# SAFETY DATA SHEET

## 1. Identification of the substance or mixture and of the supplier

<table>
<thead>
<tr>
<th>A. GHS product identifier</th>
<th>Adamas(^\circ) AMP-1090S Brilliant Black</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Recommended use of the chemical and restrictions on use</td>
<td></td>
</tr>
<tr>
<td><strong>Recommended use</strong></td>
<td>Paint and coating additives</td>
</tr>
<tr>
<td><strong>Restrictions on use</strong></td>
<td>Not available</td>
</tr>
<tr>
<td>C. Manufacturers</td>
<td></td>
</tr>
<tr>
<td><strong>Company name</strong></td>
<td>CQV Co., Ltd.</td>
</tr>
<tr>
<td><strong>Address</strong></td>
<td>144, Seongjung-Ro, Jincheon-Eup, Jincheon-Gun, Chungbuk-Do, Korea</td>
</tr>
<tr>
<td><strong>Emergency phone number</strong></td>
<td>82-43-531-2500</td>
</tr>
<tr>
<td><strong>Respondent</strong></td>
<td>Byung-Ki Choi</td>
</tr>
<tr>
<td><strong>Fax</strong></td>
<td>82-43-536-0314</td>
</tr>
</tbody>
</table>

## 2. Hazards identification

| A. GHS classification of the substance/mixture |
| **Skin corrosion/irritation** | Category 2 |
| **Skin sensitization** | Category 1 |
| **Carcinogenicity** | Category 2 |
| B. GHS label elements, including precautionary statements |
| **Pictogram and symbol** : |

![Pictogram](image)

**Signal word** : Warning

**Hazard statements** :
- H315 Causes skin irritation.
- H317 May cause an allergic skin reaction.
- H351 Suspected of causing cancer.

**Precautionary statements**

**Precaution**
- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
- P264 Wash ... thoroughly after handling.
- P272 Contaminated work clothing should not be allowed out of the workplace.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- P281 Use personal protective equipment as required.

**Treatment**
- P302+P352 If on skin: Wash with plenty of soap and water.
- P308+P313 If exposed or concerned: Get medical advice/attention.
- P321 Specific treatment (see the contents on this label).
- P332+P313 If skin irritation occurs: Get medical advice/attention.
- P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P363 Wash contaminated clothing before reuse.

**Storage**
P405 Store locked up.

**Disposal**
P501 Dispose the contents/container in accordance with local/regional/national/international regulations.

**C. Other hazard information not included in hazard classification (NFPA)**

**Health**
- Flammability: Not available
- Reactivity: Not available

### 3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS number</th>
<th>EC number</th>
<th>Content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alumina</td>
<td>1344-28-1</td>
<td>215-691-6</td>
<td>88 – 92</td>
</tr>
<tr>
<td>Nickel</td>
<td>7440-02-0</td>
<td>231-111-4</td>
<td>8 – 12</td>
</tr>
</tbody>
</table>

### 4. First aid measures

**A. Eye contact**
- Call emergency medical service.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.

**B. Skin contact**
- If skin irritation or rash occurs: Get medical advice/attention.
- Take off contaminated clothing and wash before reuse.
- For hot product, immediately immerse in or flush the affected area with large amounts of cold water to dissipate heat.
- Call emergency medical service.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.

**C. Inhalation**
- If exposed or concerned: Get medical advice/attention.
- Move victim to fresh air.
- Keep victim warm and quiet.

**D. Ingestion**
- If exposed or concerned: Get medical advice/attention.
- Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

**E. Indication of immediate medical attention and notes for physician**
- Exposures require specialized first aid with contact and medical follow-up.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

### 5. Fire fighting measures
A. Suitable (and unsuitable) extinguishing media
- Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.
- Use dry sand or earth to smother fire.

B. Specific hazards arising from the chemical
- Non-combustible, substance itself does not burn.

C. Special protective equipment and precautions for fire-fighters
- Rescuers should put on appropriate protective gear.
- Evacuate area and fight fire from a safe distance.
- Substance may be transported in a molten form.
- Dike fire-control water for later disposal: do not scatter the material.
- Move containers from fire area if you can do it without risk.
- Fire involving Tanks: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Fire involving Tanks: Cool containers with flooding quantities of water until well after fire is out.
- Fire involving Tanks: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Fire involving Tanks: Always stay away from tanks engulfed in fire.
- Fire involving Tanks: For massive fire, use unmanned hose holders or monitor nozzles: if this is impossible, withdraw from area and let fire burn.

