

# SAFETY COMPLIANCE TESTING FOR FMVSS No. 218 MOTORCYCLE HELMETS

**Brand: TRIANGLE**  
**Model: TFF20**  
**Tested Size: L (59-60 cm)**

Prepared For:

**Zhejiang Ruiyide Automobile & Motorcycle Fittings Co., Ltd.**  
Yanzhou Road, Lanxi Economic Development Area,  
Jinhua City, Zhejiang, China 321100



**07 September 2016**

**Final Report No.: 664.0009.004**

Tested By:

**Taicang ACT Sporting Goods Testing Co., Ltd.**  
No. 35 Zhenghe Road,  
Ludu Town, Taicang City, Suzhou,  
Jiangsu Province, China 215412  
[www.act-lab.com](http://www.act-lab.com)

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Contract File No.: 664.0009

Test File: 004

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Control Document Rev. 17 July 2013

Technician: Edward Wong

Test Date: 07 September 2016

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## PURPOSE OF COMPLIANCE TEST

### **Purpose:**

**The purpose of this test was to determine if the motorcycle helmets supplied by:**

**Zhejiang Ruiyide Automobile & Motorcycle Fittings Co., Ltd.**

**met the requirements of**

**Federal Motor Vehicle Safety Standard No. 218: Motorcycle Helmets effective May 13, 2013.**

**All samples received were in good condition and appropriate for these tests.**

### **Test Procedure:**

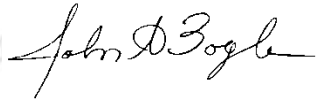
**This test was performed following TP-218-07 and ACT Lab Cadex Helmet Testing Manual 2.3.**

### HELMET DATA

Helmet Brand Name	TRIANGLE						
Model Designation	TFF20						
Manufacturer	Zhejiang Ruiyide Automobile & Motorcycle Fittings Co., Ltd.						
Helmet Size Label	L (59-60 cm)						
Test Headform size	Small		Medium	X	Large		
Helmet Positioning Index (HPI)	50 mm		Manufacturer supplied		ACT determined		X
Helmet Coverage	Partial		Full		Complete		Modular X
Shell Material	ABS Plastic						
Liner Material	EPS + FABRIC						
Comfort Padding	Resilient Foam						
Buckle Description	Quick Release Ratchet Type						

HELMET	A Ambient	B Low Temp	C High Temp	D Water Immersed	E Spare
Shell Color/Pattern	Black	Black	Black	Black	Black
Weight (grams)	1226	1232	1229	1229	1231
Month & Year of Manufacture	09/16	09/16	09/16	09/16	09/16

Reviewed by: John Bogler



**COMMENTS:**

1. This TFF20 L helmet met all FMVSS 218 requirements.
2. All helmets were received in undamaged condition and were appropriate for testing.
3. Weights listed above for helmets A-D are as tested with face shield and chin bar removed.
4. Weight for helmet E is complete with all components in place.

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## SUMMARY OF TEST RESULTS

INDICATE P - Pass or F - Fail

HELMET	A	B	C	D	COMMENTS
TEST	AMBIENT	LOW TEMP	HIGH TEMP	WATER IMMERSED	
IMPACT	Pass	Pass	Pass	Pass	
PENETRATION	Pass	Pass	Pass	Pass	
RETENTION	Pass	Pass	Pass	Pass	

TEST	PASS	FAIL
PERIPHERAL VISION	Pass	
PROJECTIONS	Pass	
LABELING	Pass	

### SELECTION OF APPROPRIATE HEADFORM

Paragraph S6.1 - If the helmet size designation falls into more than one of three size ranges, it shall be tested on each appropriate headform.

HELMET SIZE DESIGNATION	HEADFORM SIZE
Less than or equal to 6-3/4 (European Size 54)	SMALL
Greater than 6-3/4, but less than or equal to 7-1/2 (European Size 60)	MEDIUM
Greater than 7-1/2 (European 60)	LARGE

CONDITIONING FOR TESTING — Paragraph S6.4 — The protective headgear shall be conditioned for not less than 4 hours and no more than 24 hours, in the specified environmental condition shown below, prior to test.

Ambient Conditions	16°C to 26°C (61°F to 79°F); 30% to 70% Relative Humidity
Low Temperature	-15°C to -5°C (5°F to 23°F)
High Temperature	45°C to 55°C (113°F to 131°F)
Water Immersion	16°C to 26°C (61°F to 79°F)

The maximum time during which the protective headgear may be out of the conditioning environment shall not exceed 4 minutes. It must then be returned to the conditioned environment for a minimum of 3 minutes for each minute or portion of a minute in excess of 4 minutes out of the conditioning environment or 12 hours, whichever is less, prior to resumption of testing.

Ambient Temperature	Ambient Humidity:
22°C	57%

## IMPACT ATTENUATION

Helmet ID	Condition	Impact #	Impact Location	Anvil	Drop Height (cm)	Velocity (m/sec)	Duration at 150G (ms)	Duration at 200G (ms)	Peak Acc. (g)	Pass/Fail
664.0009.004-A	Ambient	1	LF SIDE	FLAT	199.0	5.9931	0.96	0.00	154.5	Pass
664.0009.004-A	Ambient	2	LF SIDE	FLAT	199.0	6.0144	1.54	0.00	173.6	Pass
664.0009.004-A	Ambient	3	REAR	FLAT	199.0	6.0404	1.96	0.00	157.9	Pass
664.0009.004-A	Ambient	4	REAR	FLAT	199.0	6.0528	2.62	0.00	170.2	Pass
664.0009.004-A	Ambient	5	FRONT	HEMI	149.0	5.2640	0.00	0.00	81.7	Pass
664.0009.004-A	Ambient	6	FRONT	HEMI	149.0	5.2538	0.00	0.00	129.9	Pass
664.0009.004-A	Ambient	7	RT SIDE	HEMI	149.0	5.2698	0.00	0.00	94.4	Pass
664.0009.004-A	Ambient	8	RT SIDE	HEMI	149.0	5.2549	0.00	0.00	145.6	Pass
664.0009.004-B	Cold	1	LF SIDE	FLAT	199.0	6.0227	1.07	0.00	159.4	Pass
664.0009.004-B	Cold	2	LF SIDE	FLAT	199.0	6.0207	2.03	0.00	178.6	Pass
664.0009.004-B	Cold	3	REAR	FLAT	199.0	6.0405	1.53	0.00	167.7	Pass
664.0009.004-B	Cold	4	REAR	FLAT	199.0	6.0473	2.31	0.00	167.7	Pass
664.0009.004-B	Cold	5	FRONT	HEMI	149.0	5.2726	0.00	0.00	81.7	Pass
664.0009.004-B	Cold	6	FRONT	HEMI	149.0	5.2459	0.00	0.00	116.6	Pass
664.0009.004-B	Cold	7	RT SIDE	HEMI	149.0	5.2417	0.00	0.00	89.0	Pass
664.0009.004-B	Cold	8	RT SIDE	HEMI	149.0	5.2361	0.00	0.00	144.6	Pass
664.0009.004-C	Hot	1	LF SIDE	FLAT	199.0	6.0218	0.49	0.00	152.0	Pass
664.0009.004-C	Hot	2	LF SIDE	FLAT	199.0	6.0148	1.66	0.00	165.3	Pass
664.0009.004-C	Hot	3	REAR	FLAT	199.0	6.0418	0.00	0.00	140.7	Pass
664.0009.004-C	Hot	4	REAR	FLAT	199.0	6.0456	0.00	0.00	145.6	Pass
664.0009.004-C	Hot	5	FRONT	HEMI	149.0	5.2556	0.00	0.00	91.0	Pass
664.0009.004-C	Hot	6	FRONT	HEMI	149.0	5.2327	0.00	0.00	112.7	Pass
664.0009.004-C	Hot	7	RT SIDE	HEMI	149.0	5.2303	0.00	0.00	91.0	Pass
664.0009.004-C	Hot	8	RT SIDE	HEMI	149.0	5.2596	0.44	0.00	154.5	Pass
664.0009.004-D	Wet	1	LF SIDE	FLAT	199.0	6.0419	0.83	0.00	151.5	Pass
664.0009.004-D	Wet	2	LF SIDE	FLAT	199.0	6.0584	2.74	0.00	169.2	Pass
664.0009.004-D	Wet	3	REAR	FLAT	199.0	6.0340	0.00	0.00	141.2	Pass
664.0009.004-D	Wet	4	REAR	FLAT	199.0	6.0799	0.00	0.00	138.2	Pass
664.0009.004-D	Wet	5	FRONT	HEMI	149.0	5.2551	0.00	0.00	64.4	Pass
664.0009.004-D	Wet	6	FRONT	HEMI	149.0	5.2510	0.00	0.00	130.4	Pass
664.0009.004-D	Wet	7	RT SIDE	HEMI	149.0	5.2651	0.00	0.00	87.1	Pass
664.0009.004-D	Wet	8	RT SIDE	HEMI	149.0	5.2847	0.00	0.00	133.8	Pass

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## PENETRATION

Paragraph S5.2 and S7.2

**WEIGHT OF STRIKER:** 2.95 to 3.06 kg (6 pounds, 8 ounces to 6 pounds, 12 ounces)

**POINT OF STRIKER:** Radius =  $0.5 \pm 0.1$  mm ( $0.02 \pm 0.004$  in.), included angle of  $60^\circ \pm 0.5^\circ$ , hardness minimum of 60 Rockwell "C" Scale and a cone height of not less than  $3.8 \pm 0.038$  cm ( $1.5 \pm 0.015$  in.).

