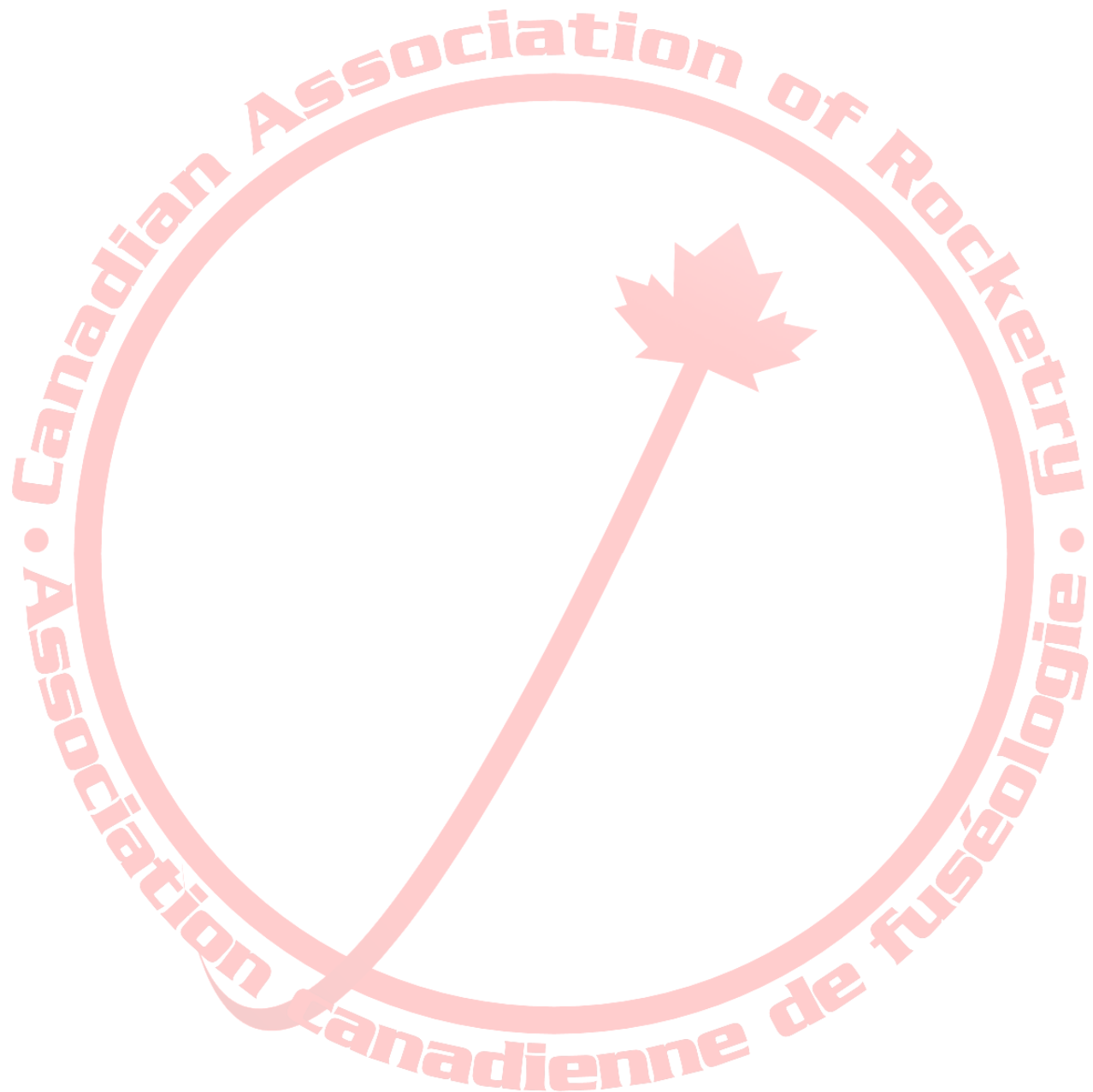


# Canadian Association of Rocketry

## *Rocket Motor Certification*



April 30 to May 4, 2009 Session

Submitted to the CAR Executive May 13, 2009

## Introduction

A motor testing session was held at the Cesaroni Technology Incorporated facility in Gormley, Ontario during the dates of April 30<sup>th</sup> to May 1<sup>st</sup>, 2009.

A total of 208 motors were fired in hardware ranging from the new 29mm diameter Pro29, up to the 162mm diameter Pro150. Impulses ranged from F to O and reloads were certified for use in hardware from CTI, AMW/ProX and Aerotech.

Ten propellants were fired, including Classic (CL), Smoky Sam (SS), Vmax (VM), White Thunder (WT), Blue Streak (BS), Skidmark (SK), Red Lightning (RL), Blue Baboon (BB), Wild Wolf (WW), and a new release – Imax (IM).

An interesting development during this round of testing was submission of two very similar reloads. Two versions of the Pro29-3G Blue Streak reloads were certified. The first was certified as an H133 (see p12) and the second as a G118 (see p21). The H- and G variants of this motor use different nozzles, but are otherwise the same.

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, several of these motors include notes that indicate they are considered high power under NFPA 1125.

I am very pleased to announce the certification of 52 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.

