# Discharge Report

## Workspace: 72181-Elaborati di calcolo

### Study: Sergnano

#### Equipment Item: Trattamento

72181-Elaborati di calcolo\Sergnano\Trattamento

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

### Scenario (Leak) : 10 mm

72181-Elaborati di calcolo\Sergnano\Trattamento\10 mm

#### Weather: Category 2/F

**INPUT DATA**

**Inventory data**

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

**Stagnation Data (upstream end for long pipe)**

| | | |
|---|---|---|
| Initial pressure (gauge) | **70** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

**Scenario data**

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **10** | mm |
| Discharge coefficient | **0,62** | fraction |

**OUTPUT DATA**

| | | |
|---|---|---|
| Mass flow rate | 0,659599 | kg/s |
| Release duration | 7200 | s |

**Orifice or pipe exit data (before atmospheric expansion)**

| | | |
|---|---|---|
| Pressure | 38,1028 | bar |
| Temperature | -19,26 | degC |
| Liquid mass fraction | **0** | fraction |

| | | |
|---|---|---|
| Velocity at vena contracta (at exit for pipe releases) | 381,747 | m/s |
| Discharge coefficient | 0,62 | |

**Final Data (after atmospheric expansion)**

| | | |
|---|---|---|
| Temperature | -33,4534 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,0567618** | m |
| Velocity | 300 | m/s |

## Weather: Category 5/D

### INPUT DATA

### Inventory data

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

### Stagnation Data (upstream end for long pipe)

| | | |
|---|---|---|
| Initial pressure (gauge) | **70** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

### Scenario data

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **10** | mm |
| Discharge coefficient | **0,62** | fraction |

### OUTPUT DATA

| | | |
|---|---|---|
| Mass flow rate | 0,659599 | kg/s |
| Release duration | 7200 | s |

### Orifice or pipe exit data (before atmospheric expansion)

| | | |
|---|---|---|
| Pressure | 38,1028 | bar |
| Temperature | -19,26 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 381,747 | m/s |
| Discharge coefficient | 0,62 | |

### Final Data (after atmospheric expansion)

| | | |
|---|---|---|
| Temperature | -33,4534 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,0567618** | m |
| Velocity | 300 | m/s |

## Scenario (Leak) : 25 mm

72181-Elaborati di calcolo\Sergnano\Trattamento\25 mm

**Weather: Category 2/F**

**INPUT DATA**

**Inventory data**

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

**Stagnation Data (upstream end for long pipe)**

| | | |
|---|---|---|
| Initial pressure (gauge) | **70** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

**Scenario data**

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **25** | mm |
| Discharge coefficient | **0,62** | fraction |

**OUTPUT DATA**

| | | |
|---|---|---|
| Mass flow rate | 4,12249 | kg/s |
| Release duration | 7200 | s |

**Orifice or pipe exit data (before atmospheric expansion)**

| | | |
|---|---|---|
| Pressure | 38,1028 | bar |
| Temperature | -19,26 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 381,747 | m/s |
| Discharge coefficient | 0,62 | |

**Final Data (after atmospheric expansion)**

| | | |
|---|---|---|
| Temperature | -33,4534 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,141905** | m |
| Velocity | 300 | m/s |

## Weather: Category 5/D

### INPUT DATA

### Inventory data

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

### Stagnation Data (upstream end for long pipe)

| | | |
|---|---|---|
| Initial pressure (gauge) | **70** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

### Scenario data

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **25** | mm |
| Discharge coefficient | **0,62** | fraction |

### OUTPUT DATA

| | | |
|---|---|---|
| Mass flow rate | 4,12249 | kg/s |
| Release duration | 7200 | s |

### Orifice or pipe exit data (before atmospheric expansion)

| | | |
|---|---|---|
| Pressure | 38,1028 | bar |
| Temperature | -19,26 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 381,747 | m/s |
| Discharge coefficient | 0,62 | |

### Final Data (after atmospheric expansion)

| | | |
|---|---|---|
| Temperature | -33,4534 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,141905** | m |
| Velocity | 300 | m/s |

## Scenario (Leak) : 50 mm

72181-Elaborati di calcolo\Sergnano\Trattamento\50 mm

**Weather: Category 2/F**

**INPUT DATA**

**Inventory data**

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

**Stagnation Data (upstream end for long pipe)**

| | | |
|---|---|---|
| Initial pressure (gauge) | **70** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

