Version 1: November 2009
Revision 1: June 2016
Revision 2: April 2018

CB4REACH Consortium

Carbon Black SIEF Information Letter 3

Classification & Uses of Carbon Black

Dear SIEF member,

This 3rd SIEF information letter would like to inform you about the classification and the registered uses of Carbon Black.

Classification

During the REACH registration process all available data for carbon black were reviewed and the consortium has concluded that carbon black is classified as non-hazardous for all end-points.

According to Article 14 paragraph 4 sentence 1 of the REACH-Regulation, a chemical safety assessment must include an exposure assessment including the generation of exposure scenario(s) (or the identification of relevant use and exposure categories if appropriate), exposure estimation and risk characterisation if the substance is classified as dangerous in accordance with Directive 67/548/EEC respectively Regulation 1272/2008/EC on classification, labelling and packaging of substances and mixtures (CLP) or is assessed to be persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB).

Carbon black is not classified as hazardous or assessed to be PBT or vPvB which means that no exposure assessment is required for this substance and the communication of uses and exposures along the supply chain are not required according to the REACH-Regulation.

Nevertheless, the identified safe uses of carbon black are described in a general way in the registration dossier / Chemical Safety Report according to the “Guidance on information requirements and chemical safety assessment Chapter R.12: Use descriptor system.”

Please be informed that the use of CB as a pigment in Tattoo colours for humans is not covered by the joint registration filed by the Lead Registrant.

Identified uses and exposure information

If any of your uses are not covered, please add such additional uses in your individual part of the IUCLID registration file.

Table 1 Manufacture and Uses (including exposure information)

Carbon black is manufactured by incomplete combustion of a hydrocarbon such as oil or gas with a limited supply of combustion air or by the thermal decomposition of gaseous or liquid hydrocarbons at temperatures in excess of 1100 °C. The carbon black is collected as a fine black and fluffy powder.

	Manufacture
M-1	**Carbon black manufacture** Manufactured composition (see section 1.2) Further description of manufacturing process: Two major processes are presently used to manufacture carbon black, the oil furnace black process and the thermal black process; the first accounting for about 90% of production, and the latter for about 10%. The oil furnace black process uses heavy aromatic oils as feedstock. The production furnace is a tightly enclosed reactor in which the feedstock is reacted under carefully controlled conditions and at extremely high temperatures. The feedstock is atomized in a hot gas stream: it vaporizes and is pyrolysed in the vapour phase to form microscopic carbon particles. In most furnace reactors, the reaction is controlled by steam or water sprays. The carbon black produced is conveyed through the reactor, cooled, and collected in bag filters in a continuous process. Furnace black is available in several grades. They are mainly used in rubber products, inks, paints and plastics. The thermal black process uses natural gas, mainly consisting of methane, as the starting material in a cyclic operation in which the gas is thermally decomposed (cracked). The process uses a pair of furnaces that alternate approximately every five minutes between preheating and carbon production. The methane is injected into a hot refractory-lined furnace. In the absence of air, the heat from the refractory material decomposes the methane into carbon black and hydrogen. The aerosol material stream is quenched with water sprays and filtered. The exiting carbon black may be further processed to remove impurities, pelletized, screened, and then packaged for shipment. The process yields

	relatively coarse particles. Two other processes (the lamp process for production of lampblack and the cracking of acetylene to produce acetylene black) are used for small-volume specialty carbon blacks that constitute less than 1% of the total production. Lampblack is produced by burning liquid hydrocarbons, e.g. kerosene. Lampblack is often oily. It is used for contact brushes in electrical apparatus. The gas black process was developed in the 1930s in Germany, where natural gas was not available in sufficient amounts. It is similar to the channel black process, but uses coal tar oils instead of natural gas. Yields and production rates are much higher with oil-based feedstock; this process is still used to manufacture high-quality pigment blacks with properties comparable to those of channel blacks. The gas black process has been used on an industrial scale since 1935 initially by Degussa (renamed to Evonik) and now by Orion Engineered Carbons which has taken over Evonik's Carbon Black business in 2011. The fluffy carbon black coming out of the filter is pneumatically conveyed into a first storage tank. During the wet pelletization process, water (containing dissolved pelletising agents) is injected via spray nozzles. The size of the pellets is around 1-2 mm. The carbon black leaving the pelletising machine contains approximately 50% by wt. water. It is dried in dryer drums by a variety of means. The most common method is indirect heating by combusting tail gas. Drying temperatures, generally between 150 and 250°C, allow further modification of the carbon black properties. The dried carbon black is transported via conveyor belts and elevators to the storage tank or packing station. Bulk densities of wet-pelletised carbon blacks are between 250 and 550 g/L. As part of some manufacturing processes, a post treatment can be applied to the surface of the carbon black to enhance the product performance in some specific applications. These post treatments are limited to a thin layer on the surface of the carbon black. Contributing activity/technique for the environment : **- Manufacturing of the substance (ERC1)** Contributing activity/technique for the workers : **- Manufacturing of the substance (PROC 1 ; PROC 2 ; PROC 3, PROC 8b ; PROC 9; PROC 15; PROC28)** **Explanation on insignificant release:** Industrial Carbon black emissions may occur from dryer vents, from the transport system vents, the clean-up system vent, and from cleaning, spills, and leaks (fugitive emissions). In the furnace process, high performance bag filters are used

	to ensure high carbon black collection efficiency and minimum product losses of the residual carbon black in the filtered tail gas (EC 2007). In the thermal process, carbon black is recovered in a bag filter between the two furnaces. The rest is recycled in the off-gas. Some adhere to surfaces of the checker brick where it is burned off in each firing cycle. Hence, carbon black emissions are negligible during normal manufacturing conditions. Process water from the production process is generally emitted in the form of water vapour. Liquid water releases come from wash down streams unless the tail gases are dehumidified to increase the quality of the fuel gas.

Exposure to carbon black may occur during production, collection, and materials handling, pulverizing, pelletizing, screening, packaging, stacking, loading, and unloading, as well as during cleaning equipment and maintenance, and from leaks, and spills.

Within any production plant, exposures to carbon black vary markedly with the highest exposures normally being seen in fitters, warehouse packers and site cleaners. Exposures can also vary greatly among factories and regionally.