Respectfully submitted,

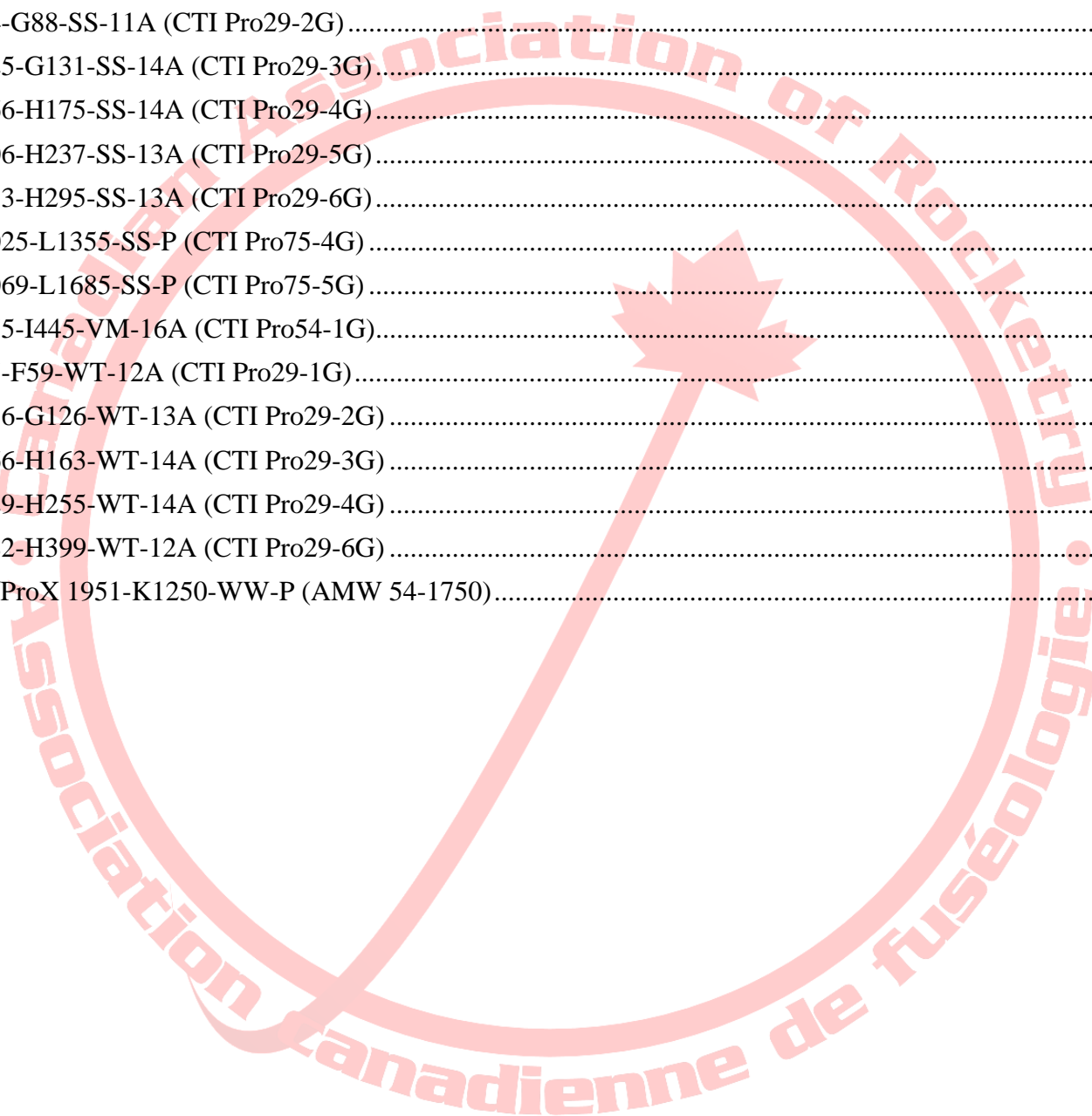
Thomas Raithby  
Chair of CAR Motor Certification

[www.CanadianRocketry.org](http://www.CanadianRocketry.org)

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## AMW/ProX 1109-J440-BB-P (AMW 54-1050)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **AMW/ProX 1109-J440-BB-P** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>1109-J440-BB-P</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	1109-J440-P	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Blue Baboon</i>	<b>Hardware</b>	AMW 54-1050
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	54mm x 326mm
<b>Loaded Weight</b>	1229 g	<b>Total Impulse</b>	1109 Ns
<b>Burnout Weight</b>	693 g	<b>Maximum Thrust</b>	662.1 N
<b>Propellant Weight</b>	528.4 g	<b>Average Thrust</b>	441.7 N
<b>Delays Tested</b>	plugged	<b>Specific Impulse (Isp)</b>	214.02 s
<b>Samples per second</b>	1000	<b>Burn time</b>	2.48 s
<b>Notes:</b>	73% J		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05040943.gra

## AMW/ProX 1233-J475-BB-P (AMW 54-1400)

Canadian Association of Rocketry  
c/o 1518-3<sup>rd</sup> Ave. S.  
Lethbridge, AB  
T1J 0K8

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **AMW/ProX 1233-J475-BB-P** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>1233-J475-BB-P</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	1233-J475-P	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Blue Baboon</i>	<b>Hardware</b>	AMW 54-1400
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	54mm x 403mm
<b>Loaded Weight</b>	1493 g	<b>Total Impulse</b>	1233.4 Ns
<b>Burnout Weight</b>	779 g	<b>Maximum Thrust</b>	627.5 N
<b>Propellant Weight</b>	704.5 g	<b>Average Thrust</b>	475.4 N
<b>Delays Tested</b>	plugged	<b>Specific Impulse (Isp)</b>	178.53 s
<b>Samples per second</b>	1000	<b>Burn time</b>	2.60 s
<b>Notes:</b>	93% J		

Respectfully submitted,

Thomas Raithby  
Chairman, CAR Motor Certification

05040936.gra

## AMW/ProX 1791-K710-BB-P (AMW 54-1750)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **AMW/ProX 1791-K710-BB-P** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>1791-K710-BB-P</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	1791-K710-P	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Blue Baboon</i>	<b>Hardware</b>	AMW 54-1750
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	54mm x 491mm
<b>Loaded Weight</b>	1812 g	<b>Total Impulse</b>	1791.4 Ns
<b>Burnout Weight</b>	910 g	<b>Maximum Thrust</b>	966.8 N
<b>Propellant Weight</b>	880.7 g	<b>Average Thrust</b>	712.2 N
<b>Delays Tested</b>	plugged	<b>Specific Impulse (Isp)</b>	207.41 s
<b>Samples per second</b>	1000	<b>Burn time</b>	2.51 s
<b>Notes</b>	40% K		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05040929.gra

## AMW/ProX 2551-K1130-BB-P (AMW 54-2550)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **AMW/ProX 2551-K1130-BB-P** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>2551-K1130-BB-P</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	2551-K1130-P	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Blue Baboon</i>	<b>Hardware</b>	AMW 54-2550
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	54mm x 728mm
<b>Loaded Weight</b>	2574 g	<b>Total Impulse</b>	2550.7 Ns
<b>Burnout Weight</b>	1215 g	<b>Maximum Thrust</b>	1548.5 N
<b>Propellant Weight</b>	1334.0 g	<b>Average Thrust</b>	1127.6 N
<b>Delays Tested</b>	plugged	<b>Specific Impulse (Isp)</b>	194.97 s
<b>Samples per second</b>	1000	<b>Burn time</b>	2.27 s
<b>Notes</b>	99% K		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05040938.gra



