1.0 PRODUCT / COMPANY IDENTIFICATION

1.1 Product Identifier

Product Name: Pro150 Rocket Motor Reload Kit
Synonyms: Rocket Motor, Hobby Rocket Motor, HPR Reload Kit, Solid Rocket Fuel
Part Numbers: Reload kit: P150R-Y-#G-XX
Where: Y = reload type (A = adjustable delay, C = C-slot)
# = number of grains, &
XX = propellant type

1.2 Relevant Identified Uses

Product Use: Solid fuel motor for propelling rockets

1.3 Details of the Supplier of the SDS

Manufacturer / Supplier: Cesaroni Technology Inc.
P.O. Box 246
2561 Stouffville Rd.
Gormley, Ont.
Canada L0H 1G0
E-mail: regulatory@cesaroni.net

1.4 Emergency Telephone Numbers

Telephone Numbers:
Product Information: Tel: +1-905-887-2370 Fax: +1-905-887-2375
24 Hour Emergency Telephone Number: Tel: +1-613-996-6666 (CANUTEC)

2.0 HAZARDS IDENTIFICATION

2.1 Classification

Classification: Explosive Article – Division 1.3
(UN GHS – ST-SG-AC10-30-Rev5e)

2.2 Label Elements

Signal Word: Danger
GHS Pictogram:

Hazard Statement: H203 Explosive; Fire, Blast or Projection Hazard

Precautionary Statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking
P250 Do not subject to grinding/shock/friction.
P370+P380 In case of fire: Evacuate Area.
P372 Explosion risk in case of fire.
P373 DO NOT fight fire when fire reaches explosives.
P401 Store in accordance with local/regional/national regulations.
P501 Dispose of in accordance with local/regional/national regulations.

2.3 Other Hazards

Emergency Overview:
These articles contain cylinders of ammonium perchlorate composite propellant, encased in inert plastic parts. The SRM 3.0 rocket motors are classified as explosives, and may cause serious injury, including death if used improperly. All explosives are dangerous and must be handled carefully and used following approved safety
procedures under the direction of competent, experienced personnel in accordance with all applicable federal, state and local laws and regulations. Avoid inhaling exhaust products.

**Potential Health Effects:**

**Eye:**
Not a likely route of exposure. May cause eye irritation.

**Skin:**
Not a likely route of exposure. Low hazard for usual industrial/hobby handling.

**Ingestion:**
Not a likely route of exposure.

**Inhalation:**
Not a likely route of exposure. May cause respiratory tract irritation. Do not inhale exhaust products.

<table>
<thead>
<tr>
<th>3.0 COMPOSITION / INFORMATION ON INGREDIENTS</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>3.1 Substances</th>
<th>n/a</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>3.2 Mixtures</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>3.2.1 Description of the Mixtures</th>
</tr>
</thead>
</table>

Propellant cylinders of ammonium perchlorate and powdered metals distributed in synthetic rubber

<table>
<thead>
<tr>
<th>3.2.2 Hazardous Ingredients</th>
</tr>
</thead>
</table>

### Propellant

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>REACH Registration No.</th>
<th>% (weight)</th>
<th>Classification according to Regulation (EC) No. 1278/2008 (CLP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Percloate</td>
<td>7790-98-9</td>
<td>232-235-1</td>
<td>01-2119490079-30-0000</td>
<td>40-85 %</td>
<td>O; R9 R44</td>
</tr>
<tr>
<td>Metal Powders</td>
<td></td>
<td></td>
<td></td>
<td>1-45 %</td>
<td></td>
</tr>
<tr>
<td>Synthetic Rubber</td>
<td></td>
<td></td>
<td></td>
<td>10-30 %</td>
<td>Not Classified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4.0 FIRST AID MEASURES</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>4.1 Description of First Aid Measures</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>4.1.1 General Information</th>
</tr>
</thead>
</table>
Burns received from lit propellant may be treated as regular burns, following normal first aid procedures.

