

ANNESSO TECNICO 6.

**Elaborati di calcolo
Scenari incidentali ragionevolmente credibili**

Ipotesi N. 31

TRR S.r.l.

Il Direttore Generale

Ing. Alfredo Romano


DISCHARGE SUMMARY

Study Folder: 70977-Fase 2-Metanolo

Unique Audit Number: 169.060

Phast 6.6



 70977-Fase 2-Metanolo

 Tubazione

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\Tubazione\Vessel/Pipe Source

User-Defined Quantities

Material	METHANOL
Temperature	25,00 degC
Pressure	155,01 bar
Inventory	60,00 kg
Scenario	Line rupture

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	29,64	degC
Final Velocity	48,48	m/s
Droplet Diameter	99,01	um
Continuous Release Data:		
Mass Flowrate	7.47454E+001	kg/s
Release Duration	0,80	s
Orifice Velocity	48,48	m/s
Exit Pressure	1,01	bar
Exit Temperature	29,64	degC
Discharge Coefficient	1,00	
Expanded Radius	0,03	m

DISCHARGE SUMMARY

Study Folder: 70977-Fase 2-Metanolo

Unique Audit Number: 169.060

Phast 6.6



Weather: Global Weathers\Category 5/D

Speed: 5.00 m/s

Stability: D

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

User-Defined Quantities

Material	METHANOL
Temperature	25,00 degC
Pressure	155,01 bar
Inventory	60,00 kg
Scenario	Line rupture

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	29,64	degC
Final Velocity	48,48	m/s
Droplet Diameter	99,01	um
Continuous Release Data:		
Mass Flowrate	7.47454E+001	kg/s
Release Duration	0,80	s
Orifice Velocity	48,48	m/s
Exit Pressure	1,01	bar
Exit Temperature	29,64	degC
Discharge Coefficient	1,00	
Expanded Radius	0,03	m

DISCHARGE SUMMARY

Study Folder: 70977-Fase 2-Metanolo

Unique Audit Number: 169.060

Phast 6.6



DETAILED DISPERSION REPORT

Unique Audit Number: 188.235



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

 70977-Fase 2-Metanolo

 Tubazione

User Defined Source-D5

Base Case

Data

 Weather: Global Weathers\Category 2/F

Speed: 2,00 m/s Stability: F

\70977-Fase 2-Metanolo\Tubazione\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	728.841,74	0,49	0,85	56,40	0,05	0,00	56,40	0,20	1,21
0,01	1,00	728.841,74	0,49	0,85	56,40	0,05	0,00	56,40	0,20	1,21
0,02	1,00	668.593,58	0,48	0,83	54,28	0,04	0,09	54,28	0,23	1,20
0,04	1,00	571.985,99	0,47	0,81	50,54	0,04	0,17	50,54	0,27	1,20
0,08	0,99	440.374,40	0,47	0,82	44,55	0,04	0,30	44,55	0,33	1,19
0,15	0,98	293.112,37	0,50	0,87	35,86	0,03	0,53	35,86	0,39	1,19
0,31	0,96	159.749,58	0,56	1,01	25,01	0,00	0,91		0,45	1,20
0,63	0,90	66.387,65	0,71	1,32	25,02	0,00	1,58		0,50	1,18
0,94	0,84	40.001,35	0,95	1,47	25,02	0,00	2,21		0,51	1,18
1,26	0,78	33.750,16	1,18	1,38	25,02	0,00	2,84		0,52	1,18

Date: 21/06/2013

1 of 4

Time: 14.20.48

DETAILED DISPERSION REPORT

Unique Audit Number:

188.235



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
1,57	0,71	32.485,94	1,17	1,41	25,01	0,00	3,46		0,52	1,18
1,88	0,62	31.320,99	1,16	1,37	25,01	0,00	4,07		0,53	1,18
2,19	0,54	30.256,27	1,16	1,32	25,01	0,00	4,67		0,54	1,18
2,81	0,40	28.402,38	1,15	1,27	25,01	0,00	5,85		0,55	1,18
3,44	0,28	26.839,89	1,14	1,26	25,01	0,00	7,02		0,55	1,18
4,70	0,07	24.285,00	1,11	1,22	25,00	0,00	9,34		0,55	1,18
5,97	0,00	22.206,41	1,08	1,18	25,00	0,00	11,67		0,55	1,18
8,53	0,00	18.757,53	0,97	1,10	25,00	0,00	16,43		0,53	1,18
13,65	0,00	13.883,86	0,37	0,49	25,00	0,00	26,19		0,52	1,18
18,77	0,00	10.641,16	0,00	0,00	25,00	0,00	35,78		0,55	1,17
29,01	0,00	6.783,89	0,00	0,00	25,00	0,00	54,07		0,57	1,17
39,25	0,00	4.629,82	0,00	0,00	25,00	0,00	71,05		0,63	1,17
59,73	0,00	2.522,24	0,00	0,00	25,00	0,00	102,41		0,67	1,17
80,21	0,00	1.534,83	0,00	0,00	25,00	0,00	130,54		0,78	1,17
84,31	0,00	1.403,93	0,00	0,00	25,00	0,00	135,56		0,85	1,17
92,50	0,00	1.189,73	0,00	0,00	25,00	0,00	145,31		0,84	1,17
94,14	0,00	1.151,59	0,00	0,00	25,00	0,00	147,21		0,89	1,17
97,41	0,00	1.081,64	0,00	0,00	25,00	0,00	150,95		0,87	1,17
100,69	0,00	1.018,84	0,00	0,00	25,00	0,00	154,66		0,90	1,17
103,97	0,00	969,51	0,00	0,00	25,00	0,00	158,31		0,90	1,17
110,52	0,00	881,18	0,00	0,00	25,00	0,00	165,56		0,91	1,17
123,63	0,00	738,14	0,00	0,00	25,00	0,00	179,81		0,93	1,17
149,84	0,00	541,29	0,00	0,00	25,00	0,00	207,48		0,97	1,17
202,27	0,00	329,13	0,00	0,00	25,00	0,00	259,93		1,03	1,17
302,27	0,00	165,31	0,00	0,00	25,00	0,00	351,63		1,15	1,17
402,27	0,00	99,32	0,00	0,00	25,00	0,00	432,62		1,32	1,17
502,27	0,00	66,72	0,00	0,00	25,00	0,00	505,61		1,42	1,17

DETAILED DISPERSION REPORT

Unique Audit Number: 188.235



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\Tubazione\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	728.844,79	0,26	0,52	56,40	0,05	0,00	56,40	0,72	1,21
0,01	1,00	728.844,79	0,26	0,52	56,40	0,05	0,00	56,40	0,72	1,21
0,02	1,00	649.124,30	0,24	0,49	53,56	0,04	0,02	53,56	0,91	1,20
0,04	1,00	540.212,98	0,23	0,46	49,20	0,04	0,04	49,20	1,17	1,19
0,08	1,00	408.896,28	0,22	0,45	42,91	0,04	0,07	42,91	1,50	1,19
0,16	1,00	271.899,46	0,23	0,47	34,34	0,03	0,12	34,34	1,85	1,19
0,32	1,00	151.784,09	0,26	0,52	24,99	0,00	0,20		2,17	1,20
0,64	1,00	66.820,54	0,32	0,65	24,99	0,00	0,34		2,40	1,18
0,96	0,99	39.479,08	0,43	0,68	24,99	0,00	0,47		2,47	1,18
1,28	0,99	29.871,12	0,52	0,60	24,99	0,00	0,60		2,50	1,18
1,60	0,99	24.943,38	0,49	0,59	24,99	0,00	0,73		2,51	1,18
2,24	0,98	18.217,40	0,39	0,50	24,99	0,00	0,98		2,53	1,18
3,52	0,97	11.028,16	0,00	0,00	24,99	0,00	1,48		2,55	1,17
6,08	0,95	5.416,48	0,00	0,00	24,99	0,00	2,48		2,57	1,17
8,64	0,94	3.274,53	0,00	0,00	24,99	0,00	3,47		2,63	1,17
11,20	0,94	2.207,77	0,00	0,00	24,99	0,00	4,42		2,75	1,17

Date: 21/06/2013

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Time: 14.20.48

DETAILED DISPERSION REPORT

Unique Audit Number:

188.235



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
16,32	0,93	1.215,79	0,00	0,00	24,99	0,00	6,24		2,87	1,17
21,44	0,93	769,05	0,00	0,00	24,99	0,00	7,96		3,08	1,17
31,68	0,93	391,13	0,00	0,00	24,99	0,00	11,20		3,23	1,17
41,92	0,93	234,69	0,00	0,00	24,99	0,00	14,23		3,53	1,17
52,16	0,93	156,04	0,00	0,00	24,99	0,00	17,05		3,72	1,17
72,64	0,92	83,19	0,00	0,00	24,99	0,00	22,42		3,91	1,17
93,12	0,92	51,07	0,00	0,00	24,99	0,00	27,44		4,25	1,17
103,36	0,92	41,59	0,00	0,00	24,99	0,00	29,79		4,47	1,17
113,60	0,92	35,11	0,00	0,00	24,99	0,00	32,06		4,55	1,17
134,08	0,92	26,08	0,00	0,00	24,99	0,00	36,52		4,64	1,17
175,04	0,92	16,13	0,00	0,00	24,99	0,00	45,19		4,81	1,17
216,00	0,92	11,00	0,00	0,00	24,99	0,00	53,46		5,10	1,17
256,96	0,92	8,01	0,00	0,00	24,99	0,00	61,34		5,29	1,17
297,92	0,92	6,11	0,00	0,00	24,99	0,00	68,95		5,48	1,17
338,88	0,92	4,82	0,00	0,00	24,99	0,00	76,32		5,64	1,17
379,84	0,92	3,91	0,00	0,00	24,99	0,00	83,49		5,78	1,17
461,76	0,92	2,74	0,00	0,00	24,99	0,00	97,49		5,92	1,17
543,68	0,92	2,03	0,00	0,00	24,99	0,00	111,02		6,19	1,17

DETAILED DISPERSION REPORT

Unique Audit Number: 188.216



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

70977-Fase 2-Metanolo

Tubazione

User Defined Source-F2

Base Case

Data



Weather: Global Weathers\Category 2/F

Speed: 2,00 m/s

Stability: F

\70977-Fase 2-Metanolo\Tubazione\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	641.823,83	0,39	0,67	53,29	0,04	0,00	53,29	0,24	1,20
0,01	1,00	641.823,83	0,39	0,67	53,29	0,04	0,00	53,29	0,24	1,20
0,01	1,00	589.631,28	0,38	0,67	51,26	0,04	0,08	51,26	0,26	1,20
0,03	1,00	505.082,86	0,38	0,66	47,65	0,04	0,15	47,65	0,30	1,19
0,07	1,00	387.838,89	0,39	0,68	41,75	0,04	0,27	41,75	0,35	1,19
0,15	0,99	254.784,04	0,42	0,74	33,04	0,03	0,49	33,04	0,41	1,19
0,31	0,97	134.410,29	0,48	0,87	25,02	0,00	0,85		0,46	1,20
0,63	0,91	53.532,07	0,61	1,15	25,02	0,00	1,52		0,50	1,18
0,94	0,86	31.673,64	0,80	1,25	25,02	0,00	2,15		0,51	1,18
1,26	0,82	26.576,64	0,93	1,11	25,02	0,00	2,77		0,51	1,18

Date: 21/06/2013

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Time: 14.19.54

DETAILED DISPERSION REPORT

Unique Audit Number:

188.216



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
1,58	0,76	25.481,77	0,91	1,12	25,02	0,00	3,39		0,52	1,18
2,20	0,61	23.534,35	0,88	1,16	25,01	0,00	4,62		0,53	1,18
2,82	0,46	21.907,03	0,85	1,11	25,01	0,00	5,82		0,54	1,18
3,45	0,35	20.548,33	0,82	1,06	25,01	0,00	7,01		0,54	1,18
4,72	0,18	18.359,85	0,75	0,96	25,00	0,00	9,38		0,54	1,18
5,99	0,04	16.618,56	0,66	0,82	25,00	0,00	11,75		0,54	1,18
8,54	0,00	13.895,86	0,30	0,41	25,00	0,00	16,53		0,53	1,18
11,10	0,00	11.791,35	0,00	0,00	25,00	0,00	21,38		0,52	1,18
16,22	0,00	8.803,05	0,00	0,00	25,00	0,00	31,19		0,52	1,17
21,34	0,00	6.779,54	0,00	0,00	25,00	0,00	40,69		0,56	1,17
31,58	0,00	4.360,17	0,00	0,00	25,00	0,00	58,78		0,58	1,17
52,06	0,00	2.182,71	0,00	0,00	25,00	0,00	92,45		0,64	1,17
72,54	0,00	1.266,12	0,00	0,00	25,00	0,00	122,04		0,74	1,17
93,02	0,00	812,82	0,00	0,00	25,00	0,00	148,34		0,81	1,17
113,50	0,00	586,85	0,00	0,00	25,00	0,00	172,30		0,89	1,17
133,98	0,00	448,77	0,00	0,00	25,00	0,00	194,69		0,93	1,17
174,94	0,00	288,72	0,00	0,00	25,00	0,00	237,36		0,99	1,17
256,86	0,00	149,84	0,00	0,00	25,00	0,00	316,48		1,09	1,17
356,86	0,00	83,64	0,00	0,00	25,00	0,00	402,38		1,24	1,17
456,86	0,00	53,63	0,00	0,00	25,00	0,00	479,00		1,37	1,17
556,86	0,00	37,45	0,00	0,00	25,00	0,00	549,29		1,48	1,17

