

Test Report No.: 317G0459.001

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Client: Alien Technology LLC
845 Embedded Way
San Jose, CA 95138 USA**Test item(s):** Components**Identification/
Model No(s):** Higgs-EC (ALC-380), Higgs 4 (ALC-370), and Higgs 3 (ALS-360) IC's**Testing Laboratory:** TÜV Rheinland of North America
2709 SE Otis Corley Dr, Suite 11 Bentonville, AR 72712**Sample Receiving date:** 4 August 2015**Testing Period:** 4 August 2015 – 21 February 2017**Test Result:** *The above described test item was tested and Passed the below-mentioned test specification.***Test specification:**

Overall results according to tests performed

Customer Requirement:

1. Risk Assessment of Articles: Screening of substances subject to restriction (according to Annex XVII of EC no. 1907/2006)
2. The tested material(s) were screened only for selected substance(s). Selection of tests refers to the material type and application and the possibility of contamination during production & material specific contamination of the product. The other substances which are not mentioned in test result were either not subject to testing or not detected.

With reference to Corrigendum to Regulation (EC) no.1907/2006, concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)

Other Information:

None

**For and on behalf of
TÜV Rheinland of North America, Inc.**

2/21/2017 Cody Carson / Lab Technician
Date Name/Position



2/21/2017 Mark Smith / Lab Manager
Date Name/Position

Test result is drawn according to the kind and extent of tests performed.

This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.

Total Cadmium and Tin Content

Test method: [HD-XRF Analysis](#)

Test result

| Material No. | ppm [mg/kg] | |
|--------------|-------------|------|
| | Cd | Sn^ |
| 1 | ND<5.1 | 44.4 |

Remark:

- RED TEXT:** These items are inconclusive by XRF-Screening – See Wet Chemistry Confirmation Results below.
- ND = Not Detected (less than limits of detection)
- (WC) = See Wet Chemistry Results
- NT = Not Tested (Tin in alloys)

Regulations on Cadmium

| EU | Legislation | <i>Maximum Permissible Limit</i> | | | | |
|---------|--|----------------------------------|-------------------|-------------------------------|---------------------------|--|
| | | Plastic materials | Paint (wet state) | Paint on the painted articles | Paint (high zinc content) | Metal parts of jewellery and imitation jewellery articles and hair accessories |
| EC | REACH regulation (EC) No. 1907/2006 Annex XVII Item 23 and its amendments (EC) No. 552/2009, (EU) No. 494/2011 and (EU) No. 835/2012 | 100mg/kg | N.D. | 1000mg/kg | 1000mg/kg | 100mg/kg |
| Denmark | Statutory no. 858 on the prohibition of sale, import and manufacture of cadmium-containing products | 100mg/kg | - | 1000mg/kg | 1000mg/kg | 100mg/kg |

| Country | Legislation | <i>Maximum Permissible Limit</i> | |
|----------------|--|--|---------------------------|
| | | Paint, plastic, plating/coating of surface treatment | Paint (high zinc content) |
| United Kingdom | Statutory Instrument 1993 No. 1643 The Environmental Protection (Controls on Injurious Substances) (No. 2) Regulations | 100mg/kg | 1000mg/kg |
| Germany | Germany Chemikalien-Verbotsverordnung – ChemVerbotsV, Anhang Abschnitt 18, Okt 1993 | 100mg/kg | - |
| Switzerland | Switzerland Chemikalien-Risikoreduktions-Verordnung- ChemRRV, 814.81, 18 May 2005 | 100mg/kg | - |

Regulations on Organo stannic compounds

| Type of organostannic compounds | Maximum Permissible Limit | Implementation date |
|--|---------------------------|--|
| Tri-substituted organostannic compounds, e.g. tributyltin (TBT) compounds and triphenyltin (TPT) compounds | 0.1 % by weight of tin | 1 July 2010 |
| Dibutyltin (DBT) compounds in mixtures and articles for supply to the general public | 0.1 % by weight of tin | 1 January 2012 The below products will not be applicable until 1 January 2015: - one-component and two-component room temperature vulcanisation sealants (RTV-1 and RTV-2 sealants) and adhesives, - paints and coatings containing DBT compounds as catalysts when applied on articles, - soft polyvinyl chloride (PVC) profiles whether by themselves or coextruded with hard PVC, - fabrics coated with PVC containing DBT compounds as stabilisers when intended for outdoor applications, - outdoor rainwater pipes, gutters and fittings, as well as covering material for roofing and façades |
| Diocetyl tin (DOT) compounds - textile articles intended to come into contact with the skin, - gloves, - footwear or part of footwear intended to come into contact with the skin, - wall and floor coverings - childcare articles, - female hygiene products, - nappies, - two-component room temperature vulcanisation moulding kits (RTV-2 moulding kits) | 0.1 % by weight of tin | 1 January 2012 |

