**Lane Regional Air Protection Agency**
**Simple Air Contaminant Discharge Permit**

## Review Report

**A&K Development Company**
410 Chambers Street
Eugene, OR 97402
Website: http://www.akdco.net

**Source Information:**

| | |
|---|---|
| Primary SIC | 3556 – Food Products Machinery |
| Secondary SIC | -- |
| Primary NAICS | 333241 – Food Products Manufacturing Machinery |
| Secondary NAICS | -- |
| Source Categories (LRAPA Title 37, Table 1) | Part B: 69. Surface coating operations: coating operations whose actual or expected usage of coating materials is greater than 250 gallons per month, excluding sources that exclusively use non-VOC and non-HAP containing coatings |
| Public Notice Category | II |

**Compliance and Emissions Monitoring Requirements:**

| | | | |
|---|---|---|---|
| Unassigned Emissions | N | Source Test [date(s)] | N |
| Emission Credits | N | COMS | N |
| Special Conditions | N | CEMS | N |
| Compliance Schedule | N | Ambient monitoring | N |

**Reporting Requirements**

| | | | |
|---|---|---|---|
| Annual Report (due date) | February 15 | Monthly Report (due dates) | N |
| SACC (due date) | N | Excess Emissions Report | Y |
| GHG Report (due date) | N | Other Reports (due date) | N |
| Quarterly Report (due date) | N | | |

**Air Programs**

| | | | |
|---|---|---|---|
| NSPS (list subparts) | N | TACT | N |
| NESHAP (list subparts) | N | >20 Megawatts | N |
| CAM | N | | |
| Regional Haze (RH) | N | | |
| Synthetic Minor (SM) | N | | |
| SM-80 | N | | |
| Title V | N | | |
| Part 68 Risk Management | N | | |
| ACDP (SIP) | N | | |
| Major FHAP Source | N | | |
| Federal Major Source | N | | |
| New Source Review (NSR) | N | | |
| Prevention of Significant Deterioration (PSD) | N | | |
| Acid Rain | N | | |
| Clean Air Mercury Rule (CAMR) | N | | |

Permittee Identification

1. A&K Development Company ('A&K Development' and/or 'the facility') operates a food processing equipment manufacturing facility at 410 Chambers Street in Eugene, Oregon.

General Background

2. The facility manufactures heavy equipment used in the processing of crops such as corn. The significant emission units at the facility include two (2) spray booths for painting manufactured equipment and general welding activities. The particulate matter emissions from paint overspray in the spray booths are controlled by dry filters.

Reasons for Permit Action and Fee Basis

3. This permit action is a renewal for an existing Simple Air Contaminant Discharge Permit (Simple ACDP) which was issued on December 11, 2014 and was scheduled to expire on December 11, 2019. The facility indicated in their renewal application submitted on May 28, 2019 that they were requesting a renewal of an existing permit without changes. Because the actual emissions from calendar year 2019 were less than 10 tons/year for VOCs, the permit action is considered a Simple "low" ACDP renewal under LRAPA 37-0064(2)(a).

Attainment Status

4. The facility is located inside the Eugene Springfield Air Quality Management Area. The facility is located in an area that has been designated an attainment area for $PM_{2.5}$, $NO_2$, $SO_2$, Ozone, and Pb and a maintenance area for CO and $PM_{10}$.

Permitting History

5. LRAPA has reviewed and issued the following permitting actions to this facility:

| Date(s) Approved/Valid | Permit Action Type | Description |
|---|---|---|
| 08/18/2010-08/18/2020 | Basic ACDP | Initial air permit |
| 12/11/2014-12/11/2019 | Simple ACDP | Source moved to Simple ACDP |

Compliance History

6. LRAPA has not initiated any enforcement actions against this facility.

Source Testing

7. The facility is not required to conduct source testing at this time. LRAPA is not aware of any historical source testing conducted at this facility.