## CTI 37,148-O4900-BS-P (CTI Pro150-40k)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 37,148-O4900-BS-P** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>37,148-O4900-BS-P</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	37,148-O4900-P	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Blue Streak</i>	<b>Hardware</b>	Pro150-40K
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	161mm x 957mm
<b>Loaded Weight</b>	32648 g	<b>Total Impulse</b>	37,148.5 Ns
<b>Burnout Weight</b>	13750 g	<b>Maximum Thrust</b>	5586.5 N
<b>Propellant Weight</b>	17700 g	<b>Average Thrust</b>	4890.9 N
<b>Delays Tested</b>	plugged	<b>Specific Impulse (Isp)</b>	214.02 s
<b>Samples per second</b>	1000	<b>Burn time</b>	7.60 s
<b>Notes</b>	81.3% O		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05030901.gra

## CTI 51-F36-BS-14A (CTI Pro29-1G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 51-F36-BS-14A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>51-F36-BS-14A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	51-F36-14A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Blue Streak</i>	<b>Hardware</b>	Pro29-1G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 98mm
<b>Loaded Weight</b>	101 g	<b>Total Impulse</b>	51.5 Ns
<b>Burnout Weight</b>	69 g	<b>Maximum Thrust</b>	46.3 N
<b>Propellant Weight</b>	25.6 g	<b>Average Thrust</b>	36.4 N
<b>Delays Tested</b>	14 to 5, adjustable	<b>Specific Impulse (Isp)</b>	205.09 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.42 s
<b>Notes</b>	29% F		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05040914.gra

## CTI 107-G83-BS-14A (CTI Pro29-2G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 107-G83-BS-14A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>107-G83-BS-14A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	107-G83-14A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Blue Streak</i>	<b>Hardware</b>	Pro29-2G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 142mm
<b>Loaded Weight</b>	145 g	<b>Total Impulse</b>	107.4 Ns
<b>Burnout Weight</b>	87 g	<b>Maximum Thrust</b>	99.0 N
<b>Propellant Weight</b>	51.1 g	<b>Average Thrust</b>	83.1 N
<b>Delays Tested</b>	14 to 5, adjustable	<b>Specific Impulse (Isp)</b>	214.35 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.29 s
<b>Notes</b>	34% G, NFPA HP due to average thrust over 80 N		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05040921.gra

## CTI 163-H133-BS-14A (CTI Pro29-3G H Variant)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 163-H133-BS-14A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>163-H133-BS-14A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	163-H133-14A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Blue Streak</i>	<b>Hardware</b>	Pro29-3G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 187mm
<b>Loaded Weight</b>	190 g	<b>Total Impulse</b>	163.3 Ns
<b>Burnout Weight</b>	105 g	<b>Maximum Thrust</b>	191.1 N
<b>Propellant Weight</b>	76.7 g	<b>Average Thrust</b>	133.1 N
<b>Delays Tested</b>	14 to 5, adjustable	<b>Specific Impulse (Isp)</b>	217.13 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.23 s
<b>Notes</b>	2% H		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300924.gra

## CTI 217-H170-BS-14A (CTI Pro29-4G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 217-H170-BS-14A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>217-H170-BS-14A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	217-H170-14A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Blue Streak</i>	<b>Hardware</b>	Pro29-4G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 231mm
<b>Loaded Weight</b>	232 g	<b>Total Impulse</b>	217.1 Ns
<b>Burnout Weight</b>	121 g	<b>Maximum Thrust</b>	243.8 N
<b>Propellant Weight</b>	102.3 g	<b>Average Thrust</b>	171.3 N
<b>Delays Tested</b>	14 to 5, adjustable	<b>Specific Impulse (Isp)</b>	216.42 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.27 s
<b>Notes</b>	36% H		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300928.gra

## CTI 261-H200-BS-14A (CTI Pro29-5G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 261-H200-BS-14A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>261-H200-BS-14A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	261-H200-14A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Blue Streak</i>	<b>Hardware</b>	Pro29-5G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 276mm
<b>Loaded Weight</b>	274 g	<b>Total Impulse</b>	260.8 Ns
<b>Burnout Weight</b>	138 g	<b>Maximum Thrust</b>	303.2 N
<b>Propellant Weight</b>	127.9 g	<b>Average Thrust</b>	201.7 N
<b>Delays Tested</b>	14 to 5, adjustable	<b>Specific Impulse (Isp)</b>	207.94 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.29 s
<b>Notes</b>	63% H		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300933.gra

## CTI 315-H255-BS-14A (CTI Pro29-6G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 315-H255-BS-14A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>315-H255-BS-14A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	315-H255-14A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Blue Streak</i>	<b>Hardware</b>	Pro29-6G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 320mm
<b>Loaded Weight</b>	318 g	<b>Total Impulse</b>	315.4 Ns
<b>Burnout Weight</b>	156 g	<b>Maximum Thrust</b>	411.1 N
<b>Propellant Weight</b>	153.4 g	<b>Average Thrust</b>	254.2 N
<b>Delays Tested</b>	14 to 5, adjustable	<b>Specific Impulse (Isp)</b>	209.65 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.24 s
<b>Notes</b>	97% H		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300935.gra



## CTI 2383-K820-BS-17A (CTI Pro54-6G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 2383-K820-BS-17A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>2383-K820-BS-17A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	2383-K820-17A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Blue Streak</i>	<b>Hardware</b>	Pro54-6G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	54mm x 572mm
<b>Loaded Weight</b>	1982 g	<b>Total Impulse</b>	2383.0 Ns
<b>Burnout Weight</b>	750 g	<b>Maximum Thrust</b>	1470.5 N
<b>Propellant Weight</b>	1164.0 g	<b>Average Thrust</b>	821.6 N
<b>Delays Tested</b>	17 to 7, adjustable	<b>Specific Impulse (Isp)</b>	208.76 s
<b>Samples per second</b>	1000	<b>Burn time</b>	2.90 s
<b>Notes</b>	86% K		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05010940.gra



## CTI 2771-L990-BS-P (CTI Pro54 6GXL)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 2771-L990-BS-P** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>2771-L990-BS-P</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	2771-L990-P	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Blue Streak</i>	<b>Hardware</b>	Pro54-6GXL
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	54mm x 649mm
<b>Loaded Weight</b>	2236 g	<b>Total Impulse</b>	2771.0 Ns
<b>Burnout Weight</b>	819 g	<b>Maximum Thrust</b>	1702.7 N
<b>Propellant Weight</b>	1369.4 g	<b>Average Thrust</b>	991.0 N
<b>Delays Tested</b>	plugged	<b>Specific Impulse (Isp)</b>	206.34 s
<b>Samples per second</b>	1000	<b>Burn time</b>	2.80 s
<b>Notes</b>	8% L		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05020901.gra