<table>
<thead>
<tr>
<th>4.1.2 Following Inhalation</th>
</tr>
</thead>
</table>
Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

<table>
<thead>
<tr>
<th>4.1.3 Following Skin Contact</th>
</tr>
</thead>
</table>
Most people will not react to skin contact. If there is any sign of skin reaction or irritation, flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

<table>
<thead>
<tr>
<th>4.1.4 Following Eye Contact</th>
</tr>
</thead>
</table>
Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

<table>
<thead>
<tr>
<th>4.1.5 Following Ingestion</th>
</tr>
</thead>
</table>
Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.
4.1.6 Self-Protection of the First Aider
Avoid inhaling exhaust products.

4.2 Most Important Symptoms and Effects, both acute and delayed

4.2.1 Symptoms:
Skin rash

4.2.2 Effects:
Continued rash may indicate sensitivity to ammonium perchlorate composite propellant

4.3 Indication of any immediate medical attention and special treatment needed

4.3.1 Notes for the doctor:
Treat with regular procedures

4.3.2 Special Treatment:
No special treatments required

5.0 FIRE FIGHTING MEASURES

5.1 Extinguishing Media

5.1.1 Suitable Extinguishing Media
In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam to contain surrounding fire.

5.1.2 Unsuitable Extinguishing Media
None

5.2 Special Hazards Arising from the Substance or Mixture

5.2.1 Hazardous Combustion Products
During a fire, irritating and highly toxic gases, including hydrochloric acid, may be generated by thermal decomposition or combustion.

5.3 Advice for Fire Fighters
Keep all persons and hazardous materials away. It is physically impossible to extinguish burning propellant. Allow it to burn out and prevent flames from spreading to surrounding areas. Avoid breathing exhaust products as in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

5.4 Additional Information
These articles burn rapidly and generate a significant flame for a short period of time. Black powder is a deflagrating explosive. It is very sensitive to flame and spark and can also be ignited by friction and impact. When ignited unconfined, it burns with explosive violence and will explode if ignited under even slight confinement. Do not inhale exhaust products.

6.0 ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel
Protective equipment: If no source of ignition present, no special PPE is required.
Emergency procedures: Replace articles in packaging and boxes and seal securely. Sweep or scoop up using non-sparking tools.

6.1.2 For emergency responders
Personal protective equipment: If no source of ignition present, no special PPE is required.

6.2 Environmental precautions
Be sure to sweep or scoop up complete spill.

6.3 Methods and material for containment and cleaning up
### 6.3 For containment:
Prevent reload kits from contaminating surface and ground water.
If black powder spills, prevent wind from carrying particles away.

### 6.3.2 For cleaning up:
Clean up spills immediately. Replace articles in packaging and boxes and seal securely. Sweep or scoop up using non-sparking tools.

### 6.3.3 Other information:
None

### 6.4 Reference to other sections
See section 13 for disposal procedures.

### 6.5 Additional information:
None

---

### 7.0 HANDLING AND STORAGE

#### 7.1 Precautions for safe handling

**Protective measures:**

**Advice on safe handling:**
Do not get in eyes, on skin or on clothing. Do not taste or swallow. Avoid prolonged or repeated contact with skin. Follow manufacturer’s instructions for use.

**Fire preventions:**
Keep away from sources of heat or ignition.

**Aerosol and dust generation preventions:**

**Environmental precautions:**
Store in a cool, dry place.

#### 7.1.2 Advice on general occupational hygiene

#### 7.2 Conditions for safe storage, including any incompatibilities

**Technical measures & storage conditions:**
Store in a cool, dry place, away from sources of heat or ignition.

**Packaging materials:**
Store in original packaging until immediately before use.

**Requirements for storage rooms and vessels:**
Store in accordance with local requirements for explosives.

**Hints on storage assembly:**
n/a

**Storage class:**
n/a

**Materials to avoid:**
Do not store with combustibles.

**Further information on storage conditions:**
n/a

#### 7.3 Specific end uses

**Recommendations:**
Use as per supplied instructions.

**Specific end uses:**
Use in accordance with national regulations for High Power Rocketry.

---

### 8.0 EXPOSURE CONTROLS / PERSONAL PROTECTION

#### 8.1 Control Parameters

**8.1.1 Occupational Exposure Limits**
No occupational exposure limits listed

**8.1.2 Biological Limit Values**
No biological limits listed

**8.1.3 Exposure Limits at Intended Use**

**8.1.4 DNEL/PNEC Values**
Ammonium Perchlorate

<table>
<thead>
<tr>
<th>Long term exposure – inhalation – systemic effects</th>
<th>DNEL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.28 mg/m³</td>
</tr>
</tbody>
</table>

