
ELECTRONICS TEST CENTRE

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TEST RESULTS

FOR

LOAD VOLTAGE, LOAD CURRENT and OPEN CIRCUIT VOLTAGE Measurements

ON THE

X26 and M26 Conducted Energy Weapons (CEW)

IN ACCORDANCE WITH

2005 TASER INTERNATIONAL TEST PROCEDURE

PROVIDED BY THE

CPRC

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1 INTRODUCTION

1.1 PURPOSE

The purpose of this report is to present the findings and results of testing performed on the X26 and M26 Conducted Energy Weapons (CEW) in accordance with the applicable guidelines provided in the 2005 TASER International Test Procedure as provided by the CPRC.

1.2 SCOPE

The scope of the documented tests is limited to the test samples provided by the Royal Canadian Mounted Police (RCMP). A full item description may be found in the 2005 TASER International Test Procedure. The results contained in this report relate only to the item(s) tested.

The Electronics Test Centre is ISO/IEC 17025 accredited.

1.3 REVISION STATUS

Version	Date Issued	Version / Reason for Issue / Re-Issue
1	February 3, 2009	TEST RESULTS

1.4 APPLICABLE DOCUMENTS

1.4.1 Government Documents

ISO/IEC 17025: 2005 General requirements for the competence of testing and calibration laboratories.

1.4.2 TASER International Documents

TASER
Peak Arcing voltage tolerance Peak arcing voltage measurement of TASER X26™ and TASER M26™ devices, Magne Nerheim, Vice President Research and Development, TASER International, dated May 21, 2008.

TASER
Performance criteria Letter to H.D.M. Madill, Deputy Commissioner, RCMP from Magne Nerheim, Vice President Research and Development, TASER International, dated December 15, 2008.

TASER
Customer Performance criteria Customer Testing of TASER X26™ and Advanced TASER M26™ Note from Magne Nerheim, Vice President Research and Development, TASER International, dated January 19, 2009.

TITP
2005 TASER International Test Procedure TASER International Test Procedure - Measurement of Open Circuit Voltage, Load Voltage and Load Current, 23 July 2005. Appendix C to Testing of Conducted Energy Weapons: Taser X26 Electrical Performance Evaluation, Canadian Police Research Centre.

1.4.3 Company Documents

Taser Model X26 Test Concepts	Taser Model X26 Test Concepts, Ian P.W. Sinclair, MPB Technologies Inc. Version 4. January 22, 2009.
Taser Model M26 Test Concepts	Taser Model M26 Test Concepts, Ian P.W. Sinclair, MPB Technologies Inc. Version 4. January 22, 2009.

1.5 DEFINITIONS

The technical terms used in this report are defined in ANSI C63.14. In addition, the following definitions are applicable for the purpose of this report.

EUT	- Equipment Under Test
CEW	- Conducted Energy Weapon (also referred as Taser or TASER X26™ or TASER M26™)
TI	- TASER International
TITP	- TASER International Test Plan
kV _{pk}	- Peak Voltage in kilovolts
I _{pk}	- Peak Current in Amperes
V _{oc}	- Open Circuit Voltage
CPRC	- Canadian Police Research Centre

2 EQUIPMENT UNDER TEST

The Taser test samples were provided by the Royal Canadian Mounted Police (RCMP).

The Tasers are manufactured by TASER International of Scottsdale, AZ 85255-6311 USA.

Two variants of CEWs were provided and are identified as the TASER X26™ and the TASER M26™.

This report contains data for thirty Tasers, fifteen M26 and fifteen X26.

3 REQUIREMENT AND RESULTS SUMMARY

The CEWs were subjected to the tests discussed below in accordance with the TITP documentation provided by the CPRC. (Refer to section 1.4.2)

3.1 OBSERVATIONS

Loaded Peak Voltage and Current

All thirty CEWs tested for the RCMP were found to be within the TASER International criteria for Peak Current at 250 Ohms Load.

All thirty CEWs tested for the RCMP were found to be within the TASER International criteria for Peak Voltage at 250 Ohms Load.

All thirty CEWs submitted were tested at 250-Ohm and 1000-Ohm loads, allowing Peak Current and Voltage values to be interpolated to 600 Ohms. The interpolated values were within the specification of TASER International at 600 Ohms load. Therefore the Peak Voltage and Current for all the submitted CEWs can be considered to be within the specifications of TASER International at 600 Ohms.