Emission Unit Description

8. The emission units regulated by this permit are the following:

| Emission Unit | EU ID | Pollution Control Device | PCD ID |
|---|---|---|---|
| Surface Coating Operations: Two (2) Paint Booths | EU-Surface Coating | Dry Filters | NA |
| Welding Activities | EU-Welding | NA | NA |

Specific Emission Limitations

9. The surface coating operations (EU-Surface Coating) are subject to the visible emission limitations under LRAPA 32-010(3). These emission units may not have visible emissions equal

to or greater than 20% opacity for a period or periods aggregating more than three (3) minutes in any one (1) hour.

10. EU-Surface Coating is subject to particulate matter emission limitations under LRAPA 32-015(2)(b). For sources installed, constructed or modified on or after June 1, 1970 but prior to April 16, 2015 for which there are no representative compliance source test results, the particulate matter emission limit is 0.14 grains per dry standard cubic foot.

11. EU-Surface Coating is subject to the process weight rate emission limitation under LRAPA 32-045. Particulate matter emissions in any one hour may not exceed the amount shown in LRAPA 32-8010 for the process weight allocated to the process.

Typically Achievable Control Technology (TACT)

12. LRAPA Title 32-008 requires that an existing emission unit at a source to meet TACT if the emissions unit meets the following criteria: the emissions of criteria pollutants are greater than five (5) tons per year of particulate or greater than ten (10) tons per year of any gaseous pollutant, the emissions unit is not subject to the emissions standards under LRAPA Title 30, Title 32, Title 33, Title 38, Title 39, or Title 46 for the pollutants emitted, and the source is required to have a permit. The facility does not currently emit more than 10 tons of VOC per year and is not required to meet TACT for VOC. The facility reported 5.66 tons of VOC emissions in 2019. While the facility is not required to meet TACT at this time, LRAPA has determined that (a) applying coatings in a spray booth fitted with filters demonstrated to achieve at least 98% capture of paint overspray, (b) the use of high volume, low pressure (HVLP) spray guns, electrostatic application, airless spray guns, or air-assisted airless spray guns or equivalent technology, (c) the cleaning of spray guns with cleaning solvents within a containment system, and (d) ensuring and certifying that all personnel, including contract personnel, who spray apply surface coatings, are trained in the proper spray application of surface coatings and the proper setup and maintenance of spray equipment, would likely meet the TACT requirement.

Plant Site Emission Limits (PSELs)

13. Provided below is a summary of the baseline emissions rate, netting basis, and PSELs for this facility.

| Pollutant | Baseline Emission Rate (TPY) | Netting Basis | | Plant Site Emission Limit (PSEL) | | PSEL Increase Over Netting Basis (TPY) | Significant Emission Rate (TPY) |
|---|---|---|---|---|---|---|---|
| | | Previous (TPY) | Proposed (TPY) | Previous PSEL (TPY) | Proposed PSEL (TPY) | | |
| PM | 0 | 0 | 0 | 24 | 24 | 24 | 25 |
| $PM_{10}$ | 0 | 0 | 0 | 14 | 14 | 14 | 15 |
| $PM_{2.5}$ | NA | 0 | 0 | 9 | 9 | 9 | 10 |
| CO | 0 | 0 | 0 | NA | NA | NA | 100 |
| NOx | 0 | 0 | 0 | NA | NA | NA | 40 |
| $SO_2$ | 0 | 0 | 0 | NA | NA | NA | 40 |
| VOC | 0 | 0 | 0 | 39 | 39 | 39 | 40 |
| GHG | 0 | 0 | 0 | NA | NA | NA | 75,000 |
| Individual HAP | NA | NA | NA | 9 | 9 | NA | NA |
| Aggregate HAPs | NA | NA | NA | 24 | 24 | NA | NA |

13a. The facility does not have a baseline emission rate for pollutants other than $PM_{2.5}$ and GHGs because the facility was not in operation during either the 1977 or 1978 baseline

year. A baseline emission rate is not established for $PM_{2.5}$ in accordance with LRAPA 42-0048(3). The facility has no baseline for GHGs because the facility did not request a baseline for this pollutant.