**HEIGHT OF FALL:**  $300 \text{ cm} \pm 1.5 \text{ cm}$ , measured from the tip of the striker point to the outer surface of the mounted protective headgear.

**FAILURE CRITERION:** When tested, the protective headgear shall be failed if the penetrator has made an indentation in the headform.

TEST	HELMET	TEST LOCATION	PASS	FAIL	CONDITIONS
1	A	Crown	X		AMBIENT
2	A	Right Rear	X		AMBIENT
3	B	Crown	X		LOW TEMPERATURE
4	B	Right Rear	X		LOW TEMPERATURE
5	C	Crown	X		HIGH TEMPERATURE
6	C	Right Rear	X		HIGH TEMPERATURE
7	D	Crown	X		IMMERSED
8	D	Right Rear	X		IMMERSED



## RETENTION SYSTEM

Paragraph S5.3 and S7.3

REQUIREMENTS:

READING	APPLIED LOAD
INITIAL	22.68 kg, + 4.54 kg, - 0 kg (50.0 lbs., + 10 lbs., - 0 lbs.)
FINAL	136 kg, + 0 kg, - 2.3 kg (300.0 Lbs., + 0 lbs., - 5 lbs.)

ELONGATION NOT TO EXCEED 2.5 cm (1.0 INCH) AFTER LOAD INCREASE

HELMET	CONDITIONS	ELONGATION (cm)
A	AMBIENT	1.3
B	LOW TEMPERATURE	1.3
C	HIGH TEMPERATURE	1.5
D	WATER IMMERSED	1.5

**PERIPHERAL VISION** - Paragraph S5.4 - Helmet shall provide a minimum peripheral vision of 105° to each side of the midsagittal plane. The brow opening shall be at least 2.54 cm (1 inch) above all points in the basic plane that are within the angles of peripheral vision.

	REQUIREMENTS	TEST RESULTS
DEGREE EACH SIDE M.S. PLANE	> 105°	Pass
BROW OPENING	> 2.5 cm (1 inch)	Pass

## PROJECTIONS

Paragraph S5.5

REQUIREMENTS:

PROJECTION	REQUIREMENT
Internal rigid	None
External rigid	Operational, shall not protrude more than 5 mm

TEST RESULTS:

PROJECTION	PRESENT?	HEIGHT (mm)
Internal	None	Not Applicable
External	Rear Vent Cover (Non-rigid)	8.5 mm

COMMENTS: The rear vent cover is greater than 5 mm in height but is loosely attached to the shell and therefore deemed non-rigid.

## LABELING

S5.6.1 *Labeling* - Each helmet shall be permanently and legibly labeled, in a manner such that the label(s) can be easily read without removing padding or any other permanent part, with the following:

Required Information	Pass/Fail	Permanent
Manufacturer's name or identification	Pass	Pass
Discrete size	Pass	Pass
Month and year of manufacture	Pass	Pass
Instructions to the purchaser as follows:	-----	-----
“Shell and liner constructed of (identify type(s) of materials).”	Pass	Pass
“Helmet can be seriously damaged by some common substances without damage being visible to the user.”	Pass	Pass
“Apply only the following: (Recommended cleaning agents, paints, adhesives, etc., as appropriate.”	Pass	Pass
“Make no modifications.”	Pass	Pass
“Fasten helmet securely.”	Pass	Pass
“If helmet experiences a severe blow, return it to the manufacturer for inspection, or destroy it and replace it.”	Pass	Pass

COMMENTS: Labels were determined to be both easily read and permanent based on the TP-218-07, Section 12.5.4.

## LABELING

S5.6.2 Certification. Each helmet shall be labeled permanently and legibly with a label, constituting the manufacturer’s certification that the helmet conforms to the applicable Federal motor vehicle safety standards, that is separate from the label(s) used to comply with S5.6.1, and complies with paragraphs (a) through (c) of this section.

(a) Content, format, and appearance. The label required by paragraph S5.6.2 shall have the following content, format, and appearance:

Required Certification Information	Pass/Fail	Permanent
The symbol “DOT,” horizontally centered on the label, in letters not less than 0.38 inch (1.0 cm) high.	Pass	Pass
The term “FMVSS No. 218,” horizontally centered beneath the symbol DOT, in letters not less than 0.09 inches (0.23 cm) high.	Pass	
The word “CERTIFIED,” horizontally centered beneath the term “FMVSS No. 218,” in letters not less than 0.09 inches (0.23 cm) high.	Pass	
The precise model designation horizontally centered above the symbol DOT, in letters and/or numerals not less than 0.09 inch (0.23 cm) high.	Pass	
The manufacturer’s name and/or brand, horizontally centered above the model designation, in letters and/or numerals not less than 0.09 inch (0.23 cm) high.	Pass	
All symbols, letters and numerals shall be in a color that contrasts with the background of the label.	Pass	
No information, other than the information specified in subparagraph (a), shall appear on the label.	Pass	
The label shall appear on the outer surface of the helmet and be placed so that it is centered laterally with the horizontal centerline of the DOT symbol located a minimum of 1 inch (2.5 cm) and a maximum of 3 inches (7.6 cm) from the bottom edge of the posterior portion of the helmet.	Pass	

COMMENTS: Labels were determined to be both easily read and permanent based on the TP-218-07, Section 12.5.4.

**TEST DATA**

Contract File No.: 664.0009

Test File: 004

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Control Document Rev. 17 July 2013

Technician: Edward Wong

Test Date: 07 September 2016

# Uni-Axial Calibration

M.E.P. Pad Model : 1 MEP

Helmet Manufacturer : RUIYIDE  
Address :

Laboratory Temperature : 22 deg C

Laboratory Humidity : 57 %

Selected Filter Frequency : 1000 Hz

Acc. sensitivity (axis Z) : 9.93 mV/G

Acc. sensitivity (axis X) : 10.30 mV/G

Acc. sensitivity (axis Y) : 10.30 mV/G

Testing Laboratory : Taicang ACT Lab

Address : No.35 Zhenghe Road, Ludu Town,  
Taicang City, Suzhou, Jiangsu Province,  
China 215412

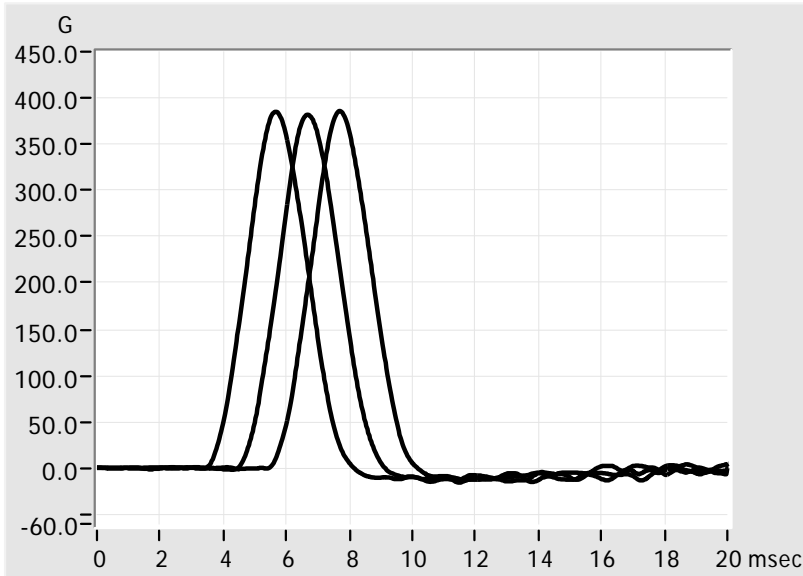
Drop Device : Spherical Impactor (Uni-Axial)

