Canadian Association of Rocketry

Rocket Motor Certification

June 26, 2009 Session

Submitted to the CAR Executive July 2, 2009

Introduction

A short motor testing session was held at the Cesaroni Technology Incorporated facility in Gormley, Ontario on June 26th, 2009. Thanks to Angelo Castellano for supervising the testing session.

Twenty-seven (27) motors were fired in hardware ranging from the new 29mm diameter Pro29-6GXL, up to the 75mm diameter Pro75. Impulses ranged from G to L and reloads were certified for use in hardware from CTI. Four propellants were fired, adding new products with Classic (CL), Smoky Sam (SS), Skidmark (SK) and Imax (IM).

This session included an "I" variant of the Pro38 5G reload which is a 99% I at 636.1 N-sec.

While these motors were certified in Canada, a reciprocal agreement between the Canadian Association of Rocketry, the Tripoli Rocketry Association and the National Association of Rocketry means they may be flown in many jurisdictions. With that in mind, one of these motors includes a note that indicate it is considered high power under NFPA 1125.

I am very pleased to announce the certification of eight (8) new reloads from Cesaroni Technology, Inc. Individual certification letters follow for each motor.

These letters and the accompanying thrust curves will be available on the official CAR website soon.

Respectfully submitted,

Thomas Raithby
Chair of CAR Motor Certification

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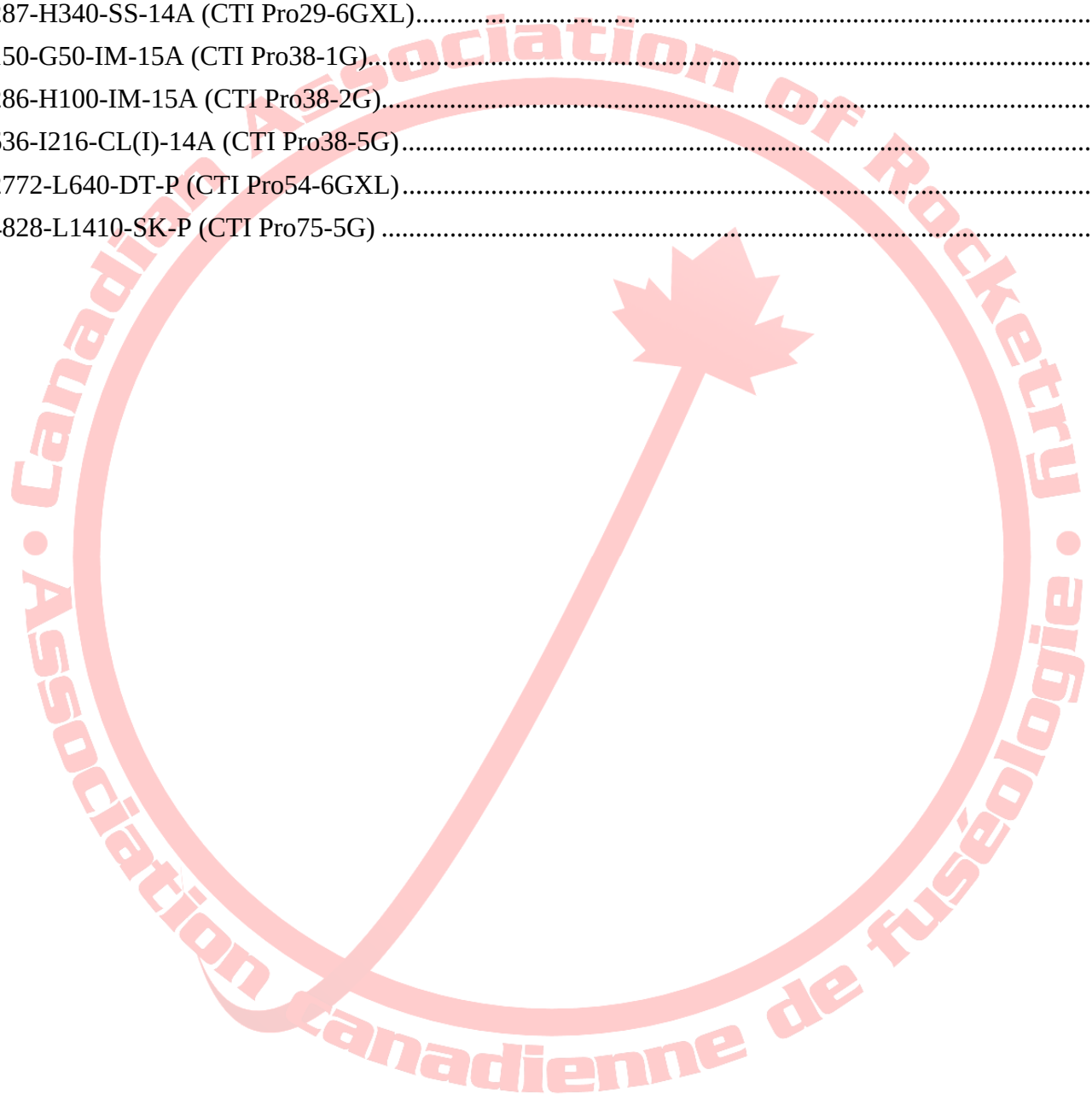