In the late 1980s and 1990s extensive monitoring campaigns have been conducted within the carbon black production industry in Western Europe in 1987-1989, 1991-1992, and 1994-1995 (Gardiner et al. 1996; Gardiner et al. 1992; Gardiner et al. 2001) and the United States in 1979 – 1980 (Smith and Musch 1982), 1994-1995 (Muranko et al. 2001), and in late 2000 (Harber et al. 2003a; Harber et al. 2003b). These studies found that geometric mean personal exposure, measured as total and inhalable carbon black was on average less than 1.0 mg/m³.

Exposure measurements from the carbon black industry in Western Europe (1987-1995; as listed above) were merged with more recent exposure monitoring data (1996-2016) collected from the same production facilities. Exposure data were available from 24 factories in Europe that manufacture carbon black, 11 of which are still in operation. The data were collated by:

- Site;
- Concentration (in mg/m^3) of carbon black (including inhalable, respirable, and/or total dust);
- Job class and/or title;
- Type of measurement (e.g. personal/stationary); and

- Sample date.

Available data included with job code and class were used to assign each measurement to one of the following scenarios, as well as an "unknown" scenario for those measurements for which insufficient information was available to classify a scenario type.

1. Maintenance;
2. Packing;
3. Process;
4. Site cleaning;
5. Supervisor;
6. Laboratory; and
7. Office workers.

As examples of scenario classification, "Warehouse" was allocated to the scenario, "Packing", and "Production" was categorized to "Process".

Some measurements indicated levels were below the instrument limit of detection (LOD) with a "<" symbol. Half the LOD was used for these concentrations and a field was created to indicate measurements representing non-detection. For a limited number of measurements, no quantitative information was provided for the non-detect data, so half the minimum applicable dust concentration was used from the relevant dataset as a surrogate measurement.

Table 2 Inhalable dust concentrations (mg/m^3) in each scenario combined over all factory locations and data sources (personal measurements**)**

	Associated PROCs	N	Non-Detect (%)	Arith Mean	Geo Mean	Geo Std Dev	Geo CI-	Geo CI+	Min	Max	75th Pct	Use of RPE[1]
Maintenance	PROC 28	1.069	3,1	1,01	0,55	3,28	0,51	0,59	0,00	19,63	1,26	0,126
Packing	PROC 8b, PROC 9	1.902	2,6	1,90	1,04	3,16	0,99	1,10	0,00	37,28	2,05	0,205
Process	PROC 1, PROC 2, PROC 3,	2.699	4,1	0,85	0,42	3,45	0,40	0,44	0,00	26,51	0,94	0,094
Site cleaning	No suitable PROC available	347	1,7	1,46	0,60	3,84	0,52	0,70	0,02	18,25	1,45	0,145
Laboratory	PROC 15	78	2,6	0,80	0,31	3,32	0,24	0,40	0,00	25,00	0,57	

[1] RPE: respiratory protection equipment capable offering a 90% reduction in inhalable concentrations; Assigned Protection Factor (APF) = 10; Exposure reduction factor 0,1 (ECETOC TRA Ver. 3.1, COSHH Essentials Sheet R2; http://www.hse.gov.uk/pubns/guidance/rpe2.pdf)

Supervisor	No suitable PROC available	23	0,0	0,38	0,18	3,73	0,11	0,31	0,01	2,10	0,43	
Office workers	No suitable PROC available	7	14,3	0,16	0,07	5,19	0,02	0,23	0,00	0,60	0,13	

Table 3 Respirable dust concentrations (mg/m^3) in each scenario combined over all factory locations and data sources (personal measurements)

	Associated PROCs	**N**	**Non-Detect (%)**	**Arith Mean**	**Geo Mean**	**Geo Std Dev**	**Geo CI-**	**Geo CI+**	**Min**	**Max**	**75th Pct**	Use of RPE[2]
Maintenance	PROC 28	852	6,7	0,33	0,18	2,95	0,17	0,20	0,02	7,71	0,37	0,037
Packing	PROC 8b, PROC 9	1.148	5,5	0,63	0,33	3,02	0,31	0,35	0,02	18,99	0,64	0,064
Process	PROC 1, PROC 2, PROC 3,	2.116	8,3	0,33	0,17	2,98	0,16	0,18	0,02	16,69	0,33	0,033
Site cleaning	No suitable PROC available	389	6,9	0,53	0,22	3,52	0,19	0,25	0,02	20,70	0,51	0,051
Laboratory	PROC 15	32	18,8	0,28	0,15	3,52	0,09	0,23	0,01	1,36	0,43	
Supervisor	No suitable PROC available	16	0,0	0,35	0,20	2,55	0,12	0,31	0,10	1,90	0,29	
Office workers	No suitable PROC available	7	14,3	0,07	0,05	2,24	0,03	0,10	0,02	0,10	0,10	

The summary statistic used for the comparison with DNELs is the 75th percentile of the exposure estimates. There are several reasons for the use of the 75th percentile. The exposure estimates for the carbon black manufacturing exposure scenarios are based on a large and high quality exposure database that was compiled using a representative and random sampling strategy. The exposure measurements listed in Table 7 and Table 8 include extensive measurement data collected from the carbon black industry in Western Europe (1987-1995; as listed above) as well as more recent exposure monitoring data (1996-2016). The database contains measurements from all or most of the carbon black facilities in Europe (although a number of facilities for which data are available, are no longer in operation). Because of the high quality and representative data set, exposure estimates with relatively low levels of uncertainty are obtained which

[2] RPE: respiratory protection equipment capable offering a 90% reduction in respirable concentrations; Assigned Protection Factor (APF) = 10; Exposure reduction factor 0,1 (ECETOC TRA Ver. 3.1, COSHH Essentials Sheet R2; http://www.hse.gov.uk/pubns/guidance/rpe2.pdf)

do not require assumptions for extrapolating results from one facility to other facilities in Europe. Some uncertainty exists, as some of the data are relatively old, however evidence from the carbon black industry (van Tongeren et al. 2000) and elsewhere (Creely et al. 2007) show that exposure levels have declined over time. Therefore, it is justified to use the 75th percentile of the exposure estimates to compare with the DNEL. This approach would also provide consistency with the estimate for carbon black exposure in downstream users (rubber industry) which are based on ECETOC TRA v.3, which represent the 75th percentile according to the TRA v.3 documentation report (ECETOC 2012).