Drop mass assembly : 5.000 kg Time gate flag height : 25.40 mm

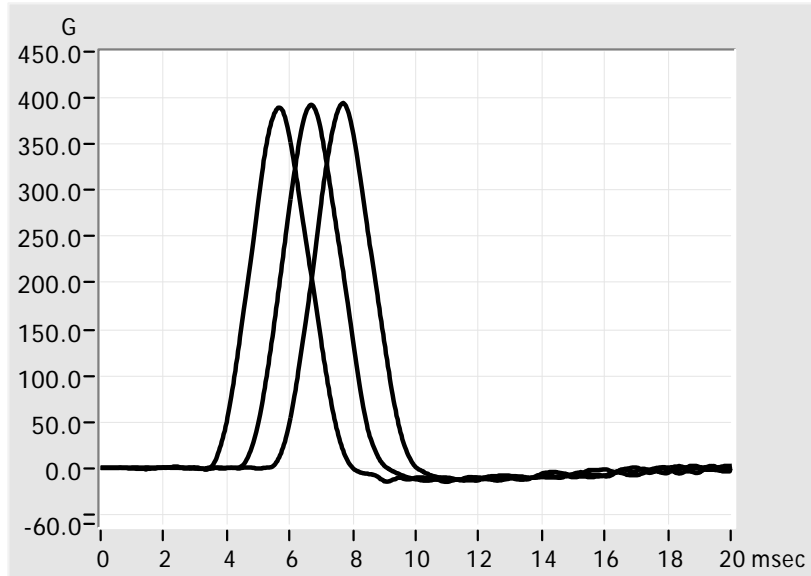
Calibration peak : 400.0 G +/- 20.00 G

Laboratory Technician name : Edward

**Pre-Test**



**Post-Test**



	Impact #	Peak Acc.(G)	Velocity IN (m/sec)	Drop Height (cm)	Delta T 150G (msec)	Delta T 200G (msec)	Position	Test Date	Test Time	Friction (%)	PASS or FAIL
Pre-Test	1	384.7	4.5323	112.0	2.48	2.08	0/0	2016-09-06	10:09:16	3.3	Pass
	2	381.7	4.5774	112.0	2.49	2.06	0/0	2016-09-06	10:10:14	2.3	Pass
	3	385.7	4.5520	112.0	2.49	2.07	0/0	2016-09-06	10:11:12	2.9	Pass
Post-Test	1	389.1	4.6050	112.0	2.48	2.06	0/0	2016-09-06	13:12:04	1.7	Pass
	2	392.1	4.5585	112.0	2.47	2.07	0/0	2016-09-06	13:13:01	2.7	Pass
	3	394.0	4.5651	112.0	2.47	2.04	0/0	2016-09-06	13:14:00	2.6	Pass

Curve impact #2 : shift of 1ms  
Curve impact #3 : shift of 2ms

# Impact Uni-Axial

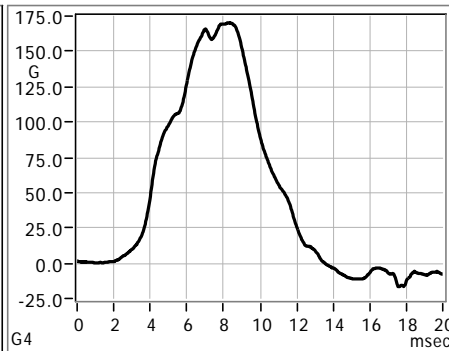
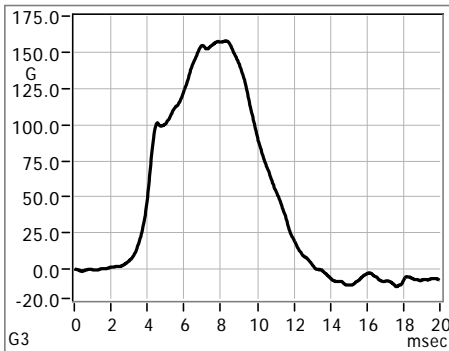
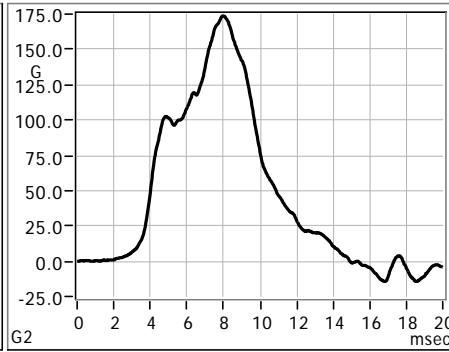
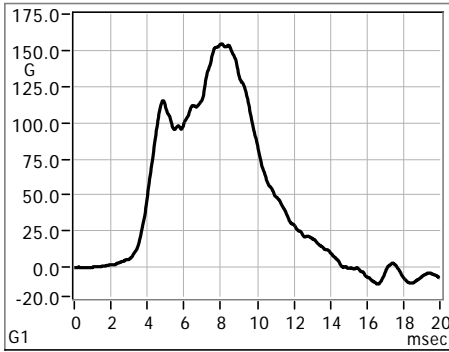
Testing Laboratory : Taicang ACT Lab  
 Address : No.35 Zhenghe Road, Ludu Town,  
 Taicang City, Suzhou, Jiangsu  
 Province, China 215412

Helmet Manufacturer : RUIYIDE  
 Address :

Laboratory Technician name : Edward

Batch Number :

Ref. P.O. Number :



Model : TFF20  
 Color : Black  
 Size : L  
 Weight : 1226.00 g  
 Manufacturing Date : 06 Sep 2016  
 Standard Request : FMVSS218  
 Identification Code : 664.0009.004-A  
 Headform Model : D.O.T.  
 Headform Size : C D.O.T  
 Conditioning : Ambient  
 Laboratory Temperature : 22 deg C  
 Laboratory Humidity : 57 %  
 Selected Filter Frequency : 1650 Hz  
 Maximum Peak G's authorized : 400 G  
 Maximum Peak m/s<sup>2</sup> authorized : 3923 m/s<sup>2</sup>  
 Drop mass assembly : 5.000 kg  
 Time gate flag height : 25.40 mm  
 Acc. sensibility (axis Z) : 9.93

Impact #	Peak Acc. (G)	Velocity IN (m/sec)	Drop Height (cm)	Anvil type	Delta T 150G (msec)	Delta T 200G (msec)	Position	Test Date	Test Time	Friction (%)	PASS or FAIL
1	154.5	5.9931	199.0	FLAT	0.96	0.00	LF SIDE	2016-09-06	11:00:01	4.1	Pass
2	173.6	6.0144	199.0	FLAT	1.54	0.00	LF SIDE	2016-09-06	11:00:11	3.7	Pass
3	157.9	6.0404	199.0	FLAT	1.96	0.00	REAR	2016-09-06	11:05:06	3.3	Pass
4	170.2	6.0528	199.0	FLAT	2.62	0.00	REAR	2016-09-06	11:05:15	3.1	Pass

# Impact Uni-Axial

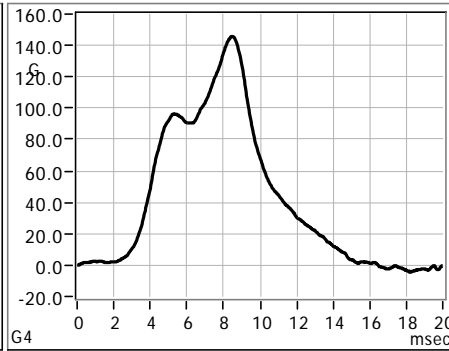
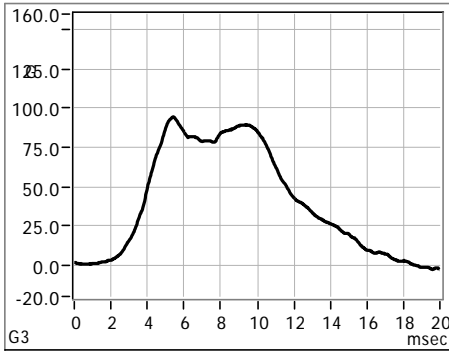
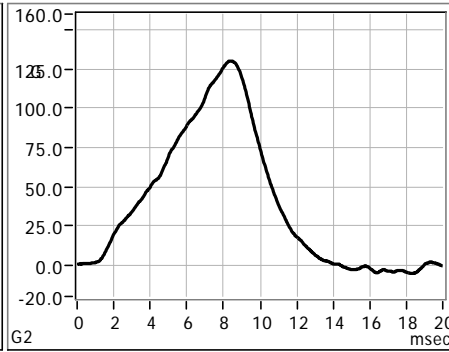
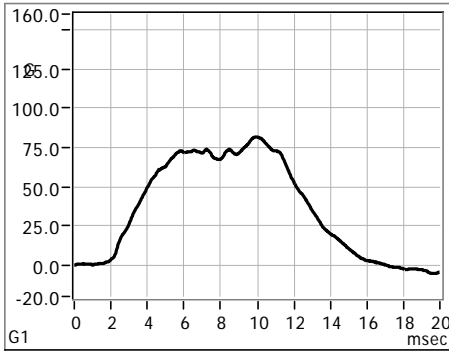
Testing Laboratory : Taicang ACT Lab  
 Address : No.35 Zhenghe Road, Ludu Town,  
 Taicang City, Suzhou, Jiangsu  
 Province, China 215412

