

**Application for Revision to
Part 70 Permit No. 0180-00003-V5
Fluorocarbon Plants
Agency Interest No. 2082**

Honeywell

Honeywell International Inc.

Geismar, LA

Volume 2

Prepared by:

RTP ENVIRONMENTAL ASSOCIATES INC.
285 West Esplanade Avenue, Suite 401
Kenner, Louisiana 70065

RTPLA Project No. 2013-012
March 2014



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Part 70 Permit No. 0180-00003-V5
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Air Emissions Calculation Sheet

RTP Environmental Associates, Inc.
Kenner, Louisiana

Client: HONEYWELL INTERNATIONAL INC. - GEISMAR PLANT

Unit: HFO-1234yf PLANT

Source Description: FUGITIVES AND UNLOADING OPERATIONS

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Raw Material

Section 0-99A

Equipment	Service	Component Count	SOCMI Average Factor kg/hr/src	Control Efficiency %	Emission Rate lb/hr	Total Emissions lb/yr
Valves	Lt. Liquid	26	4.03E-03	88	0.0277	243
	Hvy. Liquid		2.30E-04		0.0000	0
	Gas	8	5.97E-03	92	0.0084	74
Pump Seals	Lt. Liquid		1.99E-02	75	0.0000	0
	Hvy. Liquid		8.62E-03		0.0000	0
Connectors	All	65	1.83E-03	93	0.0184	161
PRV	Gas		1.04E-01		0.0000	0
Agitator Seals	Gas		1.99E-02		0.0000	0
Compressor Seals	Gas		2.28E-01		0.0000	0
Total:					0.0545	477

Speciation

G-1230xa	99.68 %	Tetrachloropropane	0.11 %
Hexachloroethane	0.11 %	Trichloropropene	0.04 %
Pentachloropropene	0.04 %		

Balance is water

G-1230xa Emissions = 0.0543 lb/hr
G-1230xa Emissions = 475.90 lb/yr

Hexachloroethane Emissions = 0.0001 lb/hr
Hexachloroethane Emissions = 0.54 lb/yr

Pentachloropropene Emissions = 0.00002 lb/hr
Pentachloropropene Emissions = 0.21 lb/yr

Tetrachloropropane Emissions = 0.0001 lb/hr
Tetrachloropropane Emissions = 0.54 lb/yr



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Trichloropropene Emissions = 0.00002 lb/hr

Trichloropropene Emissions = 0.21 lb/yr

Section 0-99B

Screening Value = 150 ppm

Equipment	Service	Component Count	Screening Emission Factor kg/hr/src	Emission Rate lb/hr	Total Emissions lb/yr
Valves	Lt. Liquid		3.48E-04	0.0000	0
	Hvy. Liquid			0.0000	0
	Gas	30	1.48E-04	0.0098	86
Pump Seals	Lt. Liquid		1.18E-03	0.0000	0
	Hvy. Liquid			0.0000	0
Connectors	All	60	2.57E-04	0.0340	298
PRV	Gas		1.18E-03	0.0000	0
Agitator Seals	Gas			0.0000	0
Compressor Seals	Gas			0.0000	0
Total:				0.0438	384

Speciation

Chlorine 100.00 %

Chlorine Emissions = 0.0438 lb/hr

Chlorine Emissions = 383.94 lb/yr



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Area 100

Section 100A

Equipment	Service	Component Count	SOCMI Average Factor kg/hr/src	Control Efficiency %	Emission Rate lb/hr	Total Emissions lb/yr
Valves	Lt. Liquid	39	4.03E-03	88	0.0416	364
	Hvy. Liquid		2.30E-04		0.0000	0
	Gas	26	5.97E-03	92	0.0274	240
Pump Seals	Lt. Liquid		1.99E-02	75	0.0000	0
	Hvy. Liquid		8.62E-03		0.0000	0
Connectors	All	143	1.83E-03	93	0.0404	354
PRV	Gas		1.04E-01		0.0000	0
Agitator Seals	Gas		1.99E-02		0.0000	0
Compressor Seals	Gas		2.28E-01		0.0000	0
Total:					0.1093	958

