Jet Fire

Workspace: 71850-Elaborati di calcolo-00

Study: Sergnano

Equipment Item: Compressione-Sovratemperatura

71850-Elaborati di calcolo-00\Sergnano\Compressione-Sovratemperatura

Material	**Gas Naturale Stogit**	
East	0	m
North	0	m

Scenario (Leak) : 25 mm

71850-Elaborati di calcolo-00\Sergnano\Compressione-Sovratemperatura\25 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
Relase 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	8,70049	kg/s
Temperature after atmospheric expansion	-38,4025	degC
Liquid fraction	0	fraction

Velocity after atmospheric expansion (input)	**300**	m/s
Rainout fraction time averaged	**0**	fraction

OUTPUT DATA

Flame emissive power	212,31	kW/m2
Fraction of emissivity	0,20632	fraction
Jet velocity	300	m/s
Flame length	31,6948	m
Frustum length	24,3839	m
Frustum base width	2,71571	m
Frustum tip width	6,99855	m
Frustum lift off distance	7,8035	m
Flame length in still air	43,0871	m
Hole to flame angle	23,4632	deg
Expanded Diameter	0,203983	m
Plane angular rotation	0	deg

Flame on ground impingement with partial truncation

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)^ProbitN.s]	Ellipse half-length [m]	Ellipse half-width [m]	Ellipse centre downwind distance [m]	Effect downwind distance [m]	Ellipse area [m2]
3	0	0,0141303	-1,38321	865.119	35,3051	43,4495	24,5116	59,8167	4819,17
5	0,000174704	0,0235504	0,360367	1.709.491	28,4861	33,7336	23,7348	52,2209	3018,88

7	0,02405	0,0329706	1,50883	2.677.313	24,9391	28,4293	23,0869	48,026	2227,39
12,5	6,52536	0,0588761	3,48789	5.800.162	20,1263	20,7776	21,7549	41,8813	1313,74
37,5	98,7381	0,176628	7,23773	25.094.924	13,6194	9,43183	18,805	32,4243	403,555

Radiation v Distance Results

INPUT DATA

Maximum distance	60,3424	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	9,215	0,0053432
1,23148	11,5268	0,0368274
2,46296	15,1304	0,194827
3,69443	21,3399	0,623037
4,92591	33,4824	0,967911
6,15739	62,1806	0,999963
7,38887	209,557	1
8,62034	212,31	1
9,85182	212,31	1
11,0833	212,31	1
12,3148	212,31	1
13,5463	212,31	1
14,7777	191,234	1
16,0092	159,506	1
17,2407	137,85	1
18,4722	122,664	1
19,7036	111,56	1
20,9351	102,417	1
22,1666	95,1847	1

23,3981	89,0456	1
24,6296	83,5591	1
25,861	78,305	0,999999
27,0925	72,8203	0,999997
28,324	66,5788	0,999986
29,5555	59,1006	0,999925
30,7869	50,2618	0,999397
32,0184	40,656	0,994024
33,2499	31,3816	0,948425
34,4814	26,414	0,851195
35,7129	23,7964	0,753444
36,9443	21,0287	0,603849
38,1758	18,4956	0,430627
39,4073	16,2175	0,266506
40,6388	14,2271	0,142231
41,8702	12,5128	0,0656981
43,1017	11,0449	0,026525
44,3332	9,78998	0,009483
45,5647	8,71559	0,00304434
46,7962	7,79335	0,000889938
48,0276	6,99876	0,000239957
49,2591	6,31134	6,03842E-05
50,4906	5,71408	1,43313E-05
51,7221	5,19276	3,23652E-06
52,9535	4,73601	7,01727E-07
54,185	4,334	1,47034E-07
55,4165	3,97873	2,99558E-08
56,648	3,66349	0
57,8795	3,38278	0
59,1109	3,13189	0
60,3424	2,90688	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
Relase 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	8,70049	kg/s
Temperature after atmospheric expansion	-38,4025	degC
Liquid fraction	0	fraction
Velocity after atmospheric expansion (input)	**300**	m/s
Rainout fraction time averaged	**0**	fraction

OUTPUT DATA

Flame emissive power	210,347	kW/m2
Fraction of emissivity	0,19959	fraction
Jet velocity	300	m/s
Flame length	35,0027	m
Frustum length	27,3382	m
Frustum base width	2,71571	m
Frustum tip width	5,9791	m

Frustum lift off distance	7,8035	m
Flame length in still air	43,0871	m
Hole to flame angle	12,2734	deg
Expanded Diameter	0,203983	m
Plane angular rotation	0	deg

Flame on ground impingement with partial truncation

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	0,0142621	-1,38321	865.119	31,7847	43,0951	26,3707	58,1562	4303,25
5	0,000174704	0,0237702	0,360367	1.709.491	26,9366	33,4076	25,4037	52,3402	2827,07
7	0,02405	0,0332783	1,50883	2.677.313	24,4178	28,1004	24,7504	49,1682	2155,6
12,5	6,52536	0,0594256	3,48789	5.800.162	20,979	20,4316	23,664	44,643	1346,6
37,5	98,7381	0,178277	7,23773	25.094.924	16,394	9,45771	21,7379	38,1319	487,104

Radiation v Distance Results

INPUT DATA

Maximum distance	69,0338	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	6,5522	0,000100904
1,40885	8,8787	0,00368461
2,81771	13,0149	0,0846705
4,22656	21,4628	0,630462
5,63542	45,2943	0,998026
7,04427	145,776	1
8,45312	210,347	1
9,86198	210,347	1
11,2708	210,347	1
12,6797	210,347	1
14,0885	210,347	1
15,4974	210,347	1
16,9062	210,347	1
18,3151	210,347	1
19,724	210,347	1
21,1328	210,347	1
22,5417	190,09	1
23,9505	176,706	1
25,3594	141,683	1
26,7682	146,987	1
28,1771	137,832	1
29,5859	129,94	1
30,9948	123,515	1
32,4036	113,516	1
33,8125	96,6427	1
35,2213	61,0838	0,999952
36,6302	48,3295	0,999044
38,0391	38,1465	0,989164
39,4479	29,4498	0,921159
40,8568	22,8307	0,706767
42,2656	17,9905	0,39385

43,6745	14,42	0,152822
45,0833	11,7419	0,0422047
46,4922	9,70351	0,00873939
47,901	8,1269	0,00143343
49,3099	6,88859	0,000195655
50,7187	5,90248	2,3192E-05
52,1276	5,10655	2,46849E-06
53,5364	4,45647	2,42546E-07
54,9453	3,9203	2,25592E-08
56,3542	3,47217	0
57,763	3,09488	0
59,1719	2,77454	0
60,5807	2,50044	0
61,9896	2,26423	0
63,3984	2,05935	0
64,8073	1,88056	0
66,2161	1,72365	0
67,625	1,58527	0
69,0338	1,46263	0