6. Accidental release measures

A. Personal precautions, protective equipment and emergency procedures
- Avoid breathing dust/fume/gas/mist/vapours/spray.
- Clean up spills immediately, observing precautions in Protective Equipment section.
- Eliminate all ignition sources.
- Stop leak if you can do it without risk.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Cover with plastic sheet to prevent spreading.
- Please note that there are materials and conditions to avoid.

B. Environmental precautions and protective procedures
- Prevent entry into waterways, sewers, basements or confined areas.

C. The methods of purification and removal
- Absorb spills with inert material (e.g., dry sand or earth), then place in a chemical waste container.
- Absorb the liquid and scrub the area with detergent and water.

7. Handling and storage

A. Precautions for safe handling
- Do not handle until all safety precautions have been read and understood.
- Avoid breathing dust/fume/gas/mist/vapours/spray.
- Wash ... thoroughly after handling.
- Contaminated work clothing should not be allowed out of the workplace.
- Follow all MSDS/label precautions even after container is emptied because they may retain product residues.
- Use carefully in handling/storage.
- Loosen closure cautiously before opening.
Avoid prolonged or repeated contact with skin.
- Do not enter storage area unless adequately ventilated.
- Please note that there are materials and conditions to avoid.

### B. Conditions for safe storage
- Store locked up.
- Empty drums should be completely drained, properly bunged, and promptly returned to a drum reconditioner, or properly disposed of.

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#### 8. Exposure controls/personal protection

##### A. Occupational Exposure limits

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Alumina TWA</th>
<th>Nickel TWA</th>
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<tbody>
<tr>
<td>Korea</td>
<td>10 mg/m³</td>
<td>1 mg/m³</td>
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<tr>
<td>ACGIH</td>
<td>10 mg/m³ (as Al, Total particulate containing no asbestos and &lt; 1% crystalline silica)</td>
<td>1.5 mg/m³ (inhalable fraction)</td>
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<tr>
<td>OSHA</td>
<td>15 mg/m³ (total), 5 mg/m³ (respirable fraction)</td>
<td>1 mg/m³ (metal)</td>
</tr>
<tr>
<td>NIOSH</td>
<td>10 mg/m³</td>
<td>0.015 mg/m³ (metal)</td>
</tr>
<tr>
<td>EU</td>
<td>Not available</td>
<td></td>
</tr>
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</table>

##### B. Appropriate engineering controls
- Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
- Facilities for storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

##### C. Personal protective equipment

**Respiratory protection**
- Wear NIOSH or European Standard EN 149 approved full or half face piece (with goggles) respiratory protective equipment when necessary.
- In case exposed to particulate material, the respiratory protective equipments as follow are recommended: facepiece filtering respirator or air-purifying respirator, high-efficiency particulate air (HEPA) filter media or respirator equipped with powered fan, filter media of use (dust, mist, fume)
- In lack of oxygen (< 19.5%), wear the supplied-air respirator or self-contained breathing apparatus, oxygen

**Eye protection**
- Wear breathable safety goggles to protect from particulate material causing eye irritation or other disorder.
- An eye wash unit and safety shower station should be available nearby work place.

**Hand protection**
- Wear appropriate protective gloves by considering physical and chemical properties of chemicals.

**Body protection**
- Wear appropriate protective clothing by considering physical and chemical properties of chemicals.

### 9. Physical and chemical properties

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>Description: Powder</td>
<td>No odor</td>
<td>Not available</td>
<td>7 – 10</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>Not applicable</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>3.6 – 4.0 g/m³</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td></td>
</tr>
</tbody>
</table>

### 10. Stability and reactivity

A. Chemical stability and Possibility of hazardous reactions:
- Non-combustible, substance itself does not burn.

B. Conditions to avoid:
- Heat, sparks or flames

C. Incompatible materials:
- Combustibles, reducing agents

D. Hazardous decomposition products:
- Not available

### 11. Toxicological information

A. Information of Health Hazardous:

**Acute toxicity**
- Oral Not classified
- **Alumina**: Rat LD50 > 10,000 mg/kg (OECD TG 401, GLP)
- **Nickel**: Rat LD50 > 9,000 mg/kg (OECD TG 401, GLP)

**Dermal** Not available

**Inhalation** Not classified

- **Alumina**: Rat LC50 > 2.3 mg/L/4hr (OECD TG 403, GLP)

**Skin corrosion/irritation** Category 2

- **Alumina**: In skin irritation test with rabbits, skin irritations were not observed. (OECD TG 404)
- **Nickel**: Industrial nickel dust causes nickel dermatitis.