CTI 168-H87-IM-12A (CTI Pro29-3G)

Canadian Association of Rocketry
CAR Motor Certification
c/o 1518-3rd Ave. S.
Lethbridge, AB
T1J 0K8

July 2nd, 2009

Cesaroni Technology Incorporated
2561 Stouffville Road
Gormley, Ontario
L0H 1G0

Dear Dr. Jeroen Louwers,

The **CTI 168-H87-IM-12A** rocket motor was tested June 26th, 2009 and is in compliance with the certification requirements and standards of the Canadian Association of Rocketry (CAR). The motor is hereby certified for hobby rocketry use by the members of CAR and any other rocketry associations with current reciprocal motor certification agreements in place with CAR.

CAR Designation	**168-H87-IM-12A**	**Test Date**	June 26, 2009
Manufacturer Designation	168-H87-12A	**Manufacturer**	Cesaroni Technology Inc.
Propellant	***Imax***	**Hardware**	Pro29-3G
Single-Use/Reload/Hybrid	Reloadable	**Motor Dimensions**	29mm x 187mm
Loaded Weight	205 g	**Total Impulse**	167.9 Ns
Burnout Weight	104 g	**Maximum Thrust**	139.2 N
Propellant Weight	92.7 g	**Average Thrust**	86.7 N
Delays Tested	12-3 seconds, adjustable	**Specific Impulse (Isp)**	184.72 s
Samples per second	1000	**Burn time**	1.94 s
Notes	5% H		

Respectfully submitted,

Thomas Raithby
Chairman, CAR Motor Certification

06260919.gra

CTI 305-H226-SK-14A (CTI Pro29-6GXL)

Canadian Association of Rocketry
CAR Motor Certification
c/o 1518-3rd Ave. S.
Lethbridge, AB
T1J 0K8

July 2nd, 2009

Cesaroni Technology Incorporated
2561 Stouffville Road
Gormley, Ontario
L0H 1G0

Dear Dr. Jeroen Louwers,

The **CTI 305-H226-SK-14A** rocket motor was tested June 26th, 2009 and is in compliance with the certification requirements and standards of the Canadian Association of Rocketry (CAR). The motor is hereby certified for hobby rocketry use by the members of CAR and any other rocketry associations with current reciprocal motor certification agreements in place with CAR.

CAR Designation	**305-H226-SK-14A**	**Test Date**	June 26, 2009
Manufacturer Designation	305-H226-14A	**Manufacturer**	Cesaroni Technology Inc.
Propellant	***Skidmark***	**Hardware**	Pro29-6GXL
Single-Use/Reload/Hybrid	Reloadable	**Motor Dimensions**	29mm x 365mm
Loaded Weight	360 g	**Total Impulse**	305.0 Ns
Burnout Weight	176 g	**Maximum Thrust**	362.3 N
Propellant Weight	175.0 g	**Average Thrust**	225.6 N
Delays Tested	14 to 5, adjustable	**Specific Impulse (Isp)**	150.49 s
Samples per second	1000	**Burn time**	1.35 S
Notes	91% H		

Respectfully submitted,

Thomas Raithby
Chairman, CAR Motor Certification

06260925.gra

CTI 287-H340-SS-14A (CTI Pro29-6GXL)

Canadian Association of Rocketry
CAR Motor Certification
c/o 1518-3rd Ave. S.
Lethbridge, AB
T1J 0K8

July 2nd, 2009

Cesaroni Technology Incorporated
2561 Stouffville Road
Gormley, Ontario
L0H 1G0

Dear Dr. Jeroen Louwers,

The **CTI 287-H340-SS-14A** rocket motor was tested June 26th, 2009 and is in compliance with the certification requirements and standards of the Canadian Association of Rocketry (CAR). The motor is hereby certified for hobby rocketry use by the members of CAR and any other rocketry associations with current reciprocal motor certification agreements in place with CAR.