## CTI 4895-L1395-BS-P (CTI Pro75-4G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 4895-L1395-BS-P** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>4895-L1395-BS-P</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	4895-L1395-P	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Blue Streak</i>	<b>Hardware</b>	Pro75-4G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	75mm x 621mm
<b>Loaded Weight</b>	4323 g	<b>Total Impulse</b>	4895.4 Ns
<b>Burnout Weight</b>	1848 g	<b>Maximum Thrust</b>	1779.9 N
<b>Propellant Weight</b>	2364.9 g	<b>Average Thrust</b>	1395.7 N
<b>Delays Tested</b>	plugged	<b>Specific Impulse (Isp)</b>	211.09 s
<b>Samples per second</b>	1000	<b>Burn time</b>	3.51 s
<b>Notes</b>	91% L		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05030905.gra

## CTI 6026-M1670-BS-P (CTI Pro75-5G / AT 75-6400)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 6026-M1670-BS-P** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>6026-M1670-BS-P</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	6026-M1670-P	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Blue Streak</i>	<b>Hardware</b>	Pro75-5G / AT 75-6400
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	75mm x 757mm / 801mm
<b>Loaded Weight</b>	CTI 5231g / AT 5322g	<b>Total Impulse</b>	6041.7 Ns
<b>Burnout Weight</b>	CTI 2130g / AT 2244g	<b>Maximum Thrust</b>	2232.1 N
<b>Propellant Weight</b>	2956.1 g	<b>Average Thrust</b>	1667.8 N
<b>Delays Tested</b>	Plugged	<b>Specific Impulse (Isp)</b>	208.41 s
<b>Samples per second</b>	1000	<b>Burn time</b>	3.63 s
<b>Notes</b>	18% M, cross-certified in Aerotech hardware, figures for CTI / Aerotech		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05020913.gra

## CTI 159-G118-BS-15A (CTI Pro29-3G G-Variant)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 159-G118-BS-15A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>159-G118-BS-15A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	159-G118-15A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Blue Streak</i>	<b>Hardware</b>	Pro29-3G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 187mm
<b>Loaded Weight</b>	188 g	<b>Total Impulse</b>	159.1 Ns
<b>Propellant Weight</b>	105 g	<b>Maximum Thrust</b>	157.3 N
<b>Burnout Weight</b>	76.7 g	<b>Average Thrust</b>	117.8 N
<b>Delays Tested</b>	15 to 6, adjustable	<b>Specific Impulse (Isp)</b>	211.58 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.35 s
<b>Notes</b>	99% G, NFPA HP due to average thrust over 80 N		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05010901.gra

## CTI 108-G57-CL-12A (CTI Pro29-2G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 108-G57-CL-12A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>108-G57-CL-12A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	108-G57-12A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Classic</i>	<b>Hardware</b>	Pro29-2G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 142mm
<b>Loaded Weight</b>	146 g	<b>Total Impulse</b>	107.8 Ns
<b>Burnout Weight</b>	87 g	<b>Maximum Thrust</b>	85.4 N
<b>Propellant Weight</b>	51.4 g	<b>Average Thrust</b>	57.2 N
<b>Delays Tested</b>	12 to 3, adjustable	<b>Specific Impulse (Isp)</b>	213.78 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.89 s
<b>Notes</b>	35% G		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300903.gra

## CTI 164-H90-CL-12A (CTI Pro29-3G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 164-H90-CL-12A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>164-H90-CL-12A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	164-H90-12A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Classic</i>	<b>Hardware</b>	Pro29-3G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 187mm
<b>Loaded Weight</b>	163 g	<b>Total Impulse</b>	164.2 Ns
<b>Burnout Weight</b>	106 g	<b>Maximum Thrust</b>	154.1 N
<b>Propellant Weight</b>	77.1 g	<b>Average Thrust</b>	90.3 N
<b>Delays Tested</b>	12 to 3, adjustable	<b>Specific Impulse (Isp)</b>	217.15 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.82 s
<b>Notes</b>	3% H		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300905.gra

## CTI 216-H118-CL-12A (CTI Pro29-4G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 216-H118-CL-12A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>216-H118-CL-12A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	216-H118-12A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Classic</i>	<b>Hardware</b>	Pro29-4G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 231mm
<b>Loaded Weight</b>	232 g	<b>Total Impulse</b>	216.2 Ns
<b>Burnout Weight</b>	121 g	<b>Maximum Thrust</b>	191.3 N
<b>Propellant Weight</b>	102.8 g	<b>Average Thrust</b>	118.4 N
<b>Delays Tested</b>	12 to 3, adjustable	<b>Specific Impulse (Isp)</b>	214.50 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.83 s
<b>Notes</b>	35% H		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300907.gra



## CTI 268-H140-CL-11A (CTI Pro29-5G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 268-H140-CL-11A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>268-H140-CL-11A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	268-H140-11A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Classic</i>	<b>Hardware</b>	Pro29-5G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 276mm
<b>Loaded Weight</b>	277 g	<b>Total Impulse</b>	268.0 Ns
<b>Burnout Weight</b>	138 g	<b>Maximum Thrust</b>	247.8 N
<b>Propellant Weight</b>	128.5 g	<b>Average Thrust</b>	141.8 N
<b>Delays Tested</b>	11 to 2, adjustable	<b>Specific Impulse (Isp)</b>	212.65 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.89 s
<b>Notes</b>	67% H		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300911.gra



## CTI 312-H160-CL-12A (CTI Pro29-6G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 312-H160-CL-12A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>312-H160-CL-12A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	312-H160-12A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Classic</i>	<b>Hardware</b>	Pro29-6G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 320mm
<b>Loaded Weight</b>	319 g	<b>Total Impulse</b>	311.7 Ns
<b>Burnout Weight</b>	153 g	<b>Maximum Thrust</b>	334.8 N
<b>Propellant Weight</b>	154.2 g	<b>Average Thrust</b>	161.5 N
<b>Delays Tested</b>	12 to 3, adjustable	<b>Specific Impulse (Isp)</b>	206.1 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.93 s
<b>Notes</b>	95% H		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300914.gra

