

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

calculations according to Design Manual chapter 4

Conditions

Flow temperature, T _f	120	°C
Installation temperature, T _{ins}	10	°C
Soil cover, H	0.9	m

Insulation class **Series 1**

Steel material properties

Expansion coefficient, α	0.0000123	°K ⁻¹
Modulus of elasticity, E	207,143	MPa

Soil parameters

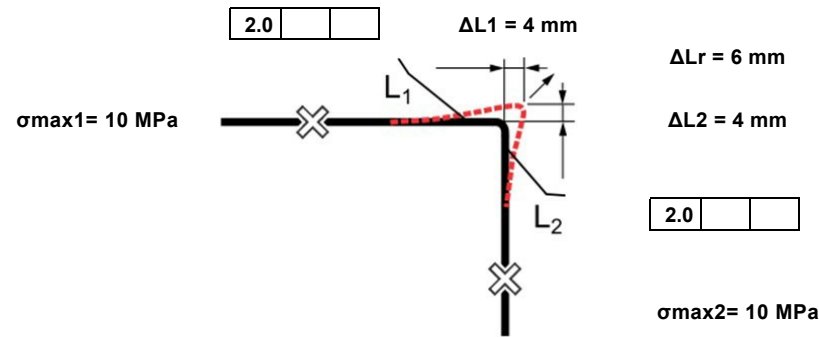
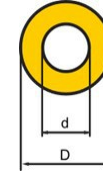
Soil density, ρ	19	kN/m ³
Soil friction angle, φ	32.5	°
Friction coefficient, μ	0.40	

Example

Nominal size	DN 65	
Steel pipe diameter, d	76.1	mm
Wall thickness, s	2.9	mm
Casing diameter, D	140	mm

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

3
3



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	
C2	3	3	DN 65	76.1	140	4.0	1.7	2			4	1.7	2			6	1
C3	19	3	DN 65	76.1	140	22.8	2.5	2.5			4	1.7	2			23	1
C6	19	9	DN 40	48.3	110	21.6	2.1	2.5			11	1.8	2			24	1
C9	9	5	DN 32	42.4	110	11.1	1.6	2			6	1.5	1.5			13	1
C11	5	3	DN 32	42.4	110	6.5	1.5	1.5			4	1.3	1.5			8	1
C12	3	7	DN 32	42.4	110	4.0	1.3	1.5			9	1.6	2			10	1
C4.1	3	2	DN 40	48.3	110	4.0	1.4	1.5			3	1.3	1.5			5	1
C4.2	2	9	DN 40	48.3	110	2.7	1.3	1.5			11	1.8	2			12	1
C4.4 i C4.5	9	1	DN 40	48.3	110	11.3	1.8	2			1	1.1	1.5			11	1
C4.6	4	5	DN 40	48.3	110	5.2	1.5	1.5			6	1.6	2			8	1