SAFETY DATA SHEET
SpectraFlair® HSA Pigment    Viavi Solutions
Date 07/10/2015
Previous date: 09/02/2015

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier
1.1.1 Commercial Product Name
SpectraFlair® HSA Pigment

1.1.2 Product code
SpectraFlair H S A, SpectraFlair SF Plus 25, Microdiffuser MD 30, Microdiffuser MD 40, Bright Silver H S A (dry), Motheye.

Components: See also section 3
REACH registration is not applicable for mixtures. The components of the mixture will be registered latest according to the 1 to 10 tonnes deadline.

1.2 Relevant identified uses of the substance or mixture and uses advised against
1.2.1 Recommended use
Colouring agents, pigments

1.3 Details of the supplier of the safety data sheet
1.3.1 Supplier
REACHLaw Ltd. (Only Representative)
Street address
Vännrikinkuja 3 JK 21
Postcode and post office
02600 Espoo
Finland
Telephone
+358(0) 9 412 3055
Telefax
+358(0) 9 412 3049
Email
SDS@reachlaw.fi, webpage: www.reachlaw.fi

1.3.3 Identification of the non-community manufacturer
Viavi Solutions
1402 Mariner Way
95407-7307 Santa Rosa
USA
Telephone: 1(707) 525-9200
Email: ospcustomerservice@viavisolutions.com

1.4 Emergency telephone number
1.4.1 Telephone number, name and address
EU-wide emergency number: 112
See section 16.6 for the list of telephone numbers of poison centers in the European Economic Area.

SECTION 2. HAZARDS IDENTIFICATION


2.1 Classification of the substance or mixture
1272/2008 (CLP)
Flam. Sol. 2, H228
Skin Irrit. 2, H315
Eye Irrit. 2, H319
STOT SE 3, H335

2.2 Label elements
1272/2008 (CLP)
GHS02 - GHS07
Signal word Warning
Hazard Statements

!!
H228 Flammable solid.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.

Precautionary Statements
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 If eye irritation persists: Get medical advice/attention.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

2.3 Other hazards
This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT). The PBT and vPvB criteria of Annex XIII to the regulation does not apply to inorganic substances.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures
This product is a microscopic 3-layer multilayer flake having a sandwich structure with aluminum in the core surrounded on each side by a layer of magnesium fluoride.

<table>
<thead>
<tr>
<th>Hazardous components</th>
<th>CAS/EC and Reg.number</th>
<th>EINECS</th>
<th>Chemical name of the substance</th>
<th>Concentration Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium</td>
<td>7429-90-5</td>
<td>231-072-3</td>
<td>Aluminium</td>
<td>25-30 % CLP: Water-react. 2; H261, Flam. Sol. 1; H228</td>
</tr>
<tr>
<td>Magnesium Fluoride</td>
<td>7783-40-6</td>
<td>231-995-1</td>
<td>Magnesium Fluoride</td>
<td>70-75 % CLP: Eye Irrit. 2; H319, Skin Irrit. 2; H315, STOT SE 3; H335</td>
</tr>
</tbody>
</table>

3.3 Other information
This product is a mixture. Health hazard information is based on its components. Physical hazards: flammable.

SECTION 4. FIRST AID MEASURES

4.1 Description of first aid measures
Consult a physician. Show this safety data sheet to the doctor in attendance.

4.1.2 Inhalation
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

4.1.3 Skin contact
Take off all contaminated clothing immediately. Wash off immediately with soap and plenty of water. Consult a physician.

4.1.4 Eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

4.1.5 Ingestion
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
Causes eye, skin, and respiratory tract irritation. Itching. Difficulty in breathing.

4.3 Indication of immediate medical attention and special treatment needed
Treat symptomatically.
SECTION 5. FIREFIGHTING MEASURES

5.1 Extinguishing media
5.1.1 Suitable extinguishing media
   Alcohol-resistant foam; Dry powder; Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.1.2 Extinguishing media which must not be used for safety reasons
   Halons; Carbon dioxide (CO2)

5.2 Special hazards arising from the substance or mixture
   Contact with water liberates extremely flammable gases. - Gives off hydrogen by reaction with metals. Decomposition products - Hydrogen fluoride metal oxides. Container may explode if heated. Water in the container will lead to increased pressure and risk of explosion. Burning produces noxious and toxic fumes.