Conversion factors for particle size metrics

In some facilities, both inhalable and respirable fraction data were available for a given year. From these measurements, it was possible to develop a factor for converting from inhalable to respirable, when measured respirable fraction data were not available. The weighted average respirable fraction for "packing" was calculated to be 0.4. In other words, the inhalable measurement can be multiplied by 0.4 to estimate the corresponding respirable fraction.

Carbon black particle sizes distribution at the workplace

In the workplace, the lower end of the size distribution curve for carbon black particles is at around 400 nm (Kuhlbusch et al. 2004) with modes (maxima) around 1-2 µm dae (d_{ae} = aerodynamic diameter) and > 8 µm dae (the larger size mode went beyond the particle size range investigated).

A study of three carbon black manufacturing facilities demonstrated that carbon black manufacturing workers are not exposed to nanoscale (size range between 1 to 100 nanometers) carbon black particles. There were no exposures to carbon black particles less than 400 nanometers aerodynamic diameter. Ultrafine particles (< 100 nm), detected in the bag filling areas, were most likely attributed to non-carbon black sources such as forklift and gas heater emissions (Kuhlbusch et al. 2004). A follow-up study of the same three facilities found no significant release of carbon black nanoparticles or agglomerates from closed production and pelletizing processes. Other particle sources, such as traffic emissions, and grease and oil fumes from maintenance activities significantly influenced particle number concentration (Kuhlbusch and Fissan 2006).

A study at an oil furnace carbon black manufacturing plant located in southern Taiwan found that workplace background nanoparticle concentrations were mainly coming from the outdoor environment. It was determined that particles could also be contributed by

forklift exhaust or fugitive emissions of heaters (Wang et al. 2010).

A study conducted at the bagging areas of a carbon black and synthetic rubber company in Taiwan found both field and laboratory data showing that nanoparticle number and mass concentrations of carbon black were close to the background level. Nanoparticle concentrations were elevated substantially when diesel forklifts were present (Tsai et al. 2011).

Wake and co-workers conducted a sampling study in the UK to measure the number of ultrafine particles with diameters between 16.5 and 805 nm at workplaces where they may be present (Wake et al. 2002). One of the locations measured was the bagging area of a carbon black manufacturing facility. Particle numbers at the carbon black manufacturing facility were much lower than outside ambient air levels. The authors state that one reason for these results is that the processes were totally enclosed, and by the time that the particles had reached the bagging operations they had formed large agglomerates outside the ultrafine range. Median particle diameter in the bagging area ranged between 51 and 399 nm. Elemental carbon analysis was not performed as part of this survey; thus, it is unclear whether carbon black contributed to the nano-size range. The median particle diameter for outside ambient air was 44 nm. The sampling results outside the carbon black manufacturing facility showed high particle number concentrations; these concentrations were thought to be associated with smoke from the flare of a nearby oil refinery.

(Klein et al. 2011) conducted a review of 25 monitoring studies that evaluated nanomaterial releases at nanotechnology workplaces. The workplaces included industrial production facilities, processing plants, pilot plant investigations, crafting of nanomaterials (drilling, sawing etc.) as well as research related work area settings. The nanomaterials included metal oxides, carbon nanotubes and carbon black. Nanoscale particles were measured in only a few studies. These releases were mainly caused by maintenance problems, open gas phase production processes, open handling of nanopowders or smoke generation during processing. A release of agglomerated nanoobjects, mainly > 300 nm in the number weighted diameter, was regularly observed, especially during open handling of dry nanomaterials. The use of fume hoods and appropriate ventilation systems seemed to significantly reduce potential exposure concentrations. The reviewers also noted that the identification of nanomaterial exposure is not straight forward and that well described and harmonized methodologies are needed a) to unambiguously link elevated particle concentrations to the nanomaterial under investigation and b) come to quantitative results.

CB4REACH Consortium

Member Companies
Cabot Corporation, Cancarb Limited, Columbian Chemicals Company Inc., Continental Carbon Company, Orion Engineered Carbons GmbH, Sid Richardson Carbon Ltd., Imerys Graphite & Carbon

Identified uses and exposure information

The identified uses of carbon black are listed according to their life-cycle stage. The uses are described by the descriptors as defined in the respective ECHA guidance (ECHA 2015).

As compared to exposures in carbon black manufacturing, where unpelletized carbon black dust nay be released into the workplace atmosphere, lower exposures are likely among workers in industries using carbon black, such as rubber, printing ink and paint manufacture (IARC 2010).

Table 4 Formulation and Re-packing

	Formulation
F-1	**Formulation of Carbon Black for use in coatings, inks, paints, dyes, lubricants, adhesives and sealants, rubber and plastic manufacturing** Further description of the use: - Formulation of Carbon Black into mixtures and to solid matrices Contributing activity/technique for the environment: **- (ERC2 ; ERC3)** Contributing activity/technique for the workers: **- (PROC 1, PROC 2, PROC 3, PROC 4 ; PROC 5 ; PROC 8b ; PROC 9 ; PROC 14 ; PROC 24)** **Product Category formulated:** PC 1: Adhesives, sealants ; PC 9a: Coatings and paints, thinners, paint removes ; PC 9b: Fillers, putties, plasters, modelling clay ; 9c: Finger paints ; PC 18: Ink and toners ; PC 23: Leather tanning, dye, finishing, impregnation and care products ; PC 24: Lubricants, greases, release products ; PC 26: Paper and board dye, finishing and impregnation products: including bleaches and other processing aids ; PC 31: Polishes and wax blends , PC 32: Polymer preparations and compounds ; PC 34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids ; PC 39: Cosmetics, personal care products **Technical function of the substance:** pigment ; UV stabiliser ; other: thermal conductive/dissipation agent; electrical conductive/dissipation agent Substance supplied to that use: as such ; in a mixture **Insignificant exposure via the following route: inhalatory** Explanation on insignificant exposure: During the production of toners,

	carbon black is mixed at high temperatures with charging agents to form a resin. This resin is then, after cooling, grinded to a fine powder (2-10 micron), in which carbon black is fixed within the polymer matrix. Occupational exposure in a toner production facility was reported by the UK authorities (HSE, 2004 as cited in IARC, 2010). Further to that report, personal TWA exposure (6-8 hours) to inhalable dust ranged from 0.01 to 3.95 mg/m^3 (n=60). In a cross-sectional study of 600 male workers handling toners (toner production, copier development, copier maintenance) and 212 controls, respirable dust concentrations ranged between 0.06 and 0.2 mg/3 (Nakadate et al. 2006) In a study of 1,504, male workers employed from 2003 to 2008 in a Japanese toner and photocopier manufacturing company, means of personal 8-hour respirable dust concentrations spanned from 0.012 mg/m^3 in toner manufacturing to 0.989 mg/m^3 in toner and photocopier recycling (Kitamura et al. 2014; Kitamura et al. 2015a; Kitamura et al. 2015b).
F-2	**Re-packing of carbon black** <u>Further description of the use:</u> Contributing activity/technique for the environment : **- (ERC2)** Contributing activity/technique for the workers : **- (PROC 8b ; PROC 9)** **Product Category formulated:** PC 0: Other: not relevant **Technical function of the substance:** no technical function Substance supplied to that use: as such

