



## **AGIS Fire & Security**

Palisadowa 20/22  
01-940 Warszawa  
Phone: (022)4308301  
TFS & BP FM-200 FLOW CALCULATION TSP3.12b  
Project: PROMERANIA TECHNOPARK  
File Name: Serw A015 A016.FLC

## **Consolidated Report**

### **Customer Information**

Company Name: Przedsiębiorstwo Usług Specjalistycznych  
Address: Widuchowska 19  
71-718 Szczecin

Phone:  
Contact:  
Title:

### **Project Data**

Project Name: PROMERANIA TECHNOPARK  
Designer: Krzysztof Majcher  
Number:  
Account:  
Location:  
Description:

## Consolidated Report Enclosure Information

Elevation: 0 m (relative to sea level)  
Atmospheric Correction Factor: 1

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Enclosure Number: 1  
Name: Przestrzeń właściwa A015  
Enclosure Temperature...  
Minimum: 20,0 C  
Maximum: 25,0 C  
Maximum Concentration: 8,827 %  
Design Concentration...  
Adjusted: 8,682 %  
Minimum: 8,500 %  
Minimum Agent Required: 52,2 kg  
Width: 0,00 m  
Length: 0,00 m  
Height: 0,00 m

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Volume: 76,89 cubic m  
Non-permeable: 0,00 cubic m

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Total Volume: 76,89 cubic m  
Adjusted Agent Required: 53,4 kg  
Number of Nozzles: 1

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Enclosure Number: 2  
Name: Podłoga techniczna A015  
Enclosure Temperature...  
Minimum: 20,0 C  
Maximum: 25,0 C  
Maximum Concentration: 10,056 %  
Design Concentration...  
Adjusted: 9,893 %  
Minimum: 8,500 %  
Minimum Agent Required: 6,7 kg  
Width: 0,00 m  
Length: 0,00 m  
Height: 0,00 m

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Volume: 9,85 cubic m  
Non-permeable: 0,00 cubic m

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Total Volume: 9,85 cubic m  
Adjusted Agent Required: 7,9 kg  
Number of Nozzles: 1

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## Consolidated Report Enclosure Information

Elevation: 0 m (relative to sea level)  
Atmospheric Correction Factor: 1

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Enclosure Number: 3  
Name: Przestrzeń właściwa A016  
Enclosure Temperature...  
Minimum: 20,0 C  
Maximum: 25,0 C  
Maximum Concentration: 8,828 %  
Design Concentration...  
Adjusted: 8,683 %  
Minimum: 8,500 %  
Minimum Agent Required: 48,3 kg  
Width: 0,00 m  
Length: 0,00 m  
Height: 0,00 m

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Volume: 71,12 cubic m  
Non-permeable: 0,00 cubic m

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Total Volume: 71,12 cubic m  
Adjusted Agent Required: 49,4 kg  
Number of Nozzles: 1

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Enclosure Number: 4  
Name: Podłoga techniczna A016  
Enclosure Temperature...  
Minimum: 20,0 C  
Maximum: 25,0 C  
Maximum Concentration: 10,048 %  
Design Concentration...  
Adjusted: 9,885 %  
Minimum: 8,500 %  
Minimum Agent Required: 6,2 kg  
Width: 0,00 m  
Length: 0,00 m  
Height: 0,00 m

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Volume: 9,11 cubic m  
Non-permeable: 0,00 cubic m

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Total Volume: 9,11 cubic m  
Adjusted Agent Required: 7,3 kg  
Number of Nozzles: 1

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## Consolidated Report Agent Information

Agent: FM-200 / Propellant N2  
(FM-200 is a Trademark of DuPont)

Adjusted Agent Required: 118,0 kg  
Container Name: 147L TPED Container Assy  
Container Part Number: 303.205.014  
Number of Main Containers: 1  
Number of Reserve Containers: 0  
Manifold: No Manifold  
  
Pipe Take Off Direction: Horizontal  
Agent Per Container: 118,0 kg  
Fill Density: 0,803 kg / l  
Container Empty Weight: 103,7 kg  
Weight, All Containers + Agent: 221,7 kg  
Floor Area Per Container: 0,13 square m  
Floor Loading Per Container: 1712 kg /square m

