strength

Tensile testing involves shaping of specimens into a number of different sizes, depending on the specification and material. Basically, the tensile sample will resemble a dog bone or hour glass. A reduced section is shaped into the area between the grips, so as to produce a failure between the grips. Tensile strength is determined by dividing the load it takes to achieve failure by the cross-sectional area of the reduced section.

ASTM D638 "Tensile Properties of Plastics"
We made samples that come from this specification, using a steel die. Samples had a width and thickness of approximately 0.5"each.

We also made two samples 1" wide by 0.5" width, and produced tensile strengths of 647 psi and 690 psi. These samples were not made to a particular specification.

Sample	Tensile Strength (psi)
1 (D638)	498
2 (D638)	785
3 (D638)	787
4	690
5	647

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Attention: *Paul Tannenbaum*
US UTILITY ENCLOSURES
2230 Highway 11 North
Sweetwater, TN 37874
P: 423-337-2330 / F:

W/O. No.: USU001-02-04-78849-1
P.O. No.: 0000949
Report Date: 2/21/2005
Date of Service: 2/25/2005

IZOD IMPACT RESISTANCE
Method: ASTM D256
Pendulum Impact at 11.3 ft./sec

Sample	Impact Resistance (ft.lbf/in.)	Type of Failure
1	0.78	Partial
2	0.91	Partial
3	0.97	Partial
Average	0.89	---

COMPRESSIVE STRENGTH
Method: ASTM D695
Cylindrical Specimens

Sample	Compressive Strength (psi)
1	> 2,700
2	> 3,405
3	> 3,405
4	> 2,955
5	> 2,955

The material did not produce a well-defined failure. As cited in ASTM D695, many plastic materials will continue to deform in compression until a flat disk is produced, with compressive stress rising steadily in the process. Compressive strength can have no real meaning in such cases. For the material tested, using a 1,000 lb. load cell, testing was manually stopped near loads of 950 lbs. The cylinders exhibited flattening, but no failure. The compressive strength is a nominal value, based on the stress carried by the samples at the time th testing was stopped. It can be stated that the material exhibits a compressive strength > 3,000 psi.

TENSILE STRENGTH PROPERTIES
Method: ASTM D638

Respectfully Submitted

Terry Wilt
Manager, Product Evaluation

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W/O. No.: USU001-02-04-78849-1
P.O. No.: 0000949
Report Date: 2/21/2005
Date of Service: 2/25/2005

Sample	Tensile Strength (psi)	Elongation
1	665	9.8 %
2	580	12.5 %
3	535	10.0 %
4	540	11.0 %
5	670	9.5 %
Average	590	10.5 %

FLEXURAL PROPERTIES
Method: ASTM D790

Sample	Flexural Modulus (psi)	Flexural Stress at 5% Strain (psi)
1	25,985	910
2	34,210	1,110
3	40,730	1,165
4	27,670	845
5	27,005	965
Average	31,120	1,000

Check parameters for modulus (limits)

A specimen is deflected either until rupture occurs or a maximum strain rate of 5% is reached. A calculation provided in D790 is used to determine the deflection at 5%. It is at that specific amount of midspan deflection that the flexural stress was reported.

WATER ABSORPTION
Method: ASTM D570
24 hour immersion

Sample	Dry Weight (g)	Post Immersion Weight (g)	% Weight Increase
1	20.373	20.408	0.17 %

Respectfully Submitted

Terry Wilt
Manager, Product Evaluation

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W/O. No.: USU001-02-04-78849-1
P.O. No.: 0000949
Report Date: 2/21/2005
Date of Service: 2/25/2005

2	21.244	21.284	0.19 %
3	18.973	18.993	0.11 %
Average	---	---	0.16 %

VICAT SOFTENING TEMPERATURE
Method: ASTM D1525

Sample #	Needle Penetration	VICAT Temperature
1	0.039"	215°F
2	0.039"	185°F

Peanut oil was used as the medium

DEFLECTION TEMPERATURE UNDER FLEXURAL LOAD
Method: ASTM D648
1.82 MPa (264 psi) Load

Sample #	Deflection	Temperature
1	0.01"	225°F
2	0.01"	220°F

Peanut oil was used as the medium

BURNING RATE
Method: ASTM D635

Sample #	Burn Time (min:sec)
1	15:30
2	9:30
3	11:00

Respectfully Submitted

Terry Wilt
Manager, Product Evaluation

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W/O. No.: USU001-02-04-78849-1
P.O. No.: 0000949
Report Date: 2/21/2005
Date of Service: 2/25/2005

D635 states that if the sample burns from the 25mm mark to the 100mm mark, record time it takes for burn travel the distance. D635 also states that if the first 3 samples burn over the length of the specimen, to st testing.