Table 5 Uses at industrial sites

	Uses at industrial sites
IW-1	**Additive to rubber/tyres & plastics** Further description of the use: - Rubber and Tyres: The major use for carbon black in elastomers is in tyre manufacture (automobile, truck, bus, agricultural, aircraft and industrial). For various types of tyres, it is used in innerliners, carcasses, sidewalls and treads. Carbon black is also used in many molded and extruded industrial rubber products, such as O-rings, insulation strippings, belts, hoses, gaskets, diaphragms, vibration isolation devices, bushings, air springs, chassis bumpers, and multiple types of pads, boots, wiper blades, fascia, conveyor wheels, grommets, conveyor belts, roofing, covers for wire and cable, coated fabrics, packaging, gloves, footwear, floor mats, tape, hard rubber products, pontoons and toys etc. Plastics: Carbon black is widely used for packaging, films, fibers, moldings, pipes and semi-conductive cable compounds in products such as refuse sacks, industrial bags, photographic containers, agriculture mulch film, stretch wrap, and thermoplastic molding applications for automotive, electrical/electronics, household appliances and blow-molded containers etc. Electronic Discharge (ESD) Compounds Carbon black is carefully designed to control the electrical conductivity of materials used in products such as electronics packaging, safety applications, and automotive parts. Contributing activity/technique for the environment : **- (ERC5)** Contributing activity/technique for the workers : **- (PROC 5 ; PROC 6 ; PROC 8a ; PROC 8b ; PROC 9 ; PROC 10 ; PROC 12 ; PROC 13 ; PROC 14 ; PROC 15 ; PROC 21; PROC 24)** **Product Category used:** PC 32: Polymer preparations and compounds ; **Sector of end use:** SU 11: Manufacture of rubber products ; SU 12: Manufacture of plastics products, including compounding and conversion **Technical function of the substance:** pigment ; UV stabiliser ; reinforcement agent, thermal conductivity/dissipation agent; electrical

	conductivity/dissipation agent; Substance supplied to that use: as such ; in a mixture Subsequent service life relevant for that use: yes Link to the subsequent service life: General rubber products ; Fabrics, textiles and apparel, leather; Paper; Tyres ; Plastic articles. Insignificant exposure via the following routes: inhalatory Explanation on insignificant exposure: Carbon black operates within the bulk of the plastic and, having no solubility at all in the plastic, has no mechanism for migration. Results from studies carried out in the rubber manufacturing industry in Europe were summarised by the IARC (2010). The data show that, since the late 1980s, exposure levels for inhalable particulate in the Dutch rubber manufacturing industry had declined by 5.7% each year. The mean dust exposure in the weighing and mixing areas in five rubber companies in the Netherlands was 2.2 mg/m^3 in 1997. The mean personal level of inhalable dust in a manufacturer of rubber conveyor belts was 9.4 mg/m^3 during compounding/mixing and 1.1 mg/m^3 during calendering. Data obtained from occupational hygiene surveys carried out by rubber manufacturers in the United Kingdom showed mean dust exposure in the weighing, mixing and milling parts of the process of 2.3 mg/m^3 in rubber goods manufacture and 2.2 mg/m^3 in rubber tyre manufacture. In the rubber manufacturing industry, the highest exposure levels are likely to occur in the compounding and mixing departments, where most handling, weighing, and mixing of raw materials, including extender oils and carbon black, takes place. Exposure conditions in the rubber manufacturing industry in the Netherlands were investigated by means of two surveys performed in 1988 and 1997 (Vermeulen et al. 2000). The median inhalable particulate exposure ranged from 0.56 to 1.85 mg/m^3 in 1988 (7 companies). In 1997, the exposure range had diminished to 0.49-0.90 mg/m^3. All companies except one showed a decrease in exposure levels ranging from 0.07 to 0.95 mg/m^3. Highest exposures were found at the compounding and mixing sites, with the exposure range diminishing from 0.50-3.71 mg/m^3 in 1988 to 0.22-1.47 mg/m^3 in 1997. This resulted in an overall decrease in inhalable particulate exposure levels ranging from 0.02 mg/m^3 at the curing department to 2.24 mg/m^3 at the compounding and mixing department. In

	1997, also the range of inhalable particulate exposure levels between companies was significantly reduced as compared with the initial survey. Although studies have been carried out to assess inhalable dust exposure levels in the rubber manufacturing industry, the levels of exposure in factories in Eastern Europe are less well documented. Routine stationary sampling for compliance testing of inhalable aerosols has however been conducted in a large factory producing tyres and tubes in Poland between 1981 and 1996 (n = 6,152). A study was conducted by de Vocht *et al.* (2009) to assess historical inhalable aerosol levels in different departments in this rubber plant and to compare the results with estimates based on European data from the United Kingdom, Sweden, the Netherlands, Germany and Poland (EXASRUB project) (de Vocht et al. 2009). Geometric mean (GM) concentrations in the factory ranged from 2.41 mg/m^3 to 5.82 mg/m^3. Whereas 3-4 fold differences between departments existed prior to about 1985, stronger reduction of exposure in the raw materials and finishing departments (-12%/year) compared to other departments (range -5%/yr to -3%/yr), resulted in comparable levels in the 1990s.
IW-2	**Use as a Pigment** <u>Further description of the use:</u> In high performance coatings and sealants, carbon black provides pigmentation, (static/thermal) conductivity, and UV protection for a number of applications including automotive (primer basecoats and clearcoats), marine, aerospace, decorative, wood, industrial coatings and adhesive sealants. Carbon black enhances formulations and delivers broad flexibility in meeting specific color requirements in toners and printing inks. The carbon black content of inks ranges from 5 to 22% (IARC, 2010). Black toners normally contain carbon black or iron oxide pigments at levels of up to 5%. In addition, toners contain various additives such as wax and silica, partly also small amounts of specific metal salts to control the electromagnetic properties. Carbon black in toner particles is fixed in a thermoplastic polymer matrix, usually a styrene-acrylate copolymer. These particles are fixed on the paper by fusing after heating. Carbon black is used for tinting and pigmentation in all types of paints. It is used for coloring leather, synthetic fibers, textile fabrics, home textiles and apparels (including automotive, agriculture, protective clothing).