Open Circuit Peak Voltage

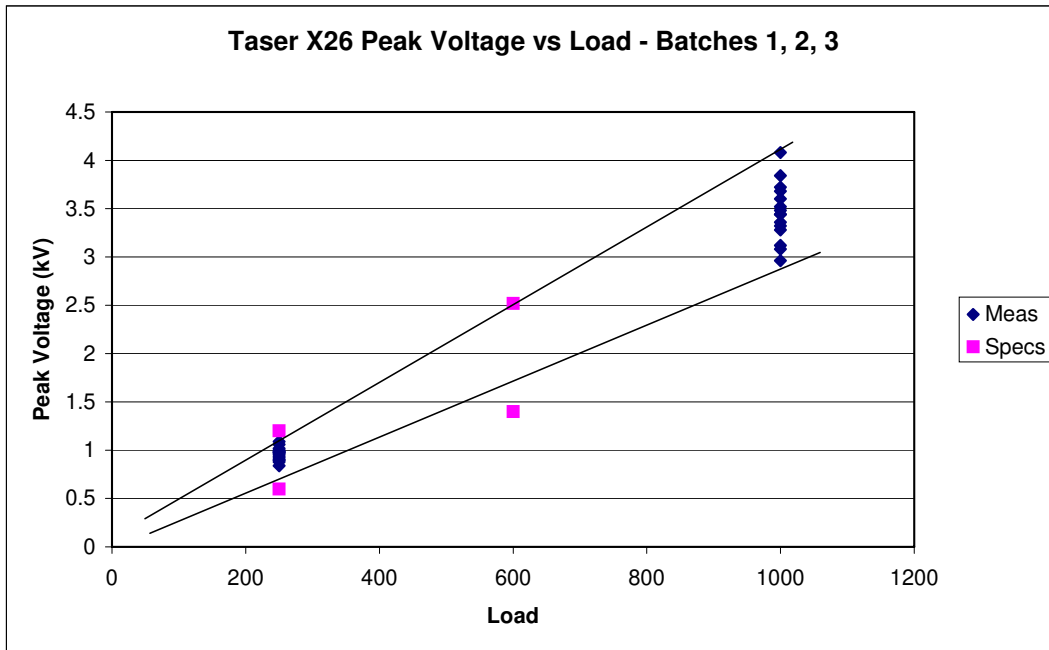
Twenty-eight of the thirty CEWs tested for the RCMP were found to be within the TASER International open-circuit peak voltage performance criteria of 50 kV $\pm 15\%$ [42.5kV to 57.5kV].

M26 CEW's out of stated tolerance were: **M26 TASER s/n P2-014535** and **M26 TASER s/n P2-009126**.

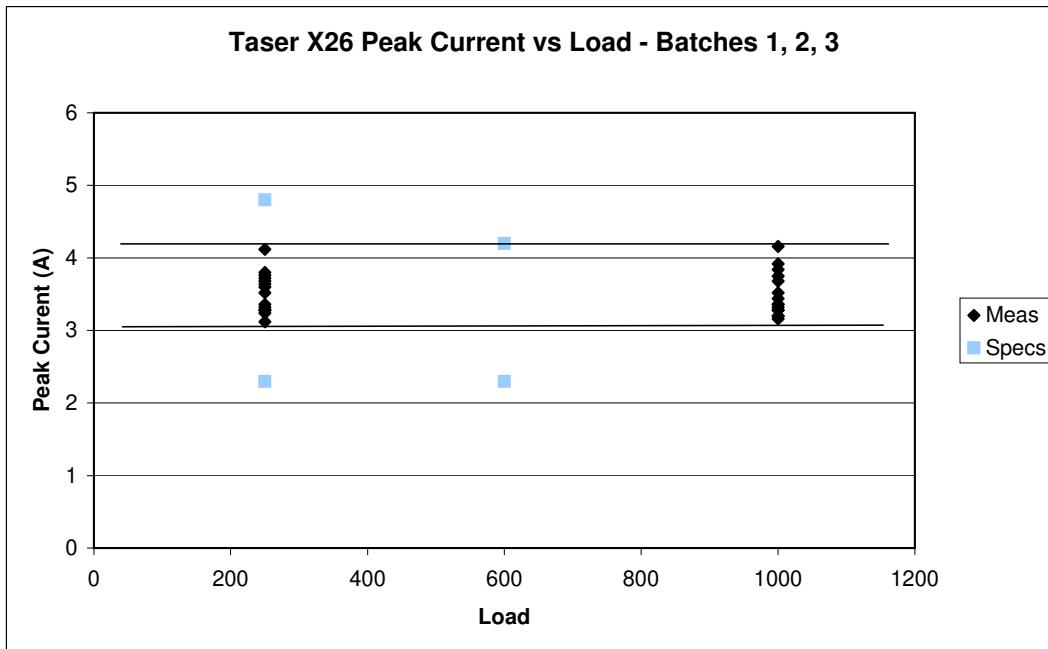
Refer to Section 4.1, Batch 2 and 3, Column D.