**Scenario data**

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **50** | mm |
| Discharge coefficient | **0,62** | fraction |

**OUTPUT DATA**

| | | |
|---|---|---|
| Mass flow rate | 16,49 | kg/s |
| Release duration | 6064,29 | s |

**Orifice or pipe exit data (before atmospheric expansion)**

| | | |
|---|---|---|
| Pressure | 38,1028 | bar |
| Temperature | -19,26 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 381,747 | m/s |
| Discharge coefficient | 0,62 | |

**Final Data (after atmospheric expansion)**

| | | |
|---|---|---|
| Temperature | -33,4534 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,283809** | m |
| Velocity | 300 | m/s |

## Weather: Category 5/D

### INPUT DATA

### Inventory data

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

### Stagnation Data (upstream end for long pipe)

| | | |
|---|---|---|
| Initial pressure (gauge) | **70** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

### Scenario data

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **50** | mm |
| Discharge coefficient | **0,62** | fraction |

### OUTPUT DATA

| | | |
|---|---|---|
| Mass flow rate | 16,49 | kg/s |
| Release duration | 6064,29 | s |

### Orifice or pipe exit data (before atmospheric expansion)

| | | |
|---|---|---|
| Pressure | 38,1028 | bar |
| Temperature | -19,26 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 381,747 | m/s |
| Discharge coefficient | 0,62 | |

### Final Data (after atmospheric expansion)

| | | |
|---|---|---|
| Temperature | -33,4534 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,283809** | m |
| Velocity | 300 | m/s |

## Scenario (Leak) : FB 203 mm

72181-Elaborati di calcolo\Sergnano\Trattamento\FB 203 mm

**Weather: Category 2/F**

**INPUT DATA**

**Inventory data**

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

**Stagnation Data (upstream end for long pipe)**

| | | |
|---|---|---|
| Initial pressure (gauge) | **70** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

**Scenario data**

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **203** | mm |
| Discharge coefficient | **1** | fraction |

**OUTPUT DATA**

| | | |
|---|---|---|
| Mass flow rate | 438,41 | kg/s |
| Release duration | 228,097 | s |

**Orifice or pipe exit data (before atmospheric expansion)**

| | | |
|---|---|---|
| Pressure | 38,1028 | bar |
| Temperature | -19,26 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 381,747 | m/s |
| Discharge coefficient | 1 | |

**Final Data (after atmospheric expansion)**

| | | |
|---|---|---|
| Temperature | -33,4534 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **1,46338** | m |
| Velocity | 300 | m/s |

## Weather: Category 5/D

### INPUT DATA

### Inventory data

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

### Stagnation Data (upstream end for long pipe)

| | | |
|---|---|---|
| Initial pressure (gauge) | **70** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

### Scenario data

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **203** | mm |
| Discharge coefficient | **1** | fraction |

### OUTPUT DATA

| | | |
|---|---|---|
| Mass flow rate | 438,41 | kg/s |
| Release duration | 228,097 | s |

### Orifice or pipe exit data (before atmospheric expansion)

| | | |
|---|---|---|
| Pressure | 38,1028 | bar |
| Temperature | -19,26 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 381,747 | m/s |
| Discharge coefficient | 1 | |

### Final Data (after atmospheric expansion)

| | | |
|---|---|---|
| Temperature | -33,4534 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **1,46338** | m |
| Velocity | 300 | m/s |

## Equipment Item: Compressione-Clusters

72181-Elaborati di calcolo\Sergnano\Compressione-Clusters

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

## Scenario (Leak) : 006 mm

72181-Elaborati di calcolo\Sergnano\Compressione-Clusters\006 mm

### Weather: Category 2/F

**INPUT DATA**

**Inventory data**

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

**Stagnation Data (upstream end for long pipe)**

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

**Scenario data**

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **6** | mm |
| Discharge coefficient | **0,62** | fraction |

**OUTPUT DATA**

| | | |
|---|---|---|
| Mass flow rate | 0,544208 | kg/s |
| Release duration | 7200 | s |

**Orifice or pipe exit data (before atmospheric expansion)**

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 0,62 | |

**Final Data (after atmospheric expansion)**

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,0473057** | m |
| Velocity | 300 | m/s |