13b. The netting basis for all pollutants is 0 (zero) in accordance with LRAPA 42-0040(3).

13c. The PSELs for PM, $PM_{10}$, $PM_{2.5}$ and VOC are set at the generic PSEL level in accordance with LRAPA 37-0064(3)(b). No PSELs are set for CO, NOx, $SO_2$ and GHGs 12 in accordance with LRAPA 42-0020(3)(a) because these pollutants are emitted below the de minimis as defined in LRAPA Title 12. There are no changes to the PSELs as compared to the previous Simple ACDP

13d. The baseline year, netting basis, and SER are not applicable for limiting federal HAPs. There are no changes to the PSELs for HAPs as compared to the previous Simple ACDP.

Federal Hazardous Air Pollutants/Toxic Air Contaminants

14. The facility currently has PSELs for federal HAPs that limit emissions to no more than 9 tons per year for an individual federal HAP and 24 tons per year for the aggregate of all federal HAP as shown in the table above. Therefore, the facility is considered a minor or area source of federal HAPs.

15. Under the Cleaner Air Oregon program, only existing sources that have been notified by LRAPA and new sources are required to perform risk assessments. This source has not been notified by LRAPA and is therefore, not yet required to perform a risk assessment or report annual emissions of toxic air contaminants. LRAPA required reporting of approximately 600 toxic air contaminants in 2016 and regulates approximately 260 toxic air contaminants that have Risk Based Concentrations established in rule. All federal HAPs are on the list of approximately 600 toxic air contaminants. After the source is notified by LRAPA, they must update their inventory and perform a risk assessment to see if they must reduce risk from their toxic air contaminant emissions. Until then, sources will be required to report toxic air contaminant emissions triennially.

16. Provided below is a summary of the federal HAP and TAC actual emission estimates based on the 2019 annual report as corrected by LRAPA. The highest individual HAP emission in 2019 was xylenes at 1.65 TPY. The aggregate of all federal HAPs in 2019 was 4.04 TPY. Note that this summary does not include minor amounts of particulate HAPs resulting from welding and/or paint overspray solids. The emission detail sheets attached to this review report conservatively assume 3 shift operation instead of 1 shift to estimate potential emissions from this facility. According to the facility they where operating near maximum capacity in 2019.

| Chemical Name (CAS Number) | HAP | TAC | 2019 Actual Emissions (lbs/yr) |
|---|---|---|---|
| Acetone (67-64-1) | No | Yes | 1,323 |
| t-Butyl Acetate (540-88-5) | No | Yes | 183 |
| Butyl Benzyl Phthalate (85-68-7) | No | Yes | 183 |
| Ethyl Benzene (100-41-4) | Yes | Yes | 886 |
| Methyl isoButyl Ketone (108-10-1) | Yes | Yes | 1,005 |
| Methyl Ethyl Ketone (78-93-3) | No | Yes | 2,132 |
| Methyl Methacrylate (80-62-6) | No | Yes | 18 |
| Tetrachloroethylene (172-18-4) | Yes | Yes | 340 |
| Toluene (108-88-3) | Yes | Yes | 2,540 |
| Xylenes (1330-20-7) | Yes | Yes | 3,303 |

| Chemical Name (CAS Number) | HAP | TAC | 2019 Actual Emissions (lbs/yr) |
|---|---|---|---|
| | | Total Federal HAP = | 4.04 TPY |

Toxics Release Inventory

17. The Toxics Release Inventory (TRI) is federal program that tracks the management of certain toxic chemicals that may pose a threat to human health and the environment, over which LRAPA has no regulatory authority. It is a resource for learning about toxic chemical releases and pollution prevention activities reported by certain industrial facilities. Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) created the TRI Program. In general, chemicals covered by the TRI Program are those that cause:
    - Cancer or other chronic human health effects;
    - Significant adverse acute human health effects; or
    - Significant adverse environmental effects.