**Serious eye damage/irritation** Not classified

- **Alumina**: In eye irritation test with rabbits, eye irritations were not observed. (OECD TG 405)

**Respiratory sensitization** Not classified

- **Alumina**: In respiratory sensitisation test with mice, respiratory sensitisation reactions were not observed.

**Skin sensitization** Category 1

- **Alumina**: In skin sensitisation test with guinea pig, skin sensitisation were not observed.
- **Nickel**: Nickel hypersensitivity dermatitis may be initiated by contact with nickel on the skin.

**Carcinogenicity** Category 2

- **IARC**: Group 2B Nickel, metallic and alloys
- **NTP**: R
- **ACGIH**: A4 (Aluminum insoluble compounds)
- **Nickel**: A5
- **KOREA–ISHL**: 2
- **EU**: 
- **Nickel**: Carc. 2

**Mutagenicity** Not classified

- **Alumina**: Negative reactions were observed in in vitro (Ames test (OECD TG 471), mammalian cell gene mutation assay (OECD TG 476)) and in vivo (dominant lethal assay (OECD TG 478), micronucleus assay (OECD TG 474))

**Reproductive toxicity** Not classified

- **Alumina**: No adverse effects were observed in reproduction/developmental toxicity test with rats.
- **Nickel**: In the toxicity to reproduction test using rat, there were no effects on clinical signs, mortality.

**Specific target organ toxicity (single exposure)** Not classified

- **Alumina**: In acute inhalation toxicity with rats, clinical signs were minor and only one animal showed lung abnormalities on necropsy. (OECD TG 403, GLP)
- **Nickel**: In the acute oral toxicity using rat, there were no effects on clinical signs, systemic toxicity. (OECD TG 401, GLP)

**Specific target organ toxicity (repeat exposure)** Not classified
Alumina: Intratracheal injection of aluminium powder caused nodular pulmonary fibrosis in the lungs of the rats only at the highest dose administered (OECD TG 413). However, this product is not classified since it is not powder.
Nickel: In nickel plating industry, exposure to nickel containing vapors has been reported to be assoc with asthma.

Aspiration Hazard Not available

### 12. Ecological information

A. Ecological toxicity
   - Acute toxicity: Not classified
   - Chronic toxicity: Not classified
Fish Not available
   - Alumina: 96hr-LC50 \( (\text{Pimephales promelas}) > 218.64 \text{ mg/L (GLP)}, 28\text{d-NOEC(Pimephales promelas)} = 4.7 \text{ mg/L} \)
   - Alumina: 48hr-LC50 \( (\text{Ceriodaphnia dubia}) > 99.6 \text{ mg/L (GLP)} \)
   - Alumina: 96hr-LC50 \( (\text{Ceriodaphnia dubia}) > 99.6 \text{ mg/L (GLP)} \)

B. Persistence and degradability
Persistence Not available
Degradability Not available

C. Bioaccumulative potential
   - Bioaccumulation: Not available
   - Nickel: Bioaccumulation is expected to be low according to the BCF < 500 (BCF = 70)

Biodegradation Not available

D. Mobility in soil
   - Alumina: Low potency of mobility to soil. (Koc = 0.192) (estimated)
   - Nickel: Low potency of mobility to soil. (Koc = 2.86)

E. Other hazardous effect Not available

### 13. Disposal considerations

A. Disposal method
   Waste must be disposed of in accordance with federal, state and local environmental control regulations.