## Weather: Category 5/D

### INPUT DATA

### Inventory data

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

### Stagnation Data (upstream end for long pipe)

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

### Scenario data

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **6** | mm |
| Discharge coefficient | **0,62** | fraction |

### OUTPUT DATA

| | | |
|---|---|---|
| Mass flow rate | 0,544208 | kg/s |
| Release duration | 7200 | s |

### Orifice or pipe exit data (before atmospheric expansion)

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 0,62 | |

### Final Data (after atmospheric expansion)

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,0473057** | m |
| Velocity | 300 | m/s |

## Scenario (Leak) : 010 mm

72181-Elaborati di calcolo\Sergnano\Compressione-Clusters\010 mm

**Weather: Category 2/F**

**INPUT DATA**

**Inventory data**

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

**Stagnation Data (upstream end for long pipe)**

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

**Scenario data**

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **10** | mm |
| Discharge coefficient | **0,62** | fraction |

**OUTPUT DATA**

| | | |
|---|---|---|
| Mass flow rate | 1,51169 | kg/s |
| Release duration | 7200 | s |

**Orifice or pipe exit data (before atmospheric expansion)**

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 0,62 | |

**Final Data (after atmospheric expansion)**

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,0788428** | m |
| Velocity | 300 | m/s |

## Weather: Category 5/D

### INPUT DATA

### Inventory data

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

### Stagnation Data (upstream end for long pipe)

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

### Scenario data

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **10** | mm |
| Discharge coefficient | **0,62** | fraction |

### OUTPUT DATA

| | | |
|---|---|---|
| Mass flow rate | 1,51169 | kg/s |
| Release duration | 7200 | s |

### Orifice or pipe exit data (before atmospheric expansion)

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 0,62 | |

### Final Data (after atmospheric expansion)

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,0788428** | m |
| Velocity | 300 | m/s |

## Scenario (Leak) : 015 mm

72181-Elaborati di calcolo\Sergnano\Compressione-Clusters\015 mm

**Weather: Category 2/F**

**INPUT DATA**

**Inventory data**

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

**Stagnation Data (upstream end for long pipe)**

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

**Scenario data**

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **15** | mm |
| Discharge coefficient | **0,62** | fraction |

**OUTPUT DATA**

| | | |
|---|---|---|
| Mass flow rate | 3,4013 | kg/s |
| Release duration | 7200 | s |

**Orifice or pipe exit data (before atmospheric expansion)**

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 0,62 | |

**Final Data (after atmospheric expansion)**

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,118264** | m |
| Velocity | 300 | m/s |

## Weather: Category 5/D

### INPUT DATA

### Inventory data

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

### Stagnation Data (upstream end for long pipe)

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

### Scenario data

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **15** | mm |
| Discharge coefficient | **0,62** | fraction |

### OUTPUT DATA

| | | |
|---|---|---|
| Mass flow rate | 3,4013 | kg/s |
| Release duration | 7200 | s |

### Orifice or pipe exit data (before atmospheric expansion)

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 0,62 | |

### Final Data (after atmospheric expansion)

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,118264** | m |
| Velocity | 300 | m/s |

## Scenario (Leak) : 025 mm

72181-Elaborati di calcolo\Sergnano\Compressione-Clusters\025 mm

**Weather: Category 2/F**

**INPUT DATA**

**Inventory data**

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

**Stagnation Data (upstream end for long pipe)**

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

**Scenario data**

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **25** | mm |
| Discharge coefficient | **0,62** | fraction |

**OUTPUT DATA**

| | | |
|---|---|---|
| Mass flow rate | 9,44806 | kg/s |
| Release duration | 7200 | s |

**Orifice or pipe exit data (before atmospheric expansion)**

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 0,62 | |

**Final Data (after atmospheric expansion)**

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,197107** | m |
| Velocity | 300 | m/s |

## Weather: Category 5/D

### INPUT DATA

### Inventory data

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

### Stagnation Data (upstream end for long pipe)

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

### Scenario data

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **25** | mm |
| Discharge coefficient | **0,62** | fraction |

### OUTPUT DATA

| | | |
|---|---|---|
| Mass flow rate | 9,44806 | kg/s |
| Release duration | 7200 | s |

