THE USE OF CADMIUM AND ITS COMPOUNDS IN ARTICLES COLOURED FOR SAFETY REASONS

(DEROGATION IN PARAGRAPH 3 OF ENTRY 23 OF ANNEX XVII)

REPORT

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1. INTRODUCTION

During the REACH Committee meeting held on 25 November 2010 for the vote on the Commission proposal to amend the cadmium restriction provisions, there was a discussion of the removal of the derogation concerning cadmium and its compounds used to give colour to articles for safety reasons (paragraph 3 of entry 23 of Annex XVII to REACH). NL argued that the derogation was not needed and should be deleted, an opinion also supported by DE. However, the UK responded that it was difficult to find examples of safety applications but that in the past such pigments were used to colour pipes. Therefore, in their view, removing this derogation without supporting evidence would not be appropriate. Other Member States reported that they found the provision vague and difficult to enforce.

Given the lack of supportive information concerning technical and socio-economic aspects of this derogation, it was decided not to delete it from the regulation. However, it was agreed that further investigation was necessary to collect appropriate data so that a decision to remove, maintain or amend this derogation could be taken.

Therefore, the European Commission requested ECHA (letter dated 28 September 2011) to investigate the issue of safety applications of articles coloured with cadmium, to identify whether or not they are still relevant and their socio-economic implications. In the event that any applications would still be applicable, ECHA was requested to prepare a guideline or clarification document which would describe the cases in which this derogation could be applied, in order to clarify the provision and help enforcement authorities.

Paragraph 3 of Entry 23 states that, 'by way of derogation, paragraphs 1 and 2 shall not apply to articles coloured with mixtures containing cadmium for safety reasons'. This investigation covered both uses of cadmium in plastic articles (scope of paragraph 1) and in any painted articles (scope of paragraph 2), the latter including glass, ceramics and any type of material, if relevant to safety applications.

2. METHODOLOGY

For the purposes of this investigation, ECHA has carried out: (i) a consultation with Member States and relevant industrial stakeholders inviting them to share any available information of a technical or socio-economic nature on the use of articles coloured with mixtures containing cadmium for safety reasons; (ii) a screening of all registered data and relevant scientific literature or cadmium reports (e.g. RPA Impact Assessment (RPA (2010)), EU Risk Assessment (EU RAR (2007) etc.).

More specifically, in the course of this investigation, ECHA established contacts with: (a) Industrial stakeholders, particularly European industry associations of relevance (e.g. International Association of Cadmium Manufacturers (ICdA), Eurocolour (European producers of pigments, dyes and fillers), The European Council of Paint, Printing Ink and Artists' Colours Industries (CEPE), and aerospace manufacturers; (b) Member State competent authorities via a CIRCABC consultation launched in May 2012; (c) Health Canada and Environment Canada who provided information on their existing legislative provisions and scientific studies concerning cadmium.

With the following main questions (adapted to the nature of the organisation) ECHA invited the associated stakeholders to contribute any available socio-economic data and/or technical evidence:

- Is there any use of cadmium and its compounds to articles coloured for safety reasons, for which the derogation in paragraph 3 of Entry 23 of Annex XVII of REACH could still be applicable?
- If YES: (a) Are there any alternatives for cadmium and its compounds available for these uses? (b) Is there any socio-economic data that would be relevant to assess the impact (e.g. potential costs for associated industry) in case this derogation was withdrawn?

The main findings of the consultation are discussed in the next section.

3. FINDINGS

3.1 General information on cadmium pigments

Cadmium pigments are stable inorganic colouring agents which can be produced in a range of brilliant shades of yellow, orange, red and maroon (ICdA, 2012). According to Environment Canada (2012), over 90% of the total volume of cadmium pigments worldwide are used in plastics and approximately 5% in ceramics. The use of cadmium in pigments in early 2000 was about 830 tonnes per annum (RPA 2000) while the consumption of cadmium oxide for end-use in pigments was around 140 tonnes in 2007-2008 (RPA (2010)). It has to be kept in mind, though, that those proportions may not fully reflect the current situation and future trends as additional restrictions have been introduced since these reports were produced (e.g. restrictions of cadmium compounds in plastic under paragraph 1 of Entry 23 of Annex XVII of REACH). Section A-1 of the Annex summarises some general information about the applications of cadmium pigments in articles based on plastics or other materials (glass, ceramics).