### Pipe Network

Part 1 - Pipe			Pipe			
Description	Start	End	Type	Diameter	Length	Elevation
Main Cyl. X 1	0	1		50 mm	1,35 m	1,35 m
Pipe	1	2	DIN244 0	50 mm	3,50 m	3,50 m
Pipe	2	3	DIN244 0	50 mm	1,80 m	0,00 m
Pipe	3	4	DIN244 0	40 mm	0,50 m	0,00 m
Pipe	4	5	DIN244 0	32 mm	1,70 m	0,00 m
Pipe/E3-N1	5	6	DIN244 0	32 mm	0,10 m	0,10 m
Pipe	4	7	DIN244 0	25 mm	0,50 m	0,00 m
Pipe	7	8	DIN244 0	25 mm	4,90 m	-4,90 m
Pipe	8	9	DIN244 0	15 mm	0,20 m	0,00 m

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Calculation Date/Time: 22 październik 2013, 13:55:08

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## Consolidated Report

### Part 1 - Pipe

Description	Start	End	Type	Diameter	Pipe Length	Elevation
Pipe	9	10	DIN244 0	15 mm	0,35 m	0,00 m
Pipe/E2-N1	10	11	DIN244 0	15 mm	0,10 m	-0,10 m
Pipe	8	12	DIN244 0	15 mm	0,20 m	0,00 m
Pipe/E4-N1	12	13	DIN244 0	15 mm	0,10 m	-0,10 m
Pipe	3	14	DIN244 0	32 mm	1,40 m	0,00 m
Pipe/E1-N1	14	15	DIN244 0	32 mm	0,10 m	0,10 m

### Part 2 - Equivalent Length

Start	End	90	45	Thru	Side	Union	Other	Added	Total
0	1	0	0	0	0	0		0,00 m	10,67 m
1	2	1	0	0	0	0		0,00 m	5,18 m
2	3	1	0	0	0	0		0,00 m	3,47 m
3	4	0	0	0	1	0		0,00 m	3,14 m
4	5	0	0	1	0	0		0,00 m	2,41 m
5	6	1	0	0	0	0		0,00 m	1,22 m
4	7	0	0	0	1	0		0,00 m	2,23 m
7	8	1	0	0	0	0		0,00 m	5,76 m
8	9	0	0	0	1	0		0,00 m	1,25 m
9	10	1	0	0	0	0		0,00 m	0,88 m
10	11	1	0	0	0	0		0,00 m	0,61 m
8	12	0	0	0	1	0		0,00 m	1,25 m
12	13	1	0	0	0	0		0,00 m	0,61 m
3	14	0	0	0	1	0		0,00 m	3,69 m
14	15	1	0	0	0	0		0,00 m	1,22 m

### Part 3 - Nozzles

Start	End	Flow	Name	Size	Type	Nozzle Area
0	1	118,0 kg				
1	2	118,0 kg				
2	3	118,0 kg				
3	4	64,6 kg				
4	5	49,4 kg				

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### Part 3 - Nozzles

Start	End	Flow	Name	Size	Type	Nozzle Area
5	6	49,4 kg	E3-N1	32 mm	360-AL (BSP)	543,43 square mm
4	7	15,2 kg				
7	8	15,2 kg				
8	9	7,9 kg				
9	10	7,9 kg				
10	11	7,9 kg	E2-N1	15 mm	180-AL (BSP)	154,43 square mm
8	12	7,3 kg				
12	13	7,3 kg	E4-N1	15 mm	180-AL (BSP)	116,33 square mm
3	14	53,4 kg				
14	15	53,4 kg	E1-N1	32 mm	360-AL (BSP)	615,81 square mm

### Parts Information

Total Agent Required: 118,0 kg

Container Name: 147L TPED Container Assy (Part: 303.205.014)

Number Of Containers: 1

Nozzle	Type	Diameter	Nozzle Area	Part Number
E1-N1	360-AL (BSP)	32 mm	615,81 square mm	310.205.110
E2-N1	180-AL (BSP)	15 mm	154,43 square mm	310.205.103
E3-N1	360-AL (BSP)	32 mm	543,43 square mm	310.205.110
E4-N1	180-AL (BSP)	15 mm	116,33 square mm	310.205.103

Nozzle	Drill Diameter	Drill Size
E1-N1	9,9000 mm	9.9 mm
E2-N1	5,3000 mm	5.3 mm
E3-N1	9,3000 mm	9.3 mm
E4-N1	4,6000 mm	4.6 mm