Notes:

1. Final qualification measurements were performed using a 250-Ohm resistive MPB/ETC- Proprietary Non-Inductive Load as requested by the customer. The results are shown in Column A of each table in Section 4.1.
The use of the MPB/ETC non-inductive load reduced setup-induced artifacts, therefore allowing more precise measurements.
Peak loaded voltage and current measurements were performed as requested.
2. Peak voltage and current measurements were initially performed using an Ohmite 250-Ohm resistor as specified by TITP. This resulted in voltage waveform distortions that gave higher apparent values (Section 4.1, Column B).
3. Measurements were also made using a 1000-Ohm non-inductive load as an aid to CEW characterization. These data are shown in Section 4.1, Column C for information purposes only. The 250 Ohm and 1000 Ohm loads bracket the resistances that are found in the human body. The mean resistance is 500 Ohms to 600 Ohms for voltages typical of the TASER X26™ and M26™.
4. Column D of the tables in Section 4.1 show Open Circuit Arcing Voltage, the voltage across the terminals of the device when the weapon is held up and fired in the air and not in contact with any surface, such as a human body.



Plot A: Peak Loaded Voltage Interpolation For 600 Ohms



Plot B : Peak Loaded Current Interpolation For 600 Ohms

Plot A shows the peak loaded main phase voltage for all X26 tests at 250 and 1000 Ohms (diamonds), together with the specifications for 250 and 600 Ohms (squares). Straight lines between the widest data points at 250 and 1000 Ohms fall within the specifications at 600 Ohms.

Plot B likewise shows the peak loaded main phase current for all X26 tests at 250 and 1000 Ohms, together with the specifications for 250 and 600 Ohms. Again, straight lines between the widest data points at 250 and 1000 Ohms fall within the specifications at 600 Ohms.

TABLE 1: TABULATED RESULTS SUMMARY

Test Requirement	Sec 4.1 Column	Load	TI Customer Acceptance Tolerances ¹	Test Finding
X26 Peak Transient Qualification Measurement: Loaded Voltage and Current	A (Qual Data)	250 Ohm Resistive (ETC Proprietary Non-Inductive Load)	I_{pk-min} (2.3 A) to I_{pk-max} (4.8 A) V_{pk-min} (580 V) to V_{pk-max} (1200 V)	X26 CEW's tested were found to be within stated TI Customer Acceptance Tolerances.
M26 Peak Transient Qualification Measurement: Loaded Voltage and Current	A (Qual Data)	250 Ohm Resistive (ETC Proprietary Non-Inductive Load)	I_{pk-min} (14.8 A) to I_{pk-max} (21.2 A) V_{pk-min} (3700 V) to V_{pk-max} (5300 V)	M26 CEW's tested were found to be within stated TI Customer Acceptance Tolerances.
Peak Transient Measurement: Loaded Voltage and Current	B	250 Ohm Resistor (Ohmite Load)	N/A: Data reflects the presence of parasitic inductance in the load.	For information/engineering purposes only.
Peak Transient Measurement: Loaded Voltage and Current	N/A	600 Ohm Interpolated Data, as per Plots A and B	I_{pk-min} (2.3 A) to I_{pk-max} (4.2 A) V_{pk-min} (1400 V) to V_{pk-max} (2520 V)	X26 CEW's tested were found to be within TI Acceptance Tolerances.
Peak Transient Measurement: Loaded Voltage and Current	C	1000, Ohm Resistive (ETC Proprietary Non-Inductive Load)	None available.	For information/engineering purposes only.
X26 and M26 Open Circuit Voltage Transient	D	Two 100 MOhm / 3 pF HV probes differentially connected to TASER output terminals [TITP]	V_{oc} : 50kV \pm 15% [42.5kV to 57.5kV].	X26 and M26 CEW's were found within Stated TI Peak Arcing Voltage Tolerance except for: M26 TASER: s/n P2-014535 and M26 TASER: s/n P2-009126

1: Customer Acceptance Tolerances provided by TASER International.