5.3 Advice for firefighters
   Wear suitable protective equipment. Wear full protective clothing and self-contained breathing apparatus. Immediately evacuate personnel to safe areas. Do not allow run-off from fire fighting to enter drains or water courses.

5.4 Specific methods
   No information available.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
   Use personal protective equipment. Avoid contact with skin, eyes and clothing. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Keep away from sources of ignition - No smoking. Keep away from flames and sparks. Avoid dust formation.

6.2 Environmental precautions
   Do not allow material to contaminate ground water system. Do not flush into surface water or sanitary sewer system. Prevent further leakage or spillage if safe to do so. Try to prevent the material from entering drains or water courses.

6.3 Methods and materials for containment and cleaning up
   Prevent further leakage or spillage if safe to do so. Sweep up and shovel into suitable containers for disposal. Clean contaminated surface thoroughly. Pick up and arrange disposal without creating dust. Keep in suitable, closed containers for disposal. - Caution: Water in the container will lead to increased pressure and risk of explosion. Dispose of as hazardous waste in compliance with local and national regulations.

6.4 Reference to other sections
   See also section 8

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling
   Ensure adequate ventilation, especially in confined areas. Wear personal protective equipment. Use only in area provided with appropriate exhaust ventilation. Do not breathe dust.

   Hygiene measures
   When using, do not eat, drink or smoke. Remove and wash contaminated clothing before re-use. Regular cleaning of equipment, work area and clothing.

7.2 Conditions for safe storage, including any incompatibilities
   Keep away from heat and sources of ignition. Keep containers tightly closed in a cool, well-ventilated place. Keep in properly labelled containers. Keep at temperatures below 49 °C. Never allow product to get in contact with water during storage.
7.3 Specific end use(s)
Colouring agents, pigments.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Mixture Threshold limits Values See also section 8.1.3

8.1.1 Threshold limits

7429-90-5  Aluminium, powder  15 mg/m³ (8 h)
           OSHA PEL, total dust
7429-90-5  Aluminiumpowder  5 mg/m³ (8 h)
           OSHA PEL, respirable fraction
7783-40-6  Magnesium Fluoride  2.5 mg/m³ (8 h)
           TWA, Mixtures of inorganic fluorides and hydrogen fluoride

8.1.2 Other information on limit values
No information available.

8.1.3 Limit values in other countries
Exposure controls / (Biological occupational exposure limits):

Aluminium, powder (CAS 7429-90-5):

Austria : STEL 20 mg/m³; MAK: 10 mg/m³
Germany : MAK: 4 mg/m³; MAK: 1.5 mg/m³ / (200 μg/L Urine EOS)
Denmark : TWA: 10 mg/m³, TWA: 10 mg/m³
Finland : TWA: 2 mg/m³
France : VME: 10 mg/m³, VME: 5 mg/m³; VME: 5 mg/m³
Ireland : TWA: 10 mg/m³; TWA: 4 mg/m³
Norway : TWA: 5 mg/m³
Poland : NDS: 2.5 mg/m³; NDS: 1.2 mg/m³
Portugal : TWA: 10 mg/m³
Switzerland : MAK: 3 mg/m³ / (60 μg/g Creatinine Urine, no restrictions)
United Kingdom : STEL: 30 mg/m³; STEL: 12 mg/m³; TWA: 10 mg/m³; TWA: 4 mg/m³
Spain : VLA-ED: 10 mg/m³

Magnesium fluoride (CAS 7783-40-6)

EU : TWA: 2.5 mg/m³
Denmark : TWA: 2.5 mg/m³
Finland : TWA: 2.5 mg/m³
France : VME: 2.5 mg/m³ / (3 mg/g Creatinine Urine: BOS; 10 mg/g Creatinine Urine: EOS)
Germany : MAK: 1 mg/m³
Ireland : TWA: 2.5 mg/m³
Italy : TWA: 2.5 mg/m³ / (3 mg/g Creatinine Urine: BOS; 10 mg/g Creatinine Urine: EOS)
Netherlands : STEL: 2 mg/m³
Norway : TWA: 0.5 mg/m³; STEL: 1.5 mg/m³
Poland : NDS: 3 mg/m³; NDS: 1 mg/m³
Portugal : TWA: 2.5 mg/m³
Spain : VLA-ED: 2.5 mg/m³
United Kingdom : TWA: 2.5 mg/m³
8.1.4 DNELs
No information available.

