

**Report No.
177:029744-36**

**CHILD RESTRAINT SYSTEM
COMPONENT TESTS
FMVSS 213**

**Model No.
Evenflo Symphony**

**SGS U.S. TESTING CO., INC.
291 Fairfield Avenue
Fairfield, NJ 07004**



July 20, 2010

FINAL REPORT

213-UST-09-36

PREPARED FOR

**U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
1200 NEW JERSEY AVE, SE (ROOM W45-304)
WASHINGTON, D.C. 20590**

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Report No.: 177:029744-36

Prepared by: SGS U.S. Testing Company Inc.

Approved by: 
Frank Savino

Date: July 20, 2010

Report Accepted by:

**Contract Technical Manager, O.V.S.C.
Office of Vehicle Safety Compliance**

Accepted By: 

Acceptance Date: July 20, 2010

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6. Performing Organization Code UST-213-09-36		7. Author: Frank Savino, Project Manager	
8. Performing Organization Report No. UST-DOT-213-09-36		9. Performing Organization Name and Address: SGS U.S. Testing Company, Inc. 291 Fairfield Avenue Fairfield, NJ 07004	
10. Work Unit No.		11. Order Number DTNH22-07-D-00065	
12. Sponsoring Agency Name and Address: U.S. DEPARTMENT OF TRANSPORTATION NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION ENFORCEMENT OFFICE OF VEHICLE SAFETY COMPLIANCE 1200 NEW JERSEY AVE, SE (ROOM W45-304) WASHINGTON, D.C. 20590		13. Type of report and Period Covered FINAL TEST REPORT June 15-July 1, 2010	
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16. Abstract THIS REPORT PRESENTS THE RESULTS OF TESTS PERFORMED IN ACCORDANCE WITH FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 213 ON CHILD RESTRAINT SYSTEM COMPONENT PARTS. MODEL NUMBER: Evenflo Symphony ALL TESTS WERE SATISFACTORILY COMPLETED.			
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TABLE OF CONTENTS

Section 1.	Purpose and Test Procedure
Section 2.	Inspection Data and Test Data
Appendix A.	Equipment List and Calibration Schedules
Appendix B.	Interpretations or Deviations from FMVSS No. 213
Appendix C.	Photographs of Equipment and Seat

SECTION 1

PURPOSE AND TEST PROCEDURES

PURPOSE AND TEST PROCEDURES

Purpose: The purpose of this report was to determine if the production child restraint components parts supplied by the National Highway Traffic Safety Administration met the requirements of Federal Motor Vehicle Safety Standard Number 213 - "Child Restraint System".

Test Procedures: The "SGS U.S. Testing Co. Laboratories Test Procedure for FMVSS No. 213" dated April 2007 submitted and approved by the office of Vehicle Safety Compliance National Highway Traffic Safety Administration contains the specific procedures used to conduct this test. This procedure shall not be interpreted to be in conflict with any portion of FMVSS No. 213 and amendments in effect as noted in the applicable order.

SECTION 2

INSPECTION DATA AND TEST DATA

INSPECTION AND TEST DATA
FMVSS NO. 213 - CHILD RESTRAINT SYSTEMS

Report No.: 177:029744-36

Child Restraint System Identification

Manufacturer:

Name: Evenflo Co. Inc.
Address: 1801 Commerce Drive
Piqua, OH 45356

Model: Symphony

Technicians: Edwin Rivera and John Roycraft

Project Manager: Frank Savino

WEBBING PERFORMANCE TESTS (a213-5.4.1)

Report No.: 177:029744-36

Test Date: July 1, 2010

Laboratory Ambient Conditions During Testing

Temperature: 73 ° F

Relative Humidity: 50 %

Webbing Usage on Restraint: Harness

<u>Test</u>	<u>Compliance Requirement</u>	<u>Test Result</u>	<u>Pass/Fail</u>
Non-Degraded Webbing (FMVSS 209, S5.1 (b))	New webbing breaking strength, 15,000 N (webbing used to secure CRS to vehicle) or 11,000 N (webbing used to secure child within CRS)	1. 13,700 2. 13,400 3. 13,800 Median: 13,700	Pass
Resistance to Abrasion (FMVSS 209, S4.2(d) & S5.1(d)) Abrasion Cycles Performed 2500 (2500 Required)	Median breaking strength, Newtons (75% of median baseline strength)	1. 13,200 2. 12,700 3. 13,000 Median: 13,000 Strength Retained: 94.9%	Pass
Resistance to Buckle Abrasion (FMVSS 209, S5.3(c)) Abrasion cycles Performed 2500 (2500 Required)	Median breaking strength, Newtons (75% of median baseline strength)	1. N/A 2. N/A 3. N/A Median: N/A	N/A

