**Instruction: 1. Determine severity score**

**2. Determine probability score**

**3. Calculate risk rating page 3**

**4. Refer to Control Band recommended actions page 4**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Hazard No** | | **Characteristic** | **Max Points** | | **10** | | **7.5** | | **5** | | **0** | |
| 1 | Surface chemistry/ reactivity | | 10 | High | | Unknown | | Medium | | Low | |
| 2 | Particle shape | | 10 | Tubular/ fibrous | | Unknown | | Anistropic (irregular) | | Compact/ spherical | |
| 3 | Particle diameter | | 10 | 1-10 nm | | Unknown | | 11-40 nm | | 41-100 | |
| 4 | Solubility | | 10 | Insoluble | | Unknown | | Soluble | |  | |
| 5 | Carcinogenicity | | 7.5 |  | | Yes | | Unknown = 5.625 | | No | |
| 6 | Reproductive Toxicity | | 7.5 |  | | Yes | | Unknown = 5.625 | | No | |
| 7 | Mutagenicity | | 7.5 |  | | Yes | | Unknown = 5.625 | | No | |
| 8 | Dermal toxicity | | 7.5 |  | | Yes | | Unknown = 5.625 | | No | |
| 9 | Toxicity of parent material | | 10 | OEL 0-1 µg m-3 | | Unknown | | OEL 2-10 µg m-3 | | OEL 11-100 µg m-3  2.5 points  OEL >100 µg m-3 = 0 points | |
| 10 | Carcinogenicity of parent material | | 5 | X | | Unknown = 3.75 points | | Yes | | No | |
| 11 | Reproductive toxicity of parent material | | 5 | X | | Unknown = 3.75 | | Yes | | No | |
| 12 | Mutagenicity of parent material | | 5 | X | | Unknown = 3.75 | | Yes | | No | |
| 13 | Dermal hazard potential of parent material | | 5 | X | | Unknown = 3.75 | | Yes | | No | |
|  |  | | 100 |  | |  | |  | |  | |

**Determining Nanoparticle Severity Score**

**Reference:** Application of a pilot control banding tool for risk level assessment and control of nanoparticle exposures

Samuel Y. Paik, David M. Zalk, Paul Swuste (Ann. Occup. Hyg., Vol 52, No. 6, pp. 419-428), online 16/7/2008

**Probability Determination**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Hazard** | | **Characteristic** | **Max points** | **points** | | **points** | | **points** | | **points** | |
| 1 | Estimated amount of Nanomaterial used during task | | 25 | > 100mg = 25 | Unknown = 18.75 | | 11 – 100 = 12.5 | | 0- 10 = 6.5 | |
| 2 | Dustiness/ mistiness | | 30 | High = 30 | Medium = 15 | | Low = 7.5 | | None = 0 | |
| 3 | Number employees with similar exposure | | 15 | >15 = 15  Unknown = 11.25 | 11 – 14 = 10 | | 6 – 10 = 5 | | 1 – 4 = 0 | |
| 4 | Frequency of operation | | 15 | Daily = 15  Unknown = 11.25 | Weekly = 10 | | Monthly = 5 | | < monthly = 0 | |
| 5 | Duration of operation | | 15 | >4 hours = 15  Unknown = 11.25 | 1 – 4 hours = 10 | | 30 – 60 minutes = 5 | | < 30 minutes = 0 | |
|  |  | | 100 |  |  | |  | |  | |

These factors determine the extent to which employees may be potentially exposed to the nanoparticle materials.

The probability score is based on the potential for nanoparticles to become airborne. (Primarily inhalation and dermal exposure)

Probability Score Rating

|  |  |  |  |
| --- | --- | --- | --- |
| 0 – 25 | 26 – 50 | 51 – 75 | 76 - 100 |
| Extremely unlikely | Less likely | Likely | Probable |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Assess date** |  | **Risk Rating** | **Calculated Control Band & Notes** | | |
| **Substance** |  |  |  | | |
| **Assess team** |  |  |  |  |  |

**Severity Score Summary**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Hazard** | | **Characteristic** | | **Score** | | **Substantiation Notes** |
| 1 | Surface chemistry/ reactivity | |  | |  | |
| 2 | Particle shape | |  | |  | |
| 3 | Particle diameter | |  | |  | |
| 4 | Solubility | |  | |  | |
| 5 | Carcinogenicity | |  | |  | |
| 6 | Reproductive Toxicity | |  | |  | |
| 7 | Mutagenicity | |  | |  | |
| 8 | Dermal toxicity | |  | |  | |
| 9 | Toxicity of parent material | |  | |  | |
| 10 | Carcinogenicity of parent material | |  | |  | |
| 11 | Reproductive toxicity of parent material | |  | |  | |
| 12 | Mutagenicity of parent material | |  | |  | |
| 13 | Dermal hazard potential of parent material | |  | |  | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Hazard** | **Characteristic** | **Score** | **Substantiation Notes** |
| **1** | Estimated amount of Nanomaterial used during task |  |  |
| **2** | Dustiness/ mistiness |  |  |
| **3** | Number employees with similar exposure |  |  |
| **4** | Frequency of operation |  |  |
| **5** | Duration of operation |  |  |

**PROBABILITY**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SEVERITY** | **Extremely unlikely**  **(0 – 25)** | **Less likely**  **(26 – 50)** | **Likely**  **(51 – 75)** | **Probable**  **(76 – 100)** |
| **Very High**  **(76 – 100)** | **RL 3** | **RL 3** | **RL 4** | **RL 4** |
| **High**  **(51 – 75)** | **RL 2** | **RL 2** | **RL 3** | **RL 4** |
| **Medium**  **(26 – 50)** | **RL 1** | **RL 1** | **RL 2** | **RL 3** |
| **Low**  **(0 – 25)** | **RL 1** | **RL 1** | **RL 1** | **RL 2** |

**CONTROL BAND ACTIONS**

**RL 1 General Ventilation**

**RL 2 Fume hoods or local exhaust ventilation**

**RL 3 Containment**

**RL 4 Seek specialist advice**