According to information found (Tozzi (2012), ICdA (2012), Cd REACH Consortium (2012)) or received by ECHA (from Eurocolour, aerospace industry) during this consultation, the following cadmium pigments have been identified as having been used in coloured articles for safety reasons: cadmium sulphide, cadmium sulphoselenide Orange 20, cadmium sulphoselenide Red 108 and cadmium zinc sulphide Yellow 35.

Some limited information about the risks due to cadmium pigments can be found in the EU RAR (2007). Regarding occupational exposure only, the report mentions that in the production of cadmium sulphide-based pigments, where cadmium oxide and cadmium metal are used as starting materials, inhalation and/or dermal exposure may occur at several steps of the process due to direct handling or incidental contact. Overall, consumer exposure (mainly to cadmium sulphide and cadmium sulphoselenide in plastics, glasses and ceramics) is generally assumed to be low. In relation to environmental risks, concern is expressed for local aquatic ecosystems at five cadmium production sites/scenarios, two of which being sites for pigment production. Section A-2 of the Annex gives more information obtained from the literature and available reports (e.g EU RAR) on hazard profiles and exposure to cadmium pigments. The overview table (in Section A-3) briefly describes the hazard properties, classification information and the currently known use volumes in the EU, for the commonly used cadmium pigments.

ECHA also performed a search of registrations dossiers. Although a large number of pre-registrations have been submitted to ECHA, only seven companies registered

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mostly between 1-10 tonnes and also 10-100 tonnes for cadmium sulphide. No registrations dossiers have been submitted for the other cadmium compounds mentioned above.

3.2 "Historical" reported safety uses of articles coloured with cadmium pigments

During this consultation, ECHA contacted the UK authorities (Health and Safety Executive, Department for Environment, Food and Rural Affairs) that had opposed the withdrawal of the relevant derogation in the REACH meeting of November 2010. In order to understand whether cadmium is still used in any safety critical applications in the UK, and if so whether it was still necessary for those uses, the UK government undertook a national consultation (November-December 2011) with various stakeholders such as the UK Ministry of Defence, rail safety regulators, the marine and coastguard agency, construction and manufacturing sectors and the main UK manufacturers of polyethylene piping used underground (e.g. gas pipes).

The key uses were based on those applications identified in earlier impact assessments on the cadmium restriction, including the use of cadmium pigments for the following:

- colouring underground gas pipelines vividly and durably yellow, as a safety measure to help anyone uncovering and/or disturbing service pipes identify what they have encountered;
- tinting drivers' windows on high speed trains to reduce glare (RPA, 2010); and,
- surface coatings for marine/coastguard craft or other emergency services.

The UK noted that their consultation received a good response, with clear indications that alternatives are now available and widely used in those applications where cadmium had previously been in use. No respondents indicated that cadmium is still necessary as a paint or pigment for safety critical applications. In January 2012, the UK authorities informed ECHA that, to the best of their knowledge, cadmium pigments have not been used for such applications in recent years, and that the UK would not object to the removal of the derogation for safety critical applications on the basis of the evidence available to them (subject to ministerial agreement at the appropriate time).

ECHA received responses from 11 other Member State competent authorities during the consultation for various cadmium applications (via CIRCABC, May 2012). Norway responded that cadmium-based pigments had been used in the past for road and traffic marking but no longer. Netherlands also restated their position – communicated previously in the 2010 REACH Committee meeting - that there is no longer a need for this derogation. This derogation was not applied in The Netherlands and there was no reaction from industry. Furthermore, in their opinion, this derogation is also difficult (if not impossible) to enforce, given that a company could easily claim that any cadmium in articles is used for safety reasons.