CAR Designation	**287-H340-SS-14A**	**Test Date**	June 26, 2009
Manufacturer Designation	287-H340-14A	**Manufacturer**	Cesaroni Technology Inc.
Propellant	***Smoky Sam***	**Hardware**	Pro29-6GXL
Single-Use/Reload/Hybrid	Reloadable	**Motor Dimensions**	29mm x 365mm
Loaded Weight	391 g	**Total Impulse**	287.3 Ns
Burnout Weight	181 g	**Maximum Thrust**	447.5 N
Propellant Weight	206.7 g	**Average Thrust**	340.6 N
Delays Tested	14 to 5, adjustable	**Specific Impulse (Isp)**	167.38 s
Samples per second	1000	**Burn time**	0.84 s
Notes	80% H		

Respectfully submitted,

Thomas Raithby
Chairman, CAR Motor Certification

06260922.gra

CTI 150-G50-IM-15A (CTI Pro38-1G)

Canadian Association of Rocketry
CAR Motor Certification
c/o 1518-3rd Ave. S.
Lethbridge, AB
T1J 0K8

July 2nd, 2009

Cesaroni Technology Incorporated
2561 Stouffville Road
Gormley, Ontario
L0H 1G0

Dear Dr. Jeroen Louwers,

The **CTI 150-G50-IM-15A** rocket motor was tested June 26th, 2009 and is in compliance with the certification requirements and standards of the Canadian Association of Rocketry (CAR). The motor is hereby certified for hobby rocketry use by the members of CAR and any other rocketry associations with current reciprocal motor certification agreements in place with CAR.

CAR Designation	**150-G50-IM-15A**	**Test Date**	June 26, 2009
Manufacturer Designation	150-G50-IM-15A	**Manufacturer**	Cesaroni Technology Inc.
Propellant	***Imax***	**Hardware**	Pro38-1G
Single-Use/Reload/Hybrid	Reloadable	**Motor Dimensions**	38mm x 127mm
Loaded Weight	218 g	**Total Impulse**	150.0 Ns
Burnout Weight	122 g	**Maximum Thrust**	78.8 N
Propellant Weight	77.7 g	**Average Thrust**	52.5 N
Delays Tested	15 to 6, adjustable	**Specific Impulse (Isp)**	196.87 s
Samples per second	1000	**Burn time**	2.87 s
Notes	88% G, NFPA 1125 (7.7.2) HP due to propellant mass over 62.5g		

Respectfully submitted,

Thomas Raithby
Chairman, CAR Motor Certification

06260911.gra

CTI 286-H100-IM-15A (CTI Pro38-2G)

Canadian Association of Rocketry
CAR Motor Certification
c/o 1518-3rd Ave. S.
Lethbridge, AB
T1J 0K8

July 2nd, 2009

Cesaroni Technology Incorporated
2561 Stouffville Road
Gormley, Ontario
L0H 1G0

Dear Dr. Jeroen Louwers,

The **CTI 286-H100-IM-15A** rocket motor was tested June 26th, 2009 and is in compliance with the certification requirements and standards of the Canadian Association of Rocketry (CAR). The motor is hereby certified for hobby rocketry use by the members of CAR and any other rocketry associations with current reciprocal motor certification agreements in place with CAR.

CAR Designation	**286-H100-IM-15A**	**Test Date**	April 30 - May 4, 2009
Manufacturer Designation	286-H100-15A	**Manufacturer**	Cesaroni Technology Inc.
Propellant	***Imax***	**Hardware**	Pro38-2G
Single-Use/Reload/Hybrid	Reloadable	**Motor Dimensions**	38mm x 186mm
Loaded Weight	327 g	**Total Impulse**	286.4 Ns
Burnout Weight	154 g	**Maximum Thrust**	117.9 N
Propellant Weight	154.4 g	**Average Thrust**	101.7 N
Delays Tested	15 to 6, adjustable	**Specific Impulse (Isp)**	189.15 s
Samples per second	1000	**Burn time**	2.82 s
Notes	79% H		

Respectfully submitted,

Thomas Raithby
Chairman, CAR Motor Certification

06260912.gra

CTI 636-I216-CL(I)-14A (CTI Pro38-5G)

Canadian Association of Rocketry
CAR Motor Certification
c/o 1518-3rd Ave. S.
Lethbridge, AB
T1J 0K8

July 2nd, 2009

Cesaroni Technology Incorporated
2561 Stouffville Road
Gormley, Ontario
L0H 1G0

Dear Dr. Jeroen Louwers,

The **CTI 636-I216-CL(I)-14A** rocket motor was tested June 26th, 2009 and is in compliance with the certification requirements and standards of the Canadian Association of Rocketry (CAR). The motor is hereby certified for hobby rocketry use by the members of CAR and any other rocketry associations with current reciprocal motor certification agreements in place with CAR.