8.1.5 PNECs
No information available.

8.2 Exposure controls

8.2.1 Appropriate engineering controls
Avoid exceeding of the given occupational exposure limits (see section 8). Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. Ensure that eyewash stations and safety showers are close to the workstation location.

8.2.2 Individual protection measures

8.2.2.1 Respiratory protection
When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

8.2.2.2 Hand protection
Neoprene; Rubber; Latex gloves.

8.2.2.3 Eye/face protection
Safety glasses with side-shields.

8.2.2.4 Skin protection
Choose body protection according to the amount and concentration of the dangerous substance at the workplace.

8.2.3 Environmental exposure controls
Do not allow material to contaminate ground water system.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Important Health Safety and Environmental Information

9.1.1 Appearance
Dry powder; grey

9.1.2 Odour
Odourless

9.1.3 Odour threshold
No information available.

9.1.4 pH
Not applicable.

9.1.5 Melting point/freezing point
1263 °C

9.1.6 Initial boiling point and boiling range
2260 °C

9.1.7 Flash point
Not applicable.

9.1.8 Evaporation rate
Not applicable.

9.1.9 Flammability (solid, gas)
Flammable solid.

9.1.10 Explosive properties

9.1.10.1 Lower explosion limit
No information available.

9.1.10.2 Upper explosion limit
No information available.

9.1.11 Vapour pressure
Not applicable.

9.1.12 Vapour density
Not applicable.

9.1.13 Relative density
2.7 g/cm³

9.1.14 Solubility(ies)

9.1.14.1 Water solubility
Insoluble

9.1.14.2 Fat solubility (solvent - oil to be specified)
No information available.

9.1.15 Partition coefficient: n-octanol/water
Not applicable.

9.1.16 Auto-ignition temperature
No information available.

9.1.17 Decomposition temperature
No information available.

9.1.18 Viscosity
Not applicable.
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1.19</td>
<td>Explosive properties</td>
<td>Not explosive</td>
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<tr>
<td>9.1.20</td>
<td>Oxidising properties</td>
<td>The substance or mixture is not classified as oxidizing.</td>
</tr>
<tr>
<td>9.2</td>
<td>Other information</td>
<td>No information available.</td>
</tr>
</tbody>
</table>

### SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity
- No information available.

10.2 Chemical stability
- Stable up to 200 °C.

10.3 Possibility of hazardous reactions
- Hazardous polymerisation does not occur.

10.4 Conditions to avoid
- Avoid dust formation.

10.5 Incompatible materials
- Acids; Oxidizing agents (strong).

10.6 Hazardous decomposition products
- Fluorine Compounds.

### SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

11.1.1 Acute toxicity
- Not classified.

11.1.2 Irritation and corrosion
- **Inhalation**: May cause respiratory tract irritation.
- **Eye contact**: Irritating to eyes. H319: Causes serious eye irritation.
- **Skin contact**: Irritating to skin. H315: Causes skin irritation.
- **Ingestion**: Not considered Likely route of exposure

11.1.3 Sensitisation
- Not classified.

11.1.4 Subacute, subchronic and prolonged toxicity
- Not classified.

11.1.5 STOT-single exposure
- Causes respiratory tract irritation. The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

11.1.6 STOT-repeated exposure
- Not classified.

11.1.7 Aspiration hazard
- Not applicable.

11.1.8 Other information on acute toxicity
- No information available.

### SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity

12.1.1 Aquatic toxicity
- Not classified. Environmentally hazardous. Aquatic toxicity is unlikely due to low solubility.
12.1.2 Toxicity to other organisms
No information available.

12.2 Persistence and degradability
12.2.1 Biodegradation
The methods for determining biodegradability are not applicable to inorganic substances.

