

Jet Fire

Workspace: 71850-Elaborati di calcolo-00

Study: Sergnano

Equipment Item: Compressione

71850-Elaborati di calcolo-00\Sergnano\Compressione

Material	Gas Naturale Stogit	
East	0	m
North	0	m

Scenario (Leak) : 10 mm

71850-Elaborati di calcolo-00\Sergnano\Compressione\10 mm

Weather: Category 2/F

Wind speed [m/s]	2
Pasquill stability	F stable - night with moderate clouds and light/moderate wind
Atmospheric temperature [degC]	25
Relative humidity [fraction]	0,75
Solar radiation flux [kW/m2]	0,5

Jet fire model results

INPUT DATA

Scenario

Elevation	1	m
Release angle from horizontal	0	deg

Jet Fire Parameters

Jet fire method	Cone model
Cross wind angle	0 deg
Rate modification factor	3

Calculated inputs

Mass flow rate	1,51169	kg/s
Temperature after atmospheric expansion	-70,7838	degC
Liquid fraction	0	fraction



Velocity after atmospheric expansion (input) **300** m/s

Rainout fraction time averaged **0** fraction

OUTPUT DATA

Flame emissive power	129,48	kW/m2
Fraction of emissivity	0,154975	fraction
Jet velocity	300	m/s
Flame length	16,3894	m
Frustum length	13,2394	m
Frustum base width	0,849812	m
Frustum tip width	3,05566	m
Frustum lift off distance	3,25274	m
Flame length in still air	20,0927	m
Hole to flame angle	16,1031	deg
Expanded Diameter	0,0788428	m
Plane angular rotation	0	deg

Radiation Intensity Ellipse Results

INPUT DATA

For ellipses 'observer direction' refers to whether inclination is 'fixed' or 'variable'. Orientation is always variable.

Observer direction	Variable
Exposure duration	20 s
Height of interest	1,7 m

OUTPUT DATA

Radiation intensity

Incident radiation [kW/m2]	Lethality [%]	View factor	Probit	Dose [(W/m2)^Probit N.s]	Ellipse half-length [m]	Ellipse half-width [m]	Ellipse centre downwind distance [m]	Effect downwind distance [m]	Ellipse area [m2]
3	0	0,0231697	-1,38321	865.119	13,361	16,317	12,2351	25,5961	684,904
5	0,000174704	0,0386161	0,360367	1.709.491	11,3782	12,5414	11,6777	23,0559	448,297
7	0,02405	0,0540625	1,50883	2.677.313	10,341	10,4397	11,313	21,654	339,159



12,5	6,52536	0,096540 2	3,48789	5.800.162	8,89295	7,30263	10,7002	19,5932	204,021
37,5	98,7381	0,289621	7,23773	25.094.92 4	6,72981	2,77713	9,58911	16,3189	58,715

Radiation v Distance Results

INPUT DATA

Maximum distance	31,9454	m
Observer type radiation modelling flag	Planar	
Observer direction	Variable	
Height of interest	1,7	m

OUTPUT DATA

Downwind distance [m]	Maximum incident radiation [kW/m2]	Lethality level [fraction]
0	4,40547	1,97451E-07
0,651948	5,90087	2,30995E-05
1,3039	8,59597	0,00263429
1,95584	14,2346	0,142633
2,60779	28,343	0,900107
3,25974	75,4073	0,999998
3,91169	129,48	1
4,56363	129,48	1
5,21558	129,48	1
5,86753	129,48	1
6,51948	129,48	1
7,17142	129,48	1
7,82337	129,48	1
8,47532	129,48	1
9,12727	123,338	1
9,77921	109,502	1
10,4312	98,8531	1
11,0831	90,257	1
11,7351	83,6044	1
12,387	78,2527	0,999999



13,039	73,7587	0,999997
13,6909	69,7244	0,999993
14,3428	65,614	0,999983
14,9948	60,3638	0,999944
15,6467	51,833	0,999585
16,2987	38,0371	0,988881
16,9506	26,3546	0,849404
17,6026	23,0781	0,719292
18,2545	19,1059	0,474495
18,9065	15,5159	0,219357
19,5584	12,6408	0,0702582
20,2104	10,3931	0,016091
20,8623	8,63737	0,00277079
21,5143	7,25649	0,000378165
22,1662	6,15989	4,29242E-05
22,8182	5,27994	4,22397E-06
23,4701	4,56627	3,72866E-07
24,1221	3,98141	3,03442E-08
24,774	3,49766	0
25,426	3,09373	0
26,0779	2,75412	0
26,7299	2,46523	0
27,3818	2,21822	0
28,0337	2,00556	0
28,6857	1,8213	0
29,3376	1,66072	0
29,9896	1,51999	0
30,6415	1,39603	0
31,2935	1,28633	0
31,9454	1,18881	0