DETAILED DISPERSION REPORT

Unique Audit Number: 188.216



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\Tubazione\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	641.827,37	0,20	0,40	53,29	0,04	0,00	53,29	0,93	1,20
0,01	1,00	641.827,37	0,20	0,40	53,29	0,04	0,00	53,29	0,93	1,20
0,01	1,00	575.249,70	0,19	0,38	50,67	0,04	0,02	50,67	1,09	1,20
0,03	1,00	479.838,31	0,18	0,37	46,48	0,04	0,03	46,48	1,32	1,19
0,07	1,00	361.242,41	0,18	0,37	40,22	0,04	0,06	40,22	1,62	1,19
0,15	1,00	236.377,34	0,20	0,39	31,57	0,02	0,11	31,57	1,94	1,19
0,31	1,00	128.125,35	0,22	0,45	24,99	0,00	0,18		2,23	1,19
0,63	1,00	53.962,16	0,28	0,56	24,99	0,00	0,32		2,43	1,18
0,95	0,99	31.042,34	0,36	0,57	24,99	0,00	0,45		2,50	1,18
1,27	0,99	23.112,67	0,40	0,46	24,99	0,00	0,58		2,52	1,18
1,59	0,99	19.063,50	0,34	0,42	24,99	0,00	0,71		2,53	1,18
2,23	0,99	13.660,73	0,09	0,12	24,99	0,00	0,96		2,54	1,18
3,51	0,98	8.062,37	0,00	0,00	24,99	0,00	1,46		2,56	1,17
6,07	0,96	3.846,36	0,00	0,00	24,99	0,00	2,46		2,57	1,17
8,63	0,96	2.288,00	0,00	0,00	24,99	0,00	3,44		2,63	1,17
11,19	0,95	1.527,42	0,00	0,00	24,99	0,00	4,39		2,75	1,17

Date: 21/06/2013

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Time: 14.19.54

DETAILED DISPERSION REPORT

Unique Audit Number:

188.216



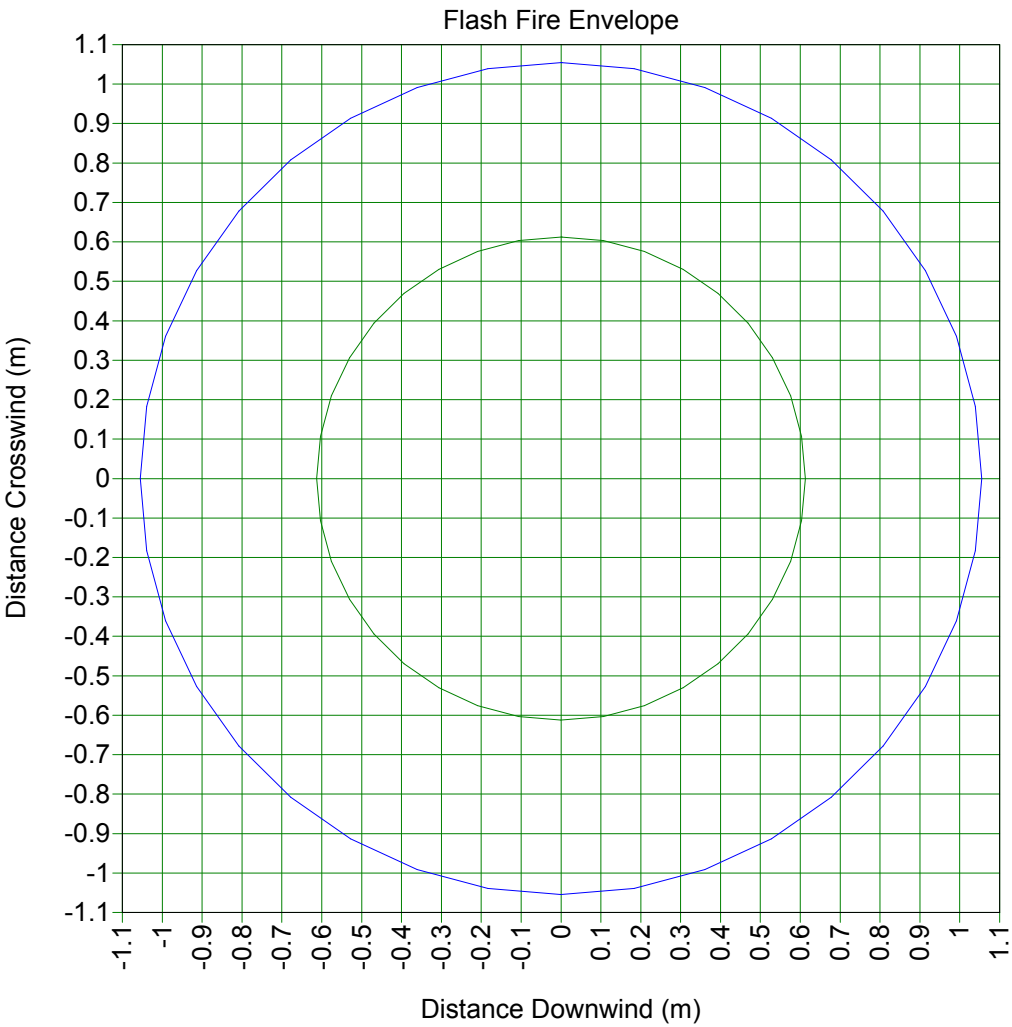
Study Folder: 70977-Fase 2-Metanolo

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
16,31	0,95	831,60	0,00	0,00	24,99	0,00	6,22		2,86	1,17
26,55	0,95	362,91	0,00	0,00	24,99	0,00	9,66		3,08	1,17
36,79	0,95	201,22	0,00	0,00	24,99	0,00	12,82		3,41	1,17
47,03	0,94	127,52	0,00	0,00	24,99	0,00	15,73		3,62	1,17
67,51	0,94	64,35	0,00	0,00	24,99	0,00	21,23		3,82	1,17
87,99	0,94	38,26	0,00	0,00	24,99	0,00	26,35		4,18	1,17
98,23	0,94	30,71	0,00	0,00	24,99	0,00	28,74		4,42	1,17
103,35	0,94	27,97	0,00	0,00	24,99	0,00	29,89		4,50	1,17
108,47	0,94	25,64	0,00	0,00	24,99	0,00	31,02		4,53	1,17
118,71	0,94	21,79	0,00	0,00	24,99	0,00	33,27		4,58	1,17
139,19	0,94	16,35	0,00	0,00	24,99	0,00	37,69		4,67	1,17
180,15	0,94	10,25	0,00	0,00	24,99	0,00	46,30		4,84	1,17
221,11	0,94	7,05	0,00	0,00	24,99	0,00	54,52		5,12	1,17
262,07	0,94	5,16	0,00	0,00	24,99	0,00	62,37		5,32	1,17
303,03	0,94	3,96	0,00	0,00	24,99	0,00	69,95		5,50	1,17
343,99	0,94	3,13	0,00	0,00	24,99	0,00	77,29		5,66	1,17
425,91	0,94	2,12	0,00	0,00	24,99	0,00	91,59		5,80	1,17
507,83	0,94	1,54	0,00	0,00	24,99	0,00	105,37		6,09	1,17