## CTI 1008-J420-CL-15A (CTI Pro38 6GXL)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 1008-J420-CL-15A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>1008-J420-CL-15A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	1008-J420-15A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Classic</i>	<b>Hardware</b>	Pro38-6GXL
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	38mm x 500mm
<b>Loaded Weight</b>	874 g	<b>Total Impulse</b>	1007.8 Ns
<b>Burnout Weight</b>	352 g	<b>Maximum Thrust</b>	783.1 N
<b>Propellant Weight</b>	479.6 g	<b>Average Thrust</b>	419.9 N
<b>Delays Tested</b>	15 to 6, adjustable	<b>Specific Impulse (Isp)</b>	214.27 s
<b>Samples per second</b>	1000	<b>Burn time</b>	2.40 s
<b>Notes</b>	57% J		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05010910.gra

## CTI 348-I204-IM-13A (CTI Pro29-6G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 348-I204-IM-13A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>348-I204-IM-13A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	348-I204-13A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Imax</i>	<b>Hardware</b>	Pro29-6G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 320mm
<b>Loaded Weight</b>	349 g	<b>Total Impulse</b>	347.7 Ns
<b>Burnout Weight</b>	155 g	<b>Maximum Thrust</b>	356.8 N
<b>Propellant Weight</b>	185.4 g	<b>Average Thrust</b>	204.2 N
<b>Delays Tested</b>	13 to 4, adjustable	<b>Specific Impulse (Isp)</b>	191.26 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.70 s
<b>Notes</b>	9% I		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05010906.gra

## CTI 1115-J530-IM-15A (CTI Pro38 6GXL)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 1115-J530-IM-15A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>1115-J530-IM-15A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	1115-J530-15A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Imax</i>	<b>Hardware</b>	Pro38-6GXL
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	38mm x 500mm
<b>Loaded Weight</b>	977 g	<b>Total Impulse</b>	1115.5 Ns
<b>Burnout Weight</b>	352 g	<b>Maximum Thrust</b>	828.8 N
<b>Propellant Weight</b>	576.5 g	<b>Average Thrust</b>	531.2 N
<b>Delays Tested</b>	15 to 6, adjustable	<b>Specific Impulse (Isp)</b>	197.30 s
<b>Samples per second</b>	1000	<b>Burn time</b>	2.10 s
<b>Notes</b>	74% J		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05010915.gra

## CTI 2653-L585-IM-P (CTI Pro75-2G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 2653-L585-IM-P** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>2653-L585-IM-P</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	2653-L585-P	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Imax</i>	<b>Hardware</b>	Pro75-2G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	75mm x 350mm
<b>Loaded Weight</b>	2784 g	<b>Total Impulse</b>	2653.4 Ns
<b>Burnout Weight</b>	1260 g	<b>Maximum Thrust</b>	679.8 N
<b>Propellant Weight</b>	1449.8 g	<b>Average Thrust</b>	583.8 N
<b>Delays Tested</b>	plugged	<b>Specific Impulse (Isp)</b>	186.63 s
<b>Samples per second</b>	1000	<b>Burn time</b>	4.55 s
<b>Notes</b>	4% L		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05020919.gra

## CTI 6819-M1540-IM-P (CTI Pro75-5G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 6819-M1540-IM-P** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>6819-M1540-IM-P</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	6819-M1540-P	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Imax</i>	<b>Hardware</b>	Pro75-5G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	75mm x 757mm
<b>Loaded Weight</b>	5906 g	<b>Total Impulse</b>	6819.4 Ns
<b>Burnout Weight</b>	2128 g	<b>Maximum Thrust</b>	2328.8 N
<b>Propellant Weight</b>	3624.4 g	<b>Average Thrust</b>	1537.1 N
<b>Delays Tested</b>	plugged	<b>Specific Impulse (Isp)</b>	191.86 s
<b>Samples per second</b>	1000	<b>Burn time</b>	4.44 s
<b>Notes</b>	33% M		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05020917.gra

## CTI 3618-L995-RL-P (CTI Pro75-3G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 3618-L995-RL-P** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>3618-L995-RL-P</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	3618-L995-P	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Red Lightning</i>	<b>Hardware</b>	Pro75-3G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	75mm x 486mm
<b>Loaded Weight</b>	3591 g	<b>Total Impulse</b>	3618.0 Ns
<b>Burnout Weight</b>	1595 g	<b>Maximum Thrust</b>	1404.5 N
<b>Propellant Weight</b>	1912.5 g	<b>Average Thrust</b>	996.5 N
<b>Delays Tested</b>	plugged	<b>Specific Impulse (Isp)</b>	192.90 s
<b>Samples per second</b>	1000	<b>Burn time</b>	3.63 s
<b>Notes</b>	41% L		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05020902.gra



## CTI 6128-M1810-RL-P (CTI Pro75 5G / AT 75-6400)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 6128-M1810-RL-P** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>6128-M1810-RL-P</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	6128-M1810-P	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Red Lightning</i>	<b>Hardware</b>	Pro75-5G / AT 75-6400
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	75mm x 757mm / 801mm
<b>Loaded Weight</b>	CTI 5416g / AT 5553g	<b>Total Impulse</b>	6132.0 Ns
<b>Burnout Weight</b>	CTI 2119g / AT 2263g	<b>Maximum Thrust</b>	2158.6 N
<b>Propellant Weight</b>	3196.0 g	<b>Average Thrust</b>	1811.3 N
<b>Delays Tested</b>	plugged	<b>Specific Impulse (Isp)</b>	195.65 s
<b>Samples per second</b>	1000	<b>Burn time</b>	3.39 s
<b>Notes</b>	20% M, cross-certified in Aerotech hardware, figures for CTI / Aerotech		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05020902.gra



## AMW/ProX 1531-K610-SK-P (AMW 54-1750)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **AMW/ProX 1531-K610-SK-P** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>1531-K610-SK-P</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	1531-K610-P	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Skidmark</i>	<b>Hardware</b>	AMW 54-1750
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	54mm x 491mm
<b>Loaded Weight</b>	1765 g	<b>Total Impulse</b>	1531.0 Ns
<b>Burnout Weight</b>	899 g	<b>Maximum Thrust</b>	730.6 N
<b>Propellant Weight</b>	861.0 g	<b>Average Thrust</b>	612.1 N
<b>Delays Tested</b>	plugged	<b>Specific Impulse (Isp)</b>	181.32 s
<b>Samples per second</b>	1000	<b>Burn time</b>	2.50 s
<b>Notes</b>	20% K		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05040939.gra