    There are currently over 650 chemicals covered by the TRI Program. Facilities that manufacture, process or otherwise use these chemicals in amounts above established levels must submit annual TRI reports on each chemical. NOTE: The TRI Program is a federal program over which LRAPA has no regulatory authority. LRAPA does not guarantee the accuracy of any information copied from EPA's TRI website.

    This facility did not report to the TRI during reporting years 2007-2019.

New Source Performance Standards

18. There are no emission units at this facility for which NSPS have been promulgated or are applicable.

National Emission Standards for Hazardous Air Pollutants (NESHAPs)

19. LRAPA reviewed the following NESHAPs to determine their applicability to this facility:

    19a. 40 CFR Part 63, Subpart MMMM - National Emission Standards for Hazardous Air Pollutants for Surface Coating of miscellaneous Metal Parts and Products is not applicable to the facility because the facility is not a major source of HAPs.

    19b. 40 CFR Part 63, Subpart PPPP - National Emission Standards for Hazardous Air Pollutants for Surface Coating of Plastic Parts and Products is not applicable to the facility because the facility is not a major source of HAPs.

    19c. 40 CFR Part 63, Subpart HHHHHH - National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources is not applicable to the facility because the facility does not use methylene chloride for paint stripping, it is not an autobody refinishing operation, and the surface coatings used at the facility do not contain the target HAPs.

    19d. 40 CFR Part 63, Subpart XXXXXX - National Emission Standards for Hazardous Air Pollutants: Nine Metal Fabrication and Finishing Source Categories is not applicable to the source because the facility does not engage in the operations listed in 40 CFR 63.11514(a).

Recordkeeping Requirements

20. The facility is required to keep and maintain a record of the following information for a period of five (5) years.

    20a. VOC/HAP-containing materials include, but are not limited to, coatings, lacquers, thinners, stains, topcoats, solvents, adhesives, cleaning, and wash-off materials.

20b. The density and VOC/HAP content information must be supplied from CPDS or SDS provided by the manufacturer/supplier of the VOC/HAP containing material.

| Activity | Parameter | Units | Minimum Recording Frequency |
|---|---|---|---|
| VOC/HAP-containing material Usage | Material name and usage | Gallons | Monthly |
| VOC/HAP-containing material Usage | Density of material | Pounds per gallon | Each coating and solvent |
| VOC- containing material usage | VOC content | % by weight | Each coating and solvent |
| HAP- containing material usage | Individual HAP content | % by weight | Each coating and solvent |
| Welding rod/welding wire usage | Rod/wire type and usage | Pounds | Monthly |
| Spray booth filter particulate matter control efficiency | Control efficiency | % | Maintain documentation from each filter manufacturer |
| Spray booth filter replacement | Occurrence | NA | Upon Replacement |
| Spray booth training | Training logs / certifications | NA | Maintain documentation of training |
| Complaints from the public | Log each complaint and the resolution | NA | Upon receipt |
| Upset log of all planned and unplanned excess emissions | See G15 | NA | Per occurrence |

Reporting Requirements

21. For each year the permit is in effect, the permittee must submit to LRAPA by February 15th, the following information from the previous calendar year:

21a. An annual summary of the total gallons of VOC and HAP-containing materials used;
21b. Calculations of annual VOC and HAP emissions determined each month to demonstrate compliance with VOC and HAP PSEL. The summary must include VOC and HAP emission calculations corresponding to each 12-month rolling period in the previous calendar year;
21c. A list of permanent changes made in facility processes, production levels, and pollution control equipment including any new SDS or CPDS;
21d. A summary of maintenance performed on pollution control equipment;
21e. A summary of complaints related to air quality received by the permittee during the previous calendar year and their resolution; and
21f. A summary of any upsets that resulted in planned and unplanned excess emissions.