No information about any historical or existing uses of cadmium compounds in coloured articles for safety applications were received from other competent authorities in the course of this consultation.

3.3 Identified safety uses of articles coloured with cadmium compounds

The consultation with industrial stakeholders (aerospace manufacturers, Eurocolour, ICdA) identified certain existing uses of cadmium compounds to colour articles for

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safety reasons. CEPE, on the other hand, responded that their members no longer use cadmium pigments for any applications.

3.3.1 Electrical wiring and cables (colored with cadmium pigments) used for safety reasons by Boeing in aircraft electrical and control systems

(a) Safety aspects of this application

An aerospace manufacturing company identified the following applications of cable coloured with cadmium pigments in critical aircraft systems to allow easy visual identification within the aircraft, to aid in troubleshooting during production and maintenance, and to ensure safe identification and handling of wires, cables and wire bundles during maintenance for correct wire termination.

The company indicated that its suppliers use different formulations to achieve the desired colours, but principally a group of yellow, orange, and red cadmium sulphides and sulphoselenides. Cadmium sulphide is the base and cadmium selenide is added to make darker red colours.

According to this advice, wire insulations and cable jackets in aircraft systems are coloured by use of cadmium pigments for high temperature applications in red, (for fire detection and extinguishing systems) in yellow (flight control system) and in orange (for flight tests). The system wire/cable connections are often used in a high temperature application (greater than 150°C ambient temperature) that may occur either due to the local external ambient environment and/or heat generated from internal wiring current during normal or single failure scenarios that are part of the system design requirements. The use of cadmium pigments in such high temperature rated wiring is essential to keep the colour from changing/fading over time. According to wiring suppliers, the use of non-cadmium alternatives tends to change or fade the colour in the high temperature application which then fails to meet the color fastness requirement. If a wire is misidentified due to the colour changing or fading and is connected incorrectly, and this goes undetected, then it may lead to erroneous operation of a system. Therefore, changing established colour conventions introduces significant risk of maintenance errors, as there would be increased potential for confusion by maintenance personnel working on the company's aircraft that employ different colour conventions, especially in global maintenance and repair operations conducted in over 100 countries. In a flight critical system, such as flight control surfaces, faulty operation of the affected system could have potentially catastrophic consequences.

The aerospace company stated that their uses of cadmium for colouring in relevant applications for safety purposes are sourced, performed and initially assembled on the aircraft outside the EU. Only if for safety reasons it is necessary to replace some wiring within the lifecycle of the aircraft might a new spare part be installed in the EU.

(b) Feasibility of alternatives

The aerospace manufacturing company consulted their wire and cable suppliers who reported that using non-cadmium alternatives with the aim of maintaining the current colour code tends to dull the colour and in some cases fails to meet the 'standard' colour limits for primary colours (e.g. the cables may turn brown or white). It was also claimed that this wiring is designed to remain in place throughout the life of the aircraft, which can be 30 to 40 years, and its colour is required to stay intact. Colour fading over this period would increase the potential of maintenance errors. Because design and process changes can adversely affect performance characteristics, any

change to a design, including changes in colour pigments, requires testing to ensure all performance requirements are met.

The company noted that any change to currently approved aircraft design specifications, including any change to a product or article, must be certified by an agency such as the Federal Aviation Administration (FAA) or the European Air Safety Agency (EASA). Any research and development programme would be a multi-year process which would still need to meet the necessary safety and airworthiness performance requirements before an alternative could be implemented.

The company reported that their wire and cable suppliers have not been able to demonstrate that a cadmium-free design can meet all the required performance characteristics for high temperature wire/cable. However, suppliers are continuing to identify and test alternatives. The process of moving to alternatives includes three phases: technology readiness validation, compliance certification to the EASA/FAA regulations, and implementation into the production system, which includes the supply base. Currently, the industry is in the technology readiness validation phase and does not have an alternative to apply a timeline for the remaining phases.