WEBBING PERFORMANCE TESTS (a213-5.4.1) (Continued)**Report No.:** 177:029744-36**Test Date:** July 1, 2010

Test	Compliance Requirement	Test Result	Pass/Fail
Resistance to Light (FMVSS 209, S4.2 (e) & S5.1(e)) Exposure Time 100 Hr. (100 Hours Required)	Median breaking strength, Newtons (60% of median baseline strength)	1. 13,500 2. 13,500 3. 13,800 Median: 13,500 Strength Retained: 98.5%	Pass
	Color Retention >= No. 2 on the Geometric Gray Scale	1. 5 2. 5 3. 5	Pass
Resistance to Micro- Organisms (FMVSS 209, S4.2 (f), S5.1 (f))	Median breaking strength, Newtons (85% of median baseline strength)	1. N/A 2. N/A 3. N/A Median: N/A	N/A
Width Requirement (FMVSS 213, S5.4.1.3)	Width >= 38 mm) If webbing contacts the test dummy torso	1. 39.0 2. 39.0 3. 39.0	Pass

Remarks:**Technicians:** John Roycraft**Project Manager:** Frank Savino

WEBBING PERFORMANCE TESTS (a213-5.4.1)**Report No.:** 177:029744-36**Test Date:** July 1, 2010**Laboratory Ambient Conditions During Testing**

Temperature: 73 ° F

Relative Humidity: 50 %

Webbing Usage on Restraint: Tether

<u>Test</u>	<u>Compliance Requirement</u>	<u>Test Result</u>	<u>Pass/Fail</u>
Non-Degraded Webbing (FMVSS 209, S5.1 (b))	New webbing breaking strength, 15,000 N (webbing used to secure CRS to vehicle) or 11,000 N (webbing used to secure child within CRS)	1. 19,800 2. 19,900 3. 20,000 Median: 19,900	Pass
Resistance to Abrasion (FMVSS 209, S4.2(d) & S5.1(d)) Abrasion Cycles Performed 2500 (2500 Required)	Median breaking strength, Newtons (75% of median baseline strength)	1. 19,800 2. 20,000 3. 19,900 Median: 19,900 Strength Retained: 100	Pass
Resistance to Buckle Abrasion (FMVSS 209, S5.3(c)) Abrasion cycles Performed 2500 (2500 Required)	Median breaking strength, Newtons (75% of median baseline strength)	1. N/A 2. N/A 3. N/A Median: N/A	N/A

WEBBING PERFORMANCE TESTS (a213-5.4.1) (Continued)**Report No.:** 177:029744-36**Test Date:** July 1, 2010

<u>Test</u>	<u>Compliance Requirement</u>	<u>Test Result</u>	<u>Pass/Fail</u>
Resistance to Light (FMVSS 209, S4.2 (e) & S5.1(e)) Exposure Time 100 Hr. (100 Hours Required)	Median breaking strength, Newtons (60% of median baseline strength)	1. 19,900 2. 19,800 3. 19,900 Median: 19,900 Strength Retained: 100	Pass
	Color Retention >= No. 2 on the Geometric Gray Scale	1. 5 2. 5 3. 5	Pass
Resistance to Micro- Organisms (FMVSS 209, S4.2 (f), S5.1 (f))	Median breaking strength, Newtons (85% of median baseline strength)	1. N/A 2. N/A 3. N/A Median: N/A	N/A
Width Requirement (FMVSS 213, S5.4.1.3)	Width >= 38 mm) If webbing contacts the test dummy torso	1. 39.0 2. 39.0 3. 39.0	N/A