22. The permittee is not subject to greenhouse gas reporting under OAR 340 Division 215 because actual greenhouse gas emissions are less than 2,500 metric tons (2,756 short tons) of $CO_2$ equivalents per year. If the source ever emits more than this amount, they will be required to report greenhouse gas emissions.

Public Notice

23. The draft permit was on public notice from December 10, 2020 to January 8, 2021. No written comments were submitted during the 30-day comment period.

JJW/cmw
01/11/2021

**A&K Development - 200042**
**Emission Detail Sheets**
**Coating Operations**

**VOC and PM Emissions**

| Product | 2019 Usage (gal/yr) | Max Usage (gal/yr) | Product Density (lb/gal) | VOC Content (%) | VOC Emissions (lbs/yr) | PM Content (%) | PM Usage (lbs) | PM Emissions Before Control (lbs/yr) | PM Emissions After Control (lbs/yr) |
|---|---|---|---|---|---|---|---|---|---|
| **Chemlok 205** | 200 | 600 | 7.73 | 76.65% | 3,555 | 23.35% | 1,083 | 650 | 8.66 |
| **Chemlok 213** | 315 | 945 | 7.41 | 78.43% | 5,492 | 21.57% | 1,510 | 906 | 12.08 |
| **Chemlok 220** | 190 | 570 | 8.94 | 75.21% | 3,833 | 24.79% | 1,263 | 758 | 10.11 |
| **Chemlok 248** | 290 | 870 | 7.31 | 99.90% | 6,353 | 0.10% | 6 | 4 | 5.1E-02 |
| **Acetone** | 190 | 570 | 7.33 | 0.00% | 0 | 0.00% | 0 | 0 | 0 |
| **Forrest Paint Toluene** | 290 | 870 | 7.25 | 100% | 6,308 | 0.00% | 0 | 0 | 0 |
| **Forrest Paint Xylene** | 5 | 15 | 7.62 | 100% | 114 | 0.00% | 0 | 0 | 0 |
| **14e Paint** | 15 | 45 | 8.30 | 56.34% | 210 | 43.66% | 163 | 98 | 1.30 |
| **16p Primer** | 241 | 723 | 8.84 | 52.63% | 3,364 | 47.37% | 3,028 | 1,817 | 24.22 |
| **64e Paint** | 228 | 684 | 8.03 | 61.38% | 3,371 | 38.62% | 2,121 | 1,273 | 16.97 |
| | | | | **Total lbs/yr** | **32,600** | | **Total lbs/yr** | **5,505** | **73.40** |
| | | | | **Total TPY** | **16.30** | | **Total TPY** | **2.75** | **3.7E-02** |

**Notes:**
Max usage conservatively assumes 3 shift operation instead of 1 shift
Assumed transfer efficency for HVLP: 60%
Required dry filter control efficiency: 98%

