

### Description:



- Completely pre-assembled, factory welded geothermal probe made of PE100 SDR11 in standard lengths, special lengths on request
- Injection moulded, separable probe, especially developed for geothermal use with flow deflection without cross section reduction, piggable
- Production is monitored acc. to the SKZ guideline HR3.26, as a third party, a governmental institute for material testing [Materialprüfungsanstalt Darmstadt] controls the production of FRANK probes
- Manufactured by DVS-qualified welders
- Individual test certificate for each probe (available on our website)

### Design:

Geothermal probe, duplex, with separable probe foot.

### Conformance:

Production acc. to SKZ guideline HR 3.26, SKZ Zertifikat A 466  
Factory welded geothermal probe acc. to VDI 4640  
Welded acc. to DVS guidelines  
Equates to the specifications of the quality seal for geothermal drilling companies (D-A-CH)

### Material:

Probe foot: Injection moulded fitting made of PE 100 SDR 11  
Pipe: extruded pipe made of PE 100 SDR 11

The material properties temperature- and pressure dependent (s. page 3)

#### alternative:

Geothermal probes with pipes made of PE 100-RC acc. to PAS 1075 deliverable for installation without sand embedding.

### Temperature range:

PE 100: Durable operating temperature  $-10^{\circ}\text{C}$  up to max.  $+40^{\circ}\text{C}$ ,  
Elevated temperature up to  $+70^{\circ}\text{C}$  allowed  
(see table on page 3)

Max. feed in temperature of the brine into the ground  $\pm 17^{\circ}\text{C}$   
compared to ground temperature (acc. to VDI guideline 4640)

### Operating pressure:

SDR 11 equates to pressure range PN 16 acc. to DIN 8074  
(safety factor 1,25)

The allowed positive operating pressure depends on temperature and time (s. page 3)

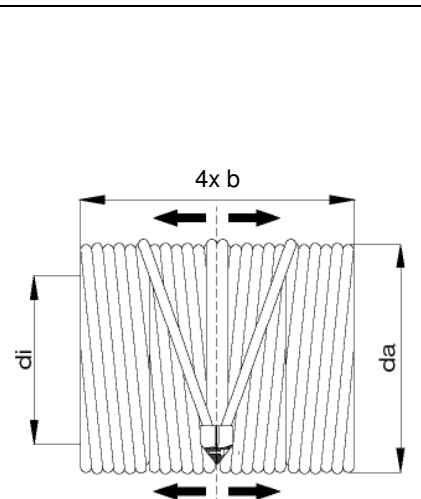
**Heat conductance:** 0,40 W/mK (at 20 °C)

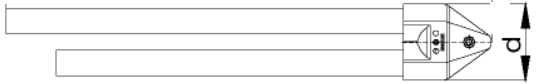
**Connecting dimensions:** Pipe dimension (2x flow and 2x return)  
 OD 32 x 2,9 mm  
 OD 40 x 3,7 mm

**Installation:** See FRANK installation remarks for geothermal probes

**Measurements:**

Geothermal probes							
Coiled bundles PE 100, black							
Pipe		Coil bundle measurements			Plies	Number of coils	Weight
OD (mm)	l (m)	OD (mm)	ND (mm)	b (mm)	(pieces)		(kg)
32	50	1.080	900	200	3	4	55
	60	1.130		200	4	4	66
	70	1.190		200	5	4	77
	80	1.190		200	5	4	88
	90	1.250		200	6	4	98
	100	1.250		200	6	4	109
	110	1.300		200	7	4	120
	120	1.300		200	7	4	131
	130	1.360		200	8	4	142
	140	1.360		200	8	4	153
	150	1.360		200	8	4	164
40	50	1.020	800	295	3	4	86
	100	1.160		295	5	4	172
	110	1.220		295	6	4	190
	120	1.220		295	6	4	207
	130	1.300		295	7	4	224
	140	1.300		295	7	4	241
	150	1.300		295	7	4	258
	170	1.370		295	8	4	293
	200	1.370		335	8	4	344
	250	1.440		335	9	4	430



	Probe foot diameter	
	OD (mm)	
<b>Geothermal probe foot 32 x 2,9</b>	approx. 99	
<b>Geothermal probe foot 40 x 3,7</b>	approx. 118	

**Compressive strength:**

Allowed component overpressure at long-term loading for PE100 dependency to temperature and operating time

Diameter- wall- thickness ratio SDR 11 / PN 16 <sup>1)</sup>		
Temperature [°C]	Operating time [Years]	Allowed component operating overpressure <sup>2)</sup> [bar]
10	5	20,2
	10	19,8
	25	19,3
	50	19,0
	100	18,7
20	5	16,9
	10	16,6
	25	16,2
	50	16,0
	100	15,7
30	5	14,4
	10	14,1
	25	13,8
	50	13,5

Diameter- wall- thickness ratio SDR 11 / PN 16 <sup>1)</sup>		
Temperature [°C]	Operating time [Years]	Allowed component operating overpressure <sup>2)</sup> [bar]
40	5	12,3
	10	12,1
	25	11,8
	50	11,6
50	5	10,7
	10	10,4
	15	9,5
60	5	7,7
70	2	6,2

The in the table given information are valid for flow medium water. They have been determined of the creep test diagram with a safety factor of C=1,25 acc. to DIN 8074.

- 1) Old pressure range description acc. DIN 8077 (of 1989)
- 2) For the calculation of the positive operating pressure in pipe system it is recommended to multiply the in the table given operating overpressure by a system, reduction ratio of fs=0,8. (This factor includes influences of installation procedures like welding connections, flange connections or bending stress.)