Helmet Manufacturer : RUIYIDE  
 Address :

Laboratory Technician name : Edward

Batch Number :

Ref. P.O. Number :



Model : TFF20  
 Color : Black  
 Size : L  
 Weight : 1226.00 g  
 Manufacturing Date : 06 Sep 2016  
 Standard Request : FMVSS218  
 Identification Code : 664.0009.004-A  
 Headform Model : D.O.T.  
 Headform Size : C D.O.T  
 Conditioning : Ambient  
 Laboratory Temperature : 22 deg C  
 Laboratory Humidity : 57 %  
 Selected Filter Frequency : 1650 Hz  
 Maximum Peak G's authorized : 400 G  
 Maximum Peak m/s<sup>2</sup> authorized : 3923 m/s<sup>2</sup>  
 Drop mass assembly : 5.000 kg  
 Time gate flag height : 25.40 mm  
 Acc. sensibility (axis Z) : 9.93

Impact #	Peak Acc. (G)	Velocity IN (m/sec)	Drop Height (cm)	Anvil type	Delta T 150G (msec)	Delta T 200G (msec)	Position	Test Date	Test Time	Friction (%)	PASS or FAIL
5	81.7	5.2640	149.0	HEMI	0.00	0.00	FRONT	2016-09-06	11:10:20	2.6	Pass
6	129.9	5.2538	149.0	HEMI	0.00	0.00	FRONT	2016-09-06	11:10:29	2.8	Pass
7	94.4	5.2698	149.0	HEMI	0.00	0.00	RT SIDE	2016-09-06	11:15:13	2.5	Pass
8	145.6	5.2549	149.0	HEMI	0.00	0.00	RT SIDE	2016-09-06	11:15:21	2.8	Pass



# Impact Uni-Axial

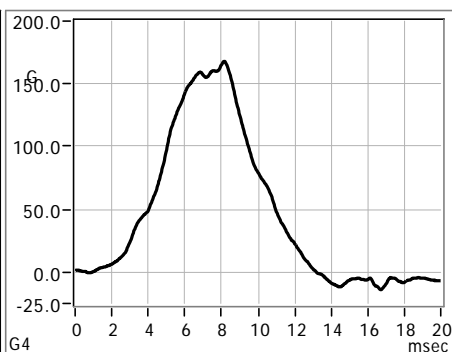
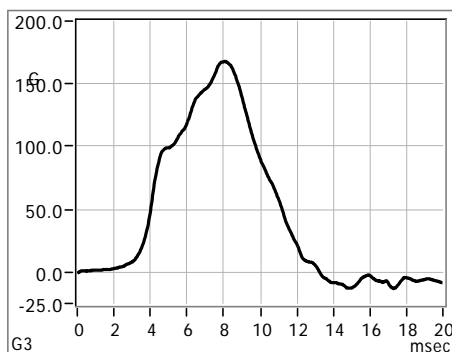
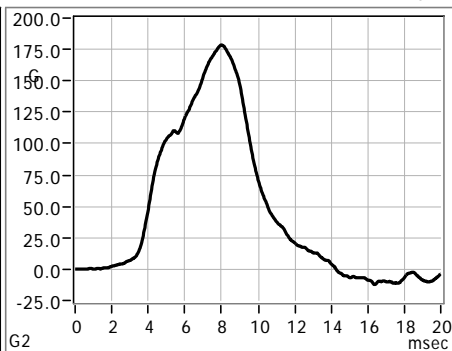
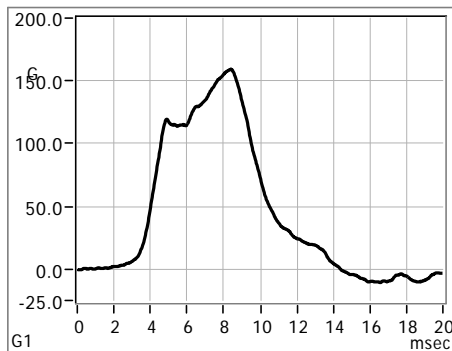
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 Province, China 215412

Helmet Manufacturer : RUIYIDE  
 Address :

Laboratory Technician name : Edward

Batch Number :

Ref. P.O. Number :



Model : TFF20  
 Color : Black  
 Size : L  
 Weight : 1232.00 g  
 Manufacturing Date : 06 Sep 2016  
 Standard Request : FMVSS218  
 Identification Code : 664.0009.004-B  
 Headform Model : D.O.T.  
 Headform Size : C D.O.T  
 Conditioning : Cold  
 Laboratory Temperature : 22 deg C  
 Laboratory Humidity : 57 %  
 Selected Filter Frequency : 1650 Hz  
 Maximum Peak G's authorized : 400 G  
 Maximum Peak m/s<sup>2</sup> authorized : 3923 m/s<sup>2</sup>  
 Drop mass assembly : 5.000 kg  
 Time gate flag height : 25.40 mm  
 Acc. sensibility (axis Z) : 9.93

Impact #	Peak Acc. (G)	Velocity IN (m/sec)	Drop Height (cm)	Anvil type	Delta T 150G (msec)	Delta T 200G (msec)	Position	Test Date	Test Time	Friction (%)	PASS or FAIL
1	159.4	6.0227	199.0	FLAT	1.07	0.00	LF SIDE	2016-09-06	11:00:51	3.6	Pass
2	178.6	6.0207	199.0	FLAT	2.03	0.00	LF SIDE	2016-09-06	11:01:01	3.6	Pass
3	167.7	6.0405	199.0	FLAT	1.53	0.00	REAR	2016-09-06	11:06:45	3.3	Pass
4	167.7	6.0473	199.0	FLAT	2.31	0.00	REAR	2016-09-06	11:06:55	3.2	Pass

# Impact Uni-Axial

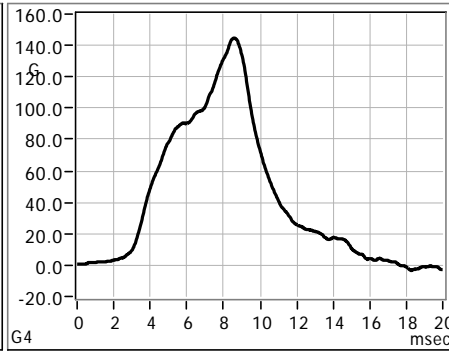
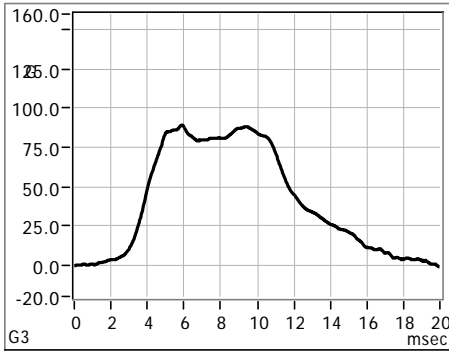
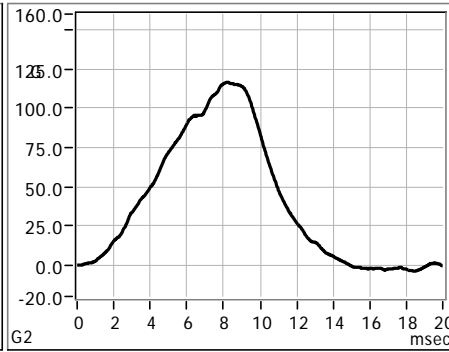
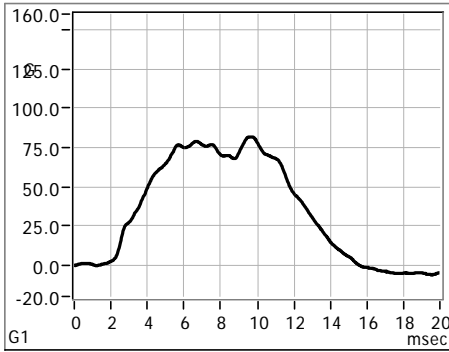
Testing Laboratory : Taicang ACT Lab  
 Address : No.35 Zhenghe Road, Ludu Town,  
 Taicang City, Suzhou, Jiangsu  
 Province, China 215412