Some information was provided on potential alternatives to cadmium-based pigments for this application. Specific examples with technical shortfalls include:

(a) Bismuth vanadate (BVA) yellow pigments, the 'heat stability of which is insufficient compared to cadmium-based pigments' (Murphy, 2001);
(b) certain organic pigments which have lower thermal stability (particularly above 400-475F) and higher formulation costs (Sherman, 1995);
(c) earth-based inorganic pigments based upon cerium oxide which have shown a 'lack of thermal stability due to the reduction of cerium (IV) oxide to cerium (III) oxide resulting in the colour turning to orange' (Kumari et al., 2010);
(d) calcinated complex inorganic colour pigments (also known as mixed-metal oxides) which do not produce sufficiently bright red or yellow colours (Sherman, 1995).

Other large aerospace companies were contacted to ascertain whether this safety use of cadmium is widespread and applicable for all aircraft designs, but no such uses were reported. The aerospace manufacturing company which did report this use indicated that they had made an informal inquiry to a small number of members of the Aerospace Industry Association and, although several reported the use of red, yellow and orange wiring in their products, they were unable to obtain pigment information from their suppliers in time to support the response.

3.3.2 Critical (security) applications of cadmium pigments

In their response to ECHA, Eurocolour identified the following continued uses of cadmium pigments in safety-related applications: (a) parts for rescue boats for ships; and, (b) parts for security equipment for outdoor applications (e.g. seats, reels and various technical parts). Three specific cadmium pigment types – Orange 20, Pigment Red 108, Pigment Yellow 35 – are used in low-density polyethylene (LDPE) polymers for the production of coloured master batches. For signal colours (red/orange) and security applications all kind of polymers are used.

According to Eurocolour, without cadmium pigments, outdoor security applications would become less secure due to a loss of signal colour strength (fading). Cadmium pigments were said to provide the highest achievable values for weather resistance, light fastness, heat resistance in converting processes and chroma, properties which

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cannot be obtained by organic alternatives for these specific applications. Alternatives with similar technical properties would be lead chromate pigments, but these are now part of REACH Annex XIV, which means that companies would need an authorisation to use them. Other alternatives are organic pigments in combination with UV-stabilizers which must be selected through trial and error. The colour shades possibly differ significantly from those available with cadmium (and lead chromate pigments) and the weather fastness is said to be limited.

3.4 Potential impacts on industry

The aerospace manufacturing company reporting the use of cadmium pigments to colour electrical and control systems did not provide detailed socioeconomic data on this use. They claimed that safety is the primary consideration in aircraft design and that the driver for cadmium use is safety, so that this is the overriding socio-economic factor.

Concerning their input on the critical application of cadmium pigments, Eurocolour noted that if cadmium (as well as lead chromates and Annex XIV substances) could no longer be used, the impact would be to shorten the replacement cycle of the coloured articles of the critical applications identified above. This has an economic impact, positive for suppliers of organic pigments and master batches and negative for their customers (public and private sector). Eurocolour claimed that the costs of suitable red organic pigments are about a factor of 6–10 higher than their inorganic counterparts.

4. CONCLUSIONS

ECHA's consultation with Member States and industry has uncovered a small number of continuing uses of cadmium as a colouring pigment in safety applications. These applications generally relate to situations where environmental or operating conditions are extreme (e.g. high temperatures, outdoor weather), where colour fastness is important for safety reasons (e.g. to identify safety equipment or to avoid safety-critical maintenance errors), and where the intended lifespan of the articles in question is relatively long. These features imply that that amending or removing the derogation provided in paragraph 3 of Entry 23 could have significant costs for industry and/or the general public while the reductions in risks would be small, if any, if the derogation was removed.

It is concluded that the derogation provided in paragraph 3 of Entry 23 is still relevant and applicable. It is proposed that ECHA prepare a new entry in the Questions and Answers for restrictions relevant to Annex XVII of REACH with explanation of the conditions under which the derogation might apply. This would improve clarity of the scope of the derogation and help with its enforcement.