## CTI 138-G106-SK-14A (CTI Pro29-3G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 138-G106-SK-14A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>138-G106-SK-14A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	138-G106-14A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Skidmark</i>	<b>Hardware</b>	Pro29-3G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 187mm
<b>Loaded Weight</b>	187 g	<b>Total Impulse</b>	138.3 Ns
<b>Burnout Weight</b>	106 g	<b>Maximum Thrust</b>	128.7 N
<b>Propellant Weight</b>	75.0 g	<b>Average Thrust</b>	106.0 N
<b>Delays Tested</b>	14 to 5, adjustable	<b>Specific Impulse (Isp)</b>	187.99 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.31 s
<b>Notes</b>	73% G, NFPA HP due to average thrust over 80 N		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300942.gra

## CTI 176-H123-SK-12A (CTI Pro29-4G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 176-H123-SK-12A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>176-H123-SK-12A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	176-H123-12A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Skidmark</i>	<b>Hardware</b>	Pro29-4G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 231mm
<b>Loaded Weight</b>	228 g	<b>Total Impulse</b>	176.5 Ns
<b>Burnout Weight</b>	122 g	<b>Maximum Thrust</b>	149.8 N
<b>Propellant Weight</b>	100.0 g	<b>Average Thrust</b>	123.0 N
<b>Delays Tested</b>	12 to 3, adjustable	<b>Specific Impulse (Isp)</b>	179.97 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.44 s
<b>Notes</b>	10% H		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300944.gra

## CTI 220-H160-SK-14A (CTI Pro29-5G)

Canadian Association of Rocketry  
 CAR Motor Certification  
 c/o 1518-3<sup>rd</sup> Ave. S.  
 Lethbridge, AB  
 T1J 0K8  
 May 12th, 2009  
 Cesaroni Technology Incorporated  
 2561 Stouffville Road  
 Gormley, Ontario  
 L0H 1G0

Dear Dr. Jeroen Louwers,

The **CTI 220-H160-SK-14A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>220-H160-SK-14A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	220-H160-14A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Skidmark</i>	<b>Hardware</b>	Pro29-5G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 276mm
<b>Loaded Weight</b>	272 g	<b>Total Impulse</b>	220.5 Ns
<b>Burnout Weight</b>	140 g	<b>Maximum Thrust</b>	191.9 N
<b>Propellant Weight</b>	125.0 g	<b>Average Thrust</b>	159.0 N
<b>Delays Tested</b>	14 to 5, adjustable	<b>Specific Impulse (Isp)</b>	179.85 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.40 s
<b>Notes</b>	38% H		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300948.gra

## CTI 258-H180-SK-14A (CTI Pro29-6G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 258-H180-SK-14A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>258-H180-SK-14A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	258-H180-14A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Skidmark</i>	<b>Hardware</b>	Pro29-6G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 320mm
<b>Loaded Weight</b>	314 g	<b>Total Impulse</b>	258.0 Ns
<b>Burnout Weight</b>	156 g	<b>Maximum Thrust</b>	266.1 N
<b>Propellant Weight</b>	150.0 g	<b>Average Thrust</b>	179.6 N
<b>Delays Tested</b>	14 to 9, adjustable	<b>Specific Impulse (Isp)</b>	175.36 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.44 s
<b>Notes</b>	61% H		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300950.gra

## CTI 1364-K454-SK-19A (CTI Pro54-4G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 1364-K454-SK-19A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>1364-K454-SK-19A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	1364-K454-19A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Skidmark</i>	<b>Hardware</b>	Pro54-4G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	54mm x 404mm
<b>Loaded Weight</b>	1391 g	<b>Total Impulse</b>	1363.7 Ns
<b>Burnout Weight</b>	570 g	<b>Maximum Thrust</b>	620.0 N
<b>Propellant Weight</b>	769.2	<b>Average Thrust</b>	454.1 N
<b>Delays Tested</b>	19 to 10, adjustable	<b>Specific Impulse (Isp)</b>	180.78 s
<b>Samples per second</b>	1000	<b>Burn time</b>	3.00 s
<b>Notes</b>	7% K		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05010919.gra

## CTI 1654-K515-SK-16A (CTI Pro54-5G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 1654-K515-SK-16A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>1654-K515-SK-16A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	1654-K515-16A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Skidmark</i>	<b>Hardware</b>	Pro54-5G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	38mm x 500mm
<b>Loaded Weight</b>	1654 g	<b>Total Impulse</b>	1653.9 Ns
<b>Burnout Weight</b>	641 g	<b>Maximum Thrust</b>	718.5 N
<b>Propellant Weight</b>	961.5 g	<b>Average Thrust</b>	513.4 N
<b>Delays Tested</b>	16 to 6, adjustable	<b>Specific Impulse (Isp)</b>	175.41 s
<b>Samples per second</b>	1000	<b>Burn time</b>	3.22 s
<b>Notes</b>	29% K		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05010922.gra



## CTI 2010-K675-SK-18A (CTI Pro54-6G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 2010-K675-SK-18A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>2010-K675-SK-18A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	2010-K675-18A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Skidmark</i>	<b>Hardware</b>	Pro54-6G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	54mm x 572mm
<b>Loaded Weight</b>	1940 g	<b>Total Impulse</b>	2009.6 Ns
<b>Burnout Weight</b>	740 g	<b>Maximum Thrust</b>	991.6 N
<b>Propellant Weight</b>	1140.8 g	<b>Average Thrust</b>	673.8 N
<b>Delays Tested</b>	18 to 8, adjustable	<b>Specific Impulse (Isp)</b>	179.63 s
<b>Samples per second</b>	1000	<b>Burn time</b>	2.98 s
<b>Notes</b>	57% K		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05010928.gra



## CTI 2304-K815-SK-P (CTI Pro54-6GXL)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 2304-K815-SK-P** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>2304-K815-SK-P</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	2304-K815-P	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Skidmark</i>	<b>Hardware</b>	Pro54-6GXL
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	54mm x 649mm
<b>Loaded Weight</b>	2197 g	<b>Total Impulse</b>	2303.7 Ns
<b>Burnout Weight</b>	826 g	<b>Maximum Thrust</b>	1246.5 N
<b>Propellant Weight</b>	1342.1 g	<b>Average Thrust</b>	814.9 N
<b>Delays Tested</b>	plugged	<b>Specific Impulse (Isp)</b>	175.03 s
<b>Samples per second</b>	1000	<b>Burn time</b>	2.83 s
<b>Notes</b>	80% K		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05010931.gra

