THERMAL CALCULATION

TYPE OF CALCULATION ACCORDING TO EN ISO 12241

OBJECT

TYPE:	PIPELINE
ORIENTATION:	HORIZONTAL
DIAMETER:	DN 80
EXTERNAL DIAMETER:	88.9 MM
LENGHT:	100 MT
OPERATING TEMPERATURE:	180.0 °C

ECONOMIC DETAIL:

ENERGY COST:	0.10 €/ KWH
OPERATION TIME:	8.760 H X YEAR

ECOLOGIC CONDITION:

FUEL TYPE:	GAS
CO2 FACTOR:	56.10 KG CO2/H

AMBIENT CONDITION:

AMBIENT TEMPERATURE:	25.0 °C
HEAT LOSS:	10.0 °C

INSULATION SISTEM:

CLADDING:	ALUMINIUM
CLADDING LOSS	0.05 °C

RESULTS FOR REQUIRED INSULATION

INSULATION THICKNESS	SURFACE TEMPERATURE AT 25 °C AMBIENT TEMP. AND 0.0 M/S WINDSPEED °C	HEAT LOSS	
		W/M	W/M2
MM 110	35,6 °C	38.2	39.4

Insulation thickness mm	Heat loss (q) W/m²	Heat loss W/m	Surface Temperature °C	CO2-Emission in tons/a t_CO2/a	Heat loss costs €/a	Convection -
0	3,285.0	917.5	180.0	162.3	80,369	laminar
25	225.9	98.6	60.4	17.4	8,636	laminar
30	185.6	86.8	55.9	15.4	7,606	laminar
40	134.4	71.3	49.7	12.6	6,249	laminar
50	103.7	61.5	45.7	10.9	5,390	laminar
60	83.4	54.7	42.8	9.7	4,796	laminar
70	69.2	49.7	40.6	8.8	4,358	laminar
80	58.7	45.9	38.9	8.1	4,021	laminar
90	50.7	42.8	37.6	7.6	3,752	laminar
100	44.4	40.3	36.5	7.1	3,533	laminar
110	39.4	38.2	35.6	6.8	3,350	laminar
120	35.3	36.5	34.8	6.5	3,195	laminar
130	31.9	34.9	34.2	6.2	3,061	laminar
140	29.0	33.6	33.6	5.9	2,945	laminar
150	26.6	32.4	33.1	5.7	2,843	laminar
160	24.5	31.4	32.6	5.6	2,752	laminar
170	22.6	30.5	32.2	5.4	2,670	laminar
180	21.0	29.6	31.9	5.2	2,597	laminar
190	19.6	28.9	31.5	5.1	2,530	laminar
200	18.4	28.2	31.3	5.0	2,469	laminar
210	17.2	27.6	31.0	4.9	2,414	laminar
220	16.2	27.0	30.7	4.8	2,363	laminar
230	15.3	26.4	30.5	4.7	2,315	laminar
240	14.5	25.9	30.3	4.6	2,272	laminar
250	13.8	25.5	30.1	4.5	2,231	laminar
260	13.1	25.0	30.0	4.4	2,193	laminar
270	12.5	24.6	29.8	4.4	2,157	laminar
280	11.9	24.2	29.6	4.3	2,124	laminar
290	11.4	23.9	29.5	4.2	2,092	laminar
300	10.9	23.5	29.4	4.2	2,062	laminar
310	10.4	23.2	29.2	4.1	2,034	laminar
320	10.0	22.9	29.1	4.1	2,008	laminar
330	9.6	22.6	29.0	4.0	1,983	laminar
340	9.3	22.4	28.9	4.0	1,959	laminar
350	8.9	22.1	28.8	3.9	1,936	laminar
360	8.6	21.9	28.7	3.9	1,914	laminar
370	8.3	21.6	28.6	3.8	1,894	laminar
380	8.0	21.4	28.5	3.8	1,874	laminar
390	7.8	21.2	28.4	3.7	1,855	laminar
400	7.5	21.0	28.4	3.7	1,837	laminar