

# SUMMARY REPORT

Unique Audit Number: 3.126



Study Folder: RDSPoggiofiorito

PHAST 6.5

## RDSPoggiofiorito

### Study

4" D10

#### Base Case

CASE Name: Data User-Defined Data

#### Material

Material Identifier	METHANE
Type of Vessel	Pressurized Gas
Pressure Specification	Pressure specified
Discharge Pressure (gauge)	90 bar
Discharge Temperature	25 degC
Mass Inventory of material to discharge	2000 kg

#### Scenario

Type of Event	Leak
Phase	Vapor
HoleDiameter	10 mm
Building Wake Option	None

#### Location

[Elevation	1 m]
Dispersion Concentration of Interest	1E4 ppm
Averaging time associated with Concentration	Flammable
Distances of Interest(1)	1 m
Distances of Interest(2)	5 m
Distances of Interest(3)	10 m
ERPG selection	ERPG is not set
IDLH selection	IDLH is not set
STEL selection	STEL is not set
User Defined Averaging	No user defined averaging time 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

Outdoor Release Direction	Horizontal
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#### Flammable

Method to use for explosions	TNT
Jet Fire Method	Shell

#### Dispersion

Ignition Location	No ignition location
Mass Inventory of material to Disperse	2000 kg

#### Fireball Parameters

[Mass Modification Factor	3]
[Calculation method for fireball	DNV Recommended]
[Temperature of fireball	1727 degC]

#### Jet Fire Parameters

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Jet fire radiation intensity level 1	3 kW/m <sup>2</sup>
Jet fire radiation intensity level 2	5 kW/m <sup>2</sup>
Jet fire radiation intensity level 3	12,5 kW/m <sup>2</sup>

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## Discharge Data

### User-Defined Quantities

Material	METHANE
Temperature	25,00 degC
Pressure	91,01 bar
Inventory	2.000,00 kg
Scenario	Leak
Fixed Duration	n/a s

### Calculated Quantities

Weather: Study\Category 2/F

Mass Flow of Air (Vent from Vapor Space Only) n/a

#### Average Values for Segment Number 1

Liquid Fraction	0,00 fraction
Final Temperature	-76,82 degC
Final Velocity	500,00 m/s
Droplet Diameter	0,00 um

#### Continuous Release Data:

Mass Flowrate	1.16616E+000 kg/s
Release Duration	1.715,03 s
Orifice Velocity	394,83 m/s
Exit Pressure	48,12 bar
Exit Temperature	-21,22 degC
Discharge Coefficient	0,87
Expanded Radius	0,03 m

Weather: Study\Category 5/D

Mass Flow of Air (Vent from Vapor Space Only) n/a

#### Average Values for Segment Number 1

Liquid Fraction	0,00 fraction
Final Temperature	-76,82 degC
Final Velocity	500,00 m/s
Droplet Diameter	0,00 um

#### Continuous Release Data:

Mass Flowrate	1.16616E+000 kg/s
Release Duration	1.715,03 s
Orifice Velocity	394,83 m/s
Exit Pressure	48,12 bar
Exit Temperature	-21,22 degC
Discharge Coefficient	0,87
Expanded Radius	0,03 m

## Consequence Results

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## Distance to Concentration Results

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 (10000)	18,75	s	66,1064	41,4089
UFL (165000)	18,75	s	2,33684	2,24372
LFL (44000)	18,75	s	8,53268	6,8553
LFL Frac (22000)	18,75	s	21,9167	14,7119

  

Concentration(ppm)	Averaging Time		Heights (m) for above distances	
			Category 2/F	Category 5/D
User Conc (10000)	18,75	s	0	0
UFL (165000)	18,75	s	1,00015	1,00014
LFL (44000)	18,75	s	1,00435	1,00226
LFL Frac (22000)	18,75	s	1,05333	1,01105

## Concentration At Distance Results

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
1	m	322540	317302
5	m	79098,6	68023,2
10	m	37686	29543,3

  

Distance		Heights (m) for above concentrations	
		Category 2/F	Category 5/D
1	m	1,00002	1,00002
5	m	1,00117	1,00109
10	m	1,0062	1,00489

  