Pipe:	Type	Diameter	Length
	DIN2440	15 mm	0,95 m
	DIN2440	25 mm	5,40 m
	DIN2440	32 mm	3,30 m

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Pipe:	Type	Diameter	Length
	DIN2440	40 mm	0,50 m
	DIN2440	50 mm	5,30 m

List of 90 degree elbows:

3 - 15 mm  
1 - 25 mm  
2 - 32 mm  
2 - 50 mm

List of Tees:

1 - 25 mm  
1 - 40 mm  
1 - 50 mm

## System Acceptance

**\* WARNING - The data in this project may have been changed after the calculations were performed.**

System Discharge Time: 8,2 seconds

Percent Agent In Pipe: 26,1%

Percent Agent Before First Tee: 17,4%

Enclosure Number: 1

Enclosure Name: Przestrzeń właściwa A015

Minimum Design Concentration: 8,500%

Adjusted Design Concentration: 8,682%

Predicted Concentration: 8,638%

Maximum Expected Agent Concentration: 8,782% (At 25,0 C)

Nozzle	Minimum Agent Required	Adjusted Agent Required	Predicted Agent Delivered	Nozzle Pressure (Average)
E1-N1	52,2 kg	53,4 kg	53,1 kg	8,780 bar

Enclosure Number: 2

Enclosure Name: Podłoga techniczna A015

Minimum Design Concentration: 8,500%

Adjusted Design Concentration: 9,893%

Predicted Concentration: 9,674%

Maximum Expected Agent Concentration: 9,834% (At 25,0 C)

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Nozzle	Minimum Agent Required	Adjusted Agent Required	Predicted Agent Delivered	Nozzle Pressure (Average)
E2-N1	6,7 kg	7,9 kg	7,7 kg	7,049 bar

Enclosure Number: 3

Enclosure Name: Przestrzeń właściwa A016

Minimum Design Concentration: 8,500%

Adjusted Design Concentration: 8,683%

Predicted Concentration: 8,819%

Maximum Expected Agent Concentration: 8,966% (At 25,0 C)

Nozzle	Minimum Agent Required	Adjusted Agent Required	Predicted Agent Delivered	Nozzle Pressure (Average)
E3-N1	48,3 kg	49,4 kg	50,2 kg	8,734 bar

Enclosure Number: 4

Enclosure Name: Podłoga techniczna A016

Minimum Design Concentration: 8,500%

Adjusted Design Concentration: 9,885%

Predicted Concentration: 9,450%

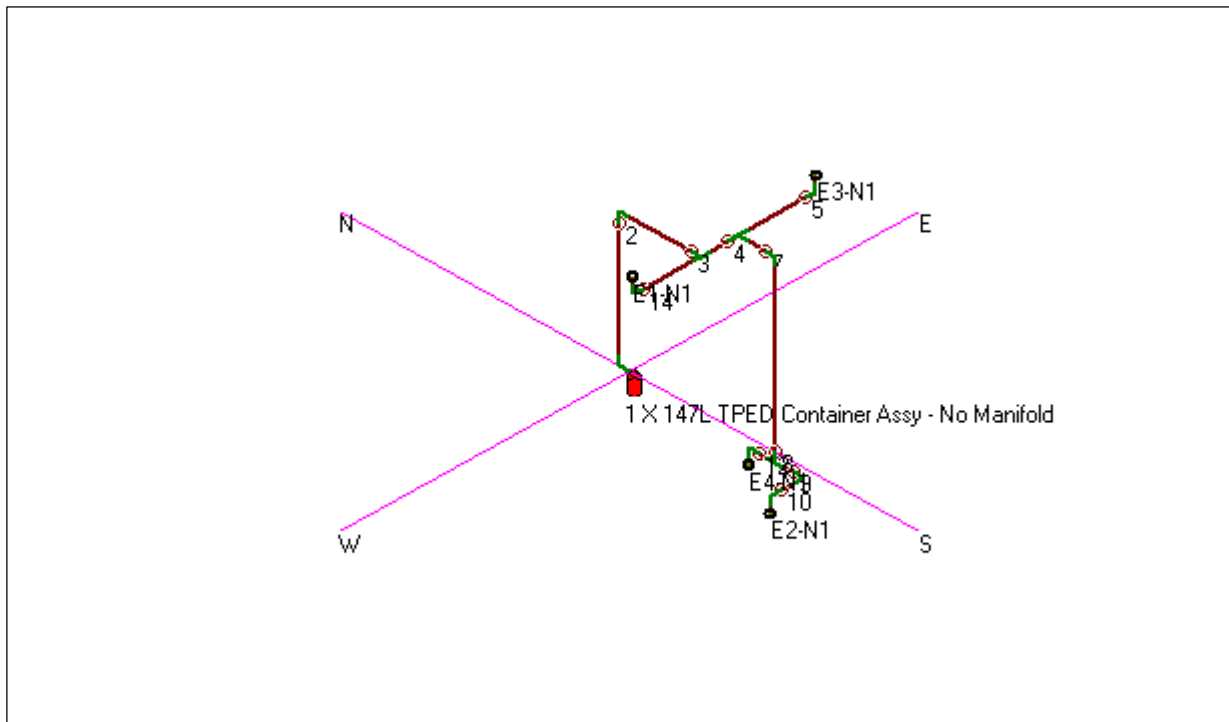
Maximum Expected Agent Concentration: 9,606% (At 25,0 C)