No PNEC values listed.
8.1.5 Risk management measures according to used control banding approach
Employ good industrial hygiene practices.

8.2 Exposure Controls

8.2.1 Appropriate Engineering Controls
Use adequate explosion proof ventilation to keep airborne concentrations low. All equipment and working surfaces must be grounded.

8.2.2 Personal Protective Equipment

8.2.2.1 Eye/Face Protection
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

8.2.2.2 Skin Protection
Clothing should be appropriate for handling pyrotechnic substances.

8.2.2.3 Respiratory protection
A respirator is not typically necessary.

8.2.2.4 Thermal Hazards
Burning propellant and/or black powder can cause severe burns. Follow supplied instructions.

8.2.3 Environmental Exposure Controls

8.2.4 Consumer Exposure Controls
Follow supplied instructions.

9.0 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on Basic Physical and Chemical Properties

9.1.1 Appearance

| Physical State:   | solid          |
| Appearance:      | rubber cylinders inside plastic parts |
| Odour:           | none           |
| Odour Threshold: | Not available. |
| pH:              | Not available. |
| Vapour Pressure: | Not available. |
| Vapour Density:  | Not available. |
| Viscosity:       | Not available. |
| Evaporation Rate:| Not available. |
| Boiling Point:   | Not available. |
| Freezing/Melting Point: | Not available. |
| Coefficient of water/oil distribution: | Not available. |
| Autoignition Temperature: | 280°C |
| Flash Point:     | Not available. |
| Explosion Limits, lower (LEL): | Not available. |
| Explosion Limits, upper (UEL): | Not available. |
| Sensitivity to Mechanical Impact: | see section 9.2 |
| Sensitivity to Static Discharge: | Not Available |
| Decomposition Temperature: | > 400°C |
| Solubility in water: | Not available |
| Specific Gravity/Density: | Propellant = 1.34-1.83 |
| Molecular Formula: | Not applicable |
| Molecular Weight: | Not applicable |

9.2 Other Information

<table>
<thead>
<tr>
<th>Safety Characteristics</th>
<th>Method</th>
<th>Value / Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitiveness to Impact</td>
<td>UN Series 3 (a)(i) – Bureau of Explosives Impact machine</td>
<td>&quot;+', positive</td>
</tr>
<tr>
<td>Sensitiveness to Impact</td>
<td>UN Series 3 (a)(v) – Modified Type 12 Impact Tool</td>
<td>H50 = 27 cm</td>
</tr>
<tr>
<td>Sensitiveness to Friction</td>
<td>UN Series 3 (b)(i) – BAM Friction Apparatus</td>
<td>60N; '+' , positive</td>
</tr>
<tr>
<td>Thermal Stability</td>
<td>UN Series 3 (c) – Thermal Stability Test at 75°C</td>
<td>'-' , negative</td>
</tr>
<tr>
<td>Response to Fire</td>
<td>UN Series 3 (d) – Small Scale Burning Test</td>
<td>'-' , negative</td>
</tr>
<tr>
<td>Thermal Stability</td>
<td>UN Series 4 (a) – Thermal Stability Test</td>
<td>'-' , negative</td>
</tr>
</tbody>
</table>
Danger from Dropping

<table>
<thead>
<tr>
<th>UN Series</th>
<th>Test Type</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (b)</td>
<td>12m Drop Test</td>
<td>- , negative</td>
</tr>
<tr>
<td>6 (a)</td>
<td>Single Package Test</td>
<td>No mass explosion</td>
</tr>
<tr>
<td>6 (c)</td>
<td>Bonfire Test</td>
<td>No mass explosion</td>
</tr>
</tbody>
</table>