It cannot be excluded, however, that there might be additional applications of interest which have not been identified in the course of this ECHA consultation. In this case, the list of uses described in any new Questions and Answers entry for restriction of Annex XVII of REACH would need to be presented as indicative rather than comprehensive.

REFERENCES

Cd REACH consortium (2012) searched July 2012, available at http://www.reach-cadmium.eu/pg_n.php?id_menu=54

Color Index (2012) searched July 2012, available on Artist's Paint and Pigments Reference, Color Index Chemical Constitution Numbers, at http://www.artiscreation.com/red.html

CPMA (1993) Safe Handling of Color Pigments, First Edition, 1993, Color Pigments Manufacturers Association Inc., 300 North Washington Street, Suite 102, Alexandria, Virginia 22314, USA.

EC (1967) Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances.

EC (2003) available at http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32003H0670:EN:HTML.

EC (2008a) Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

EC (2008b) PIC Regulation (Council Regulation No (EC) 689/2008), of the European Parliament and of the Council of 17 June 2008 concerning the export and import of dangerous chemicals available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:204:0001:0035:EN:PDF.

EFSA (2009) Opinion of the EFSA Panel on Contaminants in the Food Chain from 30 January 2009, available at http://www.efsa.europa.eu/en/efsajournal/pub/980.htm

ESIS (2012) searched July 2012, available at http://esis.jrc.ec.europa.eu/.

EU RAR (2007) European Union Risk Assessment Report: Cadmium oxide and cadmium metal. Part I – Environment. 3rd Priority List, Volume 72, EUR 22919 EN, European Chemicals Bureau.

HSE (2007) searched July 2012, available at http://www.hse.gov.uk/coshh/table1.pdf.

ICdA (2012) Cadmium pigments (http://www.cadmium.org/pg_n.php?id_menu=13).

Kumari L, Rao P, Koshy P. (2010). Red Pigments Based on CeO2–MO2–Pr6O11 (M=Zr and Sn): Solid Solutions for the Coloration of Plastics. Journal Of The American Ceramic Society [serial on the Internet].[cited July 27, 2012]; 93(5): 1402-1408. Available from: Business Source Corporate.

Murphy, John (2001). Additives for Plastics Handbook (2nd Edition), Elsevier. Pg 61-62.

RPA (2000) The Risks to Health and Environment by Cadmium used as a Colouring Agent or a Stabiliser in Polymers and for Metal Plating, Final Report, 19 December 2000, prepared for The European Commission, DG Enterprise by Risk & Policy Analysts Limited.

RPA (2010) Socio-Economic Impact of a Potential Update of the Restrictions on the Marketing and Use of Cadmium, Revised Final Report Prepared for European Commission Directorate-General Enterprise and Industry.

SCOEL (2009) Scientific Expert Group on Occupational Exposure Limits (SCOEL) (2009). Recommendations from the scientific expert group on occupational exposure limits for cadmium and its inorganic compounds. SCOEL/SUM/136. Final draft.

Sherman L. Color concentrates. (2012). Plastics Technology [serial online]. July 1995;41(7):44. Available from: Business Source Corporate, Ipswich, MA. Accessed July 25,.

SIN (2012) 'Substitute It Now!' list, searched July 2012, available at http://www.chemsec.org/list/sin-database.

Tozzi (2012) searched July 2012, available at
http://digitalfire.com/4sight/education/glaze_and_body_pigments_and_stains_in_the_ceramic_tile_industry_342.html

ANNEX

A-1 General information on the uses of cadmium pigments

All cadmium pigments are based on cadmium sulphide. The world consumption of cadmium pigments increased steadily with the development of the plastics industry and peaked at about 6,000 tons in 1975 (Environment Canada, 2012) Since then, their use has been decreased due to their hazardous properties, subject to criticism and therefore alternative products have been developed, especially high-grade, thermostable organic yellow and red pigments.