PAH Content

| Parameter | Category 1 | Category 2 |
|-------------------------------------|--|---|
| | Toys, including activity toys, and childcare articles, where any of their rubber or plastic components that come into direct as well as prolonged or short-term repetitive contact with the human skin or the oral cavity, under normal or reasonably foreseeable conditions of use. | Rubber or plastic components that come into direct as well as prolonged or short-term repetitive contact with the human skin or the oral cavity, under normal or reasonably foreseeable conditions of use |
| Benzo[a]pyrene mg/kg | < 0.5 | < 1 |
| Benzo[e]pyrene mg/kg | < 0.5 | < 1 |
| Benzo[a]anthracene mg/kg | < 0.5 | < 1 |
| Benzo[b]fluoranthene mg/kg | < 0.5 | < 1 |
| Benzo[j]fluoranthene mg/kg | < 0.5 | < 1 |
| Benzo[k]fluoranthene mg/kg | < 0.5 | < 1 |
| Chrysene mg/kg | < 0.5 | < 1 |
| Dibenzo[a,h]anthracene mg/kg | < 0.5 | < 1 |

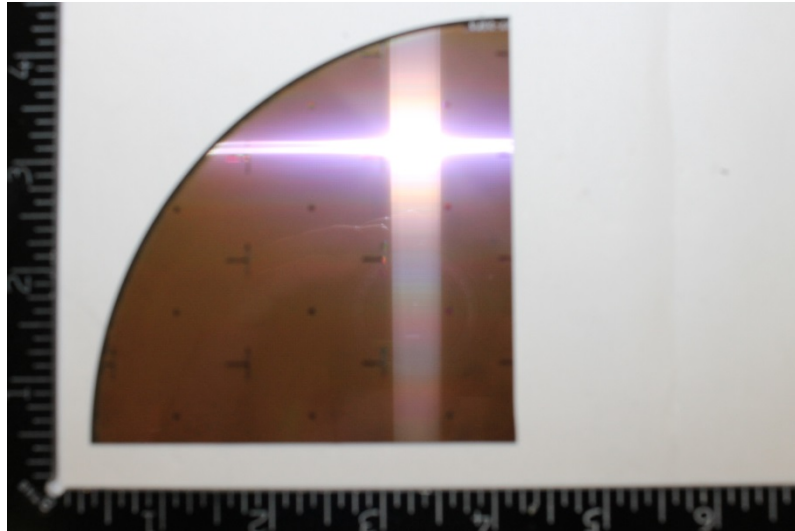
Test method: Gas Chromatography – Mass Spectroscopy

| Test Results | | Test Number: | T001 |
|------------------------|-------|------------------|--------|
| | | Material Number: | M001 |
| Parameter | Unit | MDL | Result |
| Benzo[a]pyrene | mg/kg | 0.2 | ND |
| Benzo[e]pyrene | mg/kg | 0.2 | ND |
| Benzo[a]anthracene | mg/kg | 0.2 | ND |
| Benzo[b]fluoranthene | mg/kg | 0.2 | ND |
| Benzo[j]fluoranthene | mg/kg | 0.2 | ND |
| Benzo[k]fluoranthene | mg/kg | 0.2 | ND |
| Chrysene | mg/kg | 0.2 | ND |
| Dibenzo[a,h]anthracene | mg/kg | 0.2 | ND |
| Benzo[ghi]perylene | mg/kg | 0.2 | ND |
| Category | | | 2 |
| Summary | NA | NA | Pass |

ND = Not Detected (less than limits of detection)

| Instrument | Supplier/Vendor | Model / Type |
|---------------------------------|---------------------------|--------------|
| X-ray Fluorescence Spectrometry | XOS | HD Prime |
| GC-MS | Agilent Technologies Inc. | 6890/5975 |

Sample Photos:



Test Article

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