10.0 STABILITY AND REACTIVITY

10.1 Reactivity

10.2 Chemical Stability
Under storage at normal ambient temperatures (minus 40°C to +40°C), the product is stable.

10.3 Possibility of Hazardous Reactions
Hazardous polymerization will not occur.

10.4 Conditions to Avoid
Heat, static electricity, friction, impact

10.5 Incompatible Materials
Combustible or flammable materials, explosive materials

10.6 Hazardous Decomposition Products
Oxides of Nitrogen, hydrochloric acid

11.0 TOXICOLOGICAL INFORMATION

11.1 Information on Toxicological Effects

11.1.1 Substances
not applicable

11.1.2 Mixtures
(a) Acute toxicity no data available
(b) Irritation no data available
(c) Corrosivity no data available
(d) Sensitisation no data available
(e) Repeated dose toxicity no data available
(f) Carcinogenicity no data available
(g) Mutagenicity no data available
(h) Toxicity for reproduction no data available

11.2 Other Information

Exposure Limits:

Propellant

<table>
<thead>
<tr>
<th>Ingredient Name</th>
<th>CAS Number</th>
<th>OSHA PEL</th>
<th>ACGIH TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Perchlorate</td>
<td>7790-98-9</td>
<td>not established</td>
<td>not established</td>
</tr>
<tr>
<td>metal powder</td>
<td></td>
<td>varies</td>
<td>varies</td>
</tr>
<tr>
<td>Synthetic Rubber</td>
<td></td>
<td>not established</td>
<td>not established</td>
</tr>
</tbody>
</table>

12.0 ECOLOGICAL INFORMATION

12.1 Toxicity No Data Available
12.2 Persistence and Degradability No Data Available
12.3 Bioaccumulative Potential No Data Available
12.4 Mobility in Soil No Data Available
12.5 Results of PBT and vPvB Assessment No Data Available
12.6 Other Adverse Effects  
The substance has a very low global warming potential.

### 13.0 DISPOSAL CONSIDERATIONS

<table>
<thead>
<tr>
<th>13.1 Waste Treatment Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.1.1 Product/Packaging Disposal</td>
</tr>
<tr>
<td>Pack firmly in hole in ground with nozzle pointing up. Ignite motor electrically from a safe distance and wait 5 minutes before approaching. Dispose of spent components in inert trash. Dispose of used packaging materials in inert trash.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>13.1.2 Waste Treatment Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propellant should be burned before disposal.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>13.1.3 Other Disposal Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consult local regulations about disposal of explosive materials.</td>
</tr>
</tbody>
</table>

### 13.2 Additional Information  
None

### 14.0 TRANSPORT INFORMATION

| | Land Transport (ADR/RID) | Inland Waterway Transport (AND) | Sea Transport (IMDG) | Air Transport (ICAO-TI/IATA-DGR) |
|----------------------------|-------------------------------|---------------------|--------------------------|
| 14.1 UN No.                |                               | UN 0186             |                          |                                   |
| 14.2 UN Proper Shipping Name | Rocket Motors               |                     |                          |                                   |
| 14.3 Transport Hazard Class | 1.3 C                        |                     |                          |                                   |
| 14.4 Packing Group         | n/a                          |                     |                          |                                   |
| 14.5 Environmental Hazards | None                         |                     |                          |                                   |

14.6 Special Precautions for the User

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code  
Not designed for bulk transport.