	In the paper industry, carbon black is used mainly for production of carbon paper. Other uses include use in photograph albums, leatherboard, wrapping and bag papers, in backing paper, for photographic film and in highly conductive and electrosensitive papers. In building and construction, carbon black is used in the coloring of cement, mortar, bricks, and concrete, and mulch landscaping products. Carbon black fulfilling specific purity requirements is used as a colorant in cosmetics. Contributing activity/technique for the environment : **- (ERC5)** Contributing activity/technique for the workers : **- (PROC 2 ; PROC 3 ; PROC 4 ; PROC 5 ; PROC 7, PROC 8a ; PROC 8b, PROC 9 ; PROC 10; PROC 13 ; PROC 14)** **Product Category used:** PC 1: Adhesives, sealants ; PC 9a: Coatings and paints, thinners, paint removes ; PC 9b: Fillers, putties, plasters, modelling clay ; PC 9c: Finger paints ; PC 18: Ink and toners ; PC 23: Leather tanning, dye, finishing, impregnation and care products ; PC 24: Lubricants, greases, release products ; PC 26: Paper and board dye, finishing and impregnation products: including bleaches and other processing aids ; PC 31: Polishes and wax blends ; PC 34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids ; PC 39: Cosmetics, personal care products **Sector of end use:** SU 5: Manufacture of textiles, leather, fur ; SU 6b: Manufacture of pulp, paper and paper products ; SU 7: Printing and reproduction of recorded media ; SU 13: Manufacture of other non-metallic mineral products, e.g. plasters, cement; SU0: Other: Manufacture of paints **Technical function of the substance:** pigment ; UV stabiliser ; other: thermal conductivity/dissipation agent; electrical conductivity/dissipation agent Substance supplied to that use: as such ; in a mixture Subsequent service life relevant for that use: yes Link to the subsequent service life: Fabrics, textiles and apparel, leather, and wood articles ; Paper ; Stone, plaster, cement, glass and ceramics articles
IW-3	**Chemical reagent** <u>Further description of the use:</u> Carbon black is used in carbothermic reactions as a reducing agent, e.g. in

	the purification process of metallic ores such as solar grade silicon, and in ceramic manufacturing. It is also used in applications involving graphitic products such as electrodes and carbon-metal composites such as cemented carbides. Contributing activity/technique for the environment : **- Use as chemical reagent at industrial site (ERC5 ; ERC6a ; ERC6b)** Contributing activity/technique for the workers : **- Use as chemical reagent at industrial site (PROC 1 ; PROC 2 ; PROC 3 ; PROC 4 ; PROC 5 ; PROC 8a ; PROC 8b ; PROC 9 ; PROC 12 ; PROC 15)** **Product Category used:** PC 0: Other: not relevant **Sector of end use:** SU 8: Manufacture of bulk, large scale chemicals (including petroleum products) ; SU 9: Manufacture of fine chemicals ; SU 14: Manufacture of basic metals, including alloys ; SU 24: Scientific research and development **Technical function of the substance:** reducing agent, other: carburizing agent Substance supplied to that use: as such Subsequent service life relevant for that use: no
IW-4	**Refractories and Ceramics** Further description of the use: Carbon black is used to provide chemical, slag and heat resistance to refractory and ceramic products including castable and monolithic refractories, ceramics mixes and materials. Applications include as an ingredient in basic carbon refractories for lining of steel furnaces and related products; and use as an insulating material in industrial furnaces. Extending thus the service life of refractory lining of iron and steel furnaces. Contributing activity/technique for the environment : **- (ERC5)** Contributing activity/technique for the workers : **- (PROC 2 ; PROC 3 ; PROC 4 ; PROC 5 ; PROC 8a ; PROC 8b ; PROC 9 ; PROC 14 ; PROC 15 ; PROC 22)** **Product Category used:** PC 0: Other: refractories and ceramics **Sector of end use:** SU 14: Manufacture of basic metals, including alloys **Technical function of the substance:** reducing agent ; other: thermal conductivity/dissipation agent; electrical conductivity/dissipation agent

	Substance supplied to that use: as such ; in a mixture Subsequent service life relevant for that use: no
IW-5	**Portable energy** Further description of the use: Contributing activity/technique for the environment : **- (ERC5)** Contributing activity/technique for the workers : **- (PROC 1 ; PROC 2 ; PROC 3 ; PROC 4 ; PROC 5 ; PROC 8a ; PROC 9 ; PROC 14 ; PROC 15)** **Product Category used:** PC 33: Semiconductors; PC 0: Other: Batteries **Sector of end use:** SU 16: Manufacture of computer, electronic and optical products, electrical equipment **Technical function of the substance:** thermal conductivity/dissipation agent; electrical conductivity/dissipation agent Substance supplied to that use: as such Subsequent service life relevant for that use: yes Link to the subsequent service life: Portable energy devices

Table 6 Uses by professional workers

	Uses by professional workers
PW-1	**Application of coatings, paints, inks, adhesives and sealants containing carbon black** Further description of the use: - Contributing activity/technique for the environment : - **(ERC 8a ; ERC 8c ; ERC 8d ; ERC 8f)** Contributing activity/technique for the workers : **- (PROC 2 ; PROC 3 : PROC 4 ; PROC 5; PROC 8a ; PROC 8b ; PROC 10 ; PROC 11 ; PROC 13 ; PROC 19)** **Product Category used:** PC 1: Adhesives, Sealants ; PC 9a: Coatings and paints, thinners, paint removes ; PC 9b: Fillers, putties, plasters, modelling clay ; PC 9c: Finger paints ; PC 18: Ink and toners ; **Sector of end use:** SU 7: Printing and reproduction of recorded media ; SU 19: Building and Construction **Technical function of the substance:** pigment, UV stabiliser, other: thermal conductivity/dissipation agent; electrical conductivity/dissipation agent; Substance supplied to that use: in a mixture Subsequent service life relevant for that use: yes **Link to the subsequent service life**: fabrics, textiles and apparel, leather, and wood articles ; Paper **Insignificant exposure via the following routes**: inhalatory ; **Explanation on insignificant exposure**: In a screening level risk assessment of carbon black, the Canadian Authorities (Canada 2013) calculated the upper-bound estimate of exposure to carbon black from respirable paint aerosol to be 0.00257 mg/m^3 (adjusted for removal of respirable paint aerosol by the respirator) of carbon black during the spray application of wall paints. It was noted that spray painting would not be the method of choice for most homeowners/consumers to paint large areas due to the potential for contaminating non-target surfaces. It may be possible that toner dust is emitted by laser printers and copiers during their use. Further to Ewers and Novak (2006), there is however no data showing an excess exposure of consumers working with laser printers and copiers to inhalable fine dust (Ewers and Nowak 2006).