Nozzle	Minimum Agent Required	Adjusted Agent Required	Predicted Agent Delivered	Nozzle Pressure (Average)
E4-N1	6,2 kg	7,3 kg	6,9 kg	7,886 bar

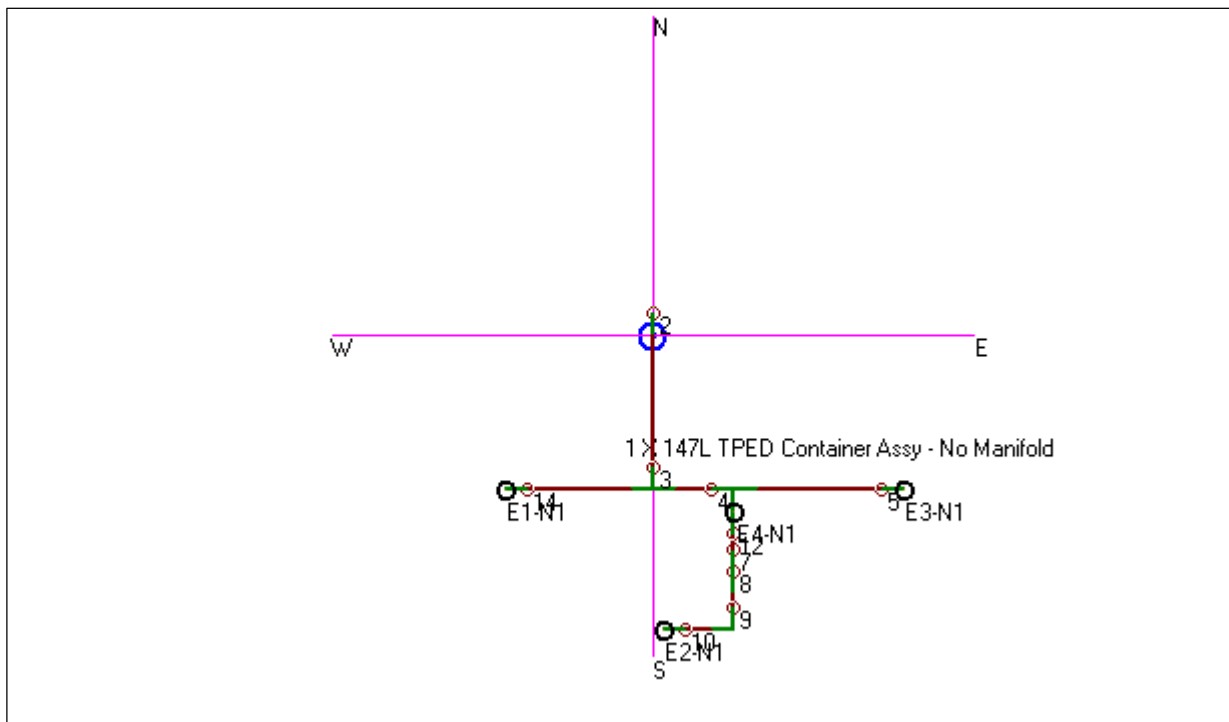


## Consolidated Report

### Standard Isometric View



### Standard Plan View



## Consolidated Report

### Standard Elevation View

