

ANNESSO TECNICO 6.

**Elaborati di calcolo
Scenari incidentali ragionevolmente credibili**

Ipotesi N. 30

TRR S.r.l.

Il Direttore Generale

Ing. Alfredo Romano


DISCHARGE SUMMARY

Study Folder: 70977-Fase 2-Metanolo

Unique Audit Number: 142.322

Phast 6.6



 70977-Fase 2-Metanolo

 Pompa

Vessel/Pipe Source

Base Case

Data



Weather:

Global Weathers\Category 2/F

Speed:

2,00 m/s

Stability:

F

Full Case Path:

\\70977-Fase 2-Metanolo\Pompa\Vessel/Pipe Source

User-Defined Quantities

Material	METHANOL
Temperature	25,00 degC
Pressure	155,01 bar
Inventory	800,00 kg
Scenario	Leak

Calculated Quantities

Mass Flow of Air (Vent from Vapor Space only)	n/a	kg/s
Wind Speed at Height	0,52	m/s
Average Values for Segment Number	1	
Liquid Fraction	1,00	fraction
Final Temperature	22,78	degC
Final Velocity	226,46	m/s
Droplet Diameter	4,65	um
Continuous Release Data:		
Mass Flowrate	8.44934E+000	kg/s
Release Duration	94,68	s
Orifice Velocity	226,46	m/s
Exit Pressure	1,01	bar
Exit Temperature	22,78	degC
Discharge Coefficient	0,60	
Expanded Radius	0,00	m

DISCHARGE SUMMARY

Study Folder: 70977-Fase 2-Metanolo

Unique Audit Number: 142.322

Phast 6.6



Weather: Global Weathers\Category 5/D

Speed: 5.00 m/s

Stability: D

Full Case Path: \70977-Fase 2-Metanolo\Pompa\Vessel/Pipe Source

User-Defined Quantities

Material	METHANOL
Temperature	25,00 degC
Pressure	155,01 bar
Inventory	800,00 kg
Scenario	Leak

Calculated Quantities

Mass Flow of Air (Vent from Vapor Space only)	n/a	kg/s
Wind Speed at Height	2,58	m/s
Average Values for Segment Number	1	
Liquid Fraction	1,00	fraction
Final Temperature	22,78	degC
Final Velocity	226,46	m/s
Droplet Diameter	4,65	um
Continuous Release Data:		
Mass Flowrate	8.44934E+000	kg/s
Release Duration	94,68	s
Orifice Velocity	226,46	m/s
Exit Pressure	1,01	bar
Exit Temperature	22,78	degC
Discharge Coefficient	0,60	
Expanded Radius	0,00	m

DISCHARGE SUMMARY

Study Folder: 70977-Fase 2-Metanolo

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DETAILED DISPERSION REPORT

Unique Audit Number: 149.439

Study Folder: 70977-Fase 2-Metanolo

Phast 6.6



70977-Fase 2-Metanolo

Pompa

User Defined Source-D5

Base Case

Data



Weather: Global Weathers\Category 2/F

Speed: 2,00 m/s

Stability: F

\70977-Fase 2-Metanolo\Pompa\User Defined Source-D5

Material: METHANOL

Note: C/Line Concentration is calculated at an averaging time of: 18,75 s
Plume Width and Height are calculated at an averaging time of: 600,00 s
and a Concentration of Interest of: 6.700,00 ppm
Concentration at Height calculated at a Height of: 0,00 m

For Instantaneous releases (and if present in this report) the Mass Flowrate is the Mass of Released Material in the cloud, and the C/Line Distance is the same as the Time.

Downwind Distance m	C/Line Height m	C/Line Conc ppm	Plume Half-width m	Plume Total Depth m	Vapor Temperature degC	Liquid Fraction fraction	Time s	Liquid Temperature degC	Centroid Velocity m/s	Cloud Density kg/m3
Segment Number:	1		Start Time:	0,00	s					
0,00	1,00	949.533,65	1,54	2,35	63,16	0,05	0,00	63,16	0,12	1,23
0,01	1,00	949.533,65	1,54	2,35	63,16	0,05	0,00	63,16	0,12	1,23
0,02	1,00	884.828,52	1,40	2,25	61,31	0,05	0,13	61,31	0,15	1,22
0,04	0,99	778.816,13	1,29	2,18	58,05	0,05	0,25	58,05	0,20	1,21
0,08	0,98	633.590,42	1,21	2,12	52,97	0,04	0,42	52,97	0,26	1,20
0,15	0,95	463.584,33	1,21	2,07	45,70	0,04	0,69	45,70	0,33	1,19
0,31	0,90	293.990,51	1,30	2,10	35,92	0,03	1,13	35,92	0,40	1,19
0,46	0,86	206.269,51	1,41	2,16	28,97	0,02	1,50	28,97	0,45	1,20
0,54	0,83	176.398,07	1,46	2,20	26,08	0,00	1,68	26,08	0,46	1,20
0,61	0,80	152.814,06	1,52	2,24	25,01	0,00	1,85		0,48	1,20

Date: 21/06/2013

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Time: 11.44.14

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Downwind Distance m	C/Line Height m	C/Line Conc ppm	Plume Half-width m	Plume Total Depth m	Vapor Temperature degC	Liquid Fraction fraction	Time s	Liquid Temperature degC	Centroid Velocity m/s	Cloud Density kg/m3
0,69	0,78	137.818,62	1,57	2,27	25,01	0,00	2,01		0,49	1,20
0,76	0,75	125.577,54	1,73	2,17	25,01	0,00	2,18		0,50	1,19
0,84	0,72	114.493,96	1,87	2,10	25,01	0,00	2,33		0,51	1,19
0,98	0,66	97.669,61	2,11	2,02	25,01	0,00	2,64		0,52	1,19
1,13	0,60	87.197,71	2,46	1,93	25,01	0,00	2,95		0,53	1,19
1,28	0,54	80.806,04	2,80	1,85	25,01	0,00	3,24		0,54	1,19
1,43	0,49	76.831,81	3,16	1,77	25,01	0,00	3,54		0,55	1,19
1,73	0,37	72.624,63	3,92	1,65	25,01	0,00	4,10		0,57	1,19
2,03	0,26	70.811,01	4,63	1,57	25,01	0,00	4,65		0,59	1,18
2,33	0,16	69.585,43	4,63	1,59	25,00	0,00	5,19		0,60	1,18
2,94	0,00	67.474,64	4,64	1,63	25,00	0,00	6,23		0,62	1,18
4,22	0,00	63.626,13	4,65	1,84	25,00	0,00	8,39		0,56	1,18
6,78	0,00	56.783,78	4,67	2,02	25,00	0,00	13,06		0,54	1,18
9,34	0,00	50.974,82	4,67	2,14	25,00	0,00	17,88		0,53	1,18
14,46	0,00	41.760,05	4,63	2,27	25,00	0,00	27,64		0,52	1,18
17,02	0,00	37.915,87	4,58	2,16	25,00	0,00	32,35		0,56	1,18
22,14	0,00	31.733,30	4,45	2,24	25,00	0,00	41,45		0,56	1,18
32,38	0,00	22.962,70	3,95	2,10	25,00	0,00	59,06		0,60	1,18
52,86	0,00	13.443,63	0,37	0,29	25,00	0,00	91,71		0,65	1,18
93,82	0,00	5.981,61	0,00	0,00	25,00	0,00	149,64		0,76	1,17
98,94	0,00	5.459,32	0,00	0,00	25,00	0,00	155,65		0,94	1,17
104,06	0,00	5.093,59	0,00	0,00	25,00	0,00	161,31		0,87	1,17
109,18	0,00	4.766,13	0,00	0,00	25,00	0,00	167,01		0,93	1,17
119,42	0,00	4.212,38	0,00	0,00	25,00	0,00	178,13		0,91	1,17
139,90	0,00	3.358,88	0,00	0,00	25,00	0,00	200,00		0,96	1,17
180,86	0,00	2.296,10	0,00	0,00	25,00	0,00	241,70		1,00	1,17
262,78	0,00	1.279,23	0,00	0,00	25,00	0,00	319,38		1,11	1,17
362,78	0,00	749,44	0,00	0,00	25,00	0,00	404,02		1,26	1,17
462,78	0,00	494,79	0,00	0,00	25,00	0,00	479,79		1,38	1,17