	Exposure to inhalable dust during the use of photocopiers has been measured in the range 0.05 – 0.23mg/m³. The toner component was found to be less than 20% of the inhalable dust fraction (UK Health and Safety Executive document (1990) as cited in (OECD 2006). During normal use, the exposure to carbon black from toner is not considered significant. Wet toners contain carbon black in a hydrocarbon solvent and are applied to the photo conductor by a roller and bath. Wet toners are almost invariably handled by a sealed system of containers that plug into the reservoir (UK Health and Safety Executive document (1990) as cited in (OECD 2006).
PW-2	**Use in scientific research and development** Further description of the use: - Contributing activity/technique for the environment : **- (ERC 8a ; ERC 8c ; ERC 8d ; ERC 8f)** Contributing activity/technique for the workers : **- (PROC 15)** **Product Category used:** PC 21: Laboratory chemicals **Sector of end use:** SU 24: Scientific research and development **Technical function of the substance:** pigment; reducing agent; UV stabiliser; other: thermal conductivity/dissipation agent; electrical conductivity/dissipation agent; no technical function; Substance supplied to that use: as such ; in a mixture Regulatory status: use in Scientific Research and Development [EU REACH]. Subsequent service life relevant for that use: no
PW-3	**Use of carbon black containing cosmetics by professionals** Further description of the use: - Contributing activity/technique for the environment: **- (ERC8a ; ERC8c; ERC 8f)** Contributing activity/technique for workers: **PROC 0: Other: manual handling of small amounts of carbon black containing formulations** **- - Product category (PC): PC 39** **Sector of end use:** SU 0: Other: public domain

	Technical function of the substance: absorbent; abrasive ; adsorbent ; filler ; pigment, UV stabiliser Substance supplied to that use: in a mixture Regulatory status: use in cosmetics products [EU REACH]. Carbon black fulfilling specific purity requirements is authorised as a colorant in cosmetics under Annex IV to Regulation (EC) No. 1223/2009. Subsequent service life relevant for that use: no **Insignificant environmental exposure** via the following routes: water; air; soil; waste **Explanation on insignificant environmental exposure**: Only a very small percentage of carbon black production is used in cosmetics. In accordance with the REACH Regulation, the chemical safety reports need not include consideration of the risks to human health from substances in cosmetic products
PW-4	**Professional end-use of carbon black containing polishes and wax blends** Further description of the use: - Contributing activity/technique for the environment : **- (ERC8a ; ERC8d)** Contributing activity/technique for the workers : **- (PROC 10 ; PROC 11)** **Product Category used:** PC 23: Leather tanning, dye, finishing, impregnation and care products ; PC 24: lubricants, greases, release products; PC 31: Polishes and wax blends **Sector of end use:** SU 0: Other: maintenance (shoes, furniture etc.) **Technical function of the substance:** pigment Substance supplied to that use: in a mixture Subsequent service life relevant for that use: no

Table 7 Consumer uses

	Consumer uses
C-1	**Use in Cosmetics and Personal Care Products** Further description of the use: - Contributing activity/technique for the environment: **- (ERC8a ; ERC 8c ; ERC8d ; ERC 8f)** Contributing activity/technique for consumers: **- Product category (PC): PC 39** **Technical function of the substance:** abrasive ; adsorbent ; filler ; pigment Substance supplied to that use: in a mixture Regulatory status: use in cosmetics products [EU REACH]. Carbon black fulfilling specific purity requirements is authorised as a colorant in cosmetics under Annex IV to Regulation (EC) No. 1223/2009. Insignificant environmental exposure via the following routes: water; air; soil; waste Justification for insignificant environmental exposure: Only a very small percentage of carbon black production is used in cosmetics. In accordance with the REACH Regulation, the chemical safety reports need not include consideration of the risks to human health from substances in cosmetic products
C-2	**Use in coatings, inks, toners, paints, adhesives and sealants** Further description of the use: - Consumer application of coatings, paints, inks, adhesives Contributing activity/technique for the environment: **- (ERC8a ; ERC8c ; ERC8d ; ERC8f)** Contributing activity/technique for consumers: **- Product category (PC): PC 1 ; PC 9a ; PC 9b ; PC 9c ; PC 18** **Technical function of the substance:** pigment Substance supplied to that use: in a mixture Subsequent service life relevant for that use: no **Insignificant environmental exposure** via the following routes: water; air;

	soil; waste; **Insignificant human exposure** via the following routes: oral: dermal; eye; inhalatory; **Explanations on insignificant exposure**: No release of free carbon black particles was found from coatings using non-weathered and artificially weathered samples (Göhler et al. 2013)
C-3	**Use of dyes and impregnating products for textiles/furnitures/shoes; use of lubricants by consumers** Further description of the use: Contributing activity/technique for the environment: **- (ERC8c ; ERC8f)** Contributing activity/technique for consumers: **- - Product category (PC): PC 24, PC 34** **Technical function of the substance:** pigment Substance supplied to that use: in a mixture Subsequent service life relevant for that use: no

Table 8 Article service life

Carbon black is used in a wide variety of articles (where the shape, surface or design is most important as compared to the chemical composition), such as tyres and various rubber products. In these products, carbon black is bound within the product matrix. Exposure of end-users to airborne carbon black particles released from rubber and plastics articles is therefore unlikely (IARC 2010).

