**Supplemental Information**

**Size Distribution and Estimated Respiratory Deposition of Total Chromium, Hexavalent Chromium, Manganese and Nickel in Gas Metal Arc Welding Fume Aerosols**

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**Table S1.** Mass concentration and mass percentage of total concentration of Mn, Cr, Ni and Cr(VI) fumes by size range.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Mass concentration (μg/m3) and mass percentage in specified size ranges (μm) | | | | | | | | | | | | | | | | | | | | | |
| *Mild Steel* | <0.01 | | 0.01-0.02 | 0.02-0.03 | 0.03-0.06 | 0.06-0.1 | 0.1-0.2 | 0.2-0.3 | 0.3-0.6 | | 0.6-1 | | 1-2 | | 2-3 | | 3-6 | 6-10 | | 10-20 | | >20 |
| *Mn* | | |  |  |  |  |  |  |  | |  | |  | |  | |  |  | |  | |  |
| Mass conc. | | 0.27 | 0.01 | 0.17 | 0.18 | 10.8 | 31.4 | 108 | 99.2 | | 21.2 | | 6.90 | | 1.94 | | 1.03 | 0.21 | | 0.15 | | 0.10 |
| SD | | 0.21 | 0.01 | 0.06 | 0.07 | 2.86 | 9.31 | 24.3 | 6.01 | | 8.10 | | 4.05 | | 0.63 | | 0.38 | 0.09 | | 0.10 | | 0.09 |
| Mass % | | 0.03 | 0.00 | 0.02 | 0.02 | 3.89 | 11.3 | 38.3 | 35.3 | | 7.47 | | 2.43 | | 0.69 | | 0.37 | 0.07 | | 0.05 | | 0.03 |
| SD | | 0.02 | 0.00 | 0.01 | 0.01 | 1.22 | 3.91 | 7.62 | 2.87 | | 2.60 | | 1.34 | | 0.21 | | 0.15 | 0.03 | | 0.03 | | 0.03 |
|  | | Mass concentration (μg/m3) and mass percentage in specified size ranges (μm) | | | | | | | | | | | | | | | | | | | | |
| *Stainless Steel* <0.01 | | | 0.01-0.02 | 0.02-0.03 | 0.03-0.06 | 0.06-0.1 | 0.1-0.2 | 0.2-0.3 | | 0.3-0.6 | 0.6-1 | 1-2 | | 2-3 | | 3-6 | | | 6-10 | 10-20 | >20 | |
| *Cr* | | |  |  |  |  |  |  | |  |  |  | |  | |  | | |  |  |  | |
| Mass conc. | | 2.15 | 2.35 | 2.83 | 3.03 | 5.92 | 25.2 | 83.4 | | 34.5 | 9.42 | 5.20 | | 2.55 | | 1.78 | | | 1.17 | 1.10 | 1.54 | |
| SD | | 0.45 | 1.18 | 1.39 | 1.89 | 1.37 | 7.84 | 11.2 | | 4.99 | 2.26 | 0.47 | | 0.47 | | 0.82 | | | 0.87 | 0.80 | 0.88 | |
| Mass % | | 0.41 | 0.46 | 0.56 | 0.60 | 3.36 | 14.2 | 47.6 | | 19.7 | 5.33 | 2.99 | | 1.47 | | 1.05 | | | 0.70 | 0.66 | 0.93 | |
| SD | | 0.06 | 0.24 | 0.33 | 0.38 | 0.48 | 2.81 | 2.66 | | 1.03 | 0.91 | 0.29 | | 0.34 | | 0.51 | | | 0.50 | 0.46 | 0.57 | |
| *Mn* | | |  |  |  |  |  |  | |  |  |  | |  | |  | | |  |  |  | |
| Mass conc. | | <0.03 | <0.03 | <0.03 | 0.04 | 7.80 | 37.5 | 114 | | 71.5 | 24.0 | 10.2 | | 2.06 | | 0.91 | | | 0.20 | 0.08 | 0.17 | |
| SD | | - | - | - | 0.08 | 2.14 | 16.8 | 23.0 | | 29.0 | 14.1 | 4.96 | | 0.89 | | 0.20 | | | 0.17 | 0.11 | 0.30 | |
| Mass % | | - | - | - | 0.01 | 2.94 | 13.8 | 43.5 | | 26.3 | 8.56 | 3.66 | | 0.76 | | 0.35 | | | 0.07 | 0.03 | 0.0 | |
| SD | | - | - | - | 0.01 | 0.30 | 2.71 | 4.60 | | 5.76 | 2.51 | 0.67 | | 0.15 | | 0.07 | | | 0.05 | 0.04 | 0.15 | |
| *Ni* | | |  |  |  |  |  |  | |  |  |  | |  | |  | | |  |  |  | |
| Mass conc. | | 0.65 | 0.20 | 0.02 | 0.11 | 1.45 | 6.82 | 21.3 | | 7.86 | 2.16 | 1.13 | | 0.45 | | 0.35 | | | 0.18 | 0.17 | 0.08 | |
| SD | | 1.12 | 0.24 | 0.03 | 0.13 | 0.39 | 1.32 | 2.76 | | 0.72 | 0.65 | 0.27 | | 0.29 | | 0.40 | | | 0.29 | 0.22 | 0.09 | |
| Mass % | | 0.46 | 0.16 | 0.01 | 0.08 | 3.43 | 16.1 | 50.5 | | 18.7 | 5.08 | 2.66 | | 1.04 | | 0.79 | | | 0.40 | 0.39 | 0.19 | |
| SD | | 0.76 | 0.20 | 0.03 | 0.11 | 0.72 | 1.15 | 1.79 | | 1.24 | 1.14 | 0.40 | | 0.58 | | 0.84 | | | 0.62 | 0.47 | 0.19 | |
| *Cr(VI)* | | |  |  |  |  |  |  | |  |  |  | |  | |  | | |  |  |  | |
| Mass conc. | | <0.01 | <0.01 | 0.64 | <0.01 | 0.82 | 2.39 | 4.11 | | 1.53 | 0.58 | 0.37 | | 0.34 | | <0.01 | | | <0.01 | <0.01 | <0.01 | |
| SD | | - | - | 1.28 | - | 0.65 | 1.28 | 0.98 | | 1.32 | 0.63 | 0.66 | | 0.68 | | - | | | - | - | - | |
| Mass % | | - | - | 1.82 | - | 6.61 | 23.3 | 47.9 | | 11.9 | 4.16 | 2.34 | | 1.92 | | - | | | - | - | - | |
| SD | | - | - | 3.65 | - | 4.83 | 3.27 | 21.6 | | 8.12 | 3.91 | 3.65 | | 3.85 | | - | | | - | - | - | |