Date: 21/06/2013

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Time: 11.44.14

DETAILED DISPERSION REPORT

Unique Audit Number: 149.439



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Downwind Distance m	C/Line Height m	C/Line Conc ppm	Plume Half-width m	Plume Total Depth m	Vapor Temperature degC	Liquid Fraction fraction	Time s	Liquid Temperature degC	Centroid Velocity m/s	Cloud Density kg/m3
562,78	0,00	352,42	0,00	0,00	25,00	0,00	549,42		1,49	1,17



Weather:

Global Weathers\Category 5/D

Speed:

5,00 m/s

Stability:

D

\70977-Fase 2-Metanolo\Pompa\User Defined Source-D5

Material: METHANOL

Note: C/Line Concentration is calculated at an averaging time of: 18,75 s
 Plume Width and Height are calculated at an averaging time of: 600,00 s
 and a Concentration of Interest of: 6.700,00 ppm
 Concentration at Height calculated at a Height of: 0,00 m

For Instantaneous releases (and if present in this report) the Mass Flowrate is the Mass of Released Material in the cloud, and the C/Line Distance is the same as the Time.

Downwind Distance m	C/Line Height m	C/Line Conc ppm	Plume Half-width m	Plume Total Depth m	Vapor Temperature degC	Liquid Fraction fraction	Time s	Liquid Temperature degC	Centroid Velocity m/s	Cloud Density kg/m3
Segment Number:	1		Start Time:	0,00 s						
0,00	1,00	949.534,39	1,15	2,15	63,16	0,05	0,00	63,16	0,21	1,23
0,01	1,00	949.534,39	1,15	2,15	63,16	0,05	0,00	63,16	0,21	1,23
0,02	1,00	843.110,91	0,82	1,65	60,07	0,05	0,04	60,07	0,46	1,22
0,03	1,00	774.632,05	0,73	1,47	57,92	0,05	0,06	57,92	0,61	1,21
0,05	1,00	678.933,19	0,66	1,32	54,65	0,05	0,09	54,65	0,84	1,20
0,09	1,00	556.394,23	0,61	1,22	49,89	0,04	0,13	49,89	1,13	1,19
0,17	1,00	414.967,20	0,59	1,19	43,23	0,04	0,19	43,23	1,49	1,19
0,25	1,00	329.960,99	0,60	1,21	38,31	0,03	0,24	38,31	1,70	1,19
0,41	0,99	228.784,79	0,64	1,27	30,94	0,02	0,33	30,94	1,96	1,19
0,73	0,99	131.250,57	0,72	1,44	24,99	0,00	0,48		2,22	1,20

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DETAILED DISPERSION REPORT

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Phast 6.6

Downwind Distance m	C/Line Height m	C/Line Conc ppm	Plume Half-width m	Plume Total Depth m	Vapor Temperature degC	Liquid Fraction fraction	Time s	Liquid Temperature degC	Centroid Velocity m/s	Cloud Density kg/m3
1,05	0,98	84.554,08	0,81	1,61	24,99	0,00	0,62		2,35	1,19
1,69	0,97	48.333,03	1,17	1,74	24,99	0,00	0,89		2,45	1,18
2,01	0,96	42.087,58	1,36	1,69	24,99	0,00	1,02		2,47	1,18
2,17	0,96	40.281,87	1,42	1,65	24,99	0,00	1,08		2,48	1,18
2,33	0,96	38.685,61	1,42	1,67	24,99	0,00	1,15		2,49	1,18
2,65	0,95	35.788,63	1,40	1,70	24,99	0,00	1,28		2,50	1,18
3,29	0,94	30.964,81	1,36	1,76	24,99	0,00	1,53		2,52	1,18
3,93	0,93	27.123,05	1,31	1,78	24,99	0,00	1,78		2,55	1,18
4,57	0,91	24.004,85	1,25	1,77	24,99	0,00	2,03		2,58	1,18
5,85	0,90	19.290,88	1,08	1,66	24,99	0,00	2,53		2,62	1,18
7,13	0,88	15.898,58	0,80	1,30	24,99	0,00	3,01		2,69	1,18
9,69	0,87	11.431,83	0,00	0,00	24,99	0,00	3,95		2,76	1,17
14,81	0,85	6.805,41	0,00	0,00	24,99	0,00	5,76		2,89	1,17
19,93	0,83	4.515,42	0,00	0,00	24,99	0,00	7,47		3,10	1,17
30,17	0,82	2.423,94	0,00	0,00	24,99	0,00	10,69		3,25	1,17
40,41	0,81	1.499,47	0,00	0,00	24,99	0,00	13,71		3,54	1,17
50,65	0,80	1.016,31	0,00	0,00	24,99	0,00	16,52		3,73	1,17
60,89	0,80	731,89	0,00	0,00	24,99	0,00	19,21		3,91	1,17
81,37	0,79	430,76	0,00	0,00	24,99	0,00	24,35		4,06	1,17
91,61	0,79	343,65	0,00	0,00	24,99	0,00	26,78		4,37	1,17
101,85	0,79	281,48	0,00	0,00	24,99	0,00	29,10		4,43	1,17
112,09	0,78	238,40	0,00	0,00	24,99	0,00	31,38		4,56	1,17
132,57	0,78	178,02	0,00	0,00	24,99	0,00	35,84		4,63	1,17
153,05	0,78	138,19	0,00	0,00	24,99	0,00	40,18		4,81	1,17
173,53	0,78	110,59	0,00	0,00	24,99	0,00	44,39		4,93	1,17
214,49	0,77	75,85	0,00	0,00	24,99	0,00	52,59		5,06	1,17
255,45	0,77	55,38	0,00	0,00	24,99	0,00	60,50		5,30	1,17
296,41	0,77	42,33	0,00	0,00	24,99	0,00	68,10		5,47	1,17
337,37	0,77	33,48	0,00	0,00	24,99	0,00	75,48		5,63	1,17