Distance		Conc.(ppm) at Core Avg.Time of 18,75 s	
		Category 2/F	Category 5/D
1	m	0	7,34224e-020
5	m	1140,37	5229,69
10	m	21489,6	18860,8

  

Distance		Heights (m) for above concentrations	
		Category 2/F	Category 5/D
1	m	0	0
5	m	0	0
10	m	0	0

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## Jet Fire Hazard

Jet fire method used: SHELL - Johnson

Jet Fire Status	Category 2/F	Category 5/D
Flame Direction	Hazard	Hazard
	Horizontal	Horizontal

## Radiation Effects: Jet Fire Ellipse

This table gives the distances to the specified radiation levels for each jet fire listed in the above hazard table

			Category 2/F	Category 5/D
Radiation Level	3	kW/m <sup>2</sup>	19,495	19,3595
Radiation Level	5	kW/m <sup>2</sup>	17,6446	17,7319
Radiation Level	12,5	kW/m <sup>2</sup>	14,7988	15,2293

## Radiation Effects: Jet Fire Distance

			Category 2/F	Radiation Level (kW/m <sup>2</sup> ) Category 5/D
Distance Of Interest 1	m		1,64242	1,69707
Distance Of Interest 5	m		35,774	35,0607
Distance Of Interest 10	m		34,9364	37,5527

## Flash Fire Envelope

All flammable results are reported at the cloud centreline height

			Category 2/F	Category 5/D
Furthest Extent	22000	ppm	21,9167	14,7119
Furthest Extent	44000	ppm	8,53268	6,8553

  

			Category 2/F	Category 5/D
Furthest Extent	22000	ppm	1,05333	1,01105
Furthest Extent	44000	ppm	1,00435	1,00226

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## Explosion Effects: Late Ignition

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	Category 5/D
Overpressure	0,02068	bar	37,065	24,7887
Overpressure	0,1379	bar	24,4185	13,8292
Overpressure	0,2068	bar	23,419	12,9629

			Supplementary Data at 0,02068 bar	
			Category 2/F	Category 5/D
Supplied Flammable Mass		kg	0,127522	0,0829955
Used Flammable Mass		kg	0,127522	0,0829955
Overpressure Radius		m	17,065	14,7887
Distance to:				
- Ignition Source		m	20	10
- Cloud Front/Centre		m	20	10
- Explosion Centre		m	20	10

			Supplementary Data at 0,1379 bar	
			Category 2/F	Category 5/D
Supplied Flammable Mass		kg	0,127522	0,0829955
Used Flammable Mass		kg	0,127522	0,0829955
Overpressure Radius		m	4,41855	3,82915
Distance to:				
- Ignition Source		m	20	10
- Cloud Front/Centre		m	20	10
- Explosion Centre		m	20	10

			Supplementary Data at 0,2068 bar	
			Category 2/F	Category 5/D
Supplied Flammable Mass		kg	0,127522	0,0829955
Used Flammable Mass		kg	0,127522	0,0829955
Overpressure Radius		m	3,41897	2,96291
Distance to:				
- Ignition Source		m	20	10
- Cloud Front/Centre		m	20	10
- Explosion Centre		m	20	10

			Overpressures (bar gauge) at Distances	
			Category 2/F	Category 5/D
Distance	1	m	0,0483626	0,0396951
Distance	5	m	0,114132	0,0919706
Distance	10	m	1	1

			Supplementary Data at 1 m	
			Category 2/F	Category 5/D
Supplied Flammable Mass		kg	0,127522	0,0829955
Used Flammable Mass		kg	0,127522	0,0829955

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		Supplementary Data at 5 m	
		Category 2/F	Category 5/D
Supplied Flammable Mass	kg	0,127522	0,0829955
Used Flammable Mass	kg	0,127522	0,0829955

  

		Supplementary Data at 10 m	
		Category 2/F	Category 5/D
Supplied Flammable Mass	kg	0,127522	0,0829955
Used Flammable Mass	kg	0,127522	0,0829955

## Weather Conditions

		Category 2/F	Category 5/D
Wind Speed	m/s	2	5
Pasquill Stability		F	D
Surface Roughness Length		183,156	183,156
Surface Roughness Parameter		0,0999999	0,0999999
Atmospheric Temperature	degC	25	25
Surface Temperature	degC	25	25
Relative Humidity	fraction	0,75	0,75