Helmet Manufacturer : RUIYIDE  
 Address :

Laboratory Technician name : Edward

Batch Number :

Ref. P.O. Number :



Model : TFF20  
 Color : Black  
 Size : L  
 Weight : 1232.00 g  
 Manufacturing Date : 06 Sep 2016  
 Standard Request : FMVSS218  
 Identification Code : 664.0009.004-B  
 Headform Model : D.O.T.  
 Headform Size : C D.O.T  
 Conditioning : Cold  
 Laboratory Temperature : 22 deg C  
 Laboratory Humidity : 57 %  
 Selected Filter Frequency : 1650 Hz  
 Maximum Peak G's authorized : 400 G  
 Maximum Peak m/s<sup>2</sup> authorized : 3923 m/s<sup>2</sup>  
 Drop mass assembly : 5.000 kg  
 Time gate flag height : 25.40 mm  
 Acc. sensibility (axis Z) : 9.93

Impact #	Peak Acc. (G)	Velocity IN (m/sec)	Drop Height (cm)	Anvil type	Delta T 150G (msec)	Delta T 200G (msec)	Position	Test Date	Test Time	Friction (%)	PASS or FAIL
5	81.7	5.2726	149.0	HEMI	0.00	0.00	FRONT	2016-09-06	11:12:39	2.5	Pass
6	116.6	5.2459	149.0	HEMI	0.00	0.00	FRONT	2016-09-06	11:12:48	3.0	Pass
7	89.0	5.2417	149.0	HEMI	0.00	0.00	RT SIDE	2016-09-06	11:16:42	3.0	Pass
8	144.6	5.2361	149.0	HEMI	0.00	0.00	RT SIDE	2016-09-06	11:16:50	3.1	Pass

# Impact Uni-Axial

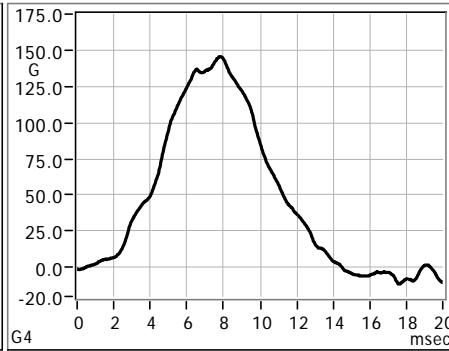
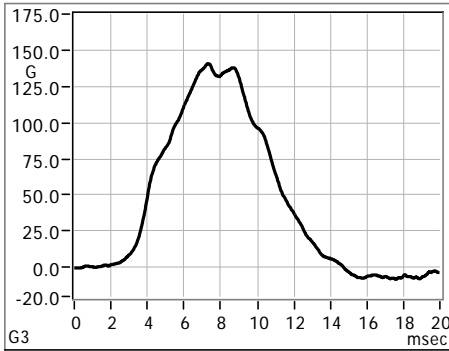
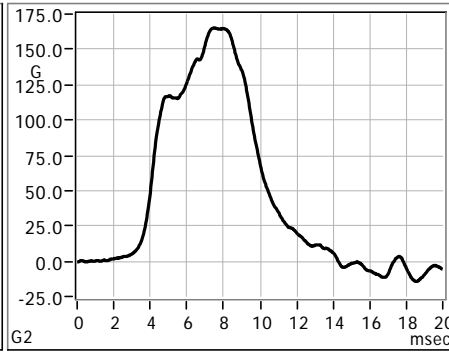
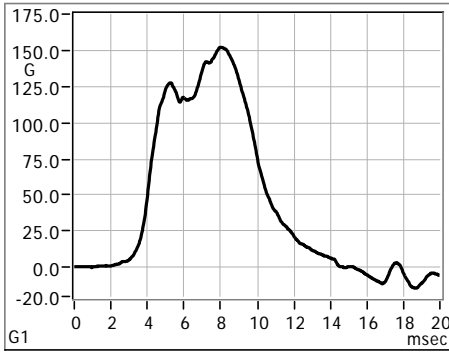
Testing Laboratory : Taicang ACT Lab  
 Address : No.35 Zhenghe Road, Ludu Town,  
 Taicang City, Suzhou, Jiangsu  
 Province, China 215412

Helmet Manufacturer : RUIYIDE  
 Address :

Laboratory Technician name : Edward

Batch Number :

Ref. P.O. Number :



Model : TFF20  
 Color : Black  
 Size : L  
 Weight : 1229.00 g  
 Manufacturing Date : 06 Sep 2016  
 Standard Request : FMVSS218  
 Identification Code : 664.0009.004-C  
 Headform Model : D.O.T.  
 Headform Size : C D.O.T  
 Conditioning : Hot  
 Laboratory Temperature : 22 deg C  
 Laboratory Humidity : 57 %  
 Selected Filter Frequency : 1650 Hz  
 Maximum Peak G's authorized : 400 G  
 Maximum Peak m/s<sup>2</sup> authorized : 3923 m/s<sup>2</sup>  
 Drop mass assembly : 5.000 kg  
 Time gate flag height : 25.40 mm  
 Acc. sensibility (axis Z) : 9.93

Impact #	Peak Acc. (G)	Velocity IN (m/sec)	Drop Height (cm)	Anvil type	Delta T 150G (msec)	Delta T 200G (msec)	Position	Test Date	Test Time	Friction (%)	PASS or FAIL
1	152.0	6.0218	199.0	FLAT	0.49	0.00	LF SIDE	2016-09-06	11:01:44	3.6	Pass
2	165.3	6.0148	199.0	FLAT	1.66	0.00	LF SIDE	2016-09-06	11:02:09	3.7	Pass
3	140.7	6.0418	199.0	FLAT	0.00	0.00	REAR	2016-09-06	11:07:48	3.3	Pass
4	145.6	6.0456	199.0	FLAT	0.00	0.00	REAR	2016-09-06	11:07:59	3.2	Pass

# Impact Uni-Axial

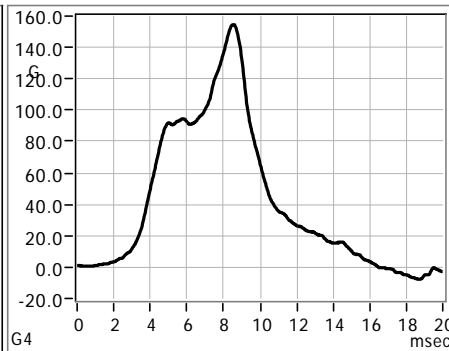
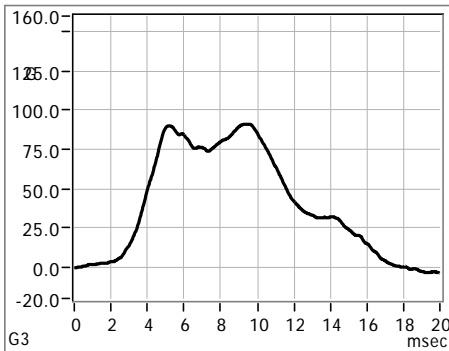
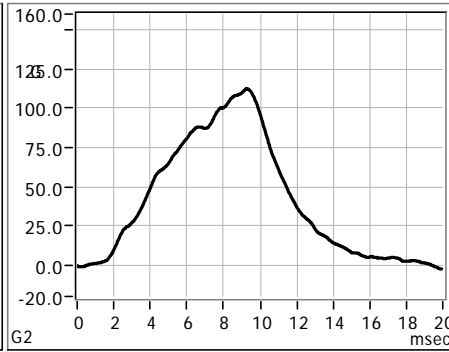
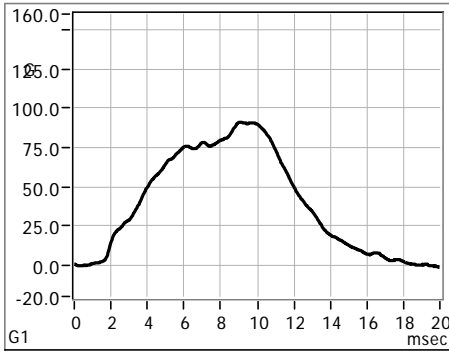
Testing Laboratory : Taicang ACT Lab  
 Address : No.35 Zhenghe Road, Ludu Town,  
 Taicang City, Suzhou, Jiangsu  
 Province, China 215412