Remarks:**Technicians:** John Roycraft**Project Manager:** Frank Savino

**BELT BUCKLE AND ADJUSTMENT HARDWARE
PERFORMANCE TESTS (S213-S5.4.2/S209-S4.3)**

Report No.: 177:029744-36

Test Date: June 21, 2010

Item Code: Evenflo Symphony

Laboratory Ambient Conditions During Testing

Temperature: 73 °F

Relative Humidity: 50 %

Test	Compliance Requirement	Test Result	Pass/Fail
Corrosion Resistance (FMVSS 209), (S4.3.(a) (2)) Exposure Time 24 Hours (24 Hours Required) Drying Time 1 Hour (1 Hour Required)	No Corrosion (NC)	1. NC	Pass
		2. NC	Pass
		3. NC	Pass
Push Buttons S213; S5.4.3.5 (c)	Area \geq 0.6 sq. in.)	0.94	Pass
	Principal Dimensions	1.54 x 0.92	N/A
Lever Release	Cylinder Insertion	N/A	N/A
Other	Two-finger Access	N/A	N/A

**BELT BUCKLE AND ADJUSTMENT HARDWARE
PERFORMANCE TESTS (S213-S5.4.2/S209-S4.3) (Continued)**

Report No.: 177:029744-36

<u>Test</u>	<u>Compliance Requirement</u>	<u>Test Result</u>		<u>Pass/Fail</u>	
Buckle Latch (FMVSS 209 S4.3(g)) Follows Corrosion Resistance Cycles 200 (200 Required)	No Functional Deterioration (NFD)	1.	NFD	1.	Pass
		2.	NFD	2.	Pass
		3.	NFD	3.	Pass
Buckle Latch (FMVSS 209 S4.3(g)) Corrosion Resistance metal to metal buckles Note: Cycle Button; Perform manual latching and unlatching prior to partial engagement test. Measurements truncated to one decimal place.	Partial Engagement Separation Force <5 lb.	Test Result As Received (Results in Pounds)		Test Result After Corrosion Resistance	
		Front	Reverse	Front	Reverse
		<u>Sample 1</u>	<u>Sample 1</u>	<u>Sample 1</u>	<u>Sample 1</u>
		1) P	1) N/A	1) P	1) N/A
		2) P	2) N/A	2) P	2) N/A
		3) P	3) N/A	3) P	3) N/A
		<u>Sample 2</u>	<u>Sample 2</u>	<u>Sample 2</u>	<u>Sample 2</u>
		1) P	1) N/A	1) P	1) N/A
		2) P	2) N/A	2) P	2) N/A
3) P	3) N/A	3) P	3) N/A		
<u>Sample 3</u>	<u>Sample 3</u>	<u>Sample 3</u>	<u>Sample 3</u>		
1) P	1) N/A	1) P	1) N/A		
2) P	2) N/A	2) P	2) N/A		
3) P	3) N/A	3) P	3) N/A		

Remarks: P = Pass
N/A = Not Applicable

Technicians: Edwin Rivera

Project Manager: Frank Savino

**BELT BUCKLE AND ADJUSTMENT HARDWARE
PERFORMANCE TESTS (S213-S5.4.2/S209-S4.3)**

Report No.: 177:029744

Test Date: June 24, 2010

Item Code: Evenflo Symphony

Laboratory Ambient Conditions During Testing

Temperature: 73 °F

Relative Humidity: 50 %

<u>Test</u>	<u>Compliance Requirement</u>	<u>Test Result</u>	<u>Pass/Fail</u>
Temperature Resistance (FMVSS 209), (S4.3.(b)) Exposure Time 24 Hours (24 Hours Required) Drying Time 1 Hour (1 Hour Required)	No Functional Deterioration (NFD)	1. NFD 2. NFD 3. NFD	Pass Pass Pass
Push Buttons S213; S5.4.3.5 (c)	Area \geq 0.6 sq. in.	0.94	Pass
	Linear Dimensions	1.54 x 0.92	N/A
Lever Release	Cylinder Insertion	N/A	N/A
Other	Two-finger Access	N/A	N/A