Date: 21/06/2013

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Time: 11.44.14

DETAILED DISPERSION REPORT

Unique Audit Number: 149.439

Study Folder: 70977-Fase 2-Metanolo

Phast 6.6



Downwind Distance m	C/Line Height m	C/Line Conc ppm	Plume Half-width m	Plume Total Depth m	Vapor Temperature degC	Liquid Fraction fraction	Time s	Liquid Temperature degC	Centroid Velocity m/s	Cloud Density kg/m3
378,33	0,77	27,19	0,00	0,00	24,99	0,00	82,66		5,78	1,17
419,29	0,77	22,56	0,00	0,00	24,99	0,00	89,66		5,91	1,17
460,25	0,76	19,04	0,00	0,00	24,99	0,00	96,52		6,03	1,17
501,21	0,76	16,30	0,00	0,00	24,99	0,00	103,25		6,15	1,17

DETAILED DISPERSION REPORT

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Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

70977-Fase 2-Metanolo

Pompa

User Defined Source-F2

Base Case

Data



Weather: Global Weathers\Category 2/F

Speed: 2,00 m/s

Stability: F

\70977-Fase 2-Metanolo\Pompa\User Defined Source-F2

Material: METHANOL

Note: C/Line Concentration is calculated at an averaging time of: 18,75 s
Plume Width and Height are calculated at an averaging time of: 600,00 s
and a Concentration of Interest of: 6.700,00 ppm
Concentration at Height calculated at a Height of: 0,00 m

For Instantaneous releases (and if present in this report) the Mass Flowrate is the Mass of Released Material in the cloud, and the C/Line Distance is the same as the Time.

Downwind Distance m	C/Line Height m	C/Line Conc ppm	Plume Half-width m	Plume Total Depth m	Vapor Temperature degC	Liquid Fraction fraction	Time s	Liquid Temperature degC	Centroid Velocity m/s	Cloud Density kg/m3
Segment Number:	1		Start Time:	0,00	s					
0,00	1,00	934.791,30	1,32	2,15	62,75	0,05	0,00	62,75	0,12	1,23
0,01	1,00	934.791,30	1,32	2,15	62,75	0,05	0,00	62,75	0,12	1,23
0,02	1,00	866.958,69	1,22	2,08	60,79	0,05	0,13	60,79	0,15	1,22
0,04	0,99	757.649,19	1,12	1,96	57,36	0,05	0,24	57,36	0,20	1,21
0,08	0,98	609.898,54	1,06	1,86	52,06	0,04	0,41	52,06	0,27	1,20
0,15	0,96	439.596,21	1,06	1,87	44,51	0,04	0,68	44,51	0,34	1,19
0,31	0,91	273.323,50	1,15	1,97	34,44	0,03	1,10	34,44	0,41	1,19
0,62	0,82	137.779,73	1,36	2,10	25,01	0,00	1,82		0,48	1,20
0,69	0,79	119.304,22	1,42	2,14	25,01	0,00	1,98		0,49	1,19
0,77	0,77	107.436,73	1,48	2,17	25,01	0,00	2,15		0,50	1,19

Date: 21/06/2013

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Time: 11.44.36

DETAILED DISPERSION REPORT

Unique Audit Number: 149.439



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Downwind Distance m	C/Line Height m	C/Line Conc ppm	Plume Half-width m	Plume Total Depth m	Vapor Temperature degC	Liquid Fraction fraction	Time s	Liquid Temperature degC	Centroid Velocity m/s	Cloud Density kg/m3
0,84	0,74	98.439,61	1,61	2,10	25,01	0,00	2,31		0,51	1,19
0,99	0,69	84.929,90	1,95	1,99	25,01	0,00	2,62		0,52	1,19
1,14	0,63	76.800,86	2,28	1,90	25,01	0,00	2,92		0,53	1,19
1,29	0,58	71.996,49	2,61	1,82	25,01	0,00	3,22		0,54	1,19
1,44	0,52	69.181,82	2,97	1,74	25,01	0,00	3,52		0,55	1,18
1,75	0,42	66.728,72	3,61	1,62	25,01	0,00	4,09		0,57	1,18
2,05	0,31	65.367,22	3,61	1,61	25,01	0,00	4,65		0,58	1,18
2,65	0,11	63.051,96	3,62	1,64	25,00	0,00	5,73		0,61	1,18
3,27	0,00	61.106,28	3,63	1,66	25,00	0,00	6,77		0,62	1,18
3,91	0,00	59.245,11	3,64	1,80	25,00	0,00	7,84		0,58	1,18
5,19	0,00	55.730,31	3,66	1,91	25,00	0,00	10,11		0,55	1,18
7,75	0,00	49.512,57	3,68	2,05	25,00	0,00	14,83		0,53	1,18
12,87	0,00	39.805,67	3,68	2,20	25,00	0,00	24,54		0,52	1,18
15,43	0,00	35.841,89	3,65	2,09	25,00	0,00	29,27		0,56	1,18
20,55	0,00	29.549,58	3,54	2,14	25,00	0,00	38,42		0,56	1,18
30,79	0,00	20.872,17	3,04	1,91	25,00	0,00	56,13		0,60	1,18
41,03	0,00	15.365,08	1,90	1,26	25,00	0,00	72,54		0,65	1,18
61,51	0,00	9.232,96	0,00	0,00	25,00	0,00	103,06		0,69	1,17
81,99	0,00	5.994,28	0,00	0,00	25,00	0,00	130,51		0,80	1,17
86,08	0,00	5.539,39	0,00	0,00	25,00	0,00	135,44		0,86	1,17
94,27	0,00	4.781,29	0,00	0,00	25,00	0,00	145,00		0,85	1,17
110,66	0,00	3.791,81	0,00	0,00	25,00	0,00	163,68		0,90	1,17
127,04	0,00	3.107,34	0,00	0,00	25,00	0,00	181,43		0,94	1,17
159,81	0,00	2.208,74	0,00	0,00	25,00	0,00	215,53		0,98	1,17
225,35	0,00	1.290,55	0,00	0,00	25,00	0,00	279,65		1,06	1,17
325,35	0,00	704,46	0,00	0,00	25,00	0,00	368,04		1,20	1,17
425,35	0,00	444,74	0,00	0,00	25,00	0,00	446,58		1,35	1,17
525,35	0,00	307,97	0,00	0,00	25,00	0,00	518,00		1,45	1,17

DETAILED DISPERSION REPORT

Unique Audit Number: 149.439



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6



Weather: Global Weathers\Category 5/D

Speed: 5,00 m/s

Stability: D

\70977-Fase 2-Metanolo\Pompa\User Defined Source-F2

Material: METHANOL

Note: C/Line Concentration is calculated at an averaging time of: 18,75 s
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For Instantaneous releases (and if present in this report) the Mass Flowrate is the Mass of Released Material in the cloud, and the C/Line Distance is the same as the Time.