Helmet Manufacturer : RUIYIDE  
 Address :

Laboratory Technician name : Edward

Batch Number :

Ref. P.O. Number :



Model : TFF20  
 Color : Black  
 Size : L  
 Weight : 1229.00 g  
 Manufacturing Date : 06 Sep 2016  
 Standard Request : FMVSS218  
 Identification Code : 664.0009.004-C  
 Headform Model : D.O.T.  
 Headform Size : C D.O.T  
 Conditioning : Hot  
 Laboratory Temperature : 22 deg C  
 Laboratory Humidity : 57 %  
 Selected Filter Frequency : 1650 Hz  
 Maximum Peak G's authorized : 400 G  
 Maximum Peak m/s<sup>2</sup> authorized : 3923 m/s<sup>2</sup>  
 Drop mass assembly : 5.000 kg  
 Time gate flag height : 25.40 mm  
 Acc. sensibility (axis Z) : 9.93

Impact #	Peak Acc. (G)	Velocity IN (m/sec)	Drop Height (cm)	Anvil type	Delta T 150G (msec)	Delta T 200G (msec)	Position	Test Date	Test Time	Friction (%)	PASS or FAIL
5	91.0	5.2556	149.0	HEMI	0.00	0.00	FRONT	2016-09-06	11:13:22	2.8	Pass
6	112.7	5.2327	149.0	HEMI	0.00	0.00	FRONT	2016-09-06	11:13:32	3.2	Pass
7	91.0	5.2303	149.0	HEMI	0.00	0.00	RT SIDE	2016-09-06	11:17:26	3.2	Pass
8	154.5	5.2596	149.0	HEMI	0.44	0.00	RT SIDE	2016-09-06	11:17:33	2.7	Pass

# Impact Uni-Axial

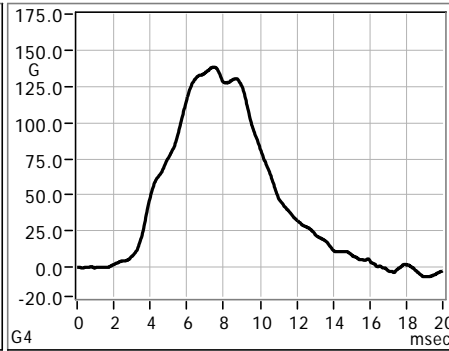
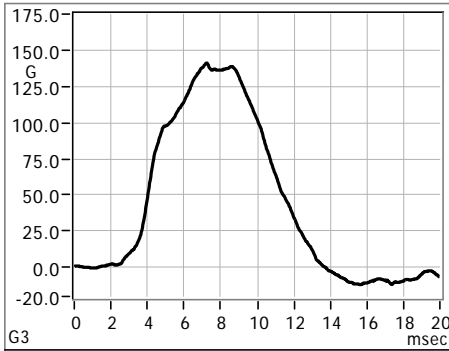
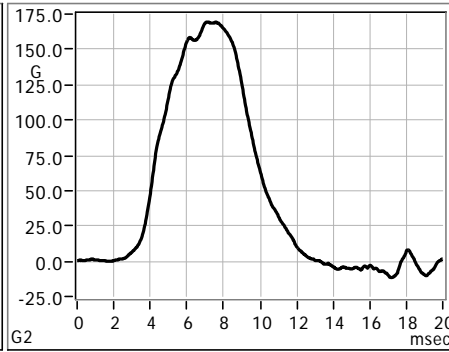
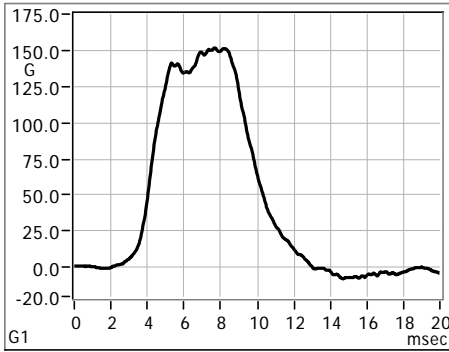
Testing Laboratory : Taicang ACT Lab  
 Address : No.35 Zhenghe Road, Ludu Town,  
 Taicang City, Suzhou, Jiangsu  
 Province, China 215412

Helmet Manufacturer : RUIYIDE  
 Address :

Laboratory Technician name : Edward

Batch Number :

Ref. P.O. Number :



Model : TFF20  
 Color : Black  
 Size : L  
 Weight : 1229.00 g  
 Manufacturing Date : 06 Sep 2016  
 Standard Request : FMVSS218  
 Identification Code : 664.0009.004-D  
 Headform Model : D.O.T.  
 Headform Size : C D.O.T  
 Conditioning : Wet  
 Laboratory Temperature : 22 deg C  
 Laboratory Humidity : 57 %  
 Selected Filter Frequency : 1650 Hz  
 Maximum Peak G's authorized : 400 G  
 Maximum Peak m/s<sup>2</sup> authorized : 3923 m/s<sup>2</sup>  
 Drop mass assembly : 5.000 kg  
 Time gate flag height : 25.40 mm  
 Acc. sensibility (axis Z) : 9.93

Impact #	Peak Acc. (G)	Velocity IN (m/sec)	Drop Height (cm)	Anvil type	Delta T 150G (msec)	Delta T 200G (msec)	Position	Test Date	Test Time	Friction (%)	PASS or FAIL
1	151.5	6.0419	199.0	FLAT	0.83	0.00	LF SIDE	2016-09-06	11:03:00	3.3	Pass
2	169.2	6.0584	199.0	FLAT	2.74	0.00	LF SIDE	2016-09-06	11:03:15	3.0	Pass
3	141.2	6.0340	199.0	FLAT	0.00	0.00	REAR	2016-09-06	11:05:51	3.4	Pass
4	138.2	6.0799	199.0	FLAT	0.00	0.00	REAR	2016-09-06	11:06:02	2.7	Pass

# Impact Uni-Axial

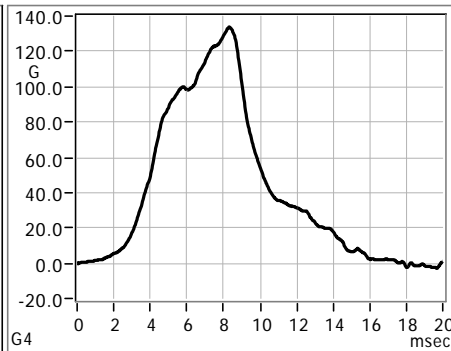
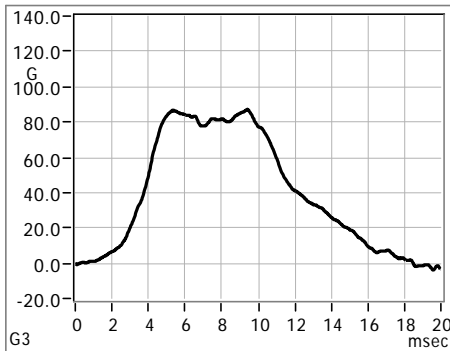
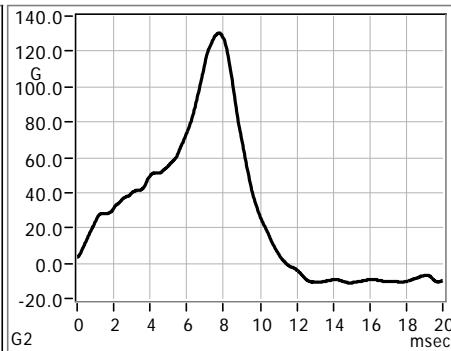
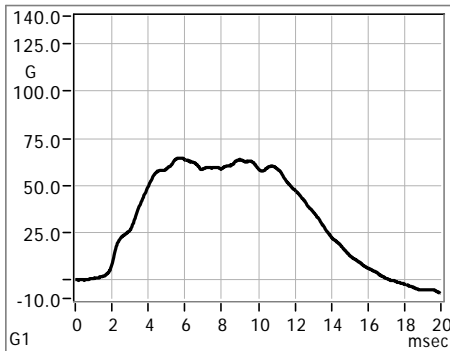
Testing Laboratory : Taicang ACT Lab  
 Address : No.35 Zhenghe Road, Ludu Town,  
 Taicang City, Suzhou, Jiangsu  
 Province, China 215412