**BELT BUCKLE AND ADJUSTMENT HARDWARE
PERFORMANCE TESTS (S213-S5.4.2/S209-S4.3) (Continued)**

Report No.: 177:029744-36

<u>Test</u>	<u>Compliance Requirement</u>	<u>Test Result</u>		<u>Pass/Fail</u>	
Buckle Latch (FMVSS 209 S4.3(g)) Follows Temperature Resistance Cycles 200 (200 Required))	No Functional Deterioration (NFD)	1. NFD		1. Pass	
		2. NFD		2. Pass	
		3. NFD		3. Pass	
Buckle Latch (FMVSS 209 S4.3(g)) Temperature Resistance metal to metal buckles Note: Cycle Button; Perform manual latching and unlatching prior to partial engagement test. Measurements truncated to one decimal place.	Partial Engagement Separation Force <5 lb.	Test Result As Received (Results in Pounds)		Test Result After Temperature Resistance	
		Front	Reverse	Front	Reverse
		<u>Sample 1</u>	<u>Sample 1</u>	<u>Sample 1</u>	<u>Sample 1</u>
		1) P	1) N/A	1) P	1) N/A
		2) P	2) N/A	2) P	2) N/A
		3) P	3) N/A	3) P	3) N/A
		<u>Sample 2</u>	<u>Sample 2</u>	<u>Sample 2</u>	<u>Sample 2</u>
		1) P	1) N/A	1) P	1) N/A
		2) P	2) N/A	2) P	2) N/A
		3) P	3) N/A	3) P	3) N/A
		<u>Sample 3</u>	<u>Sample 3</u>	<u>Sample 3</u>	<u>Sample 3</u>
		1) P	1) N/A	1) P	1) N/A
2) P	2) N/A	2) P	2) N/A		
3) P	3) N/A	3) P	3) N/A		

Remarks: P = Pass
N/A = Not Applicable

Technicians: Edwin Rivera

Project Manager: Frank Savino

APPENDIX A

EQUIPMENT LIST AND CALIBRATION

SGS U.S. TESTING COMPANY INC.

TEST EQUIPMENT

<u>NO.</u>	<u>ITEM</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NO.</u>	<u>CAL. PERIOD</u>	<u>DATE OF LAST CAL.</u>	<u>ACCURACY</u>	<u>REMARKS</u>
<u>WEBBING TESTING</u>								
1	Steel Ruler	L.S. Starrett	607R	---	---	---	+/-0.01 inch	Webbing Width
2	Hex-Bar Abrader	U.S. Testing	---	---	1Year*	5/10	---	*Timer-Counter Assembly and Weights
3	Weatherometer	Atlas Electric Co.	CXW	CB-12295	1 Year*	4/10	+/-1%	*Temp. and Voltage Meters
4	Weatherometer	Atlas Electric Co.	CXW	CB-1214	1 Year*	4/10	+/-1%	*Temp. and Voltage Meters
5	Weatherometer	Atlas Electric Co.	XW-WT	W0-3009	1 Year*	4/10	+/-1%	*Temp. and Voltage Meters
6	Color Change - Gray Scale	AATCC	---	---	---	---	---	Visual Comparison
7	Universal Testing Machine	Instron	1115	3289	1 Year	4/10	+/-1%	Webbing Strength
8	2" Split Drum Grips	U.S. Testing Co.	---	---	---	---	---	Instron Fixture

SGS U.S. TESTING COMPANY INC.

TEST EQUIPMENT

<u>NO.</u>	<u>ITEM</u>	<u>MANUFACTURER</u>	<u>MODEL</u>	<u>SERIAL NO.</u>	<u>CAL. PERIOD</u>	<u>DATE OF LAST CAL.</u>	<u>ACCURACY</u>	<u>REMARKS</u>
<u>BUCKLE TESTING</u>								
9	Salt Spray Chamber	Singleton Corp.	SCCH22	SCCH22-21947	---	---	---	Checked daily in accordance with ASTM B-117
10	Temperature Recorder	Honeywell	DR4300	0318Y359 016800003	1 Year	5/10	+/- 5°F	Monitor Salt Spray Temperature
11	Temperature Humidity Chamber	Blue-M	FR-386PC	AA221	1Year	4/10	+/-2°C +/-5% R.H	Temperature-Humidity Exposure
12	Temperature Humidity Chamber	Blue-M	FR-386PBX	AA278	1Year	4/10	+/-2°C +/-5% R.H	Temperature-Humidity Exposure
13	Temperature Chamber	Despatch	52392 V29	037-15	1 Year	4/10	+/-2°C +/-5% R.H	Temperature Exposure
14	Temperature Recorder	Bristol	N15-T25	736652	1 Year	4/10	+/-1%	Temperature Measurement
15	Pushbutton Latch Fixture	U.S. Testing	---	---	1 Year*	5/10	---	Force checked prior to use. *Timer Counter

