

Bonded system - 80-90° L-bends with foam pads

calculations according to Design Manual chapter 4

Conditions

Flow temperature, T _f	130	°C
Installation temperature, T _{ins}	10	°C
Soil cover, H	0.6	m

Insulation class **Series 1**

Steel material properties

Expansion coefficient, α	0.0000124	°K ⁻¹
Modulus of elasticity, E	206,571	MPa

Soil parameters

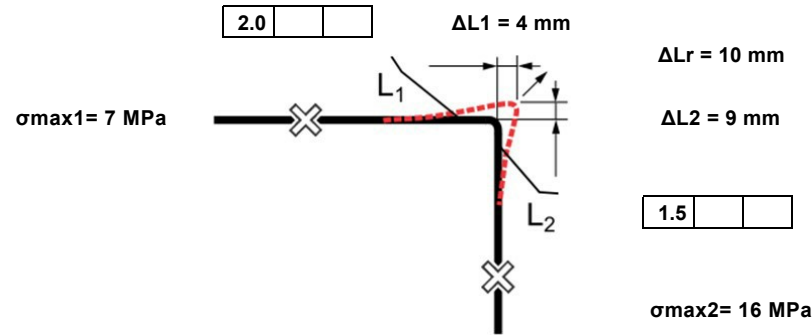
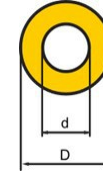
Soil density, ρ	19	kN/m ³
Soil friction angle, φ	32.5	°
Friction coefficient, μ	0.40	

Example

Nominal size	DN 50		
Steel pipe diameter, d	60.3	mm	
Wall thickness, s	2.9	mm	
Casing diameter, D	125	mm	

Dist. to anchor point, L1
Dist. to anchor point, L2

2.8
6



Multiple calculations

Input				Output													
Node no.	L1	L2	Nominal size	d	D	ΔL1	F1 min	Foam pads for ΔL1			ΔL2	F2 min	Foam pads for ΔL2			ΔLr	Number of layers
	m	m		mm	mm	mm	m	1	2	3	mm	m	1	2	3	mm	
1	10	50	DN 65	76.1	140	14.3	2.3	2.5	1.5	1.0	60	3.2	3.5	2.0	1.0	62	3
2	10	50	DN 65	76.1	140	14.3	2.3	2.5	1.5	1.0	60	3.2	3.5	2.0	1.0	62	3
3	10	50	DN 65	76.1	140	14.3	2.3	2.5	1.5	1.0	60	3.2	3.5	2.0	1.0	62	3
4	10	50	DN 65	76.1	140	14.3	2.3	2.5	1.5	1.0	60	3.2	3.5	2.0	1.0	62	3
5	10	50	DN 65	76.1	140	14.3	2.3	2.5	1.5	1.0	60	3.2	3.5	2.0	1.0	62	3
6	10	50	DN 65	76.1	140	14.3	2.3	2.5	1.5	1.0	60	3.2	3.5	2.0	1.0	62	3
7	10	50	DN 65	76.1	140	14.3	2.3	2.5	1.5	1.0	60	3.2	3.5	2.0	1.0	62	3
8	10	50	DN 65	76.1	140	14.3	2.3	2.5	1.5	1.0	60	3.2	3.5	2.0	1.0	62	3
9	10	50	DN 65	76.1	140	14.3	2.3	2.5	1.5	1.0	60	3.2	3.5	2.0	1.0	62	3
10	10	50	DN 65	76.1	140	14.3	2.3	2.5	1.5	1.0	60	3.2	3.5	2.0	1.0	62	3