	Article service life
SL-1	**General rubber products** Further description of the use: Examples of articles include rubber handles, flooring, footwear, rubber toys etc. Article used by: workers ; consumers Substance intended to be released from article: no **Article category related to subsequent service life (AC):** AC 1: Vehicles ; AC1a: Vehicles covered by End of Life Vehicles (ELV) directive ; AC1b: Other vehicles, AC 10: Rubber articles ; AC10a: Rubber articles: Large surface area articles ; AC10b: Rubber articles: Toys intended for children's use (and child dedicated articles) ; AC10c: Rubber articles: Packaging (excluding food packaging) ; AC10d: Rubber articles: Articles intended for food contact ; AC10e: Rubber articles: Furniture & furnishings, including furniture coverings ; AC10f: Rubber articles: Articles with intense direct dermal contact during normal use ; AC10g: Other rubber articles Contributing activity/technique for the environment: **- Wear and tear of general rubber products during use (ERC10a ; ERC11a ; ERC12a ; ERC12c)** Contributing activity/technique for consumers: **- Consumers using general rubber goods containing carbon black - Article Category (AC): AC 10 ; AC10a ; AC10b ; AC10c ; AC10d ; AC10e ; AC10f ; AC10g** Contributing activity/technique for the workers: **- Workers using general rubber goods containing carbon black (PROC 21)** **Technical function of the substance:** pigment ; UV stabiliser ; other: reinforcing agent, thermal conductivity/dissipation agent; electrical

	conductivity/dissipation agent **Insignificant environmental exposure** via the following routes: water; air; soil; waste; **Insignificant human exposure** via the following routes: oral; dermal; eye; inhalatory; **Explanations of insignificant exposure**: No release of carbon black particles was found from plastics (LDPE) or rubber (EPDM) samples, even under stress conditions (abrasion, bending, stressing). Even after using severe stress conditions (without destroying the polymer) carbon black seems to be fully covered with polymer. Abrasion of uncoated carbon black particles from the surface is not possible, since uncoated „surface-CB particles“ still do not exist (Fraunhofer IVV, 2016; unpublished data).
SL-2	**Tyres** Further description of the use: - As a result of the friction with the pavement surface, tread wear particles are generated from the tyre thread compound. Tyres are mounted on and/or separated from the wheel by specialists in the course of the professional activities. Consumers mount complete wheels on to cars Article used by: workers ; consumers Substance intended to be released from article: no **Article category related to subsequent service life (AC):** AC 1: Vehicles ; AC1a: Vehicles covered by End of Life Vehicles (ELV) directive ; AC1b: Other vehicles Contributing activity/technique for the environment: **- (wear and tear of tyres ERC10a; ERC 11a, ERC 12c** Contributing activity/technique for consumers: **- - Article Category (AC): AC 1 ; AC1a ; AC1b** Contributing activity/technique for the workers: **- (PROC 21)** **Technical function of the substance:** UV stabiliser; other: reinforcing agent **Insignificant environmental exposure** via the following routes: water; air; soil; waste **Insignificant human exposure** via the following routes: oral; dermal; eye;

	inhalatory; **Explanations of insignificant exposure:** Carbon black is tightly bound in the product matrix. Since carbon black is used widely in tyres, one potential source of environmental exposure to carbon black is through tyre and road wear particles (TRWP). TRWP are produced from the interaction of tyres with the roadway surface. A global sampling program was conducted to quantify tyre and road wear particles (TRWP) in the ambient air in order to understand potential human exposures and the overall contribution of these particles to particulate matter in the environment, specifically PM10 (particulate matter with aerodynamic diameter up to 10 um) (Panko et al. 2013). Quantification of airborne TRWP was conducted on 81 air samples collected within the Seine River Watershed in France, Chesapeake Bay Watershed in the United States and Yodo River Watershed in Japan. The air samples were analyzed using validated chemical markers for rubber polymer based on a pyrolysis technique. Based on 81 air samples collected near roadways on three continents, the results indicated that TRWP concentrations in the PM10 fraction were low with averages ranging from 0.05 to 0.70 mg/m3, representing an average PM10 contribution of 0.84%. These results demonstrate that the contribution of TRWP to PM10 is low. In addition, free carbon black is unlikely to be released from TRWP based on study results described above. (Wohlleben et al. 2016) conducted a study to simulate filler particle release from aged and worn tyres in the environment. They simulated a novel car tyre represented by highly filled natural rubber with fillers consisting of 40% carbon black and additionally 4% carbon nanotubes. Following laboratory-simulated aging and wearing scenarios, they determined a maximum free filler mass of 0.045% of the aged tread wear mass. These results demonstrate that any release of free carbon black from tyres in the environment is likely to be insignificant. This is also supported by the results of a recent study, where no release of carbon black particles was found from plastics (LDPE) or rubber (EPDM) samples, even under stress conditions (abrasion, bending, stressing). Even after using severe stress conditions (without destroying the polymer) carbon black seems to be fully covered with polymer. Abrasion of uncoated carbon black particles from the surface is not possible, since uncoated „surface-CB particles“ still do not exist (Fraunhofer IVV, 2016; unpublished data).

SL-3	**Plastic articles – excluding food packaging** Further description of the use: - Article used by: workers ; consumers Substance intended to be released from article: no **Article category related to subsequent service life (AC):** AC 1: Vehicles ; AC1a: Vehicles covered by End of Life Vehicles (ELV) directive ; AC1b: Other vehicles, AC 13: Plastic articles ; AC13a: Plastic articles: Large surface area articles ; AC13b: Plastic articles: Toys intended for children's use (and child dedicated articles) ; AC13c: Plastic articles: Packaging (excluding food packaging) ; AC13e: Plastic articles: Furniture & furnishings, including furniture coverings ; AC13f: Plastic articles: Articles with intense direct dermal contact during normal use ; AC13g: Other plastic articles Contributing activity/technique for the environment: **- Use of plastic articles containing carbon black (ERC10a ; ERC11a ; ERC12a ; ERC12c)** Contributing activity/technique for consumers: **- Use of plastic articles containing carbon black - Article Category (AC): AC13a ; AC13b ; AC13c ; AC13e ; AC13f ; AC13g** Contributing activity/technique for the workers: (PROC 21) **Technical function of the substance:** pigment ; UV stabiliser, other: thermal conductivity/dissipation agent; electrical conductivity/dissipation agent **Insignificant environmental exposure** via the following routes: water; air; soil; waste **Insignificant human exposure** via the following routes: oral, dermal; eye; inhalatory; **Explanations on insignificant exposure**: No release of carbon black particles was found from plastics (LDPE) or rubber (EPDM) samples, even under stress conditions (abrasion, bending, stressing). Even after using severe stress conditions (without destroying the polymer) carbon black seems to be fully covered with polymer. Abrasion of uncoated carbon black particles from the surface is not possible, since uncoated „surface-CB particles" still do not exist (Fraunhofer IVV, 2016; unpublished data).
SL-4	**Plastic articles – food contact articles** Further description of the use: - Article used by: workers, consumers