CAR Designation	**636-I216-CL(I)-14A**	**Test Date**	June 26, 2009
Manufacturer Designation	636-I216-CL(I)-14A	**Manufacturer**	Cesaroni Technology Inc.
Propellant	***Classic (I Variant)***	**Hardware**	Pro38-5G
Single-Use/Reload/Hybrid	Reloadable	**Motor Dimensions**	38mm x 367mm
Loaded Weight	601 g	**Total Impulse**	636.1 Ns
Burnout Weight	264 g	**Maximum Thrust**	379.5 N
Propellant Weight	312.5 g	**Average Thrust**	216.1 N
Delays Tested	14 to 5, adjustable	**Specific Impulse (Isp)**	207.58 s
Samples per second	1000	**Burn time**	2.94 s
Notes	99% I		

Respectfully submitted,

Thomas Raithby
Chairman, CAR Motor Certification

06260916.gra

CTI 2772-L640-DT-P (CTI Pro54-6GXL)

Canadian Association of Rocketry
CAR Motor Certification
c/o 1518-3rd Ave. S.
Lethbridge, AB
T1J 0K8

July 2nd, 2009

Cesaroni Technology Incorporated
2561 Stouffville Road
Gormley, Ontario
L0H 1G0

Dear Dr. Jeroen Louwers,

The **CTI 2772-L640-DT-P** rocket motor was tested June 26th, 2009 and is in compliance with the certification requirements and standards of the Canadian Association of Rocketry (CAR). The motor is hereby certified for hobby rocketry use by the members of CAR and any other rocketry associations with current reciprocal motor certification agreements in place with CAR.

CAR Designation	**2772-L640-DT-P**	**Test Date**	June 26, 2009
Manufacturer Designation	2772-L640-P	**Manufacturer**	Cesaroni Technology Inc.
Propellant	***Dual Thrust***	**Hardware**	Pro54-6GXL
Single-Use/Reload/Hybrid	Reloadable	**Motor Dimensions**	54mm x 649mm
Loaded Weight	2244 g	**Total Impulse**	2772.2 Ns
Burnout Weight	789 g	**Maximum Thrust**	1590.0 N
Propellant Weight	1293.0 g	**Average Thrust**	638.4 N
Delays Tested	plugged	**Specific Impulse (Isp)**	218.63 s
Samples per second	1000	**Burn time**	4.28 s
Notes	8% L		

Respectfully submitted,

Thomas Raithby
Chairman, CAR Motor Certification

06260904.gra

CTI 4828-L1410-SK-P (CTI Pro75-5G)

Canadian Association of Rocketry
CAR Motor Certification
c/o 1518-3rd Ave. S.
Lethbridge, AB
T1J 0K8

July 2nd, 2009

Cesaroni Technology Incorporated
2561 Stouffville Road
Gormley, Ontario
L0H 1G0

Dear Dr. Jeroen Louwers,

The **CTI 4828-L1410-SK-P** rocket motor was tested June 26th, 2009 and is in compliance with the certification requirements and standards of the Canadian Association of Rocketry (CAR). The motor is hereby certified for hobby rocketry use by the members of CAR and any other rocketry associations with current reciprocal motor certification agreements in place with CAR.

CAR Designation	**CTI 4828-L1410-SK-P**	**Test Date**	June 26, 2009
Manufacturer Designation	4828-L1410-P	**Manufacturer**	Cesaroni Technology Inc.
Propellant	***Skidmark***	**Hardware**	Pro75-5G
Single-Use/Reload/Hybrid	Reloadable	**Motor Dimensions**	75mm x 757mm
Loaded Weight	5115 g	**Total Impulse**	4828.3 Ns
Burnout Weight	2136 g	**Maximum Thrust**	1669.9 N
Propellant Weight	2875.0 g	**Average Thrust**	1409.1 N
Delays Tested	plugged	**Specific Impulse (Isp)**	171.25 s
Samples per second	1000	**Burn time**	3.43 s
Notes	89% L		

Respectfully submitted,

Thomas Raithby
Chairman, CAR Motor Certification

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Canadian Association of Rocketry
Association canadienne de fusée