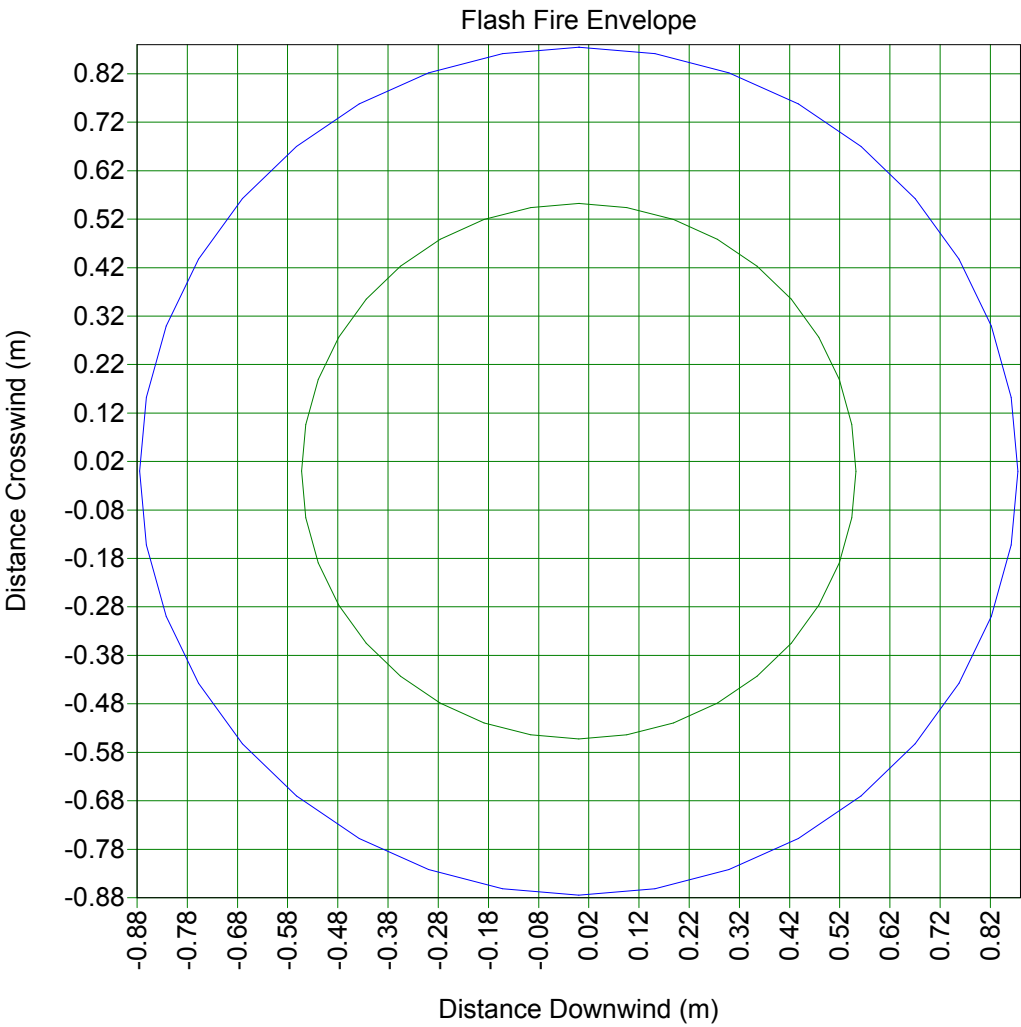
Study Folder: 70977-Fase
2-Metanolo
Audit No: 175773
Model: User Defined
Source-D5
Weather: Category 5/D
Material: METHANOL
Concentration

3.65e+004 ppm
7.3e+004 ppm



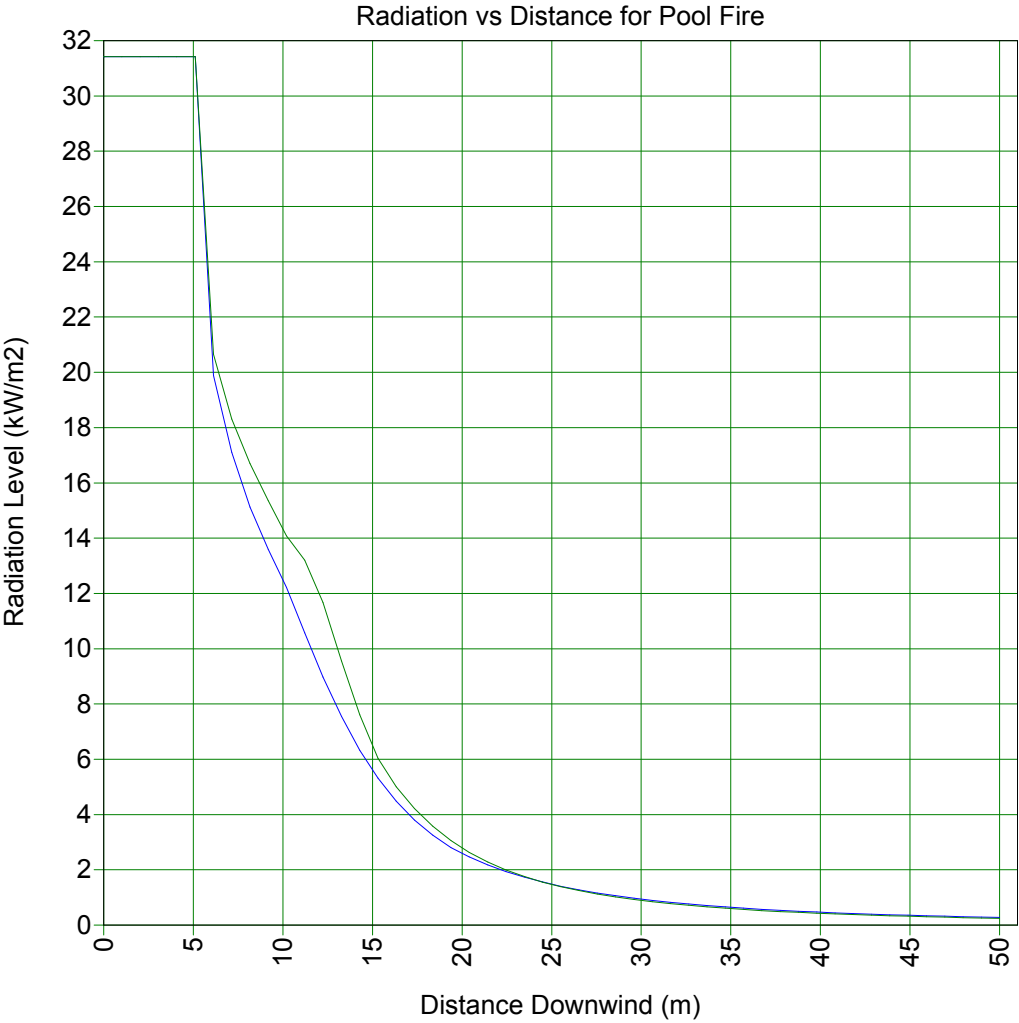
Study Folder: 70977-Fase
2-Metanolo
Audit No: 172401
Model: User Defined
Source-F2
Weather: Category 2/F
Material: METHANOL
Concentration