Their importance in the paint sector is now marginal. The following properties of cadmium pigments are an advantage in plastics: (i) ready dispersability; (ii) a continuous range of brilliant shades from green-yellow to bordeaux; (iii) high-shade-temperature-time resistance; (iv) fastness to migration; (v) very good hiding power; (vi) outstanding light fastness; (vii) outstanding weathering fastness (with the exception of yellow); and (viii) also suitable for aggressive plastic melts (e.g. polyamide).

Cadmium pigments are also used to colour ceramic glazes and enamels. In both cases, high firing temperatures are required. This excludes organic pigments and reduces the number of suitable inorganic pigments. For yellow hues there are various alternatives, but cadmium sulphoselenide is the only usable brilliant red pigment according to the associated industry. Cadmium pigments are suitable for all surface-finished ceramics. The main applications of cadmium enamel colours are red cooking pots and enamel decorations. Cadmium pigments also have a number of other minor uses in rubber, paper and inks although these are small in terms of cadmium consumption.

A-2 Information on hazard profile/exposure to cadmium pigments

The EU RAR (2007) concluded that cadmium *is considered to be a non-threshold carcinogen* and therefore identified *concerns for genotoxicity and carcinogenicity irrespective of the route of exposure* (EU RAR, 2007). This reports refers only to metallic cadmium and cadmium oxide because both products are transformed in the environment into the same form and the risk is associated with the exposure to the most toxic form, mainly ionic Cd^{2+}. No risk assessments have been made previously to REACH entering into force for other compounds of cadmium. The information given in the EU RAR about cadmium pigments has been discussed in section 3.1.

Color Pigments Manufacturers Association (CPMA, 1993), stated that (a) toxicity of cadmium pigments was considered nonetheless very much lower (by several orders of magnitude) than that of other cadmium compounds (b) long-term animal feeding studies with various cadmium compounds showed no carcinogenic potential.

Furthermore, CPMA highlighted that cadmium pigments as insoluble substances even in dilute acids, and especially after their incorporation into polymers, typically at a 1 % loading, (and consequently pigmented articles) were considered to be safe for landfill disposal (CPMA, 1993). Incineration in the US of polymers pigmented with up to four times the usual concentration of cadmium showed that these products had no significant impact on incinerator emissions.

Cadmium sulphide has been included in the SIN list (SIN, 2012) with a high priority score of 5 (out of maximum 6) for hazard, production volume, workers exposure, consumer exposure and widespread use. In its RMO analyse submitted to ECHA on 29 December 2011, Sweden highlighted the adverse effects of cadmium sulphide on kidney and bone tissue at low exposure and its acute inhalatory toxicity which makes a concern for workers exposure. Following their information search on the potential exposure to cadmium from the use of CdS, Sweden decided to, despite the restriction on many of cadmium's applications, perform a re-analysis of the risk associated with Cd-substances involved in artists colours as no data to assess consumer exposure are available on the non-restricted uses.
Cadmium and cadmium compounds are listed in Annex II of the European Schedule of Occupational Diseases (EC, 2003). It is thus suspected of being a causal agent for professional diseases.

Recently the Scientific Committee on Occupational Exposure Limits (SCOEL, 2009) recommended an OEL equivalent to 4 µg Cd/m^3 (respirable fraction) for cadmium and its inorganic compounds as protective against long-term effects (including respiratory effects and lung cancer) and a biological limit value (BLV) of 2 µg Cd/g creatinine. EFSA (2009) used a lower value, 1 µg/g creatinine, as reference point for the risk evaluation of cadmium in food.

The HSE list from 2007 (HSE, 2007) includes an OEL of 0.025mg/m3 of cadmium, for cadmium and cadmium compounds excluding CdS, and 0.03 mg/m3 for CdS.