Downwind Distance m	C/Line Height m	C/Line Conc ppm	Plume Half-width m	Plume Total Depth m	Vapor Temperature degC	Liquid Fraction fraction	Time s	Liquid Temperature degC	Centroid Velocity m/s	Cloud Density kg/m3
Segment Number:	1		Start Time:	0,00	s					
0,00	1,00	934.792,24	0,94	1,88	62,75	0,05	0,00	62,75	0,25	1,23
0,01	1,00	934.792,24	0,94	1,88	62,75	0,05	0,00	62,75	0,25	1,23
0,02	1,00	827.531,05	0,70	1,40	59,59	0,05	0,04	59,59	0,49	1,22
0,03	1,00	757.787,72	0,62	1,25	57,37	0,05	0,06	57,37	0,65	1,21
0,05	1,00	660.258,33	0,57	1,13	53,97	0,04	0,08	53,97	0,88	1,20
0,09	1,00	536.030,85	0,53	1,06	49,02	0,04	0,12	49,02	1,18	1,19
0,17	1,00	394.262,86	0,52	1,04	42,11	0,04	0,18	42,11	1,54	1,19
0,33	0,99	253.071,13	0,55	1,09	32,91	0,03	0,27	32,91	1,90	1,19
0,49	0,99	179.824,38	0,58	1,17	26,43	0,01	0,35	26,43	2,09	1,20
0,81	0,99	104.619,93	0,67	1,33	24,99	0,00	0,50		2,30	1,19
1,13	0,98	67.611,24	0,75	1,49	24,99	0,00	0,64		2,40	1,18
1,77	0,97	38.274,17	1,04	1,59	24,99	0,00	0,90		2,48	1,18
2,09	0,97	32.956,67	1,16	1,53	24,99	0,00	1,03		2,49	1,18
2,41	0,96	30.154,78	1,21	1,44	24,99	0,00	1,16		2,51	1,18
2,73	0,96	27.879,54	1,19	1,45	24,99	0,00	1,28		2,52	1,18
3,37	0,95	24.091,71	1,12	1,45	24,99	0,00	1,54		2,54	1,18

Date: 21/06/2013

3 of 4

Time: 11.44.36

DETAILED DISPERSION REPORT

Unique Audit Number: 149.439



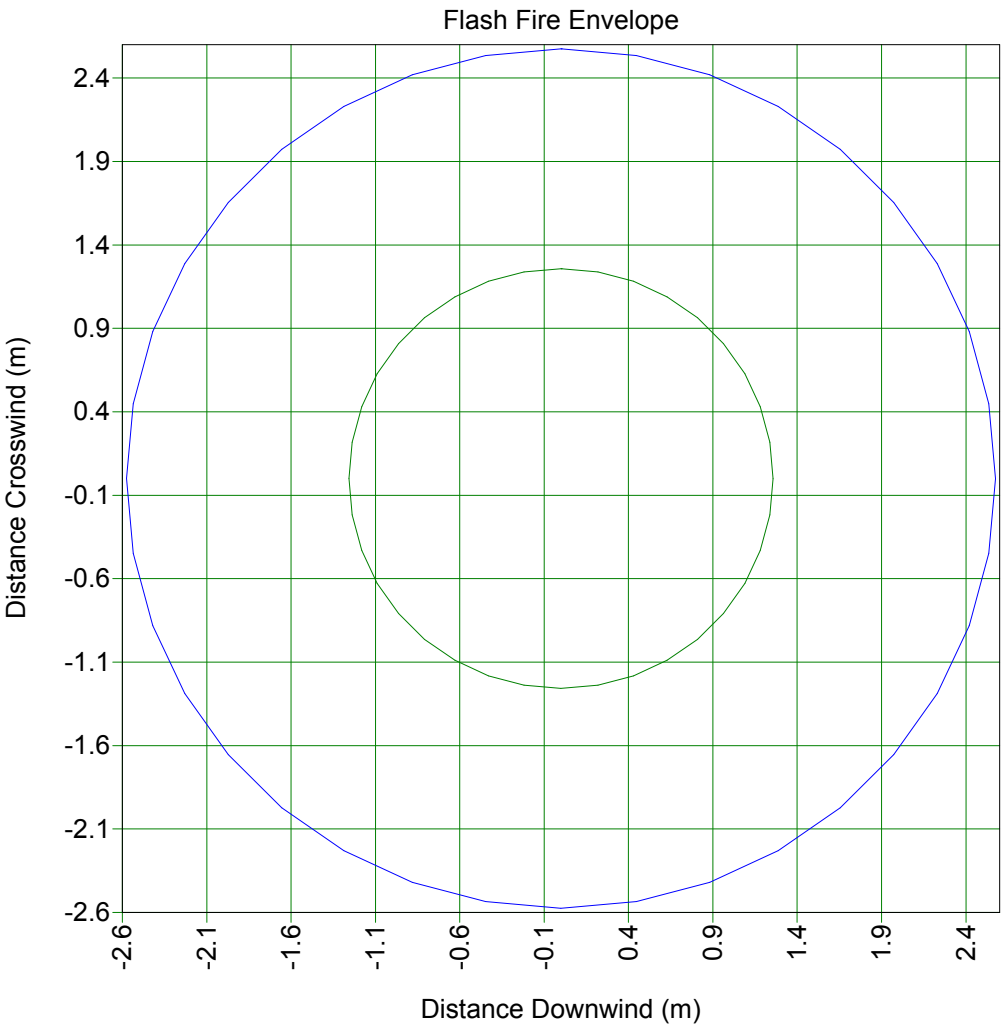
Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Downwind Distance m	C/Line Height m	C/Line Conc ppm	Plume Half-width m	Plume Total Depth m	Vapor Temperature degC	Liquid Fraction fraction	Time s	Liquid Temperature degC	Centroid Velocity m/s	Cloud Density kg/m3
4,65	0,93	18.643,59	0,92	1,33	24,99	0,00	2,04		2,57	1,18
5,93	0,91	14.942,03	0,58	0,90	24,99	0,00	2,53		2,64	1,18
7,21	0,90	12.288,90	0,00	0,00	24,99	0,00	3,01		2,70	1,18
9,77	0,89	8.805,95	0,00	0,00	24,99	0,00	3,95		2,77	1,17
14,89	0,87	5.218,82	0,00	0,00	24,99	0,00	5,76		2,89	1,17
20,01	0,86	3.452,98	0,00	0,00	24,99	0,00	7,46		3,10	1,17
30,25	0,85	1.847,89	0,00	0,00	24,99	0,00	10,68		3,25	1,17
40,49	0,84	1.141,24	0,00	0,00	24,99	0,00	13,70		3,54	1,17
50,73	0,84	772,78	0,00	0,00	24,99	0,00	16,51		3,73	1,17
60,97	0,84	556,20	0,00	0,00	24,99	0,00	19,19		3,91	1,17
81,45	0,83	327,16	0,00	0,00	24,99	0,00	24,33		4,07	1,17
91,69	0,83	260,96	0,00	0,00	24,99	0,00	26,75		4,37	1,17
101,93	0,83	213,73	0,00	0,00	24,99	0,00	29,08		4,44	1,17
112,17	0,83	181,01	0,00	0,00	24,99	0,00	31,35		4,56	1,17
132,65	0,82	135,16	0,00	0,00	24,99	0,00	35,81		4,64	1,17
153,13	0,82	104,91	0,00	0,00	24,99	0,00	40,14		4,81	1,17
173,61	0,82	83,96	0,00	0,00	24,99	0,00	44,34		4,94	1,17
214,57	0,82	57,59	0,00	0,00	24,99	0,00	52,54		5,06	1,17
255,53	0,82	42,05	0,00	0,00	24,99	0,00	60,44		5,30	1,17
296,49	0,81	32,15	0,00	0,00	24,99	0,00	68,04		5,48	1,17
337,45	0,81	25,43	0,00	0,00	24,99	0,00	75,41		5,64	1,17
378,41	0,81	20,65	0,00	0,00	24,99	0,00	82,58		5,78	1,17
419,37	0,81	17,13	0,00	0,00	24,99	0,00	89,59		5,92	1,17
460,33	0,81	14,46	0,00	0,00	24,99	0,00	96,44		6,04	1,17
501,29	0,81	12,38	0,00	0,00	24,99	0,00	103,16		6,15	1,17

