

# SUMMARY REPORT

Unique Audit Number: 3.060



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)	140 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	141,01 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	-98,42 degC
Final Velocity	500,00 m/s
Droplet Diameter	0,00 um

#### Continuous Release Data:

Mass Flowrate	1.89246E+000 kg/s
Release Duration	1.056,82 s
Orifice Velocity	393,82 m/s
Exit Pressure	71,65 bar
Exit Temperature	-22,89 degC
Discharge Coefficient	0,86
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	-98,42 degC
Final Velocity	500,00 m/s
Droplet Diameter	0,00 um

#### Continuous Release Data:

Mass Flowrate	1.89246E+000 kg/s
Release Duration	1.056,82 s
Orifice Velocity	393,82 m/s
Exit Pressure	71,65 bar
Exit Temperature	-22,89 degC
Discharge Coefficient	0,86
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		Category 2/F	Category 5/D
User Conc (10000)	18,75	s	116,216	69,645
UFL (165000)	18,75	s	3,05536	2,79034
LFL (44000)	18,75	s	11,4315	9,02379
LFL Frac (22000)	18,75	s	35,1152	23,6737

  

Concentration(ppm)	Averaging Time		Category 2/F	Category 5/D
User Conc (10000)	18,75	s	0	0
UFL (165000)	18,75	s	1,00023	1,00016
LFL (44000)	18,75	s	1,00596	1,00289
LFL Frac (22000)	18,75	s	0,970795	1,00167

## 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	381836	376912
5	m	100497	89313,2
10	m	49184,9	40099,5

  

Distance		Heights (m) for above concentrations	
		Category 2/F	Category 5/D
1	m	1,00001	1,00001
5	m	1,00074	1,00071
10	m	1,00437	1,0035

  

Distance		Conc.(ppm) at Core Avg.Time of 18,75 s	
		Category 2/F	Category 5/D
1	m	0	1,94421e-018
5	m	1382,85	5954,96
10	m	26801,2	24574,1

  

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>	25,3277	25,2181
Radiation Level	5	kW/m <sup>2</sup>	22,8157	22,9989
Radiation Level	12,5	kW/m <sup>2</sup>	19,1579	19,7903

## Radiation Effects: Jet Fire Distance

			Category 2/F	Radiation Level (kW/m <sup>2</sup> ) Category 5/D
Distance Of Interest 1	m		1,4965	1,56404
Distance Of Interest 5	m		37,8234	38,9251
Distance Of Interest 10	m		51,1147	51,9816

## Flash Fire Envelope

All flammable results are reported at the cloud centreline height

			Category 2/F	Category 5/D
Furthest Extent	22000	ppm	35,1152	23,6737
Furthest Extent	44000	ppm	11,4315	9,02379

  

			Category 2/F	Category 5/D
Furthest Extent	22000	ppm	0,970795	1,00167
Furthest Extent	44000	ppm	1,00596	1,00289

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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	52,1663	39,0993
Overpressure	0,1379	bar	35,7394	24,9453
Overpressure	0,2068	bar	34,441	23,8266

			Supplementary Data at 0,02068 bar	
			Category 2/F	Category 5/D
Supplied Flammable Mass		kg	0,279478	0,178782
Used Flammable Mass		kg	0,279478	0,178782
Overpressure Radius		m	22,1663	19,0993
Distance to:				
- Ignition Source		m	30	20
- Cloud Front/Centre		m	30	20
- Explosion Centre		m	30	20

			Supplementary Data at 0,1379 bar	
			Category 2/F	Category 5/D
Supplied Flammable Mass		kg	0,279478	0,178782
Used Flammable Mass		kg	0,279478	0,178782
Overpressure Radius		m	5,73941	4,94529
Distance to:				
- Ignition Source		m	30	20
- Cloud Front/Centre		m	30	20
- Explosion Centre		m	30	20

			Supplementary Data at 0,2068 bar	
			Category 2/F	Category 5/D
Supplied Flammable Mass		kg	0,279478	0,178782
Used Flammable Mass		kg	0,279478	0,178782
Overpressure Radius		m	4,44102	3,82656
Distance to:				
- Ignition Source		m	30	20
- Cloud Front/Centre		m	30	20
- Explosion Centre		m	30	20

			Overpressures (bar gauge) at Distances	
			Category 2/F	Category 5/D
Distance	1	m	0,0676791	0,0566694
Distance	5	m	0,164643	0,135683
Distance	10	m	1	1

			Supplementary Data at 1 m	
			Category 2/F	Category 5/D
Supplied Flammable Mass		kg	0,259252	0,178782
Used Flammable Mass		kg	0,259252	0,178782

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		Supplementary Data at 5 m	
		Category 2/F	Category 5/D
Supplied Flammable Mass	kg	0,259252	0,178782
Used Flammable Mass	kg	0,259252	0,178782

		Supplementary Data at 10 m	
		Category 2/F	Category 5/D
Supplied Flammable Mass	kg	0,259252	0,178782
Used Flammable Mass	kg	0,259252	0,178782

## 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