14.8 Additional Information

14.8.1 All Transport Carriers  
See below

14.8.2 Land Transport (ADR/RID)  
Limited Quantity: 0  
Special Provisions: none  
Tunnel Restriction Code: C5000D  
Classification Code: 1.43  
Transport Category: 1  
Hazard Identification Number (Kemler No.): none  
Remark: none

14.8.3 Inland Waterway Transport (AND)  
Limited Quantity: 0  
Special Provisions: none  
Category: not applicable  
Remark: Handling provisions- LO01, HA01, HA03

14.8.4 Sea Transport (IMDG)  
Limited Quantity: None  
Special Provisions: None  
Marine Pollutant: not applicable  
Segregation Group: not applicable  
Remark: Packing Instruction 101

14.8.5 Air Transport (ICAO-TI / IATA-DGR)
Limited Quantity: None
Special Provisions: A802
Remark: Cargo Aircraft Only, Max. 220 kg per package

15.0 REGULATORY INFORMATION

15.1 Safety, Health and Environmental Regulations/Legislation

15.1.1 EU Regulations

Authorizations
No current EU approvals

Restrictions on Use
Follow local regulations for use and storage of class 1.3C explosives

Other EU Regulations

15.1.2 National Regulations

Canada
This product has been classified according to the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the SDS contains all of the information required by the CPR.

WHMIS Classification: Not Controlled (explosive)
Canadian Explosives Classification: Rocket Motors - R2, PE3
These products are authorized explosives in Canada.
These products are not considered “Controlled Goods” in Canada under the Controlled Goods Regulations.

United States of America
EPA Hazard Categories (SARA 311,312)

Hazardous Chemical Lists
- CERCLA Hazardous Substance (40 CFR 302.4) No
- SARA Extremely Hazardous Substance (40CFR 355) No
- SARA Toxic Chemical (40CFR 372.65) No
- Massachusetts Right-To-Know Substance List (MSL) No
- Pennsylvania Right-To-Know Substance List No
- New Jersey Worker & Community Right-To-Know Act No
- California Proposition 65 No

Chemical Inventories
- Canada All ingredients are listed on the DSL.
- United States All ingredients are listed on the TSCA Inventory.
- Europe All ingredients are listed on the EINECS inventory.
- Australia All ingredients are listed on the AICS Inventory.
- China All ingredients are listed on the IECSC Inventory.
- Japan All ingredients are listed on the ENCS Inventory.
- Korea All ingredients are listed on the Existing Chemicals List (ECL).
- Philippines All ingredients are listed on the PICCS.

15.2 Chemical safety Assessment
A Chemical Safety Assessment is not required for this product.
16.0 OTHER INFORMATION

16.1 Changes From Last Version
Corrected 15.1.1 to read 1.3C.

16.2 Abbreviations and Acronyms
- **DNEL**: Derived No-Effect Exposure Limit
- **HS**: Globally Harmonized System
- **PNEL**: Predicted No Effect level

16.3 Key Literature References and Sources of Data
- **GESTIS**

16.4 Classification for mixtures and used evaluation method according to regulation (EC) 1207/2008 [CLP]
No tests conducted.

16.5 Relevant R-, H-, and EUH- Phrases

**Risk Phrases:**
- **R 2**: Risk of explosion by shock, friction, fire or other sources of ignition.
- **R 11**: Highly flammable
- **R 44**: Risk of explosion if heated under confinement.

**Safety Phrases:**
- **S 1/2**: Keep locked up and out of the reach of children.
- **S 8**: Keep container dry.
- **S 15**: Keep away from heat.
- **S 16**: Keep away from sources of ignition -- No smoking.
- **S 17**: Keep away from combustible material.
- **S 18**: Handle and open container with care.
- **S 33**: Take precautionary measures against static discharges.
- **S 41**: In case of fire and/or explosion do not breathe fumes.

16.6 Training Advice
Follow supplied instructions carefully.

16.7 Further Information

**SDS Prepared by:** Regulatory Affairs Department
Cesaroni Technology Inc.
P.O. Box 246
2561 Stouffville Rd.
Gormley, ON
Canada L0H 1G0

**Telephone:** 905-887-2370 x239
**Fax:** 905-887-2375
**Web Sites:**
- [www.cesaronitech.com](http://www.cesaronitech.com)
- [www.Pro38.com](http://www.Pro38.com)

The data in this Material Safety Data Sheet relates only to the specific material or product designated herein and does not relate to use in combination with any other material or in any process.

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.