**HAP/TAC Emissions**

| | Acetone (67-64-1) | | t-Butyl Acetate (540-88-5) | | Butyl Benzyl Phthalate (85-68-7) | | Cumene (98-82-8) | | Ethyl Benzene (100-41-4) | | Methyl isoButyl Ketone (108-10-1) | | Methyl Ethyl Ketone (78-93-3) | | Methyl Methacrylate (80-62-6) | | Tetrachloroethylene (127-18-4) | | Toluene (108-88-3) | | Xylenes (1330-20-7) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Product** | **% by wt.** | **lb** | **% by wt.** | **lb** | **% by wt.** | **lb** | **% by wt.** | **lb** | **% by wt.** | **lb** | **% by wt.** | **lb** | **% by wt.** | **lb** | **% by wt.** | **lb** | **% by wt.** | **lb** | **% by wt.** | **lb** | **% by wt.** | **lb** |
| **Chemlok 205** | | 0 | | 0 | | 0 | | 0 | | 0 | 65.0% | 3,015 | | 0 | | 0 | | 0 | 0.9% | 41.7 | 15.0% | 696 |
| **Chemlok 213** | | 0 | | 0 | | 0 | | 0 | 5.0% | 350 | | 0 | 55.0% | 3,851 | | 0 | | 0 | | 0 | 15.0% | 1,050 |
| **Chemlok 220** | | 0 | | 0 | | 0 | | 0 | 15.0% | 764 | | 0 | | 0 | | 0 | 20.0% | 1,019 | 0.9% | 45.9 | 50.0% | 2,548 |
| **Chemlok 248** | | 0 | | 0 | | 0 | | 0 | 5.0% | 318 | | 0 | 40.0% | 2,544 | | 0 | | 0 | | 0 | 20.0% | 1,272 |
| **Acetone** | 100.0% | 4,178 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| **Forrest Paint Toluene** | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | 100.0% | 6,308 | | 0 |
| **Forrest Paint Xylene** | | 0 | | 0 | | 0 | 1.0% | 1.14 | 25.0% | 28.6 | | 0 | | 0 | | 0 | | 0 | 1.0% | 1.14 | 95.0% | 109 |
| **14e Paint** | | 0 | | 0 | | 0 | | 0 | 10.0% | 37.4 | | 0 | | 0 | | 0 | | 0 | 10.0% | 37.4 | 45.0% | 168 |
| **16p Primer** | | 0 | | 0 | | 0 | | 0 | 10.0% | 639 | | 0 | | 0 | | 0 | | 0 | 10.0% | 639 | 35.0% | 2,237 |
| **64e Paint** | | 0 | 10.0% | 549 | 10.0% | 549 | | 0 | 10.0% | 549 | | 0 | | 0 | 1.0% | 54.9 | | 0 | 10.0% | 549 | 35.0% | 1,922 |
| | HAP = | N | HAP = | N | HAP = | N | HAP = | Y | HAP = | Y | HAP = | Y | HAP = | N | HAP = | N | HAP = | Y | HAP = | Y | HAP = | Y |
| | TAC = | Y | TAC = | Y | TAC = | Y | TAC = | Y | TAC = | Y | TAC = | Y | TAC = | Y | TAC = | Y | TAC = | Y | TAC = | Y | TAC = | Y |
| | **Total lbs/yr** | 4,178 | **Total lbs/yr** | 549 | **Total lbs/yr** | 549 | **Total lbs/yr** | 1.14 | **Total lbs/yr** | 2,687 | **Total lbs/yr** | 3,015 | **Total lbs/yr** | 6,395 | **Total lbs/yr** | 54.9 | **Total lbs/yr** | 1,019 | **Total lbs/yr** | 7,622 | **Total lbs/yr** | 10,002 |
| | **Total TPY** | 2.09 | **Total TPY** | 0.27 | **Total TPY** | 0.27 | **Total TPY** | 5.7E-04 | **Total TPY** | 1.34 | **Total TPY** | 1.51 | **Total TPY** | 3.20 | **Total TPY** | 2.7E-02 | **Total TPY** | 0.51 | **Total TPY** | 3.81 | **Total TPY** | 5.00 |

**Total Federal HAPs = 12.2 TPY**

**A&K Development - 200042**
**Emission Detail Sheets**
**Welding Operations**

| Welding Wire/Rod | 2019 Usage | Unit | Max Usage | Unit |
|---|---|---|---|---|
| E308L (wire) | 775 | lbs/yr | 2325 | lbs/yr |
| ER309 (wire) | 1800 | lbs/yr | 5400 | lbs/yr |
| ER70S (wire) | 3872 | lbs/yr | 11616 | lbs/yr |
| E71T (wire) | 297 | lbs/yr | 891 | lbs/yr |
| E70S (rod) | 10 | lbs/yr | 30 | lbs/yr |