EVALUATING RESISTANCE TO CHEMICAL AGENTS
Method: ASTM D543

Solution	% Dimensional Change	% Weight Change	Visual Change
Kerosene 100%	27.5% increase	26.5% Iicrease	Slick feel, rough surface (like flak
Transformer Oil	3.3% increase	3% increase	Slick feel, rough surface (like flak
Sodium Chloride 5%	0.32% increase	0.15% increase	No change
Sodium Hydroxide 0.1N	0.4% decrease (thickness)	0.35% increase	No change
Sodium Sulfate 0.1N	0.32% increase	0.35% increase	No change
Sodium Carbonate 0.1N	0.99% increase	0.32% increase	No change
Hydrochloric Acid 0.2N	0.07% increase	0.33% increase	No change

Respectfully Submitted

Terry Wilt
Manager, Product Evaluation

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W/O. No.: USU001-03-09-80997-1
P.O. No.: 0000949
Report Date: 3/11/2005

IZOD IMPACT RESISTANCE
Method: ASTM D256
Pendulum Impact at 11.3 ft./sec
With 0.13 diameter tup

Sample	Impact Resistance (ft.lbf/in.)	Type of Failure
1	4.15	Partial
2	3.98	Partial
3	4.14	Partial
Average	4.09	---

IZOD IMPACT RESISTANCE
Method: ASTM D256
Pendulum Impact at 11.3 ft./sec
With striker edge

Sample	Impact Resistance (ft.lbf/in.)	Type of Failure
1	5.96	Partial
2	5.29	Partial
3	4.37	Partial
Average	5.21	---

BRITTLENESS TEMPERATURE
Method: ASTM D746
Type I specimens

Lowest temperature
-34°F

5 successive samples did not break or crack upon impact at -34°F, which establishes the brittle point temperature. Methanol and CO_2 chips were used to maintain temperature. Samples rested at temperature for 3 minutes prior to impact.

Respectfully Submitted

Terry Wilt
Manager, Product Evaluation

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W/O. No.: USU001-03-09-80997-1
P.O. No.: 0000949
Report Date: 3/11/2005

COMPRESSIVE STRENGTH
Method: ASTM D695
Cylindrical Specimens

Sample	Compressive Strength (psi)
1	> 2,700
2	> 3,405
3	> 3,405
4	> 2,955
5	> 2,955

The material did not produce a well-defined failure. As cited in ASTM D695, many plastic materials will continue to deform in compression until a flat disk is produced, with compressive stress rising steadily in the process. Compressive strength can have no real meaning in such cases. For the material tested, using a 1,000 lb. load cell, testing was manually stopped near loads of 950 lbs. The cylinders exhibited flattening, but no failure. The compressive strength is a nominal value, based on the stress carried by the samples at the time the testing was stopped. It can be stated that the material exhibits a compressive strength > 3,000 psi.

VICAT SOFTENING TEMPERATURE
Method: ASTM D1525

Sample #	Needle Penetration	VICAT Temperature
1	0.039"	215°F
2	0.039"	185°F

Peanut oil was used as the medium

DEFLECTION TEMPERATURE UNDER FLEXURAL LOAD
Method: ASTM D648
1.82 MPa (264 psi) Load

Sample #	Deflection	Temperature
1	0.01"	225°F
2	0.01"	220°F

Peanut oil was used as the medium

Respectfully Submitted

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W/O. No.: USU001-03-09-80997-1
P.O. No.: 0000949
Report Date: 3/11/2005

BURNING RATE
Method: ASTM D635

Sample #	Burn Time (min:sec)
1	15:30
2	9:30
3	11:00

D635 states that if the sample burns from the 25mm mark to the 100mm mark, record time it takes for burn to travel the distar
D635 also states that if the first 3 samples burn over the length of the specimen, to stop testing.

EVALUATING RESISTANCE TO CHEMICAL AGENTS
Method: ASTM D543

Solution	% Dimensional Change	% Weight Change	Visual Change
Kerosene 100%	27.5% increase	26.5% increase	Slick feel, rough surface (like flakes)
Transformer Oil	3.3% increase	3% increase	Slick feel, rough surface (like flakes)
Automotive Motor oil	2.4% increase	1.6% increase	Slick feel, rough surface (like flakes)
Sodium Chloride 5%	0.32% increase	0.15% increase	No change
Sodium Hydroxide 0.1N	0.4% decrease (thickness)	0.35% increase	No change
Sodium Sulfate 0.1N	0.32% increase	0.35% increase	No change
Sodium Carbonate 0.1N	0.99% increase	0.32% increase	No change
Hydrochloric Acid 0.2N	0.07% increase	0.33% increase	No change

WATER ABSORPTION
Method: ASTM D570
24 hour immersion

Sample	Dry Weight (g)	Post Immersion Weight (g)	% Weight Increase
1	20.373	20.408	0.17 %
2	21.244	21.284	0.19 %
3	18.973	18.993	0.11 %
Average	---	---	0.16 %

Respectfully Submitted

Terry Wilt
Manager, Product Evaluation