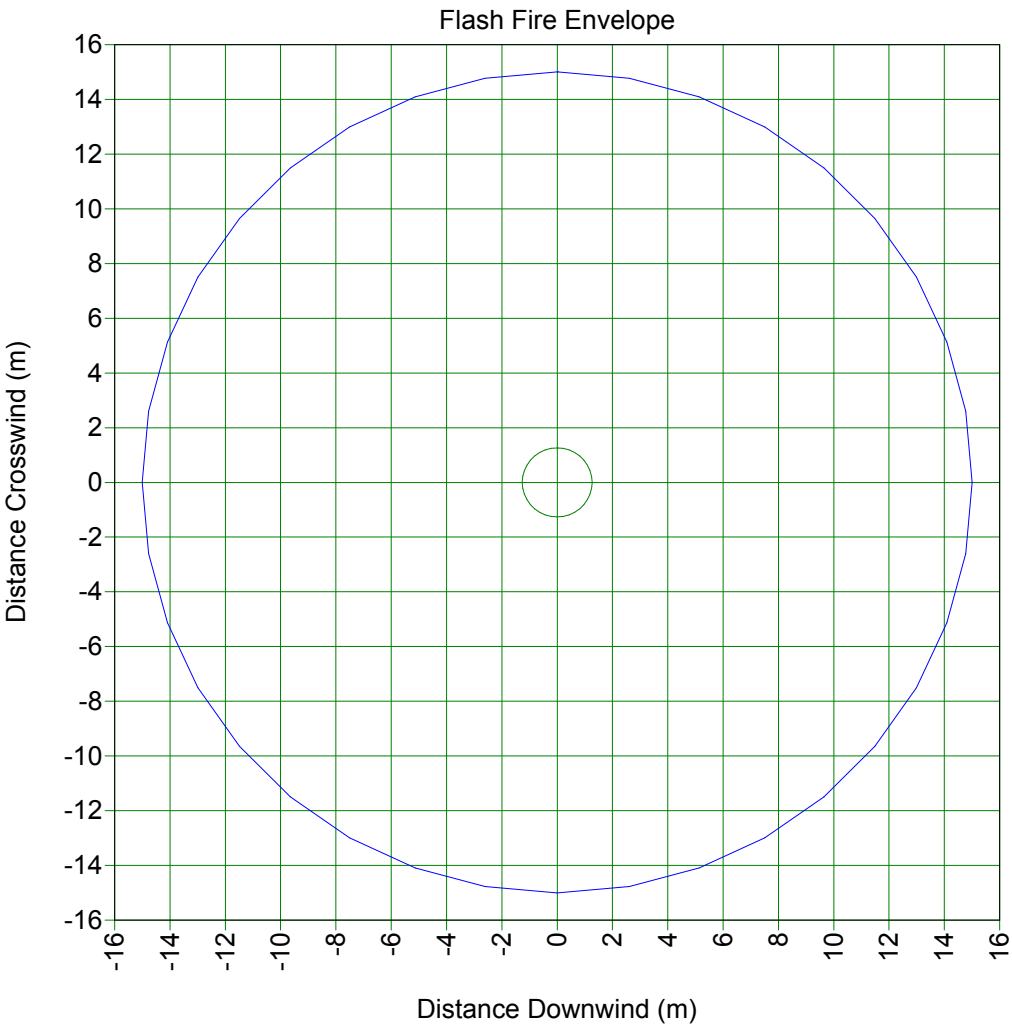
Study Folder: 70977-Fase
2-Metanolo
Audit No: 149439
Model: User Defined
Source-D5
Weather: Category 5/D
Material: METHANOL
Concentration

3.65e+004 ppm
7.3e+004 ppm



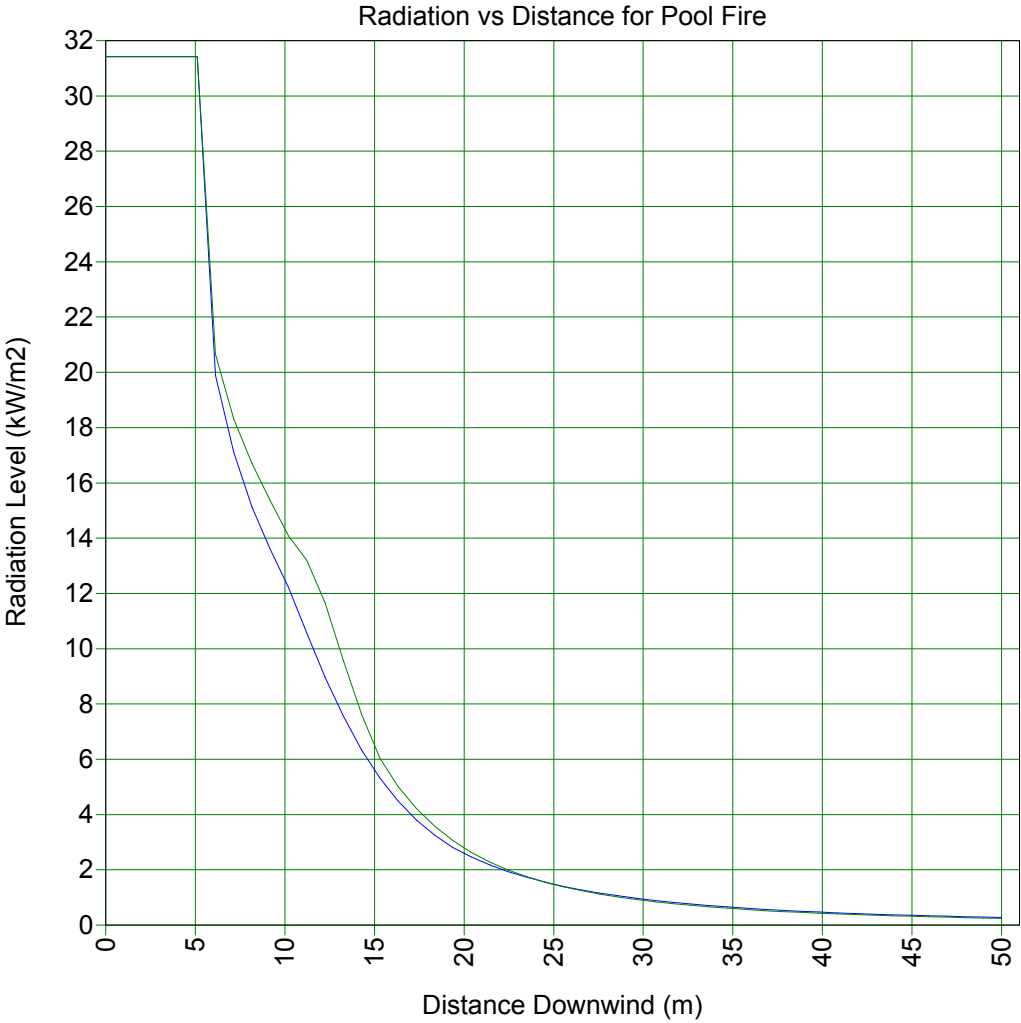
Study Folder: 70977-Fase
2-Metanolo
Audit No: 145695
Model: User Defined
Source-F2
Weather: Category 2/F
Material: METHANOL
Concentration

