

**Project description:**  
Obliczenia hydrauliczne.



**Pipesystem data:**

Section-No:	Starting-node	Endnode	Length [m]	Height [m]	Pipetype	Diameter [mm]	Fitting *	Component code	Component coefficient	Nb of containers FK-5-1-12 quantity
1	0	1	0,100	0,100	20	44,4	C	420	4,200	1
2	1	2	0,200	0,000	11	36,0	E	-	-	
3	2	3	1,260	1,260	11	36,0	E	-	-	
4	3	4	2,700	0,000	11	36,0	E	-	-	
5	4	9	1,600	0,000	11	36,0	E	-	-	
6	9	10	0,100	0,000	11	36,0	E	-	-	
7	10	7	0,750	0,000	11	27,3	T-90°	-	-	
8	7	51608	0,100	-0,100	11	27,3	E	-	-	27.9
9	10	5	0,750	0,000	11	27,3	T-90°	-	-	
10	5	51606	0,100	-0,100	11	27,3	E	-	-	27.9

\* C=Component, B=Bend, T=T-Piece, E=Elbow

**Legend of pipetypes**

Type	Pipeclass	Pipe roughness
20	RURKI SYFONOWE	smooth
11	RURY ST. O.C. wg DIN2458	galvanized

**Legend of components**

Code	Type	Resistance coefficient
420	cylinder valves KD-1230, 42 bar	4,200



**Calculation zone data:**

Zone	Total volume [m3]	Volume of building parts [m3]	Calculated volume [m3]	Max. Over-pressure [mbar]	Design temp. [°C]	Extinguish-conc. [% Vol]	Design factor	Design conc. [% Vol]	Design quantity [kg]
1 Prz. główna	61,6	0,0	61,6	2,000	20,0	4,7	1,30	6,1	55,78

Regulation rule for calculation of FK-5-1-12 quantities: ISO 14520-1, Edition 2000

Calczone no. 1: (n\_Heptane)

Altitude above sealevel: 100,0 m

**Further information:**

Design with included gas discharge time



## Calculation results:

### FK-5-1-12 storage data:

Design quantity:	55,8 kg
Supplement factor:	1,10
Minimum storage quantity:	61,4 kg
Container volume:	80,0 l
Filling ratio:	0,77 kg/l
Filling pressure:	42,0 bar abs
FK-5-1-12 -mass per container:	61,4 kg
Number of containers:	1
Actual storage quantity:	61,4 kg
Storage temperature:	20,0 °C
Starting container pressure:	42,0 bar abs

### Discharge time:

Discharge time air:	0,3 s
Total gas discharge time:	0,3 s
Two-phase discharge time:	9,7 s
Total discharge time:	10,0 s

### System information:

Container working pressure:	26,0 bar abs
Container working temperature:	20,0 °C
Total network volume:	6,9 l
Medium pipe content:	10,6 kg FK-5-1-12
Filling portion in pipe system:	0,19 kg FK-5-1-12 /kg FK-5-1-12 -storage



**Pipe system:**

Section-No:	Starting-node	Endnode	Pressure [bar abs]	Flowrate [kg/s]	Pipedimension Di [mm]	DN
1	0	1	25,86	5,46	44,4	
2	1	2	25,61	5,46	36,0	11/4
3	2	3	25,14	5,46	36,0	11/4
4	3	4	24,82	5,46	36,0	11/4
5	4	9	24,53	5,46	36,0	11/4
6	9	10	24,30	5,46	36,0	11/4
7	10	7	24,06	2,73	27,3	1
8	7	51608	23,89	2,73	27,3	1
9	10	5	24,06	2,73	27,3	1
10	5	51606	23,89	2,73	27,3	1



**Nozzle data:**

Calculation- zone no:	Nozzle no.	Nozzle type	Number of orifices	Pipeconnection Di [mm]	DN	Orifice [mm]	FK-5-1-12 out- put [kg]
1	51608	5	16	27,3	1	2,2	27,9
1	51606	5	16	27,3	1	2,2	27,9

MAXIMUM TRANSPORT TIME DIFF. BETWEEN NOZZLES: 51606./ 51608. IS 0.00 S



**Concentrations:**

Calculation- zone no:	O2	Gascomposition after discharge [%]	
		FK-5-1-12	N2
1	19,5	6,6	73,0

**Pressure relief opening:**

Calculation- zone no:	Recommended area against overpressure		Max. flow [kg/s]
	Area [m <sup>2</sup> ]	Overpressure [mbar]	
1	0,039	2,0	



### **Component list:**

Component	Number	Code	Coefficient
cylinder valves KD-1	1	420	4,200

Nozzle-type	Number
KD-1230: 2 to 16 orifices	2

Pipe-type	Di [mm]	DN	Length [m]
20	44,40		0,100
11	36,00	11/4	5,900
11	27,30	1	1,800

### **Number of bends (+) and elbows (-)**

Bend-type	Di [mm]	DN	Number
-90	36,00	11/4	5
-90	27,30	1	2

### **Number of T-distributors (in- and outdiameter)**

Number	Input	90-out	90-out	0-out
1	36,0	27,3	27,3	0,0