STANDARD LABORATORY CONDITIONING

16	Temperature / Humidity Recorder	Dickson	TH800	07150222	1Year	5/10	+/-2°F +/-5% R.H.	Monitor Room Conditioning
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APPENDIX B

INTERPRETATION AND/OR DEVIATIONS FROM FMVSS NO. 213

NO INTERPRETATIONS OR DEVIATIONS FROM FMVSS NO. 213

APPENDIX C

PHOTOGRAPHS

LISTS OF PHOTOGRAPHS

The following section identifies photographed testing equipment.

Page Number	Description of Photograph
C-2	Corrosion Resistance
C-3	Temperature Humidity Chamber
C-4	Temperature Chamber
C-5	Button Cycling Apparatus
C-6	Breaking Strength Apparatus
C-7	Resistance to Light
C-8	Hex Bar Abrasion Apparatus

The following section identifies photographs of the seat.

Photograph Number	Description of Photograph
C-9	Top of Box
C-10	Side of Box
C-11	Front of Seat
C-12	Side of Seat
C-13	Back of Seat

C-2

Salt Spray Chamber



C-3



Temperature/Humidity Chamber

C-4



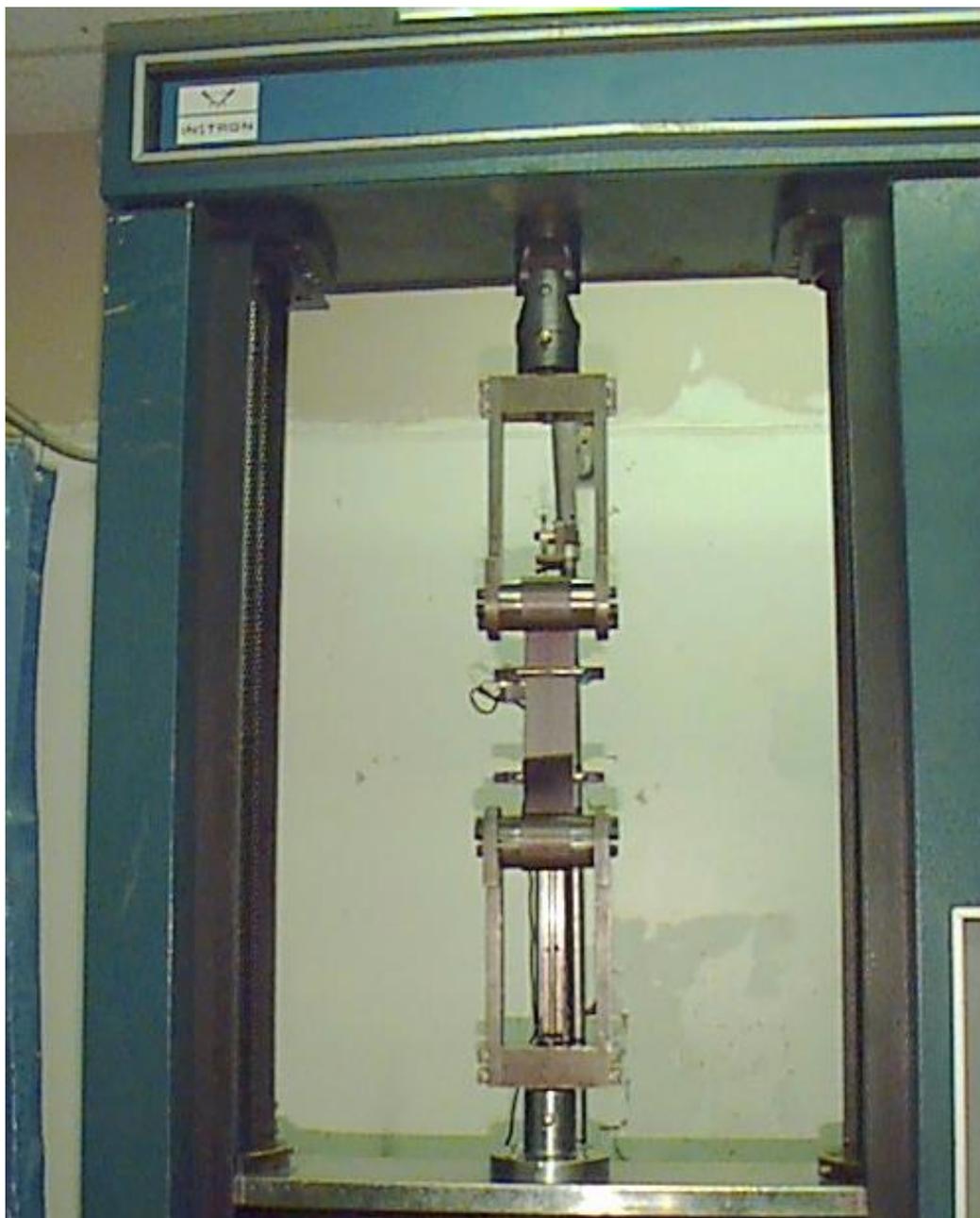
Temperature Chamber

C-5



Button Cycling Apparatus

C-6



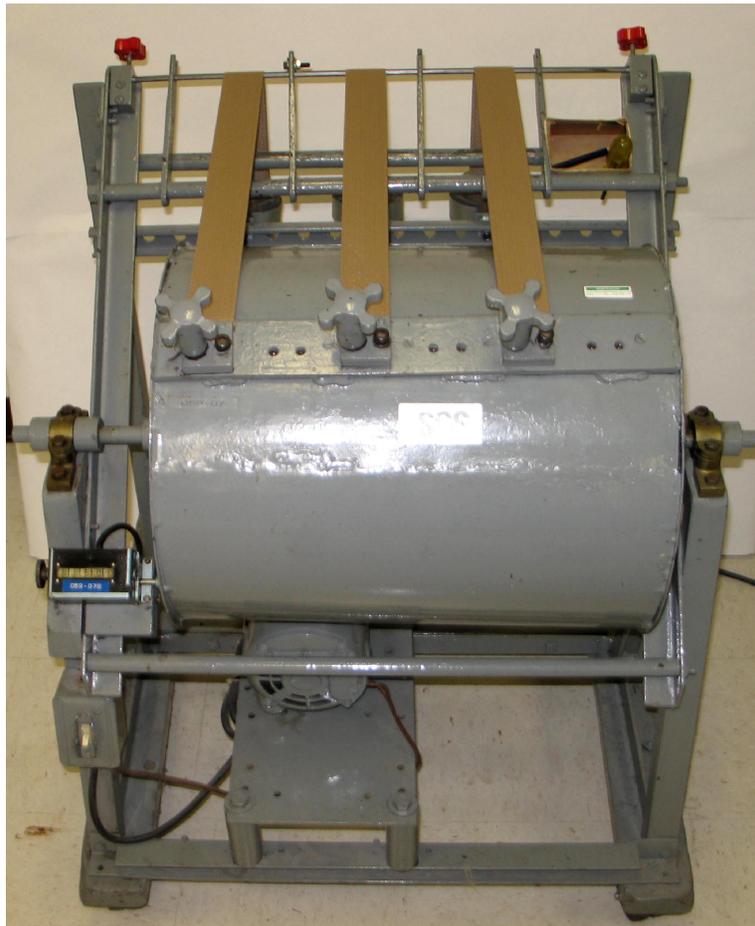
Instron Universal Testing Machine

C-7



Weatherometer

C-8



Hex Bar Abrasion Apparatus

C-9

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Best for Baby™

#36

Symphony
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Meets or exceeds all applicable
Federal Safety Standards **AND**
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Cumple o excede todas las normas
de seguridad federales y la Prueba
de Impacto Lateral de Evenflo

Satisfait ou surpasse toutes les
normes de sécurité fédérales en
vigueur **AJINSI QU'É** le test de choc
latéral conforme à la norme d'Evenflo

#36 C-09

C-11

#36 C-11



C-12

#36 C-12



C-13

#36 C-13