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



Study Folder: 70977-Fase
2-Metanolo
Audit No: 151563
Model: Pool Fire
Material: METHANOL
Weathers

Category 2/F
Category 5/D



POOL VAPORIZATION REPORT

Unique Audit Number: 169.140



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6



70977-Fase 2-Metanolo



Tubazione

Pool Vaporization

Base Case

Data



Weather: Global Weathers\Category 2/F

Speed: 2,00 m/s

Stability: F

\70977-Fase 2-Metanolo\Tubazione\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 not hit
Maximum Pool Radius	2,20 m

Averages for Release Segment: 1

Number of Cloud Segments	1
Rainout Fraction	1,00 fraction
Spill Rate	60.000,00 kg/s
Spill Duration	0,00 s
Spill Mass	60,00 kg
Spill Temperature	25,00 degC
Mass Remaining	52,58 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	0,02	300,00	18,86	7,42	2,11	0,16

POOL VAPORIZATION REPORT

Unique Audit Number: 169.140



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\Tubazione\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 not hit
Maximum Pool Radius	2,19 m

Averages for Release Segment: 1

Number of Cloud Segments	1
Rainout Fraction	1,00 fraction
Spill Rate	60.000,00 kg/s
Spill Duration	0,00 s
Spill Mass	60,00 kg
Spill Temperature	25,00 degC
Mass Remaining	50,86 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	0,03	300,00	15,92	9,14	2,08	0,24

SUMMARY REPORT

Unique Audit Number: 188.263



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6



70977-Fase 2-Metanolo



Tubazione

User Defined Source-D5

Base Case

CASE Name: Data

Path: \70977-Fase 2-Metanolo\Tubazione\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) 2000 s
Final Temperature(1) 25 degC
Release Rate(1) 0.03 kg/s
Pool Radii(1) 11 m
Pre-Dilution Air Rates(1) 0.01 kg/s

SUMMARY REPORT

Unique Audit Number: 188.263



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Late Ignition Location
Mass Inventory of material to Disperse

No ignition location
60 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: 188.263



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Consequence Results

Distance to Concentration Results

Path: \70977-Fase 2-Metanolo\Tubazione\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		14.414	No Hazard
UFL (360000)	18.75	s		0.118789	0.104308
LFL (73000)	18.75	s		0.604863	0.612465
LFL Frac (36500)	18.75	s		1.11763	1.05494
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		0.988516	0.999523
LFL (73000)	18.75	s		0.903365	0.99558
LFL Frac (36500)	18.75	s		0.806234	0.992004

SUMMARY REPORT

Study Folder: 70977-Fase 2-Metanolo

Unique Audit Number: 188.263

Phast 6.6



Concentration At Distance Results

Path: \70977-Fase 2-Metanolo\Tubazione\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	3523.55	172.598
250	m	250.942	8.51376
500	m	67.4641	2.4068