Weather: Category 5/D

Wind speed [m/s]	5
Pasquill stability	D neutral - little sun and high wind or overcast/windy night
Atmospheric temperature [degC]	25
Relative humidity [fraction]	0,75
Solar radiation flux [kW/m2]	0,5

Jet fire model results

INPUT DATA

Scenario

Elevation	1	m
Release angle from horizontal	0	deg

Jet Fire Parameters

Jet fire method	Cone model
Cross wind angle	0 deg
Rate modification factor	3

Calculated inputs

Mass flow rate	1,51169	kg/s
Temperature after atmospheric expansion	-70,7838	degC
Liquid fraction	0	fraction
Velocity after atmospheric expansion (input)	300	m/s
Rainout fraction time averaged	0	fraction

OUTPUT DATA

Flame emissive power	119,894	kW/m2
Fraction of emissivity	0,145411	fraction
Jet velocity	300	m/s
Flame length	18,2547	m
Frustum length	15,034	m
Frustum base width	0,849812	m
Frustum tip width	2,71104	m



Frustum lift off distance	3,25274	m
Flame length in still air	20,0927	m
Hole to flame angle	8,86793	deg
Expanded Diameter	0,0788428	m
Plane angular rotation	0	deg

Radiation Intensity Ellipse Results

INPUT DATA

For ellipses 'observer direction' refers to whether inclination is 'fixed' or 'variable'. Orientation is always variable.

Observer direction	Variable
Exposure duration	20 s
Height of interest	1,7 m

OUTPUT DATA

Radiation intensity

Incident radiation [kW/m ²]	Lethality [%]	View factor	Probit	Dose [(W/m ²) [^] Probit N.s]	Ellipse half-length [m]	Ellipse half-width [m]	Ellipse centre downwind distance [m]	Effect downwind distance [m]	Ellipse area [m ²]
3	0	0,025022 2	-1,38321	865.119	12,965	15,8285	12,8845	25,8495	644,703
5	0,000174 704	0,041703 6	0,360367	1.709.491	11,5028	12,0371	12,401	23,9038	434,985
7	0,02405	0,058385	1,50883	2.677.313	10,7233	9,89813	12,1117	22,835	333,451
12,5	6,52536	0,104259	3,48789	5.800.162	9,62288	6,75729	11,6716	21,2945	204,281
37,5	98,7381	0,312777	7,23773	25.094.92 4	8,03817	2,6139	11,0379	19,0761	66,008

Radiation v Distance Results

INPUT DATA

Maximum distance	36,214	m
Observer type radiation modelling flag	Planar	
Observer direction	Variable	
Height of interest	1,7	m

OUTPUT DATA



Downwind distance [m]	Maximum incident radiation [kW/m ²]	Lethality level [fraction]
0	3,10894	0
0,739061	4,5447	3,43117E-07
1,47812	7,49882	0,0005646
2,21718	14,909	0,181263
2,95624	36,1554	0,982704
3,6953	87,477	1
4,43436	119,894	1
5,17342	119,894	1
5,91249	119,894	1
6,65155	119,894	1
7,39061	119,894	1
8,12967	119,894	1
8,86873	119,894	1
9,60779	119,894	1
10,3468	119,894	1
11,0859	119,894	1
11,825	119,894	1
12,564	119,894	1
13,3031	119,894	1
14,0422	119,894	1
14,7812	119,894	1
15,5203	119,894	1
16,2593	111,738	1
16,9984	105,727	1
17,7375	97,9468	1
18,4765	52,5339	0,999648
19,2156	34,5074	0,974641
19,9546	23,1429	0,722512
20,6937	16,245	0,268406
21,4328	11,8037	0,0438437
22,1718	8,84999	0,00356472
22,9109	6,82404	0,000173111

23,6499	5,3927	5,89618E-06
24,389	4,35268	1,58931E-07
25,1281	3,57789	0
25,8671	2,98771	0
26,6062	2,52912	0
27,3452	2,16647	0
28,0843	1,87521	0
28,8234	1,63803	0
29,5624	1,44251	0
30,3015	1,27964	0
31,0405	1,14244	0
31,7796	1,02591	0
32,5187	0,926146	0
33,2577	0,840094	0
33,9968	0,765373	0
34,7359	0,700091	0
35,4749	0,642733	0
36,214	0,592073	0