Helmet Manufacturer : RUIYIDE  
 Address :

Laboratory Technician name : Edward

Batch Number :

Ref. P.O. Number :



Model : TFF20  
 Color : Black  
 Size : L  
 Weight : 1229.00 g  
 Manufacturing Date : 06 Sep 2016  
 Standard Request : FMVSS218  
 Identification Code : 664.0009.004-D  
 Headform Model : D.O.T.  
 Headform Size : C D.O.T  
 Conditioning : Wet  
 Laboratory Temperature : 22 deg C  
 Laboratory Humidity : 57 %  
 Selected Filter Frequency : 1650 Hz  
 Maximum Peak G's authorized : 400 G  
 Maximum Peak m/s<sup>2</sup> authorized : 3923 m/s<sup>2</sup>  
 Drop mass assembly : 5.000 kg  
 Time gate flag height : 25.40 mm  
 Acc. sensibility (axis Z) : 9.93

Impact #	Peak Acc. (G)	Velocity IN (m/sec)	Drop Height (cm)	Anvil type	Delta T 150G (msec)	Delta T 200G (msec)	Position	Test Date	Test Time	Friction (%)	PASS or FAIL
5	64.4	5.2551	149.0	HEMI	0.00	0.00	FRONT	2016-09-06	11:11:18	2.8	Pass
6	130.4	5.2510	149.0	HEMI	0.00	0.00	FRONT	2016-09-06	11:11:30	2.9	Pass
7	87.1	5.2651	149.0	HEMI	0.00	0.00	RT SIDE	2016-09-06	11:16:01	2.6	Pass
8	133.8	5.2847	149.0	HEMI	0.00	0.00	RT SIDE	2016-09-06	11:16:10	2.2	Pass

# DOT Auto – Test results

## Laboratory

**Laboratory** ACT Lab  
**Technician** Carry  
**Temperature** 22°C  
**Humidity** 57%

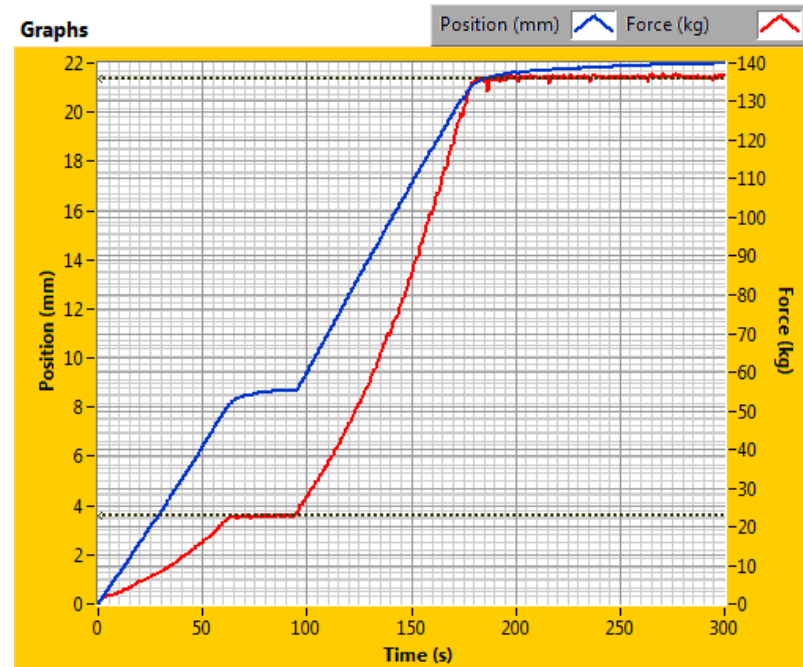
## Sample

**Model** TFF20  
**Color** Black  
**Size** L  
**Weight** 1226  
**Manufacturer** RUIYIDE  
**Manuf. Date** 09/16

## Infos

**Standard** FMVSS No.218  
**Comment** 664.0009.004-A

## Graphs



## Results

Test	Time Data D/M/Y h:ms	DL ?	Status	Tar1 (Kg)	Tar1 (S)	Tar2 (Kg)	Tar2 (S)	Delta(Del1 to Del2) (mm)	Pass/Fail
Test#24	[06/09/16 15:03:16]	NO	Valid	22.7	30.0	136.1	120.0	13.2	Pass

# DOT Auto – Test results

## Laboratory

**Laboratory** ACT Lab  
**Technician** Carry  
**Temperature** 22°C  
**Humidity** 57%

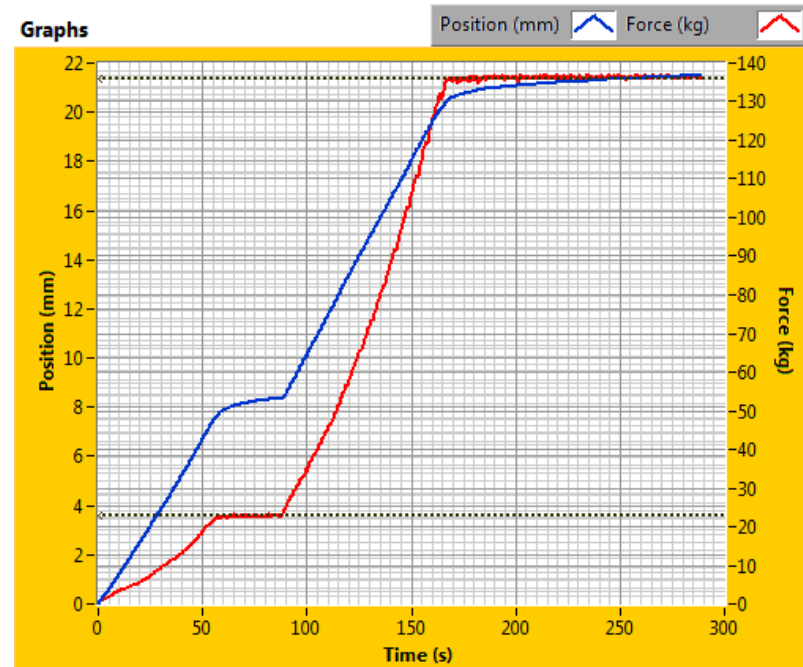
## Sample

**Model** TFF20  
**Color** Black  
**Size** L  
**Weight** 1232  
**Manufacturer** RUIYIDE  
**Manuf. Date** 09/16

## Infos

**Standard** FMVSS No.218  
**Comment** 664.0009.004-B

## Graphs



## Results

Test	Time Data D/M/Y h:ms	DL ?	Status	Tar1 (Kg)	Tar1 (S)	Tar2 (Kg)	Tar2 (S)	Delta(Del1 to Del2) (mm)	Pass/Fail
Test#25	[06/09/16 15:10:49]	NO	Valid	22.7	30.0	136.1	120.0	13.0	Pass



# DOT Auto – Test results

## Laboratory

**Laboratory** ACT Lab  
**Technician** Carry  
**Temperature** 22°C  
**Humidity** 57%

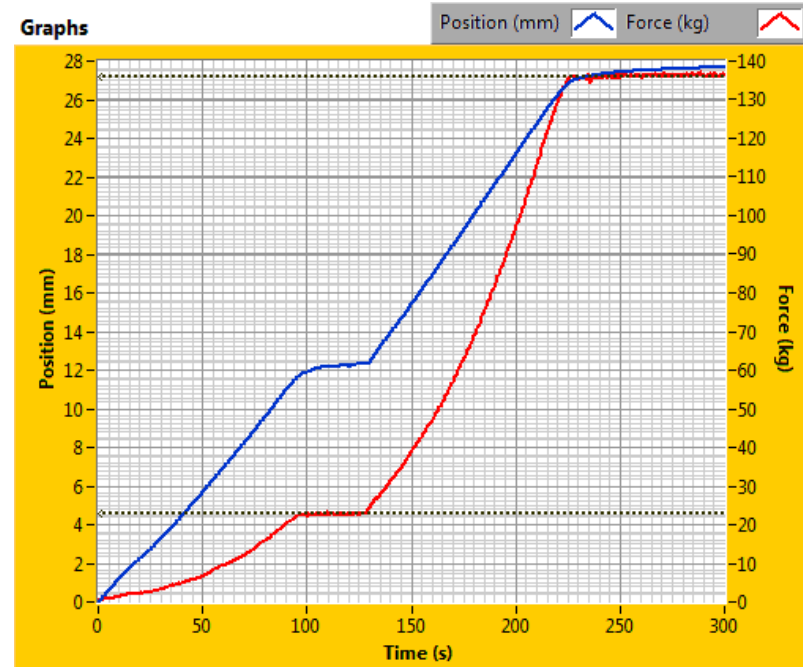
## Sample

**Model** TFF20  
**Color** Black  
**Size** L  
**Weight** 1229  
**Manufacturer** RUIYIDE  
**Manuf. Date** 09/16

## Infos

**Standard** FMVSS No.218  
**Comment** 664.0009.004-C

## Graphs



## Results

Test	Time Data D/M/Y h:ms	DL ?	Status	Tar1 (Kg)	Tar1 (S)	Tar2 (Kg)	Tar2 (S)	Delta(Del1 to Del2) (mm)	Pass/Fail
Test#26	[06/09/16 15:17:13]	NO	Valid	22.7	30.0	136.1	120.0	15.3	Pass