**Welding Emissions**

| | PM | | PM10 | | PM2.5 | | Cr | | Co | | Mn | | Ni | | Pb | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Welding Wire/Rod** | lb/yr | TPY | lb/yr | TPY | lb/yr | TPY | lb/yr | TPY | lb/yr | TPY | lb/yr | TPY | lb/yr | TPY | lb/yr | TPY |
| E308L (wire) | 1.3E+01 | 6.3E-03 | 1.3E+01 | 6.3E-03 | 1.3E+01 | 6.3E-03 | 1.2E+00 | 6.1E-04 | 2.3E-03 | 1.2E-06 | 8.0E-01 | 4.0E-04 | 4.3E-01 | 2.1E-04 | 0.0E+00 | 0.0E+00 |
| ER309 (wire) | 9.5E+01 | 4.8E-02 | 9.0E+01 | 4.5E-02 | 8.3E+01 | 4.2E-02 | 5.4E-02 | 2.7E-05 | -- | -- | 4.9E-01 | 2.4E-04 | 5.4E-02 | 2.7E-05 | 5.4E-02 | 2.7E-05 |
| ER70S (wire) | 6.0E+01 | 3.0E-02 | 6.0E+01 | 3.0E-02 | 6.0E+01 | 3.0E-02 | 1.2E-02 | 5.8E-06 | 1.2E-02 | 5.8E-06 | 3.7E+00 | 1.8E-03 | 1.2E-02 | 5.8E-06 | 0.0E+00 | 0.0E+00 |
| E71T (wire) | 1.1E+01 | 5.4E-03 | 1.1E+01 | 5.4E-03 | 1.1E+01 | 5.4E-03 | 1.8E-03 | 8.9E-07 | 8.9E-04 | 4.5E-07 | 5.9E-01 | 2.9E-04 | 3.6E-03 | 1.8E-06 | 0.0E+00 | 0.0E+00 |
| E70S (rod) | 1.6E-01 | 7.8E-05 | 1.6E-01 | 7.8E-05 | 1.6E-01 | 7.8E-05 | 3.0E-05 | 1.5E-08 | 3.0E-05 | 1.5E-08 | 9.5E-03 | 4.8E-06 | 3.0E-05 | 1.5E-08 | 0.0E+00 | 0.0E+00 |
| **Total =** | **1.8E+02** | **9.0E-02** | **1.7E+02** | **8.7E-02** | **1.7E+02** | **8.4E-02** | **1.3E+00** | **6.4E-04** | **1.5E-02** | **7.4E-06** | **5.6E+00** | **2.8E-03** | **5.0E-01** | **2.5E-04** | **5.4E-02** | **2.7E-05** |

**Welding Emission Factors**

| Welding Wire/Rod | PM | PM10 | PM2.5 | Cr | Co | Mn | Ni | Pb |
|---|---|---|---|---|---|---|---|---|
| E308L (wire) | 5.4 | 5.4 | 5.4 | 5.24 | 0.01 | 3.46 | 1.84 | 0 |
| ER309 (wire) | 17.62 | 16.65 | 15.43 | 0.1 | -- | 0.9 | 0.1 | 0.1 |
| ER70S (wire) | 5.2 | 5.2 | 5.2 | 0.01 | 0.01 | 3.18 | 0.01 | 0 |
| E71T (wire) | 12.2 | 12.2 | 12.2 | 0.02 | 0.01 | 6.62 | 0.04 | 0 |
| E70S (rod) | 5.2 | 5.2 | 5.2 | 0.01 | 0.01 | 3.18 | 0.01 | 0 |

**Notes:**

Max usage conservatively assumes 3 shift operation instead of 1 shift

Except for ER309, all emission factors are from US EPA AP-42 Ch. 12.19

The emission factors for ER309 are from "Shipyard Welding Emission Factor Development" by Mener, Rosen, Austin and Holt

Units for PM/PM10/PM2.5 are lb/1000 lb of electrode consumed

Units for metal HAPs are 10^-1 lb/1000 lb of electrode consumed