## CTI 41-F36-SS-11A (CTI Pro29-1G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 41-F36-SS-11A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>41-F36-SS-11A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	41-F36-11A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Smoky Sam</i>	<b>Hardware</b>	Pro29-1G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 98mm
<b>Loaded Weight</b>	104 g	<b>Total Impulse</b>	41.2 Ns
<b>Burnout Weight</b>	69 g	<b>Maximum Thrust</b>	72.7 N
<b>Propellant Weight</b>	29.5 g	<b>Average Thrust</b>	38.5 N
<b>Delays Tested</b>	11 to 2, adjustable	<b>Specific Impulse (Isp)</b>	142.32 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.07 s
<b>Notes</b>	3% F		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05040919.gra

## CTI 84-G88-SS-11A (CTI Pro29-2G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 84-G88-SS-11A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>84-G88-SS-11A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	84-G88-11A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Smoky Sam</i>	<b>Hardware</b>	Pro29-2G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 142mm
<b>Loaded Weight</b>	152 g	<b>Total Impulse</b>	84.3 Ns
<b>Burnout Weight</b>	88 g	<b>Maximum Thrust</b>	123.6 N
<b>Propellant Weight</b>	59.0 g	<b>Average Thrust</b>	87.8 N
<b>Delays Tested</b>	11 to 2, adjustable	<b>Specific Impulse (Isp)</b>	145.74 s
<b>Samples per second</b>	1000	<b>Burn time</b>	0.96 s
<b>Notes</b>	5% G, NFPA HP due to average thrust over 80 N		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300975.gra

## CTI 125-G131-SS-14A (CTI Pro29-3G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 125-G131-SS-14A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>125-G131-SS-14A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	125-G131-14A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Smoky Sam</i>	<b>Hardware</b>	Pro29-3G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 187mm
<b>Loaded Weight</b>	200 g	<b>Total Impulse</b>	125.2 Ns
<b>Burnout Weight</b>	106 g	<b>Maximum Thrust</b>	182.6 N
<b>Propellant Weight</b>	88.6 g	<b>Average Thrust</b>	130.8 N
<b>Delays Tested</b>	14 to 5, adjustable	<b>Specific Impulse (Isp)</b>	144.06 s
<b>Samples per second</b>	1000	<b>Burn time</b>	0.96 s
<b>Notes</b>	56% G, NFPA HP due to average thrust over 80 N		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300979.gra

## CTI 166-H175-SS-14A (CTI Pro29-4G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 166-H175-SS-14A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>166-H175-SS-14A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	166-H175-14A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Smoky Sam</i>	<b>Hardware</b>	Pro29-4G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 231mm
<b>Loaded Weight</b>	247 g	<b>Total Impulse</b>	166.0 Ns
<b>Burnout Weight</b>	125 g	<b>Maximum Thrust</b>	221.6 N
<b>Propellant Weight</b>	118.1 g	<b>Average Thrust</b>	175.1 N
<b>Delays Tested</b>	14 to 5, adjustable	<b>Specific Impulse (Isp)</b>	143.32 s
<b>Samples per second</b>	1000	<b>Burn time</b>	0.95 s
<b>Notes</b>	4% H		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300982.gra

## CTI 206-H237-SS-13A (CTI Pro29-5G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 206-H237-SS-13A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>206-H237-SS-13A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	206-H237-13A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Smoky Sam</i>	<b>Hardware</b>	Pro29-5G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 276mm
<b>Loaded Weight</b>	294 g	<b>Total Impulse</b>	206.2 Ns
<b>Burnout Weight</b>	143 g	<b>Maximum Thrust</b>	295.9 N
<b>Propellant Weight</b>	147.6 g	<b>Average Thrust</b>	237.2 N
<b>Delays Tested</b>	13 to 4, adjustable	<b>Specific Impulse (Isp)</b>	142.46 s
<b>Samples per second</b>	1000	<b>Burn time</b>	0.88 s
<b>Notes</b>	29% H		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300984.gra

## CTI 253-H295-SS-13A (CTI Pro29-6G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 253-H295-SS-13A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>253-H295-SS-13A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	253-H295-13A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Smoky Sam</i>	<b>Hardware</b>	Pro29-6G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 320mm
<b>Loaded Weight</b>	342 g	<b>Total Impulse</b>	252.7 Ns
<b>Burnout Weight</b>	161 g	<b>Maximum Thrust</b>	359.5 N
<b>Propellant Weight</b>	177.1	<b>Average Thrust</b>	296.0 N
<b>Delays Tested</b>	13 to 4, adjustable	<b>Specific Impulse (Isp)</b>	145.51 s
<b>Samples per second</b>	1000	<b>Burn time</b>	0.85 s
<b>Notes</b>	58% H		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300988.gra



## CTI 4025-L1355-SS-P (CTI Pro75-4G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 4025-L1355-SS-P** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>4025-L1355-SS-P</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	4025-L1355-P	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Smoky Sam</i>	<b>Hardware</b>	Pro75-4G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	75mm x 621mm
<b>Loaded Weight</b>	4962 g	<b>Total Impulse</b>	4025.5 Ns
<b>Burnout Weight</b>	1886 g	<b>Maximum Thrust</b>	1792.2 N
<b>Propellant Weight</b>	3012.4 g	<b>Average Thrust</b>	1355.7 N
<b>Delays Tested</b>	plugged	<b>Specific Impulse (Isp)</b>	136.26 s
<b>Samples per second</b>	1000	<b>Burn time</b>	2.97 s
<b>Notes</b>	57% L		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05020903.gra



## CTI 5069-L1685-SS-P (CTI Pro75-5G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 5069-L1685-SS-P** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>5069-L1685-SS-P</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	5069-L1685-P	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Smoky Sam</i>	<b>Hardware</b>	Pro75-5G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	75mm x 757mm
<b>Loaded Weight</b>	6051 g	<b>Total Impulse</b>	5069.3 Ns
<b>Burnout Weight</b>	2221 g	<b>Maximum Thrust</b>	2569.9 N
<b>Propellant Weight</b>	3773.1 g	<b>Average Thrust</b>	1685.8 N
<b>Delays Tested</b>	plugged	<b>Specific Impulse (Isp)</b>	137.00 s
<b>Samples per second</b>	1000	<b>Burn time</b>	3.01 s
<b>Notes</b>	98% L		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05020910.gra