Under the Existing Substances Information System (ESIS, 2012), the cadmium sulphoselenides and the cadmium zinc sulphide are not classified in the Annex VI to R 1272/2008 (EC, 2008a) as such, but they may be included in one of the group entries. As entry no 048-001-00-5 specifically excludes these compounds ("cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex") we can consider all these as non-classified according to CLP.

The self-classifications submitted for cadmium sulphoselenide Red only indicates Acute toxicity 4, some indicate STOT SE 3 and skin irritation, but no CMR. ESIS (2012) further indicates for all the above substances that are included in the subcategory of industrial chemicals for professional use as severely restricted under R 689/2008 (PIC Regulation) (EC, 2008b).

A-3 Information on classification and uses of the main cadmium pigments

Substance / Information		Cadmium sulphide	Cadmium sulphoselenide Orange 20	Cadmium sulphoselenide Red 108	Cadmium zinc sulphide Yellow 35
Identifiers	Name	Cadmium sulphide	cadmium sulphoselenide orange C.I. 77202**	cadmium sulphoselenide red (108) C.I. 77202** C.I. 77196.	cadmium zinc sulphide yellow (35) C.I. 77205**
	CAS	1306-23-6	12656-57-4	58339-34-7	8048-07-5
	EC	215-147-8	235-758-3	261-218-1	232-466-8
	Index No	048-010-00-4	-	-	-
Classification and Labelling	DSD	T+; R48/23/25 Toxic; Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. Carc. Cat. 2; R45 May cause cancer. Muta. Cat. 3; R68 Possible risk of irreversible effects. Repr. Cat. 3; R62 Possible risk of impaired fertility R63 Possible risk of harm to the unborn child. R53 May cause long-term adverse effects in the aquatic environment. Specific concentrations limits: Concentration / Classification C ≥ 10 % / Xn; R22 C ≥ 10 % / T; R48/23/25 0,1 % ≤ C < 10 % / Xn; R48/20/22	-	-	-

	CLP	Acute Tox. 4 (Hazard statement: H302: Harmful if swallowed.) Repr. 2 (Hazard statement: H361: Suspected of damaging fertility or the unborn child) Muta. 2 (Hazard statement: H341: Suspected of causing genetic defects) Carc. 1B (Hazard statement: H350: May cause cancer) STOT Rep. Exp. 1 (Hazard statement: H372: Causes damage to organs through prolonged or repeated exposure) Concentration (%) — Classification >= 0.1 — < 10.0 — STOT Rep. Exp. 2 >= 10.0 — STOT Rep. Exp. 1 Hazards to the aquatic environment: — Aquatic Chronic 4 H413: May cause long lasting harmful effects to aquatic life.)	This substance is not classified in the Annex VI to R 1272/2008 as such, but it may be included in one of the group entries.	This substance is not classified in the Annex VI to R 1272/2008 as such, but it may be included in one of the group entries.	This substance is not classified in the Annex VI to R 1272/2008 as such, but it may be included in one of the group entries.
	Self-classification	Acute tox 4 H 302 Repr 2 H361 Muta 2 H341 Carc 1B H350 STOT Rep Exp 1 H372 Aq chr 4 H413	-	Acute Tox.4 H302 Acute Tox.4 H332 Skin Irrit. 2 H315 STOT SE 3 H335. or Acut Tox.4 H302 Acutee Tox 4 H312 Acute Tox.4 H332	-
Registrations*	Pre-Registrations	281	80	122	80
	Registrations	7 R + 1 update	0	0	0
	C&L notifications	37 bulk 5 bulk, 13 in total 45 individual 8	5 0	2 8	1 4
	Tonnage	3 companies registered for 1-10t/year 1 company registered for 10-100t/year In total, for 2010 they reported 18t imported, 3.6t manufactured and 0.1t SiA for all the uses: colouring agents, pigments, electronic components.	0	0	0

All the above substances are included in the subcategory of industrial chemicals for professional use as severely restricted under R 689/2008 (PIC) (EC, 2008b).
* REACH IT search on 16.07.2012
** Color Index (2012)