B. Disposal precaution
   Consider the required attentions in accordance with waste treatment management regulation.

### 14. Transport information

A. UN Number Not applicable
B. UN Proper shipping name Not applicable
C. Transport Hazard class Not applicable
D. Packing group Not applicable
E. Marine pollutant Not applicable
F. Special precautions
   in case of fire Not applicable
in case of leakage Not applicable

15. Regulatory information

A. Occupational Safety and Health Regulation
   Alumina : Administration subject listed
   Alumina : Occupational exposure limits listed
   Alumina : Work environment monitoring listed (6 months)
   Alumina : Health examination agent (12 months)
   Nickel : Administration subject listed
   Nickel : Occupational exposure limits listed
   Nickel : Health examination agent (12 months)
   Nickel : Work environment monitoring listed (6 months)

B. Toxic Chemical Control Act
   Alumina : Existing Chemical Substance (KE-01012)
   Nickel : Existing Chemical Substance (KE-25818)

C. Dangerous Material Safety Management Regulation
   Alumina : Dangerous Material Safety Management Regulation Non-dangerous goods
   Nickel : Dangerous Material Safety Management Regulation

D. Wastes Control Act
   Nickel : Wastes Control Act

E. Other regulation (internal and external)
   Internal information
      Persiant Organic Pollutants Acts Not regulated
   External information
      EU classification(classification)
         Alumina : Classification Not classified
         Nickel : Classification Carc. Cat. 3: R40, T: R48/23, R43, R52–53
      EU classification(risk phrases)
         Alumina : Hazard statements Not applicable
         Nickel : Hazard statements R40, R43, R48/23, R52/53
      EU classification(safety phrases)
         Alumina : Precautionary statements Not applicable
         Nickel : Precautionary statements S(2), S36/37/39, S45, S61
      EU SVHC list Not regulated
      EU Authorisation List Not regulated
      EU Restriction list
         Nickel : EU Restriction list Regulated
      U.S.A management information (OSHA Regulation) Not regulated
      U.S.A management information (CERCLA Regulation)
         Nickel : CERCLA RQ 100 lb
      U.S.A management information (EPCRA 302 Regulation) Not regulated
      U.S.A management information (EPCRA 304 Regulation) Not regulated
      U.S.A management information (EPCRA 313 Regulation)
         Nickel : EPCRA 313
      Substance of Roterdame Protocol Not regulated
      Substance of Stockholme Protocol Not regulated
      Substance of Montreal Protocol Not regulated

Foreign Inventory Status
   Alumina
      U.S.A management information Section 8(b) Inventory (TSCA): Present
Japan management information Existing and New Chemical Substances (ENCS): (1)–23
China management information Inventory of Existing Chemical Substances (IECSC): Present
Canada management information Domestic Substances List (DSL): Present
Australia management information Inventory of Chemical Substances (AICS): Present
New Zealand management information Inventory of Chemicals (NZIoC): May be used as a single component chemical under an appropriate group standard.
Philippines management information Inventory of Chemicals and Chemical Substances (PICCS): Present
EU management information European Inventory of Existing Commercial Chemical Substances (EINECS): 215–691–6

Nickel
U.S.A management information Section 8(b) Inventory (TSCA): Present
China management information Inventory of Existing Chemical Substances (IECSC): Present 25343
Canada management information Domestic Substances List (DSL): Present
Australia management information Inventory of Chemical Substances (AICS): Present
New Zealand management information Inventory of Chemicals (NZIoC): HSNO Approval: HSR003031
Philippines management information Inventory of Chemicals and Chemical Substances (PICCS): Present

16. Other information

A. Information source and references
EPISUITE v4.1: http://www.epa.gov/opt/exposure/pubs/episuiteld.htm
Waste Control Act enforcement regulation attached [1]
National Toxicology Program: http://ntp-apps.niehs.nih.gov/ntp_tox/index.cfm
American Conference of Governmental Industrial Hygienists TLVs and BEIs.
REACH information on registered substances: http://apps.eca.europa.eu/registered/registered-sub.aspx
Korea Maritime Dangerous Goods Inspection Center: http://www.komdi.or.kr/index.html
International Uniform Chemical Information Database (IUCLID):
http://esis.jrc.ec.europa.eu/

B. Issuing date  08–01–2016

C. Revision number and date
   revision number  0
   date of the latest revision  08–01–2016

D. Others
   • Since the user’s working conditions are not known by us, the information supplied on
     this safety data sheet is based on our current level of knowledge and on national and
     community regulations.
   • The product must not be used for any purposes other than those specified under
     heading 1 without first obtaining written handling instructions.
   • It is at all times the responsibility of the user to take all necessary measures to comply
     with legal requirements and local regulations.
   • The information given on this safety data sheet must be regarded as a description of
     the safety requirements relating to our product and not a guarantee of its properties.