- 3.65e+004 ppm
- 7.3e+004 ppm



Study Folder: 70977-Fase
2-Metanolo
Audit No: 142322
Model: Pool Fire
Material: METHANOL
Weathers

Category 2/F
Category 5/D



POOL VAPORIZATION REPORT

Unique Audit Number: 142.402



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6



 70977-Fase 2-Metanolo

 Pompa

Pool Vaporization

Base Case

Data

 Weather: Global Weathers\Category 2/F

Speed: 2,00 m/s

Stability: F

\70977-Fase 2-Metanolo\Pompa\Pool Vaporization

User-Defined Quantities

Material	METHANOL
Type of Spill	Instantaneous
Surface Type	Concrete
Bund Diameter	11,00 m
Ambient Temperature	25,00 degC
Bund Surface Temperature	25,00 degC
Ambient Wind Speed	2,00 m/s
Solar Flux	1,20 kW/m2

Calculated Quantities

Status of Bund:	The Bund was hit
Maximum Pool Radius	5,50 m

Averages for Release Segment: 1

Number of Cloud Segments	1
Rainout Fraction	1,00 fraction
Spill Rate	800.000,00 kg/s
Spill Duration	0,00 s
Spill Mass	800,00 kg
Spill Temperature	25,00 degC
Mass Remaining	750,66 kg

Cloud Segments for this Release Segment

Cloud Segment	Rate	Duration	Temperature	Total Mass	Radius	Mass Air Entrained
	kg/s	s	degC	kg	m	kg/s
1	0,16	300,00	20,49	49,34	5,46	0,99

POOL VAPORIZATION REPORT

Unique Audit Number: 142.402



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6



Weather: Global Weathers\Category 5/D

Speed: 5,00 m/s

Stability: D

\70977-Fase 2-Metanolo\Pompa\Pool Vaporization

User-Defined Quantities

Material	METHANOL
Type of Spill	Instantaneous
Surface Type	Concrete
Bund Diameter	11,00 m
Ambient Temperature	25,00 degC
Bund Surface Temperature	25,00 degC
Ambient Wind Speed	5,00 m/s
Solar Flux	1,20 kW/m2

Calculated Quantities

Status of Bund:	The Bund was hit
Maximum Pool Radius	5,50 m

Averages for Release Segment: 1

Number of Cloud Segments	1
Rainout Fraction	1,00 fraction
Spill Rate	800.000,00 kg/s
Spill Duration	0,00 s
Spill Mass	800,00 kg
Spill Temperature	25,00 degC
Mass Remaining	736,78 kg

Cloud Segments for this Release Segment

Cloud Segment	Rate kg/s	Duration s	Temperature degC	Total Mass kg	Radius m	Mass Air Entrained kg/s
1	0,21	300,00	17,87	63,22	5,46	1,49

SUMMARY REPORT

Unique Audit Number: 188.261



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6



70977-Fase 2-Metanolo



Pompa

User Defined Source-D5

Base Case

CASE Name: Data

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-D5

User-Defined Data

Material

Material Identifier METHANOL

Scenario

Building Wake Effect None

Vessel/Tank

Release Type Pool Source (Radius given)

Location

[Elevation 1 m]
Concentration of Interest 6700 ppm
Averaging time associated with Concentration Toxic
Distances for Radiation Modeling and Dispersion Scope(1) 50 m
Distances for Radiation Modeling and Dispersion Scope(2) 250 m
Distances for Radiation Modeling and Dispersion Scope(3) 500 m
Use ERPG averaging time ERPG not selected
Use IDLH averaging time IDLH not selected
Use STEL averaging time STEL not selected
Supply a user defined averaging time Not supplied

Bund

Status of Bund No bund present
[Type of Bund Surface Concrete]
[Bund Height 0 m]
[Bund Failure Modeling Bund cannot fail]

Indoor/Outdoor

Location of release Open air release
Outdoor Release Direction Horizontal

Flammable

Explosion Method TNT
Jet Fire Method API Model

Dispersion

Number of Release Segments 1
Fluid Phase(1) Vapor
Duration of Discharge(1) 3600 s
Final Temperature(1) 25 degC
Release Rate(1) 0.21 kg/s
Pool Radii(1) 11 m
Pre-Dilution Air Rates(1) 0.01 kg/s

SUMMARY REPORT

Unique Audit Number: 188.261



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Late Ignition Location
Mass Inventory of material to Disperse

No ignition location
800 kg

Fireball Parameters

[Mass Modification Factor 3]
[Calculation method for fireball DNV Recommended]
[TNO model flame temperature 1727 degC]

Toxic Parameters

[Indoor Calculations Unselected]
[Wind Dependent Exchange Rate Case Specified]
[Building Exchange Rate 4 /hr]
[Tail Time 1800 s]
[Set averaging time equal to exposure time Use a fixed averaging time]
[Cut-off fraction of toxic load for exposure time calculation 0.05 fraction]
[Cut-off concentration for exposure time calculations 0 fraction]

Geometry

Shape Point
Dimension 2D
System Absolute
East(1) 0 m
North(1) 0 m

SUMMARY REPORT

Unique Audit Number: 188.261



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Consequence Results

Distance to Concentration Results

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-D5

The height for user defined concentrations is the user defined height 0 m

All toxic results are reported at the toxic effect height 0 m

All flammable results are reported at the cloud centreline height

Concentration(ppm) Averaging Time				Distance (m)	
				Category 2/F	Category 5/D
User Conc (6700)	600	s		53.1026	0.0136008
UFL (360000)	18.75	s		0.2479	0.225281
LFL (73000)	18.75	s		1.70516	1.25755
LFL Frac (36500)	18.75	s		18.1956	2.5746

Concentration(ppm) Averaging Time				Heights (m) for above distances	
				Category 2/F	Category 5/D
User Conc (6700)	600	s		0	0
UFL (360000)	18.75	s		0.920718	0.995503
LFL (73000)	18.75	s		0.383519	0.977575
LFL Frac (36500)	18.75	s		0	0.953461

SUMMARY REPORT

Study Folder: 70977-Fase 2-Metanolo

Unique Audit Number: 188.261

Phast 6.6



Concentration At Distance Results

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-D5

The height for user defined concentrations is the user defined height 0 m

All toxic results are reported at the toxic effect height 0 m

All flammable results are reported at the cloud centreline height

Distance		Conc.(ppm) at Flammable Avg.Time of 18.75 s	
		Category 2/F	Category 5/D
50	m	14774.4	1047.1
250	m	1437.91	58.1049
500	m	441.806	16.3817

Distance		Heights (m) for above concentrations	
		Category 2/F	Category 5/D
50	m	0	0.802533
250	m	0	0.771236
500	m	0	0.763882

Distance		Conc.(ppm) at Toxic Avg.Time of 600 s	
		Category 2/F	Category 5/D
50	m	7387.19	516.483
250	m	718.954	29.0208
500	m	220.903	8.18755