### Orifice or pipe exit data (before atmospheric expansion)

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 0,62 | |

### Final Data (after atmospheric expansion)

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,197107** | m |
| Velocity | 300 | m/s |

## Scenario (Leak) : 030 mm

72181-Elaborati di calcolo\Sergnano\Compressione-Clusters\030 mm

**Weather: Category 2/F**

**INPUT DATA**

**Inventory data**

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

**Stagnation Data (upstream end for long pipe)**

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

**Scenario data**

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **30** | mm |
| Discharge coefficient | **0,62** | fraction |

**OUTPUT DATA**

| | | |
|---|---|---|
| Mass flow rate | 13,6052 | kg/s |
| Release duration | 7200 | s |

**Orifice or pipe exit data (before atmospheric expansion)**

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 0,62 | |

**Final Data (after atmospheric expansion)**

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,236528** | m |
| Velocity | 300 | m/s |

## Weather: Category 5/D

### INPUT DATA

### Inventory data

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

### Stagnation Data (upstream end for long pipe)

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

### Scenario data

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **30** | mm |
| Discharge coefficient | **0,62** | fraction |

### OUTPUT DATA

| | | |
|---|---|---|
| Mass flow rate | 13,6052 | kg/s |
| Release duration | 7200 | s |

### Orifice or pipe exit data (before atmospheric expansion)

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 0,62 | |

### Final Data (after atmospheric expansion)

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,236528** | m |
| Velocity | 300 | m/s |

## Scenario (Leak) : 046 mm

72181-Elaborati di calcolo\Sergnano\Compressione-Clusters\046 mm

**Weather: Category 2/F**

**INPUT DATA**

**Inventory data**

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

**Stagnation Data (upstream end for long pipe)**

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

**Scenario data**

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **46** | mm |
| Discharge coefficient | **0,62** | fraction |

**OUTPUT DATA**

| | | |
|---|---|---|
| Mass flow rate | 31,9874 | kg/s |
| Release duration | 3126,23 | s |

**Orifice or pipe exit data (before atmospheric expansion)**

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 0,62 | |

**Final Data (after atmospheric expansion)**

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,362677** | m |
| Velocity | 300 | m/s |

## Weather: Category 5/D

### INPUT DATA

### Inventory data

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

### Stagnation Data (upstream end for long pipe)

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

### Scenario data

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **46** | mm |
| Discharge coefficient | **0,62** | fraction |

### OUTPUT DATA

| | | |
|---|---|---|
| Mass flow rate | 31,9874 | kg/s |
| Release duration | 3126,23 | s |

### Orifice or pipe exit data (before atmospheric expansion)

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 0,62 | |

### Final Data (after atmospheric expansion)

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,362677** | m |
| Velocity | 300 | m/s |

## Scenario (Leak) : 050 mm

72181-Elaborati di calcolo\Sergnano\Compressione-Clusters\050 mm

**Weather: Category 2/F**

**INPUT DATA**

**Inventory data**

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

**Stagnation Data (upstream end for long pipe)**

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

**Scenario data**

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **50** | mm |
| Discharge coefficient | **0,62** | fraction |

**OUTPUT DATA**

| | | |
|---|---|---|
| Mass flow rate | 37,7923 | kg/s |
| Release duration | 2646,04 | s |

**Orifice or pipe exit data (before atmospheric expansion)**

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 0,62 | |

**Final Data (after atmospheric expansion)**

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,394214** | m |
| Velocity | 300 | m/s |

## Weather: Category 5/D

### INPUT DATA

### Inventory data

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

### Stagnation Data (upstream end for long pipe)

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

### Scenario data

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **50** | mm |
| Discharge coefficient | **0,62** | fraction |

### OUTPUT DATA

| | | |
|---|---|---|
| Mass flow rate | 37,7923 | kg/s |
| Release duration | 2646,04 | s |

### Orifice or pipe exit data (before atmospheric expansion)

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 0,62 | |

### Final Data (after atmospheric expansion)

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **0,394214** | m |
| Velocity | 300 | m/s |

## Scenario (Leak) : FB 102 mm

72181-Elaborati di calcolo\Sergnano\Compressione-Clusters\FB 102 mm

**Weather: Category 2/F**

**INPUT DATA**

**Inventory data**

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

**Stagnation Data (upstream end for long pipe)**

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

**Scenario data**

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **102** | mm |
| Discharge coefficient | **1** | fraction |