# DOT Auto – Test results

## Laboratory

Laboratory ACT Lab  
 Technician Carry  
 Temperature 22°C  
 Humidity 57%

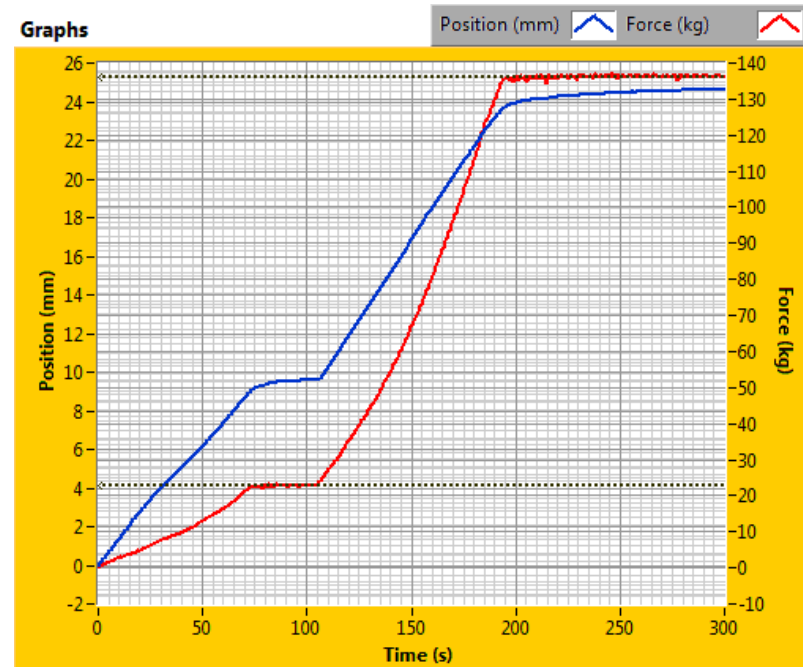
## Sample

Model TFF20  
 Color Black  
 Size L  
 Weight 1229  
 Manufacturer RUIYIDE  
 Manuf. Date 09/16

## Infos

Standard FMVSS No.218  
 Comment 664.0009.004-D

## Graphs



## Results

Test	Time Data D/M/Y h:ms	DL ?	Status	Tar1 (Kg)	Tar1 (S)	Tar2 (Kg)	Tar2 (S)	Delta(Del1 to Del2) (mm)	Pass/Fail
Test#27	[06/09/16 15:24:42]	NO	Valid	22.7	30.0	136.1	120.0	14.9	Pass

## APPENDIX A

### INTERPRETATIONS OR DEVIATIONS FROM FMVSS 218

None

## APPENDIX B

### EQUIPMENT LIST AND CALIBRATION SCHEDULES

#### EQUIPMENT INFORMATION

##### General Information

Drop System: Monorail  
Software: Cadex Impact Software v 6.4f

Item	Model	S/N
Computer	VD200PA#AB2	CNG9211DB1
Data Acquisition Board	187570H-01	13EC16A
Time Gate	Cadex	HVTG12009033-1
Control Box	PC4300	CCS120090331-1

##### Headforms

Item	Size	Model	Assembly Wt., grams
Uni-Axial	Headform Size A DOT SMALL	Cadex	3454
Uni-Axial	Headform Size C DOT MEDIUM	Cadex	4941
Uni-Axial	Headform Size D DOT LARGE	Cadex	6071

##### Sensors

Item	Model	S/N
Uni-Axial	Accelerometer - axis Z (9.9260 mV/G)	2262A-1000 L14909

## EQUIPMENT LIST AND CALIBRATION SCHEDULES

Testing Equipment					
<u>Item No.</u>	<u>Description</u>	<u>Manufacture</u>	<u>Model</u>	<u>S/N</u>	<u>Dimensional Check</u>
H1002	Monorail	Cadex	Series 2000	None	N/A
H1015	Positional Stability Fixture	Protec	N/A	None	N/A
H1017	Dynamic Strap Machine	Cadex	SB033	None	13 Sept 2015
H1049	DOT Headform	Cadex	Small	5178	13 Sept 2015
H1050	DOT Headform	Cadex	Medium	5179	13 Sept 2015
H1051	DOT Headform	Cadex	Large	5190	13 Sept 2015
H1053	System Check MEP Pad	Cadex	345_08_MP60	30051201	N/A
H1060	Anvil	Cadex	Hemispherical	None	13 Sept 2015
H1062	Anvil	Cadex	Flat	None	13 Sept 2015
H1030	High Temp Cabinet	Shanghai Boxun	GZX-9240MBE	8285	N/A
H1032	Low Temp Cabinet	Haier	DW-25W300	BE062100NO OB29578VMO	N/A
H1034	Water Conditioning Container	Rubbermaid	None	None	N/A
H1026	Laser Test Line Table	Cadex	SB005	TLTV2KB	N/A
---	Computer	HP	DX2040	CNG92SK-581DB1	N/A
H1010	Control Center System	Cadex	Pc4300	CCS120090331-1	N/A
H1011	Impact Machine Control System	Cadex	DX3000	None	N/A
H1027	Peripheral Vision Apparatus	Hongtu	H-002	0.7°	13 Sept 2015
---	Velocity Gate Flag	Cadex	None	1.00mm	13 Oct 2015

Contract File No.: 664.0009

Test File: 004

T:\Templates\DOT Helmet Templates\Official DOT Report Template for ACT Taicang 17 July 2013.dot

Control Document Rev. 17 July 2013

Technician: Edward Wong

Test Date: 07 September 2016

### Calibrated Measurement Equipment

Item No.	Description	Manufacture and Model	Serial No.	Accuracy	Calibration	
					Last	Next
H1003	Velocity Gate	Cadex	HVTG120090331-1	0.16msec	31 Mar 2016	31 Mar 2017
H1007	Accelerometer	PCB - 353B18	86079	10.120 mV/g	13 Oct 2015	13 Oct 2016
H1014	LVDT	Volfa - LWE-200	2002572	0.01	16 Nov 2015	16 Nov 2016
H1013	LVDT Amplifier	Schaevitz - ATA2001	J72863	-	16 Nov 2015	16 Nov 2016
H1036	Environmental Monitoring	Anymeter TH-602F	3238	2%	20 Oct 2015	20 Oct 2016
H1025	Scale	Shanghai Yousheng ACS-6	118233	0.050g	15 July 2015	15 July 2016
H1028	Digital Calipers	Shangliang	N/A	0.01 mm	27 Oct 2015	27 Oct 2016
H1009	Digital Tape	Starrett	5027526	0.1 mm	15 July 2015	15 July 2016
H1029	Height Gauge	Shanghai LR MC 130	9090053	0.01 mm	27 Oct 2015	27 Oct 2016

Contract File No.: 664.0009

Test File: 004

T:\Templates\DOT Helmet Templates\Official DOT Report Template for ACT Taicang 17 July 2013.dot

Control Document Rev. 17 July 2013

Technician: Edward Wong

Test Date: 07 September 2016

**APPENDIX C**  
**PHOTOGRAPHS**



Monorail Apparatus



Retention System  
Strength Test Apparatus



Data Acquisition Equipment





High Temperature Chamber



Low Temperature Conditioning Cabinet



Water Immersion Equipment