Distance		Heights (m) for above concentrations	
		Category 2/F	Category 5/D
50	m	0	0
250	m	0	0
500	m	0	0

Distance		Conc.(ppm) at Core Avg.Time of 18.75 s	
		Category 2/F	Category 5/D
50	m	14774.4	1032.97
250	m	1437.91	58.0416
500	m	441.806	16.3751

Distance		Heights (m) for above concentrations	
		Category 2/F	Category 5/D
50	m	0	0
250	m	0	0
500	m	0	0

Distance to Equivalent Toxic Dose

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-D5

Toxic Calculation Method = Mixture Probit

Concentration(ppm) Reference Time		Distance (m)	
		Category 2/F	Category 5/D
User Conc (6700)	600 s	185.919	31.6863

SUMMARY REPORT

Unique Audit Number: 188.261



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Time to Equivalent Toxic Dose

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-D5

Toxic Calculation Method = Mixture Probit

At 50 m

Concentration(ppm)	Reference Time		Category 2/F	Time (s)	Category 5/D
User Conc (6700)	600	s	631.347	No Hazard	No Hazard

At 250 m

Concentration(ppm)	Reference Time		Category 2/F	Time (s)	Category 5/D
User Conc (6700)	600	s	No Hazard	No Hazard	No Hazard

At 500 m

Concentration(ppm)	Reference Time		Category 2/F	Time (s)	Category 5/D
User Conc (6700)	600	s	No Hazard	No Hazard	No Hazard

Late Pool Fire Hazard

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-D5

	Category 2/F	Category 5/D
Late Pool Fire Status	Hazard	Hazard

Radiation Effects: Late Pool Fire Ellipse

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-D5

			Category 2/F	Distance (m)	Category 5/D
Radiation Level	4	kW/m2	31.9226	32.8968	
Radiation Level	12.5	kW/m2	19.8206	22.512	
Radiation Level	37.5	kW/m2	Not Reached	Not Reached	

Radiation Effects: Late Pool Fire Distance

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-D5

			Category 2/F	Radiation Level (kW/m2)	Category 5/D
Distance Of Interest	50	m	1.25595	1.22453	
Distance Of Interest	250	m	0.0297453	0.0259814	
Distance Of Interest	500	m	0.00635365	0.00550813	

SUMMARY REPORT

Unique Audit Number: 188.261



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Flash Fire Envelope

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-D5

All flammable results are reported at the cloud centreline height

				Distance (m)	
				Category 2/F	Category 5/D
Furthest Extent	36500	ppm		18.1956	2.5746
Furthest Extent	73000	ppm		1.70516	1.25755
				Heights (m) for above distances	
				Category 2/F	Category 5/D
Furthest Extent	36500	ppm		0	0.953461
Furthest Extent	73000	ppm		0.383519	0.977575

SUMMARY REPORT

Unique Audit Number: 188.261



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Explosion Effects: Late Ignition

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-D5

Explosion Model Used : TNT

Explosion Location Criterion: Cloud Front (LFL Fraction)

All distances are measured from the Source

All flammable results are reported at the cloud centreline height

			Maximum Distance (m) at Overpressure Level Category 2/F
Overpressure	0.02068	bar	27.5593
Overpressure	0.1379	bar	14.5465
Overpressure	0.2068	bar	13.518

			Supplementary Data at 0.02068 bar Category 2/F
Supplied Flammable Mass	kg		0.34897
Used Flammable Mass	kg		0.34897
Overpressure Radius	m		17.5593
Distance to:			
- Ignition Source	m		10
- Cloud Front/Centre	m		10
- Explosion Centre	m		10

			Supplementary Data at 0.1379 bar Category 2/F
Supplied Flammable Mass	kg		0.34897
Used Flammable Mass	kg		0.34897
Overpressure Radius	m		4.54655
Distance to:			
- Ignition Source	m		10
- Cloud Front/Centre	m		10
- Explosion Centre	m		10

			Supplementary Data at 0.2068 bar Category 2/F
Supplied Flammable Mass	kg		0.34897
Used Flammable Mass	kg		0.34897
Overpressure Radius	m		3.51802
Distance to:			
- Ignition Source	m		10
- Cloud Front/Centre	m		10
- Explosion Centre	m		10

			Overpressures (bar gauge) at Distances Category 2/F
Distance	50	m	0.00792141
Distance	250	m	0.00163528
Distance	500	m	0.00106063

			Supplementary Data at 50 m Category 2/F
Supplied Flammable Mass	kg		0.34897

SUMMARY REPORT

Unique Audit Number: 188.261



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Used Flammable Mass	kg	0.34897
Supplementary Data at 250 m Category 2/F		
Supplied Flammable Mass	kg	0.34897
Used Flammable Mass	kg	0.34897
Supplementary Data at 500 m Category 2/F		
Supplied Flammable Mass	kg	0.34897
Used Flammable Mass	kg	0.34897

Weather Conditions

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-D5

		Category 2/F	Category 5/D
Wind Speed	m/s	2	5
Pasquill Stability		F	D
Surface Roughness Length	mm	1000	1000
Surface Roughness Parameter		0.173718	0.173718
Atmospheric Temperature	degC	25	25
Surface Temperature	degC	25	25
Relative Humidity	fraction	0.75	0.75

SUMMARY REPORT

Unique Audit Number: 188.260



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6



70977-Fase 2-Metanolo



Pompa

User Defined Source-F2

Base Case

CASE Name: Data

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-F2

User-Defined Data

Material

Material Identifier METHANOL

Scenario

Building Wake Effect None

Vessel/Tank

Release Type Pool Source (Radius given)

Location

[Elevation 1 m]
Concentration of Interest 6700 ppm
Averaging time associated with Concentration Toxic
Distances for Radiation Modeling and Dispersion Scope(1) 50 m
Distances for Radiation Modeling and Dispersion Scope(2) 250 m
Distances for Radiation Modeling and Dispersion Scope(3) 500 m
Use ERPG averaging time ERPG not selected
Use IDLH averaging time IDLH not selected
Use STEL averaging time STEL not selected
Supply a user defined averaging time Not supplied

Bund

Status of Bund No bund present
[Type of Bund Surface Concrete]
[Bund Height 0 m]
[Bund Failure Modeling Bund cannot fail]

Indoor/Outdoor

Location of release Open air release
Outdoor Release Direction Horizontal

Flammable

Explosion Method TNT
Jet Fire Method API Model

Dispersion

Number of Release Segments 1
Fluid Phase(1) Vapor
Duration of Discharge(1) 3600 s
Final Temperature(1) 25 degC
Release Rate(1) 0.16 kg/s
Pool Radii(1) 11 m
Pre-Dilution Air Rates(1) 0.01 kg/s

SUMMARY REPORT

Unique Audit Number: 188.260



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Late Ignition Location
Mass Inventory of material to Disperse

No ignition location
800 kg

Fireball Parameters

[Mass Modification Factor 3]
[Calculation method for fireball DNV Recommended]
[TNO model flame temperature 1727 degC]

