

Note: This is a reference cited in AP 42, *Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources*. AP42 is located on the EPA web site at [www.epa.gov/ttn/chief/ap42/](http://www.epa.gov/ttn/chief/ap42/)

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02\_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

<b>AP42 Section:</b>	<b>9.12.1</b>
<b>Background Chapter</b>	<b>4</b>
<b>Reference:</b>	<b>18</b>
<b>Title:</b>	<b>Stack Emissions Survey, Adolph Coors Company Fermentation - Aging Facilities, Golden, Colorado, Western Environmental Services and Testing, Inc., Casper, WY, November, 1990.</b>

## COORS REFERENCE 18 TEST DATA SUMMARY

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	Run 4
2	Stack temperature	Deg F				
CO2 VENT STACK (ferm.)	Moisture	%	4.52	3.61	2.92	
	Oxygen	%	2	2	2	
	Volumetric flow, actual	acfm	435	455	463	
	Volumetric flow, standard	dscfm	355	376	385	372
	Isokinetic variation	%	NA	NA	NA	
Average production rate (packaged product volume)		1000 bbl/hr	1.17	1.17	1.17	
Pollutant concentrations:						
	TNMNEOC as propane	ppmdv	442	451	436	
	CO2	%	97	97	98	
	SO2	ppmdv	ND	ND	ND	
	Hydrogen sulfide	ppmdv	0.3	4.5	21.3	
Pollutant mass flux rates:						
	TNMNEOC as propane	lb/hr	1.08	1.16	1.15	1.13
	Ethanol (2.04 theor. conv.)	lb/hr	2.19	2.37	2.35	2.30
	CO2	lb/hr	2359	2499	2585	2481
	SO2	lb/hr	ND	ND	ND	
	Hydrogen sulfide	lb/hr	5.64E-04	0.00896	0.0434	0.0176
Emission factors:						Average
	TNMNEOC as propane	lb/1000 bbl	0.92	1.0	1.0	1.0
	Ethanol (2.04 theor. conv.)	lb/1000 bbl	1.9	2.0	2.0	2.0
	CO2	lb/1000 bbl	2010	2129	2202	2114
	SO2	lb/1000 bbl	ND	ND	ND	ND
	Hydrogen sulfide	lb/1000 bbl	0.00048	0.0076	0.037	0.015

D. Emission Data/Mass Flux Rates/Emission Factors

APPROPRIATE  
EF UNITS FOR  
VENTING &  
EVALUATING!

This process  
← is the evacuation  
of CO<sub>2</sub> from empty  
fermenting tanks  
prior to yeast  
removal.

VOID

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	Run 4
1	Stack temperature	Deg F	49	47	45	
CO2 EXHAUST STACK	Moisture	%	1.56	0.82	0.7	
	Oxygen	%	20.2	20	20	
	Volumetric flow, actual	acfm	915	870	860	
	Volumetric flow, standard	dscfm	743	714	709	722
	Isokinetic variation	%	NA	NA	NA	
Circle: Production or feed rate		bbl/hr				
Capacity:						
Pollutant concentrations:						
	TNMNEOC as propane	ppmdv	4.6	5.7	4.3	
	CO2	%	2	2	1.7	
	SO2	ppmdv	ND	ND	ND	
	Hydrogen sulfide	ppmdv	ND	ND	ND	
Pollutant mass flux rates:						
	TNMNEOC as propane	lb/hr	0.0234	0.0279	0.0209	
	Ethanol (2.04 theor. conv.)	lb/hr	0.0478	0.0569	0.0426	0.0491
	CO2	lb/hr	102	98	83	
	SO2	lb/hr	ND	ND	ND	
	Hydrogen sulfide	lb/hr	ND	ND	ND	
Emission factors:						
			Average			
	TNMNEOC as propane	lb/bbl	ERR	ERR	ERR	ERR
	Ethanol (2.04 theor. conv.)	lb/bbl	ERR	ERR	ERR	ERR
	CO2	lb/bbl	ERR	ERR	ERR	ERR
	SO2	lb/bbl	ND	ND	ND	ND
	Hydrogen sulfide	lb/bbl	ND	ND	ND	ND

NOTE: NO FERMENTERS WERE EVACUATING DURING TEST <sup>THIS</sup>, THEREFORE DATA ARE NOT USEFUL.

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	Run 4
2	Stack temperature	Deg F				
CO2 VENT STACK	Moisture	%	4.52	3.61	2.92	
	Oxygen	%	2	2	2	
	Volumetric flow, actual	acfm	435	455	463	
	Volumetric flow, standard	dscfm	355	376	385	372
	Isokinetic variation	%	NA	NA	NA	
Circle: Production or feed rate		bbl/hr				
Capacity:						
Pollutant concentrations:						
	TNMNEOC as propane	ppmdv	442	451	436	
	CO2	%	97	97	98	
	SO2	ppmdv	ND	ND	ND	
	Hydrogen sulfide	ppmdv	0.3	4.5	21.3	
Pollutant mass flux rates:						
	TNMNEOC as propane	lb/hr	1.08	1.16	1.15	1.13
	Ethanol (2.04 theor. conv.)	lb/hr	2.19	2.37	2.35	2.30
	CO2	lb/hr	2359	2499	2585	
	SO2	lb/hr	ND	ND	ND	
	Hydrogen sulfide	lb/hr	5.64E-04	0.00896	0.0434	
Emission factors:						
			Average			
	TNMNEOC as propane	lb/bbl	ERR	ERR	ERR	ERR
	Ethanol (2.04 theor. conv.)	lb/bbl	ERR	ERR	ERR	ERR
	CO2	lb/bbl	ERR	ERR	ERR	ERR
	SO2	lb/bbl	ND	ND	ND	ND
	Hydrogen sulfide	lb/bbl	ERR	ERR	ERR	ND

