

**C-B Reciprocating Products Division**  
**0812100082 R005**  
**Calculations**  
**12/95**

R005 - Paint spray Booth

24 hours/day; 7 days/week; 52 weeks/year = 8,760 hours/year  
 application rate: 0.6 gallons/hour

Polane Strobe White - Solvent Based Coating

41.4% by weight solids  
 27.8% by volume solids  
 72.2% by volume VOC  
 9.44 lbs ctg/gal ctg

Solvent Density:

Solvent	% by Volume (gal mtl/gal solvent)	Density (lbs mtl/gal mtl)	Weighted Average (lbs VOC/gal VOC)
cyclohexanone	19.73	7.88	1.55
ethylbenzene	3.09	7.3	0.23
MEK	21.21	6.7	1.42
MIBK	6.25	6.7	0.42
n-butyl acetate	11.0	7.2	0.79
toluene	10.34	7.3	0.75
xylene	17.61	7.3	1.29
1-methoxy-2-propyl acetate	10.73	7.6	0.82
<b>Total</b>	<b>100</b>	<b>-</b>	<b>7.27</b>

$(7.27 \text{ lbs VOC/gal VOC})(0.722 \text{ gal VOC/gal ctg}) = 5.25 \text{ lbs VOC/gal ctg}$   
 $(9.44 \text{ lbs ctg/gal ctg})(0.556 \text{ lbs VOC/lb ctg}) = 5.25 \text{ lbs VOC/gal ctg}$

Sheffield Red Hot Aluminum - Solvent Based Coating

19.5% by weight solids  
 11.33% by volume solids  
 88.67% by volume VOC  
 7.11 lbs ctg/gal ctg

Solvent Density: 100% mineral spirits @ 6.44 lbs/gal

$(6.44 \text{ lbs VOC/gal VOC})(0.8867 \text{ gal VOC/gal ctg}) = 5.71 \text{ lbs VOC/gal ctg}$   
 $(7.11 \text{ lbs ctg/gal ctg})(0.805 \text{ lbs VOC/lb ctg}) = 5.72 \text{ lbs VOC/gal ctg}$

Gray Top Coat - Water Based Coating

28.86% by volume solids  
 13.13% by volume VOC  
 58.01% by volume water

Solvent Density:

Solvent	% by Volume (gal mtl/gal solvent)	Density (lbs mtl/gal mtl)	Weighted Average (lbs VOC/gal VOC)
butyl cellosolve	64.6	7.51	4.85
secondary butanol	12.6	6.72	0.85
butyl carbitol	11.2	7.94	0.89
triethylamine	8.8	6.07	0.53
dibutyl phthalate	2.8	8.71	0.24
<b>Total</b>	<b>100</b>	-	<b>7.36</b>

$(7.36 \text{ lbs VOC/gal VOC})(.1313 \text{ gal VOC/gal ctg}) = 0.97 \text{ lbs VOC/gal ctg}$   
 $(0.97 \text{ lbs VOC/gal ctg}) / (1 - 0.5801 \text{ gal water/gal ctg}) = 2.31 \text{ lbs VOC/gal ctg - water}$

Tan Primer - Water Based Coating

29.02% by volume solids  
 18.24% by volume VOC  
 52.74% by volume water

Solvent Density:

Solvent	% by Volume (gal mtl/gal solvent)	Density (lbs mtl/gal mtl)	Weighted Average (lbs VOC/gal VOC)
butyl cellosolve	47.26	7.51	3.55
n-butanol	33.00	6.75	2.23
Ektasolve	11.95	7.51	0.91
diethylamine	7.79	5.9	0.46
<b>Total</b>	<b>100</b>	-	<b>7.15</b>

$(7.15 \text{ lbs VOC/gal VOC})(0.1824 \text{ gal VOC/gal ctg}) = 1.3 \text{ lbs VOC/gal ctg}$   
 $(1.3 \text{ lbs VOC/gal ctg}) / (1 - 0.5274 \text{ gal water/gal ctg}) = 2.75 \text{ lbs VOC/gal ctg - water}$

Cleanup - Mineral Spirits

$(0.3 \text{ gal/day})(6.44 \text{ lbs VOC/gal}) = 1.9 \text{ lbs VOC/day}$

About 75% of painting is done with the water based coatings. However, certain customers still require the use of the solvent based coatings. As yet, water based replacements have not been identified that meet customer satisfaction. It is necessary for C-B Reciprocating to have the flexibility to paint exclusively with a solvent based coating for an entire day in order to complete a job. On a day such as this, the source cannot comply with the daily weighted average limitation of OAC rule 3745-21-09(U)(1)(d). In order to accommodate this need for flexibility, C-B Reciprocating requests that OAC rule 3745-21-09(U)(2)(e) apply to this source. C-B Reciprocating is currently, and will continue to work with its coating suppliers to identify an acceptable replacement for the two remaining solvent based coatings. C-B Reciprocating also proposes to use the daily coating usage limitation of OAC rule 3745-21-09(U)(2)(e) of 8 gallons per day, and the maximum possible VOC content of 6.0 lbs VOC/gal ctg for the FESOP to maintain the potential to emit VOC's from this source to 9.125 TPY.

$$(6.0 \text{ lbs VOC/gal ctg})(0.60 \text{ gal/hr}) = \mathbf{3.6 \text{ lbs/hour}}$$

$$(6.0 \text{ lbs VOC/gal ctg})(8.0 \text{ gal/day}) = \mathbf{48 \text{ lbs/day}}$$

$$(6.44 \text{ lbs VOC/gal})(0.30 \text{ gal/day}) = \mathbf{1.9 \text{ lbs/day}}$$

$$\mathbf{\text{Total} = 50 \text{ lbs/day}}$$

$$(50 \text{ lbs/day})(365 \text{ days/year}) = \mathbf{9.125 \text{ TPY VOC}}$$