Toxic Parameters

[Indoor Calculations Unselected]
[Wind Dependent Exchange Rate Case Specified]
[Building Exchange Rate 4 /hr]
[Tail Time 1800 s]
[Set averaging time equal to exposure time Use a fixed averaging time]
[Cut-off fraction of toxic load for exposure time calculation 0.05 fraction]
[Cut-off concentration for exposure time calculations 0 fraction]

Geometry

Shape Point
Dimension 2D
System Absolute
East(1) 0 m
North(1) 0 m

SUMMARY REPORT

Unique Audit Number: 188.260



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Consequence Results

Distance to Concentration Results

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-F2

The height for user defined concentrations is the user defined height 0 m

All toxic results are reported at the toxic effect height 0 m

All flammable results are reported at the cloud centreline height

Concentration(ppm) Averaging Time				Distance (m)	
				Category 2/F	Category 5/D
User Conc (6700)	600	s		47.5887	No Hazard
UFL (360000)	18.75	s		0.228564	0.210663
LFL (73000)	18.75	s		1.2622	1.08514
LFL Frac (36500)	18.75	s		15.0007	1.87841
Concentration(ppm) Averaging Time				Heights (m) for above distances	
				Category 2/F	Category 5/D
User Conc (6700)	600	s		0	0
UFL (360000)	18.75	s		0.934735	0.996406
LFL (73000)	18.75	s		0.590187	0.982884
LFL Frac (36500)	18.75	s		0	0.971175

SUMMARY REPORT

Study Folder: 70977-Fase 2-Metanolo

Unique Audit Number: 188.260

Phast 6.6



Concentration At Distance Results

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-F2

The height for user defined concentrations is the user defined height 0 m

All toxic results are reported at the toxic effect height 0 m

All flammable results are reported at the cloud centreline height

Distance		Conc.(ppm) at Flammable Avg.Time of 18.75 s	
		Category 2/F	Category 5/D
50	m	12678	799.091
250	m	1146.05	44.1499
500	m	342.638	12.4495

Distance		Heights (m) for above concentrations	
		Category 2/F	Category 5/D
50	m	0	0.840022
250	m	0	0.816167
500	m	0	0.810572

Distance		Conc.(ppm) at Toxic Avg.Time of 600 s	
		Category 2/F	Category 5/D
50	m	6339	393.629
250	m	573.027	22.0481
500	m	171.319	6.22192

Distance		Heights (m) for above concentrations	
		Category 2/F	Category 5/D
50	m	0	0
250	m	0	0
500	m	0	0

Distance		Conc.(ppm) at Core Avg.Time of 18.75 s	
		Category 2/F	Category 5/D
50	m	12678	787.257
250	m	1146.05	44.0962
500	m	342.638	12.4438

Distance		Heights (m) for above concentrations	
		Category 2/F	Category 5/D
50	m	0	0
250	m	0	0
500	m	0	0

Distance to Equivalent Toxic Dose

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-F2

Toxic Calculation Method = Mixture Probit

Concentration(ppm) Reference Time		Distance (m)	
		Category 2/F	Category 5/D
User Conc (6700)	600 s	160.385	27.222

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Time to Equivalent Toxic Dose

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-F2

Toxic Calculation Method = Mixture Probit

At 50 m

Concentration(ppm)	Reference Time		Category 2/F	Time (s)	Category 5/D
User Conc (6700)	600	s	720.066	No Hazard	No Hazard

At 250 m

Concentration(ppm)	Reference Time		Category 2/F	Time (s)	Category 5/D
User Conc (6700)	600	s	No Hazard	No Hazard	No Hazard

At 500 m

Concentration(ppm)	Reference Time		Category 2/F	Time (s)	Category 5/D
User Conc (6700)	600	s	No Hazard	No Hazard	No Hazard

Late Pool Fire Hazard

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-F2

	Category 2/F	Category 5/D
Late Pool Fire Status	Hazard	Hazard

Radiation Effects: Late Pool Fire Ellipse

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-F2

			Category 2/F	Distance (m)	Category 5/D
Radiation Level	4	kW/m2	31.9226	32.8968	
Radiation Level	12.5	kW/m2	19.8206	22.512	
Radiation Level	37.5	kW/m2	Not Reached	Not Reached	

Radiation Effects: Late Pool Fire Distance

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-F2

			Category 2/F	Radiation Level (kW/m2)	Category 5/D
Distance Of Interest	50	m	1.25595	1.22453	
Distance Of Interest	250	m	0.0297453	0.0259814	
Distance Of Interest	500	m	0.00635365	0.00550813	

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Flash Fire Envelope

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-F2

All flammable results are reported at the cloud centreline height

				Distance (m)	
				Category 2/F	Category 5/D
Furthest Extent	36500	ppm		15.0007	1.87841
Furthest Extent	73000	ppm		1.2622	1.08514
				Heights (m) for above distances	
				Category 2/F	Category 5/D
Furthest Extent	36500	ppm		0	0.971175
Furthest Extent	73000	ppm		0.590187	0.982884

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Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Explosion Effects: Late Ignition

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-F2

Explosion Model Used : TNT

Explosion Location Criterion: Cloud Front (LFL Fraction)

All distances are measured from the Source

All flammable results are reported at the cloud centreline height

			Maximum Distance (m) at Overpressure Level Category 2/F
Overpressure	0.02068	bar	25.1214
Overpressure	0.1379	bar	13.9153
Overpressure	0.2068	bar	13.0296

			Supplementary Data at 0.02068 bar Category 2/F
Supplied Flammable Mass	kg		0.222862
Used Flammable Mass	kg		0.222862
Overpressure Radius	m		15.1214
Distance to:			
- Ignition Source	m		10
- Cloud Front/Centre	m		10
- Explosion Centre	m		10

			Supplementary Data at 0.1379 bar Category 2/F
Supplied Flammable Mass	kg		0.222862
Used Flammable Mass	kg		0.222862
Overpressure Radius	m		3.9153
Distance to:			
- Ignition Source	m		10
- Cloud Front/Centre	m		10
- Explosion Centre	m		10

			Supplementary Data at 0.2068 bar Category 2/F
Supplied Flammable Mass	kg		0.222862
Used Flammable Mass	kg		0.222862
Overpressure Radius	m		3.02957
Distance to:			
- Ignition Source	m		10
- Cloud Front/Centre	m		10
- Explosion Centre	m		10

			Overpressures (bar gauge) at Distances Category 2/F
Distance	50	m	0.00676159
Distance	250	m	0.00147997
Distance	500	m	0.001

			Supplementary Data at 50 m Category 2/F
Supplied Flammable Mass	kg		0.222862

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Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Used Flammable Mass	kg	0.222862
Supplementary Data at 250 m		
Category 2/F		
Supplied Flammable Mass	kg	0.222862
Used Flammable Mass	kg	0.222862
Supplementary Data at 500 m		
Category 2/F		
Supplied Flammable Mass	kg	0.222862
Used Flammable Mass	kg	0.222862

Weather Conditions

Path: \70977-Fase 2-Metanolo\Pompa\User Defined Source-F2

		Category 2/F	Category 5/D
Wind Speed	m/s	2	5
Pasquill Stability		F	D
Surface Roughness Length	mm	1000	1000
Surface Roughness Parameter		0.173718	0.173718
Atmospheric Temperature	degC	25	25
Surface Temperature	degC	25	25
Relative Humidity	fraction	0.75	0.75