

## Summary of Changes to AP-42 - Chapter 12, Section 20

October 2021

### Changes to AP-42 Chapter 12, Section 20

- Edited footnote 'a' for Tables 12.20-1 and 12.20-4:

<sup>a</sup>Factors represent uncontrolled emissions unless noted. All emission factors in units of grains per ampere-hour (grains/A-hr) and as concentrations in units of grains per dry standard cubic foot (grains/dscf). To convert from grains/A-hr to mg/A-hr multiply by 64.8. To convert grains/dscf to mg/dscm, multiply by 2,290. ~~To convert grains/A-hr to grains/dscf, multiply by 0.01. To convert grains/dscf to grains/A-hr multiply by 100. Note that there is considerable uncertainty in these latter two conversion factors because of the differences in tank geometry, ventilation, and control device performance.~~ SCC = Source Classification Code. NA = units not applicable. **Grains/A-hr are used for the electroplating tank without control while the grains/dscf are for samples taken after the control device.**

- Updated Emission Factor for Nickel Electroplating Tank (SCC 3-09-010-68) in Table 12.20-4 from 0.63 grains/A-hr to 0.37 grains/A-hr based on errors identified in the calculation
  - For more information see changes made to background document.
- Updated Figure 12.20-1 to show correct SCC: The SCC for Chromic Acid Anodic Treatment (SCC 3-09-010-16) has been revoked and updated to Chromic Acid Anodizing (SCC 3-09-010-38)
- Added hyperlinks to references for those references that are available

### Changes to AP-42 Chapter 12, Section 20 Background Document

- Corrected errors in data points and calculations for Nickel Plating (No Control and Wet Scrubber) in Table 4-40:
  - Corrected incorrect process rate values (A-hr) (based on pages 162-166 in stack test PDF: [https://gaftp.epa.gov/ap42/ch12/s20/reference/ref\\_31c12s20\\_jul1996.pdf](https://gaftp.epa.gov/ap42/ch12/s20/reference/ref_31c12s20_jul1996.pdf)).
  - Corrected emissions factors based on corrected process rate following:

$$EF_{gr/A-hr} = 7,000 \cdot ER_{lb/hr} \cdot (t_{min}/60) / C_{A-hr}$$

where:  $EF_{gr/A-hr}$  = emission factor in grains per ampere-hour

7,000 = grains per pound conversion factor

$ER_{lb/hr}$  = emission rate in pounds per hour

$t_{min}$  = test time in minutes

60 = minute per hour conversion factor

$C_{A-hr}$  = electroplating tank charge in ampere-hours

- Table 1 provides a summary of this calculation (with the correct values from the stack testing report used).
- Table 2 shows changes made in the background document of AP-42 Chapter 12, Section 20

**Table 1.** Summary of EF Calculation.

Run ID	Sample Time	Emission Rate (lb/hr)	Process Rate (A-hr)	Emission Factor (gr/A-hr)
1	65	0.00753	117	0.49
2	120	0.00685	200 <sup>(2)</sup>	0.48
3	90	0.00253	167 <sup>(3)</sup>	0.16
Average				0.377
1	73	0.00171 <sup>(1)</sup>	85.1	0.17
2	90	0.0117	161.8	0.76
3	80	0.00286	158.7	0.17
Average				0.367
Overall Average				<b>0.372</b>

- Footnotes:
- (1) Emission Rate erroneously reported in EPA Table 4-40 as 0.0171 lb/hr, which is inconsistent with the value reported in Table 3-1 and Table 4-1 in the Deutsch Engineered Connecting Devices stack test report (PDF file pages 13 and 26, respectively).
- (2) Process Rate erroneously reported in EPA Table 4-40 as 182 A-hr, which is inconsistent with the value reported in note sheet in Deutsch Engineered Connecting Devices stack test report (PDF file page 165).

- (3) Process Rate erroneously reported in EPA Table 4-40 as 200 A-hr, which is inconsistent with the value reported in note sheet in Deutsch Engineered Connecting Devices stack test report (PDF file page 166).

**Table 2.** Changes made to Table 4-40 in AP-42 Background Document

TABLE 4-40. SUMMARY OF PARAMETERS AND RESULTS OF EMISSION TESTS FOR REFERENCE 67.

Tank type	Type of control(b)	Pollutant	Run No.	Test Meth.	Samp. time, min	Isokin. %	Gas volume, DSCF	Volum. flow rate, DSCFM	Mass, ug (c)	Concen., gr/DSCF	Emission rate, lb/hr	Process rate, A-hr	Emission factor		Rating	
													mg/A-hr	gr/A-hr		
Nickel plating	None	nickel	1	0012	73	94.3	64.07	29,628	280.00	6.74E-005	<del>0.017</del> 0.0017	Average	85.1	<del>111</del> 11	<del>1.7</del> 0.17	NR
		nickel	2		90	93.6	67.82	31,593	190.00	4.32E-005	0.012	161.8	49	0.76		
		nickel	3		80	91.3	48.72	33,923	31.00	9.82E-006	0.0029	158.7	11	0.17		
	WS	nickel	1	0012	73	96.7	45.44	39,508	6.00	2.04E-006	0.00069	Average	85.1	<del>57</del> 23.7	<del>0.88</del> 0.37	B
		nickel	2		90	98.7	46.70	39,783	27.00	8.92E-006	0.0030	161.8	13	0.20		
		nickel	3		80	102.5	48.33	39,645	19.20	6.13E-006	0.0021	158.7	7.9	0.12		
									5.70E-006		Average	8.4	0.13	B		

TABLE 4-40. (Continued)

Tank type	Type of control(b)	Pollutant	Run No.	Test Meth.	Samp. time, min	Isokin. %	Gas volume, DSCF	Volum. flow rate, DSCFM	Mass, ug	Concen., gr/DSCF	Emission rate, lb/hr	Process rate, A-hr	Emission factor		Rating
													mg/A-hr	gr/A-hr	
Nickel plating	None	nickel	1	CARB	65	90.0	54.28	26,298	117.50	3.34E-005	0.0075	117	32	0.49	C
		nickel	2	424	120	92.1	45.64	31,515	75.00	2.54E-005	0.0068	<del>182</del> 200	<del>34</del> 31.1	<del>0.53</del> 0.48	
		nickel	3		90	91.6	48.87	33,937	27.50	8.68E-006	0.0025	<del>200</del> 167	<del>8.6</del> 10.4	<del>0.13</del> 0.16	
	WS	nickel	1	CARB	65	98.4	47.27	40,387	32.50	1.06E-005	0.0037	Average	117	<del>25</del> 24.5	0.38
		nickel	2	424	120	100.2	47.64	39,983	25.00	8.10E-006	0.0028	<del>182</del> 200	<del>44</del> 13	<del>0.21</del> 0.20	
		nickel	3		90	99.0	46.49	39,503	12.50	4.15E-006	0.0014	<del>200</del> 167	<del>4.8</del> 5.7	<del>0.074</del> 0.088	
									7.62E-006		Average	<del>11</del> 11.23	<del>0.17</del> 0.176	B	