Speciation

G-1230xa	0.36 %	Hi Boilers - VOC/ODS	0.06 %
HCFC-1232	0.29 %	HCl	10.58 %
G-1233xf	18.75 %	HF	69.44 %
Hi Boilers - VOC	0.51 %		
Balance is water			

G-1230xa Emissions = 0.0004 lb/hr

G-1230xa Emissions = 3.42 lb/yr

HCFC-1232 Emissions = 0.0003 lb/hr

HCFC-1232 Emissions = 2.75 lb/yr

G-1233xf Emissions = 0.0205 lb/hr

G-1233xf Emissions = 179.62 lb/yr

Hi Boilers - VOC Emissions = 0.0006 lb/hr

Hi Boilers - VOC Emissions = 4.86 lb/yr



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Hi Boilers - VOC/ODS Emissions = 0.0001 lb/hr
Hi Boilers - VOC/ODS Emissions = 0.54 lb/yr

Screening Value = 15 ppm

Equipment	Service	Component Count	Screening Emission Factor kg/hr/src	Emission Rate lb/hr	Total Emissions lb/yr
Valves	Lt. Liquid	39	5.55E-05	0.0048	42
	Hvy. Liquid			0.0000	0
	Gas	26	1.99E-05	0.0011	10
Pump Seals	Lt. Liquid		1.77E-04	0.0000	0
	Hvy. Liquid			0.0000	0
Connectors	All	143	3.35E-05	0.0106	93
PRV	Gas		1.77E-04	0.0000	0
Agitator Seals	Gas			0.0000	0
Compressor Seals	Gas			0.0000	0
Total:				0.0165	144

Speciation

HF 100.00 %

HF Emissions = 0.0165 lb/hr
HF Emissions = 144.31 lb/yr



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Screening Value = 150 ppm

Equipment	Service	Component Count	Screening Emission Factor kg/hr/src	Emission Rate lb/hr	Total Emissions lb/yr
Valves	Lt. Liquid	39	3.48E-04	0.0299	262
	Hvy. Liquid			0.0000	0
	Gas	26	1.48E-04	0.0085	75
Pump Seals	Lt. Liquid		1.18E-03	0.0000	0
	Hvy. Liquid			0.0000	0
Connectors	All	143	2.57E-04	0.0811	710
PRV	Gas		1.18E-03	0.0000	0
Agitator Seals	Gas			0.0000	0
Compressor Seals	Gas			0.0000	0
Total:				0.1195	1047

Speciation

HCl 100.00 %

HCl Emissions = 0.1195 lb/hr

HCl Emissions = 1046.50 lb/yr



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Section 100B

Equipment	Service	Component Count	SOCMI Average Factor kg/hr/src	Control Efficiency %	Emission Rate lb/hr	Total Emissions lb/yr
Valves	Lt. Liquid	16	4.03E-03	88	0.0171	149
	Hvy. Liquid		2.30E-04		0.0000	0
	Gas	12	5.97E-03	92	0.0126	111
Pump Seals	Lt. Liquid		1.99E-02	75	0.0000	0
	Hvy. Liquid		8.62E-03		0.0000	0
Connectors	All	47	1.83E-03	93	0.0133	116
PRV	Gas		1.04E-01		0.0000	0
Agitator Seals	Gas		1.99E-02		0.0000	0
Compressor Seals	Gas		2.28E-01		0.0000	0
Total:					0.0430	376

Speciation

G-1233xf	78.01 %	HF	21.98 %
HCl	0.004 %		

Balance is water

G-1233xf Emissions = 0.0335 lb/hr

G-1233xf Emissions = 293.61 lb/yr

HCl Emissions = 0.000002 lb/hr

HCl Emissions = 0.01 lb/yr



Air Emissions Calculation Sheet

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Unit: HFO-1234yf PLANT

Source Description: FUGITIVES AND UNLOADING OPERATIONS

TEMPO ID No. :