← 13 fermenters  
venting to  
atmosphere  
during  
testing

Applies to  
facilities that  
vent gases  
@ beginning  
of fermentation  
cycle to purge  
the headspace  
gases until the  
CO<sub>2</sub> is pure  
enough to  
collect.

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	Run 4
3	Stack temperature	Deg F				
PROP. STACK	Moisture	%	2.69	3.3	3.53	
	Oxygen	%	2	2.5	2	
	Volumetric flow, actual	acfm	10	10	9	
	Volumetric flow, standard	dscfm	8	8	7	7.6666667
	Isokinetic variation	%	NA	NA	NA	
Circle: Production or feed rate		bbl/hr				
Capacity:						
Pollutant concentrations:						
	TNMNEOC as propane	ppmdv	495	489	499	
	CO2	%	97	93	94.6	
	SO2	ppmdv	1.3	ND	ND	
	Hydrogen sulfide	ppmdv	ND	ND	ND	
Pollutant mass flux rates:						
	TNMNEOC as propane	lb/hr	0.0271	0.0268	0.0239	
	Ethanol (2.04 theor. conv.)	lb/hr	0.0554	0.0547	0.0488	0.0530
	CO2	lb/hr	53.2	51.0	45.4	
	SO2	lb/hr	1.04E-04	ND	ND	
	Hydrogen sulfide	lb/hr	ND	ND	ND	
Emission factors: <span style="float: right;">Average</span>						
	TNMNEOC as propane	lb/bbl	ERR	ERR	ERR	ERR
	Ethanol (2.04 theor. conv.)	lb/bbl	ERR	ERR	ERR	ERR
	CO2	lb/bbl	ERR	ERR	ERR	ERR
	SO2	lb/bbl	ERR	ND	ND	ND
	Hydrogen sulfide	lb/bbl	ND	ND	ND	ND

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	Run 4
4	Stack temperature	Deg F				
AGING VENT STACK	Moisture	%	6.33			
	Oxygen	%	1.8			
	Volumetric flow, actual	acfm	1282			
	Volumetric flow, standard	dscfm	1000			
	Isokinetic variation	%	NA			
Circle: Production or feed rate		bbl/hr				
Capacity:						
Pollutant concentrations:						
	TNMNEOC as propane	ppmdv	507			
	CO2	%	94.8			
	SO2	ppmdv	ND			
	Hydrogen sulfide	ppmdv	ND			
Pollutant mass flux rates:						
	TNMNEOC as propane	lb/hr	3.47			
	Ethanol (2.04 theor. conv.)	lb/hr	7.09			
	CO2	lb/hr	6496			
	SO2	lb/hr	ND			
	Hydrogen sulfide	lb/hr	ND			
Emission factors:						
	TNMNEOC as propane	lb/bbl	ERR			
	Ethanol (2.04 theor. conv.)	lb/bbl	ERR			
	CO2	lb/bbl	ERR			
	SO2	lb/bbl	ND			
	Hydrogen sulfide	lb/bbl	ND			

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	Run 4
5	Stack temperature	Deg F				
AGING	Moisture	%	0.88	0.57	0.39	
EVACUAT.	Oxygen	%	16.8	19.2	19.2	
STACK	Volumetric flow, actual	acfm	1043	915	888	
	Volumetric flow, standard	dscfm	847	745	726	772.66667
	Isokinetic variation	%	NA	NA	NA	
Circle: Production or feed rate		bbbl/hr				
Capacity:						
Pollutant concentrations:						
	TNMNEOC as propane	ppmdv	593	493	417	
	CO2	%	13.2	6.8	4.6	
	SO2	ppmdv	1.1	ND	ND	
	Hydrogen sulfide	ppmdv	ND	ND	ND	
Pollutant mass flux rates:						
	TNMNEOC as propane	lb/hr	3.44	2.52	2.07	2.68
	Ethanol (2.04 theor. conv.)	lb/hr	7.02	5.13	4.23	5.46
	CO2	lb/hr	766	347	229	
	SO2	lb/hr	0.00929	ND	ND	
	Hydrogen sulfide	lb/hr	ND	ND	ND	
Emission factors:						Average
	TNMNEOC as propane	lb/bbl	ERR	ERR	ERR	ERR
	Ethanol (2.04 theor. conv.)	lb/bbl	ERR	ERR	ERR	ERR
	CO2	lb/bbl	ERR	ERR	ERR	ERR
	SO2	lb/bbl	ERR	ND	ND	ND
	Hydrogen sulfide	lb/bbl	ND	ND	ND	ND