Distance		Heights (m) for above concentrations	
		Category 2/F	Category 5/D
50	m	0	0.925281
250	m	0	0.920418
500	m	0	0.919351

Distance		Conc.(ppm) at Toxic Avg.Time of 600 s	
		Category 2/F	Category 5/D
50	m	1761.77	84.6311
250	m	125.471	4.25022
500	m	33.732	1.20271

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	3523.55	169.262
250	m	250.942	8.50045
500	m	67.4641	2.40543

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\Tubazione\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	45.1758	No Hazard

SUMMARY REPORT

Unique Audit Number: 188.263



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Time to Equivalent Toxic Dose

Path: \70977-Fase 2-Metanolo\Tubazione\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	No Hazard	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\Tubazione\User Defined Source-D5

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

Radiation Effects: Late Pool Fire Ellipse

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

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

Radiation Effects: Late Pool Fire Distance

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

			Radiation Level (kW/m2)	
			Category 2/F	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: 188.263



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Flash Fire Envelope

Path: \70977-Fase 2-Metanolo\Tubazione\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	1.11763	1.05494
Furthest Extent	73000	ppm	0.604863	0.612465

			Heights (m) for above distances	
			Category 2/F	Category 5/D
Furthest Extent	36500	ppm	0.806234	0.992004
Furthest Extent	73000	ppm	0.903365	0.99558

Weather Conditions

Path: \70977-Fase 2-Metanolo\Tubazione\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: 188.262



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6



70977-Fase 2-Metanolo



Tubazione

User Defined Source-F2

Base Case

CASE Name: Data

Path: \70977-Fase 2-Metanolo\Tubazione\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) 3000 s
Final Temperature(1) 25 degC
Release Rate(1) 0.02 kg/s
Pool Radii(1) 11 m
Pre-Dilution Air Rates(1) 0.01 kg/s

SUMMARY REPORT

Unique Audit Number: 188.262



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Late Ignition Location
Mass Inventory of material to Disperse

No ignition location
60 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: 188.262



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Consequence Results

Distance to Concentration Results

Path: \70977-Fase 2-Metanolo\Tubazione\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		9.14478	No Hazard
UFL (360000)	18.75	s		0.0915251	0.0757957
LFL (73000)	18.75	s		0.552498	0.552844
LFL Frac (36500)	18.75	s		0.874952	0.878783
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		0.994303	0.999795
LFL (73000)	18.75	s		0.925776	0.996668
LFL Frac (36500)	18.75	s		0.875455	0.99444

SUMMARY REPORT

Study Folder: 70977-Fase 2-Metanolo

Unique Audit Number: 188.262

Phast 6.6



Concentration At Distance Results

Path: \70977-Fase 2-Metanolo\Tubazione\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	2401.9	118.372
250	m	161.471	5.71972
500	m	46.6493	1.59164

Distance		Heights (m) for above concentrations	
		Category 2/F	Category 5/D
50	m	0	0.94402
250	m	0	0.940736
500	m	0	0.940019

Distance		Conc.(ppm) at Toxic Avg.Time of 600 s	
		Category 2/F	Category 5/D
50	m	1200.95	58.0057
250	m	80.7354	2.85516
500	m	23.3247	0.79534

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	2401.9	116.011
250	m	161.471	5.71033
500	m	46.6493	1.59068

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\Tubazione\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	47.3843	No Hazard

SUMMARY REPORT

Unique Audit Number: 188.262



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Time to Equivalent Toxic Dose

Path: \70977-Fase 2-Metanolo\Tubazione\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	No Hazard	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\Tubazione\User Defined Source-F2

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

Radiation Effects: Late Pool Fire Ellipse

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

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

Radiation Effects: Late Pool Fire Distance

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

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

SUMMARY REPORT

Unique Audit Number: 188.262



Study Folder: 70977-Fase 2-Metanolo

Phast 6.6

Flash Fire Envelope

Path: \70977-Fase 2-Metanolo\Tubazione\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	0.874952	0.878783
Furthest Extent	73000	ppm	0.552498	0.552844

			Heights (m) for above distances	
			Category 2/F	Category 5/D
Furthest Extent	36500	ppm	0.875455	0.99444
Furthest Extent	73000	ppm	0.925776	0.996668

Weather Conditions

Path: \70977-Fase 2-Metanolo\Tubazione\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