4 TEST RESULTS

4.1 OVERVIEW OF TEST DATA – TASER TESTING WITH NO CARTRIDGE

TABLE 2: BATCH NO. 1 OF 3 – TEST DATE: NOVEMBER 20TH, 2008

TASER		A (Qual Data)		B		C		D
		250 Ohm Non-Ind		250 Ohm Ohmite		1000 Ohm Non-Ind		Open Circuit
Model	S/N	kV _{pk}	I _{pk}	kV _{pk}	I _{pk}	kV _{pk}	I _{pk}	kV _{pk}
M26	P1-009601	4.16	17.20	4.44	16.80	14.80	15.20	53.6
M26	P2-009219	3.92	16.20	4.40	16.00	13.00	13.20	56.8
M26	P2-014334	4.12	17.20	4.48	16.60	13.20	13.00	53.8
M26	P3-012388	4.28	17.60	4.92	17.80	14.60	14.80	55.2
M26	P3-014732	4.16	16.80	4.68	17.40	13.80	14.00	54.4
M26	P3-041473	4.36	17.80	4.68	17.20	15.20	15.00	56.6
M26	P3-042225	4.16	17.20	6.32	16.80	14.80	14.80	56.0
M26	P4-020524	4.40	18.20	4.84	18.20	16.00	15.80	48.8
M26	P4-022264	4.72	19.60	5.44	20.20	17.00	17.20	54.8
X26	X00-107260	0.96	3.64	1.16	3.60	3.52	3.68	57.0
X26	X00-179760	1.02	3.28	1.18	3.64	3.48	3.32	50.4
X26	X00-179846	0.98	3.60	1.14	3.52	3.32	3.28	53.8
X26	X00-181741	1.09	4.12	1.30	4.08	3.84	3.92	52.8
X26	X00-197387	0.98	3.72	1.18	3.56	3.44	3.52	52.6
X26	X00-256092	1.00	3.80	1.24	3.84	3.72	3.76	52.4
X26	X00-284967	0.97	3.68	1.12	3.24	3.08	3.20	54.4
X26	X00-312783	0.84	3.12	0.96	3.08	3.12	3.28	50.0
X26	X00-328874	0.92	3.36	0.98	3.56	3.44	3.16	52.0
X26	X00-348605	0.90	3.28	1.08	3.20	2.96	3.20	52.4

NOTE:
 - CEWs tested above (Batch 1 of 3) were found to be within TASER International peak voltage and current performance criteria.
 - CEWs tested above (Batch 1 of 3) were found to be within TASER International open-circuit peak arcing voltage performance criteria of 50kV ±15% [42.5kV to 57.5kV].
 - Each CEW serial number was recorded and photographed by ETC.

TABLE 3: BATCH NO. 2 OF 3 – TEST DATE: DECEMBER 4TH, 2008

TASER		A (Qual Data)		B		C		D
		250 Ohm Non-Ind		250 Ohm Ohmite		1000 Ohm Non-Ind		Open Circuit
Type	S/N	kV _{pk}	I _{pk}	kV _{pk}	I _{pk}	kV _{pk}	I _{pk}	kV _{pk}
M26	P4-007606	3.72	15.20	3.88	14.60	13.40	12.60	56.8
M26	P3-041968	4.28	17.20	4.64	17.00	15.40	14.20	55.2
M26	P2-014640	4.84	19.60	5.24	19.40	16.60	15.60	56.2
M26	P2-014535	4.40	17.60	4.72	17.20	15.00	14.20	59.4
M26	P4-015210	4.16	17.00	4.44	16.60	15.00	14.00	56.6
X26	X00-260166	0.94	3.32	0.96	3.36	3.60	3.44	53.4
X26	X00-359320	0.88	3.24	0.96	3.96	3.28	3.36	55.2
X26	X00-346146	0.90	3.28	0.96	3.48	3.36	3.36	56.2

NOTE:

- CEWs tested above (Batch 2 of 3) were found to be within TASER International peak voltage and current performance criteria.
- CEWs tested above (Batch 2 of 3) were found to be within TASER International open-circuit peak arcing voltage performance criteria of 50kV ±15% [42.5kV to 57.5kV] **except for M26 TASER s/n P2-014535.**
- Each CEW serial number was recorded and photographed by ETC.

TABLE 4: BATCH NO. 3 OF 3 – TEST DATE: DECEMBER 10TH, 2008

TASER		A (Qual Data)		B		C		D
		250 Ohm Non-Ind		250 Ohm Ohmite		1000 Ohm Non-Ind		Open Circuit
Type	S/N	kV _{pk}	I _{pk}	kV _{pk}	I _{pk}	kV _{pk}	I _{pk}	kV _{pk}
M26	P2-009126	4.24	17.00	4.52	16.60	14.60	13.80	64.2
X26	X00-210899	0.99	3.52	0.92	3.44	3.68	3.84	53.8
X26	X00-210900	1.06	3.76	1.00	4.00	4.08	4.16	57.2

NOTE:

- CEWs tested above (Batch 3 of 3) were found to be within TASER International peak voltage and current performance criteria.
- CEWs tested above (Batch 3 of 3) were found to be within TASER International open-circuit peak arcing voltage performance criteria of 50kV ±15% [42.5kV to 57.5kV] **except for M26 TASER s/n P2-009126.**
- Each CEW serial number was recorded and photographed by ETC.