	Substance intended to be released from article: no **Article category related to subsequent service life (AC): AC13d** Contributing activity/technique for the environment: **- Food packaging (ERC10a, ERC 11a)** Contributing activity/technique for consumers: **- Food packaging - Article Category (AC): AC13d** - Contributing activity/technique for the workers:**(PROC 21)** **Technical function of the substance:** UV stabiliser Regulatory status: use in food contact materials [EU REACH]. In the EU, carbon black fulfilling specific purity requirements is authorised as a food contact material in plastics (Commission Regulation EU 10/2011). **Insignificant environmental exposure** via the following routes: water; air; soil; waste **Insignificant human exposure** via the following routes: oral, dermal; eye; inhalatory; **Explanations on insignificant exposure:** In a migration study, carbon black particles incorporated into food contact plastics (low-density polyethylene (LDPE), and polystyrene, at 2.5 and 5.0% (w/w) loading), were not migrating out of the matrix into food simulants. LDPE is generally recognised as the plastic material with the highest diffusivity. Both, the 2 chosen carbon black grades) and LDPE as test polymer can be considered as worst case scenarios for such migration testing. The results of this study can therefore be generalised and extended to other food contact plastics in which carbon black is completely embedded. As a consequence consumers will not be exposed to carbon black particles incorporated in plastics when using those materials or articles for food packaging or as kitchen utensils (Bott et al. 2014).
SL-5	**Paper** <u>Further description of the use: -</u> Article used by: workers ; consumers Substance intended to be released from article: no **Article category related to subsequent service life (AC):** AC 8: Paper articles ; AC8a: Paper articles: Large surface area articles ; AC8b: Paper articles: Toys intended for children's use (and child dedicated articles) ; AC8c: Paper articles: Packaging (excluding food packaging) ; AC8d: Paper articles: Articles intended for food contact ; AC8e: Paper articles: Furniture & furnishings ; AC8f1: Paper articles: Articles with intense direct dermal

	contact during normal use: personal hygiene articles ; AC8f2: Paper articles: Articles with intense direct dermal contact during normal use: printed articles with dermal contact in normal conditions of use ; AC8g: Other paper articles ; Contributing activity/technique for the environment: **- (ERC10a ; ERC11a)** Contributing activity/technique for consumers: **- - Article Category (AC): AC 8a ; 8b ; 8c ; AC 8d ; AC 8e ; AC 8f1 ; AC 8f2 ; AC 8g** Contributing activity/technique for the workers: **- (PROC 21)** **Technical function of the substance:** adsorbent ; UV stabiliser
SL-6	**Portable energy devices** Further description of the use: - Article used by: workers ; consumers Substance intended to be released from article: no **Article category related to subsequent service life (AC):** AC 3: Electrical batteries and accumulators Contributing activity/technique for the environment: **- (ERC10a ; ERC11a ; ERC12c)** Contributing activity/technique for consumers: **- - Article Category (AC): AC 2; AC 3** Contributing activity/technique for the workers: **- (PROC 21)** **Technical function of the substance:** semiconductor and photovoltaic agent; other: dissipation agent; electrical conductivity/dissipation agent
SL-7	**Stone, plaster, cement, glass and ceramic articles** Further description of the use: - Article used by: workers ; consumers Substance intended to be released from article: no **Article category related to subsequent service life (AC):** AC 4: Stone, plaster, cement, glass and ceramic articles ; Contributing activity/technique for the environment:**-** **- (ERC10a ; ERC11a ; ERC12a ; ERC 12c)** Contributing activity/technique for consumers: **- Article Category (AC): AC 4 ; AC4a ; AC4b ; AC4c ; AC4d ; AC4e ; AC4g** Contributing activity/technique for the workers: **(PROC 21; PROC 24)** **Technical function of the substance:** pigment ; UV stabiliser

SL-8	**Fabrics, textiles and apparel, leather and wood articles** Further description of the use: Examples of articles include: Car seat, chair, flooring, clothing, towel, purse, wallet, covering steering wheel (car), footwear (shoes, boots), furniture, etc. Article used by: workers ; consumers Substance intended to be released from article: no **Article category related to subsequent service life (AC):** AC 1: Vehicles ; AC 5: Fabrics, textiles and apparel ; AC 6: Leather articles ; AC 11: Wood articles ; Contributing activity/technique for the environment: **- (ERC10a ; ERC11a ; ERC12a ; ERC12c)** Contributing activity/technique for consumers: **- Article Category (AC): AC 5 ; AC5a ; AC5b ; AC5c ; AC5d ; AC5e ; AC5f ; AC5g ; AC5h ; AC 6 ; AC6a ; AC6b ; AC6c ; AC6d ; AC6e ; AC6f ; AC6g ; AC 11 ; AC11a ; AC11b ; AC11c ; AC11d ; AC11e ; AC11f ; AC11g** Contributing activity/technique for the workers: **- (PROC 21)** **Technical function of the substance:** pigment ; UV stabiliser

Uses advised against

Use as pigment in tattoo colours for humans.

Table 9 Uses by professional workers advised against

	Uses by professional workers advised against
PW-1	**Use as pigment in tattoo colours for humans** Further description of the use: Contributing activity/technique for the environment: negligible Contributing activity/technique for the workers: **- (PROC 0)** Product Category: PC 39: Cosmetics, personal care products Sector of end use: SU 0: Other:Z - public domain Technical function of the substance: pigment

Table 10 Consumer uses advised against

	Consumer uses advised against
C-1	**Use as pigment in tattoo colours for humans** Further description of the use: Contributing activity/technique for the environment: negligible Contributing activity/technique for consumers: **- - Product category (PC): PC 39** Technical function of the substance: pigment

Uses covered by legislations other than REACH

Please note that carbon black uses for cosmetics, medical, food or food contact applications are regulated by specific legislations other than REACH. The health aspects for this kind of applications are consequently out of the scope of REACH (see Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18/12/2006, Title I, Chapter 1, Article 2) and compliance with these specific regulations still applies.