## CTI 475-I445-VM-16A (CTI Pro54-1G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 475-I445-VM-16A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>475-I445-VM-16A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	475-I445-16A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>Vmax</i>	<b>Hardware</b>	Pro54-1G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	54mm x 143mm
<b>Loaded Weight</b>	575 g	<b>Total Impulse</b>	474.9 Ns
<b>Burnout Weight</b>	333 g	<b>Maximum Thrust</b>	526.2 N
<b>Propellant Weight</b>	212.7 g	<b>Average Thrust</b>	442.7 N
<b>Delays Tested</b>	16 to 6, adjustable	<b>Specific Impulse (Isp)</b>	227.66 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.07 s
<b>Notes</b>	48% I		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05010918.gra

## CTI 57-F59-WT-12A (CTI Pro29-1G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 57-F59-WT-12A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>57-F59-WT-12A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	57-F59-12A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>White Thunder</i>	<b>Hardware</b>	Pro29-1G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 98mm
<b>Loaded Weight</b>	99 g	<b>Total Impulse</b>	57.0 Ns
<b>Burnout Weight</b>	68 g	<b>Maximum Thrust</b>	70.9 N
<b>Propellant Weight</b>	26.1 g	<b>Average Thrust</b>	58.9 N
<b>Delays Tested</b>	12 to 3, adjustable	<b>Specific Impulse (Isp)</b>	222.72 s
<b>Samples per second</b>	1000	<b>Burn time</b>	0.96 s
<b>Notes</b>	43% F		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05040905.gra

## CTI 116-G126-WT-13A (CTI Pro29-2G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 116-G126-WT-13A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>116-G126-WT-13A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	116-G126-13A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>White Thunder</i>	<b>Hardware</b>	Pro29-2G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 142mm
<b>Loaded Weight</b>	145 g	<b>Total Impulse</b>	116.0 Ns
<b>Burnout Weight</b>	86 g	<b>Maximum Thrust</b>	167.4 N
<b>Propellant Weight</b>	52.1 g	<b>Average Thrust</b>	125.8 N
<b>Delays Tested</b>	13 to 4, adjustable	<b>Specific Impulse (Isp)</b>	227.03 s
<b>Samples per second</b>	1000	<b>Burn time</b>	0.93 s
<b>Notes</b>	45% G, NFPA HP due to average thrust over 80 N		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300958.gra

## CTI 166-H163-WT-14A (CTI Pro29-3G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 166-H163-WT-14A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>166-H163-WT-14A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	166-H163-14A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>White Thunder</i>	<b>Hardware</b>	Pro29-3G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 187mm
<b>Loaded Weight</b>	187 g	<b>Total Impulse</b>	166.3 Ns
<b>Burnout Weight</b>	101 g	<b>Maximum Thrust</b>	216.9 N
<b>Propellant Weight</b>	78.2 g	<b>Average Thrust</b>	162.7 N
<b>Delays Tested</b>	14 to 5, adjustable	<b>Specific Impulse (Isp)</b>	216.86 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.02 s
<b>Notes</b>	4% H		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300962.gra

## CTI 229-H255-WT-14A (CTI Pro29-4G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 229-H255-WT-14A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>229-H255-WT-14A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	229-H255-14A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>White Thunder</i>	<b>Hardware</b>	Pro29-4G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 231mm
<b>Loaded Weight</b>	232 g	<b>Total Impulse</b>	229.3 Ns
<b>Burnout Weight</b>	119 g	<b>Maximum Thrust</b>	363.0 N
<b>Propellant Weight</b>	104.3 g	<b>Average Thrust</b>	254.3 N
<b>Delays Tested</b>	14 to 5, adjustable	<b>Specific Impulse (Isp)</b>	224.14 s
<b>Samples per second</b>	1000	<b>Burn time</b>	0.90 s
<b>Notes</b>	43% H		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300964.gra

## CTI 282-H399-WT-12A (CTI Pro29-6G)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **CTI 282-H399-WT-12A** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>282-H399-WT-12A</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	282-H399-12A	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>White Thunder</i>	<b>Hardware</b>	Pro29-6G
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	29mm x 320mm
<b>Loaded Weight</b>	294 g	<b>Total Impulse</b>	282.2 Ns
<b>Burnout Weight</b>	154 g	<b>Maximum Thrust</b>	545.8 N
<b>Propellant Weight</b>	132.6 g	<b>Average Thrust</b>	399.3 N
<b>Delays Tested</b>	12 to 3, adjustable	<b>Specific Impulse (Isp)</b>	217.02 s
<b>Samples per second</b>	1000	<b>Burn time</b>	0.71 s
<b>Notes</b>	76% H		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

04300966.gra



## AMW/ProX 1951-K1250-WW-P (AMW 54-1750)

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

May 12th, 2009

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

Dear Dr. Jeroen Louwers,

The **AMW/ProX 1951-K1250-WW-P** rocket motor was tested April 30th to May 4th, 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.

<b>CAR Designation</b>	<b>1951-K1250-WW-P</b>	<b>Test Date</b>	April 30 - May 4, 2009
<b>Manufacturer Designation</b>	1951-K1250-P	<b>Manufacturer</b>	Cesaroni Technology Inc.
<b>Propellant</b>	<i>White Wolf</i>	<b>Hardware</b>	AMW 54-1750
<b>Single-Use/Reload/Hybrid</b>	Reloadable	<b>Motor Dimensions</b>	54mm x 491mm
<b>Loaded Weight</b>	1815 g	<b>Total Impulse</b>	1950.9 Ns
<b>Burnout Weight</b>	890 g	<b>Maximum Thrust</b>	1660.9 N
<b>Propellant Weight</b>	915.0	<b>Average Thrust</b>	1251.9 N
<b>Delays Tested</b>	plugged	<b>Specific Impulse (Isp)</b>	217.42 s
<b>Samples per second</b>	1000	<b>Burn time</b>	1.56 s
<b>Notes</b>	52% K		

Respectfully submitted,

Thomas Raithby  
 Chairman, CAR Motor Certification

05040945.gra