

## APPENDIX 1: NanoRiskCat●●●|●● Template

### Literature methodology/sources of information

The following sources of information were used to fill out the NanoRiskCat●●●|●● for nano carbon black including graphite- and amorphous carbon nanoparticles:

1. Relevant literature was identified through ICON The Virtual Journal of Nanotechnology Environment, Health and Safety <http://www.icon.rice.edu/advancedsearch.cfm> searching for articles that use “Carbon black”; “Graphite”; and “amorphous carbon” in Keyword(s) or Word(s) in the Abstract.
2. Stone V, Hankin S, Aitken R, Aschberger K, Baun A, Christensen F, Fernandes T, Hansen SF, Hartmann NB, Hutchinson G, Johnston H, Micheletti G, Peters S, Ross B, Sokull-Kluettgen B, Stark D, Tran L. 2009. Engineered Nanoparticles: Review of Health and Environmental Safety (ENRHES). Available at: <http://ihcp.jrc.ec.europa.eu/whats-new/enhres-final-report> (Accessed July 15, 2010)
3. International Agency for Research on Cancer (IARC) - Summaries & Evaluations CARBON BLACK (Group 2B). Available: <http://www.inchem.org/documents/iarc/vol65/carbon.html> (Accessed 15-04-2012)

### Human hazard profile

1. **HARN: Does the nanomaterial fulfill the HARN paradigm?**

**Answer: No**

**Arguments and explanation:** Carbon black, graphite and amorphous carbon nanoparticles exist in many shapes, but to the best of our knowledge none of them do not fulfill the HARN paradigm

2. **Bulk – “Level A CLP”: Is the bulk form of the nanomaterial known to cause or may cause serious damaging effects?**

**Answer: No**

**Arguments and explanation:** Neither Carbon black, graphite and amorphous carbon are classified in the Annex VI of Regulation (EC) No 1272/2008 OF THE EUROPEAN

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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

3. **Bulk – “Level B CLP”:** Is the bulk form of the nanomaterial classified for other less adverse effects according to the CLP?

**Answer: No**

**Arguments and explanation:** Neither Carbon black, graphite and amorphous carbon are classified in the Annex VI of 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

4. **Nano – Acute toxicity:** Is the specific nanomaterial known to be acute toxic?

**Answer: No**

**Arguments and explanation:** To the best of our knowledge, neither carbon black, graphite or amorphous carbon have been reported to be acute toxic.

5. **Are there indications that the nanomaterial causes genotoxic-, mutagenic-, carcinogenic-, respiratory-, cardiovascular, neurotoxic or reproductive effects in humans and/or laboratory animals or has organ-specific accumulation been documented?**

**Answer: No data**

**Arguments and explanation:**

- a. Genotoxicity and mutagenicity: According to IARC:” Most assays for mutagenicity are negative for carbon black” noting that: “Average primary particle diameters in several commercially produced carbon blacks range from 10 to 400 nm, while average aggregate diameters range from 100 to 800 nm.”
- b. Respiratory tract toxicity: After reviewing the *results from the epidemiology studies of the carbon black industry, Stone et al. (2010) conclude that there are studies “...indicate some adverse effects of exposure to carbon black dust on respiratory health.”*

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- c. Cardiovascular toxicity: No information available
- d. Neurotoxicity: No information available
- e. Reproductive damage: No information available
- f. Carcinogenicity: After a review in 1996, IARC has concluded that there is “inadequate evidence” of carcinogenicity in humans and have classified carbon black as a, a Group 2B “possible human carcinogen” based evidence from animal studies. IARC notes that “Average primary particle diameters in several commercially produced carbon blacks range from 10 to 400 nm, while average aggregate diameters range from 100 to 800 nm.”
- g. Does the nanomaterial accumulate in tissue and/or organs?:  
No information available

### 6. Overall evaluation of human hazard

We conclude that the color-code that best reflects the human hazard profile of the nanomaterial used is ● based on the association between carbon black and respiratory tract toxicity.

## Environment hazard profile

1. Bulk – “Level A CLP”: Is the bulk form of the nanomaterial classified as CLP Acute 1 or Chronic 1 or Chronic 2?

**Answer: No**

**Arguments and explanation:** Carbon black is not classified in the Annex VI of 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

2. Nano – LC<sub>50</sub><10 mg/l: Is the nanomaterial in question reported to be hazardous to environmental species i.e. LC50 or EC 50 <10 mg/l?

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**Answer: No data**

**Arguments and explanation:** No information available

3. **Bulk – “Level B CLP”: Is the bulk form of the nanomaterial classified as CLP Chronic 3 or Chronic 4 or documented nano-specific effects?**

**Answer: No**

**Arguments and explanation:** Carbon black is not classified in the Annex VI of 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

4. **Nano – LC50<100 mg/l: Is the nanomaterial in question reported to be hazardous to environmental species i.e. LC50 or EC 50 <100 mg/l?**

**Answer: No data**

**Arguments and explanation:** No information available

5. **T<sub>1/2</sub>>40 days: Is the nanomaterial in question persistent i.e. T<sub>1/2</sub>>40 days?**

**Answer: No data**

**Arguments and explanation:** No information available

6. **BCF>50: Is the nanomaterial in question bioaccumulative i.e. BCF>50?**

**Answer: No data**

**Arguments and explanation:** No information available

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### 7. Dispersive or long-range transport, ecosystem effects?

**Answer:** No data

**Arguments and explanation:** No information available

### 8. Overall evaluation of environmental hazard

We conclude that the color-code that best reflects the environmental hazard profile of the nanomaterial used is  as no information is available on human health hazards of carbon black