**OUTPUT DATA**

| | | |
|---|---|---|
| Mass flow rate | 253,671 | kg/s |
| Release duration | 394,211 | s |

**Orifice or pipe exit data (before atmospheric expansion)**

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 1 | |

**Final Data (after atmospheric expansion)**

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **1,02133** | m |
| Velocity | 300 | m/s |

## Weather: Category 5/D

### INPUT DATA

### Inventory data

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

### Stagnation Data (upstream end for long pipe)

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

### Scenario data

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **102** | mm |
| Discharge coefficient | **1** | fraction |

### OUTPUT DATA

| | | |
|---|---|---|
| Mass flow rate | 253,671 | kg/s |
| Release duration | 394,211 | s |

### Orifice or pipe exit data (before atmospheric expansion)

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 1 | |

### Final Data (after atmospheric expansion)

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **1,02133** | m |
| Velocity | 300 | m/s |

## Scenario (Leak) : FB 152 mm

72181-Elaborati di calcolo\Sergnano\Compressione-Clusters\FB 152 mm

**Weather: Category 2/F**

**INPUT DATA**

**Inventory data**

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

**Stagnation Data (upstream end for long pipe)**

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

**Scenario data**

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **152** | mm |
| Discharge coefficient | **1** | fraction |

**OUTPUT DATA**

| | | |
|---|---|---|
| Mass flow rate | 563,324 | kg/s |
| Release duration | 177,518 | s |

**Orifice or pipe exit data (before atmospheric expansion)**

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 1 | |

**Final Data (after atmospheric expansion)**

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **1,52198** | m |
| Velocity | 300 | m/s |

## Weather: Category 5/D

### INPUT DATA

### Inventory data

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

### Stagnation Data (upstream end for long pipe)

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

### Scenario data

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **152** | mm |
| Discharge coefficient | **1** | fraction |

### OUTPUT DATA

| | | |
|---|---|---|
| Mass flow rate | 563,324 | kg/s |
| Release duration | 177,518 | s |

### Orifice or pipe exit data (before atmospheric expansion)

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 1 | |

### Final Data (after atmospheric expansion)

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **1,52198** | m |
| Velocity | 300 | m/s |

## Scenario (Leak) : FB 203 mm

72181-Elaborati di calcolo\Sergnano\Compressione-Clusters\FB 203 mm

**Weather: Category 2/F**

**INPUT DATA**

**Inventory data**

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

**Stagnation Data (upstream end for long pipe)**

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

**Scenario data**

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **203** | mm |
| Discharge coefficient | **1** | fraction |

**OUTPUT DATA**

| | | |
|---|---|---|
| Mass flow rate | 1004,76 | kg/s |
| Release duration | 99,5261 | s |

**Orifice or pipe exit data (before atmospheric expansion)**

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 1 | |

**Final Data (after atmospheric expansion)**

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **2,03265** | m |
| Velocity | 300 | m/s |

## Weather: Category 5/D

### INPUT DATA

### Inventory data

| | | |
|---|---|---|
| Mass in vessel | **100000** | kg |

### Stagnation Data (upstream end for long pipe)

| | | |
|---|---|---|
| Initial pressure (gauge) | **146** | bar |
| Initial temperature | **25** | degC |
| Fluid state | **Pressurized gas** | |

### Scenario data

| | | |
|---|---|---|
| Phase to be released | Vapour | |
| Hole diameter | **203** | mm |
| Discharge coefficient | **1** | fraction |

### OUTPUT DATA

| | | |
|---|---|---|
| Mass flow rate | 1004,76 | kg/s |
| Release duration | 99,5261 | s |

### Orifice or pipe exit data (before atmospheric expansion)

| | | |
|---|---|---|
| Pressure | 73,9449 | bar |
| Temperature | -22,0263 | degC |
| Liquid mass fraction | **0** | fraction |
| Velocity at vena contracta (at exit for pipe releases) | 376,607 | m/s |
| Discharge coefficient | 1 | |

### Final Data (after atmospheric expansion)

| | | |
|---|---|---|
| Temperature | -70,7838 | degC |
| Liquid mass fraction | 0 | fraction |
| Droplet diameter | 0 | um |
| Expanded diameter | **2,03265** | m |
| Velocity | 300 | m/s |