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Screening Value = 15 ppm

Equipment	Service	Component Count	Screening Emission Factor kg/hr/src	Emission Rate lb/hr	Total Emissions lb/yr
Valves	Lt. Liquid	16	5.55E-05	0.0020	17
	Hvy. Liquid			0.0000	0
	Gas	12	1.99E-05	0.0005	5
Pump Seals	Lt. Liquid		1.77E-04	0.0000	0
	Hvy. Liquid			0.0000	0
Connectors	All	47	3.35E-05	0.0035	30
PRV	Gas		1.77E-04	0.0000	0
Agitator Seals	Gas			0.0000	0
Compressor Seals	Gas			0.0000	0
Total:				0.0060	52

Speciation

HF 100.00 %

HF Emissions = 0.0060 lb/hr

HF Emissions = 52.17 lb/yr



Air Emissions Calculation Sheet

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Section 100C

Equipment	Service	Component Count	SOCMI Average Factor kg/hr/src	Control Efficiency %	Emission Rate lb/hr	Total Emissions lb/yr
Valves	Lt. Liquid	39	4.03E-03	88	0.0416	364
	Hvy. Liquid		2.30E-04		0.0000	0
	Gas	26	5.97E-03	92	0.0274	240
Pump Seals	Lt. Liquid		1.99E-02	75	0.0000	0
	Hvy. Liquid		8.62E-03		0.0000	0
Connectors	All	143	1.83E-03	93	0.0404	354
PRV	Gas		1.04E-01		0.0000	0
Agitator Seals	Gas		1.99E-02		0.0000	0
Compressor Seals	Gas		2.28E-01		0.0000	0
Total:					0.1093	958

Speciation

G-1230xa	0.32 %	HCl	24.48 %
HCFC-1232	0.65 %	HF	31.23 %
G-1233xf	43.31 %		

Balance is water

G-1230xa Emissions = 0.0003 lb/hr
G-1230xa Emissions = 3.03 lb/yr

HCFC-1232 Emissions = 0.0007 lb/hr
HCFC-1232 Emissions = 6.21 lb/yr

G-1233xf Emissions = 0.0474 lb/hr
G-1233xf Emissions = 414.81 lb/yr



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Screening Value = 15 ppm

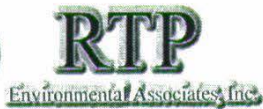
Equipment	Service	Component Count	Screening Emission Factor kg/hr/src	Emission Rate lb/hr	Total Emissions lb/yr
Valves	Lt. Liquid	39	5.55E-05	0.0048	42
	Hvy. Liquid			0.0000	0
	Gas	26	1.99E-05	0.0011	10
Pump Seals	Lt. Liquid		1.77E-04	0.0000	0
	Hvy. Liquid			0.0000	0
Connectors	All	143	3.35E-05	0.0106	93
PRV	Gas		1.77E-04	0.0000	0
Agitator Seals	Gas			0.0000	0
Compressor Seals	Gas			0.0000	0
Total:				0.0165	144

Speciation

HF 100.00 %

HF Emissions = 0.0165 lb/hr

HF Emissions = 144.31 lb/yr



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Screening Value = 150 ppm

Equipment	Service	Component Count	Screening Emission Factor kg/hr/src	Emission Rate lb/hr	Total Emissions lb/yr
Valves	Lt. Liquid	39	3.48E-04	0.0299	262
	Hvy. Liquid			0.0000	0
	Gas	26	1.48E-04	0.0085	75
Pump Seals	Lt. Liquid		1.18E-03	0.0000	0
	Hvy. Liquid			0.0000	0
Connectors	All	143	2.57E-04	0.0811	710
PRV	Gas		1.18E-03	0.0000	0
Agitator Seals	Gas			0.0000	0
Compressor Seals	Gas			0.0000	0
Total:				0.1195	1047

Speciation

HCl 100.00 %

HCl Emissions = 0.1195 lb/hr

HCl Emissions = 1046.50 lb/yr