12.2.2 Chemical degradation
Not applicable.

12.3 Bioaccumulative potential
No information available.

12.4 Mobility in soil
Adsorbs on soil.

12.5 Results of PBT and vPvB assessment
The PBT and vPvB criteria of Annex XIII to the regulation does not apply to inorganic substances.

12.6 Other adverse effects
No information available.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods
Dispose of as hazardous waste in compliance with local and national regulations. Contaminated packaging should be emptied as far as possible. Handle in accordance with good industrial hygiene and safety practice. Dispose of product residue in accordance with the instructions of the person responsible for waste disposal. Waste must be classified and labelled prior to recycling or disposal. Empty containers should be taken to an approved waste handling site for recycling or disposal.

SECTION 14. TRANSPORT INFORMATION

14.1 UN number 3178
14.2 UN proper shipping name FLAMMABLE SOLID, INORGANIC, N.O.S. (Contains Aluminium, Magnesium Fluoride)
14.3 Transport hazard class(es) 4.1
14.4 Packing group III
14.5 Environmental hazards Not classified.
14.6 Special precautions for users No information available.
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code No information available.

SECTION 15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
EU Regulation (EC) No. 1907/2006 (REACH)
Annex XIV - List of substances subject to authorisation, Substances of very high concern: N/A
Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles: N/A

15.2 Chemical safety assessment
Not applicable. A Chemical Safety Assessment is not required for this substance.
SECTION 16. OTHER INFORMATION

16.1 Additions, Deletions, Revisions
Version 3.0

16.2 Key or legend to abbreviations and acronyms
- EWC - European Waste Catalogue
- MAK - Maximale Arbeitsplatzkonzentrationen (Germany): maximum concentration of a chemical substance in the workplace, expressed as daily 8-hour time-weighed average values and apply to healthy adults.
- OEL - Occupational exposure limit
- OSHA - Occupational Safety and Health Administration (USA)
- PBT/vPvB - Persistent, bioaccumulative and toxic/ very persistent and very bioaccumulative
- PEL - Permissible exposure limit
- STEL - Short term exposure limit
- STOT SE - Specific Target Organ Toxicity, Single Exposure

16.3 Key literature references and sources for data
Material Safety Data Sheet SpectraFlair® pigment Version 10-11-2011

16.4 Classification procedure
Classification according to Regulation (EU) 1272/2008 with the correlation table 67/548/EEC or 1999/45/EC (Annex VII of CLP)

16.5 List of relevant R phrases, hazard statements, safety phrases and/or precautionary statements
H261 In contact with water releases flammable gases.

16.6 Emergency telephone number
Europe-wide emergency number: 112

Contact a poison control centre. List of Telephone Numbers:
Austria (Vienna Wien) +43 1 406 43 43; Belgium (Brussels Bruxelles) +32 70 245 245; Bulgaria (Sofia) +359 2 9154 409; Czech Republic (Prague Praha) +420 224 919 293; Denmark (Copenhagen) 82 12 12 12; Estonia (Tallinn) 112; Finland (Helsinki) +358 9 471 977; France (Paris) +33 1 40 0548 48; Germany (Berlin) +49 30 19240; Greece (Athens Athinai) +30 10 779 3777; Hungary (Budapest) 06 80 20 11 99; Iceland (Reykjavik) +354 525 111, +354 543 2222; Ireland (Dublin) +353 1 8379964; Italy (Rome) +39 06 305 4343; Latvia (Riga) +371 704 2468; Lithuania (Vilnius) +370 5 236 20 52 or +370 687 53378; Malta (Valletta) 2425 0000; Netherlands (Bilthoven) +31 30 274 88 88; Norway (Oslo) 22 591300; Poland (Gdansk) +48 58301 65 16 or +48 58 349 2831; Portugal (Lisbon Lisboa) 808 250 143; Romania (Bucharest) +40 21 3183606 Slovakia (Bratislava) +421 2 54 77 4166; Slovenia (Ljubljana) +386 41 650 500; Spain (Barcelona) +34 93 227 98 33 or +34 93 227 54 00 bleep 190; Sweden (Stockholm) 112 or +46 8 33 12 31 (mon-fri 9.00-17.00); United Kingdom (London) 112 or 0845 4647 (NHS Direct).