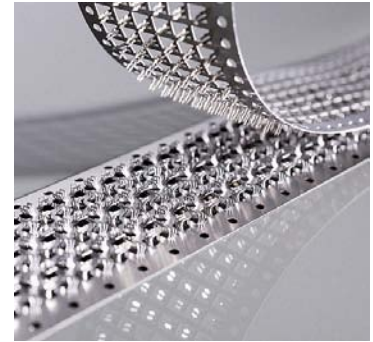


Datasheet Entenkopf

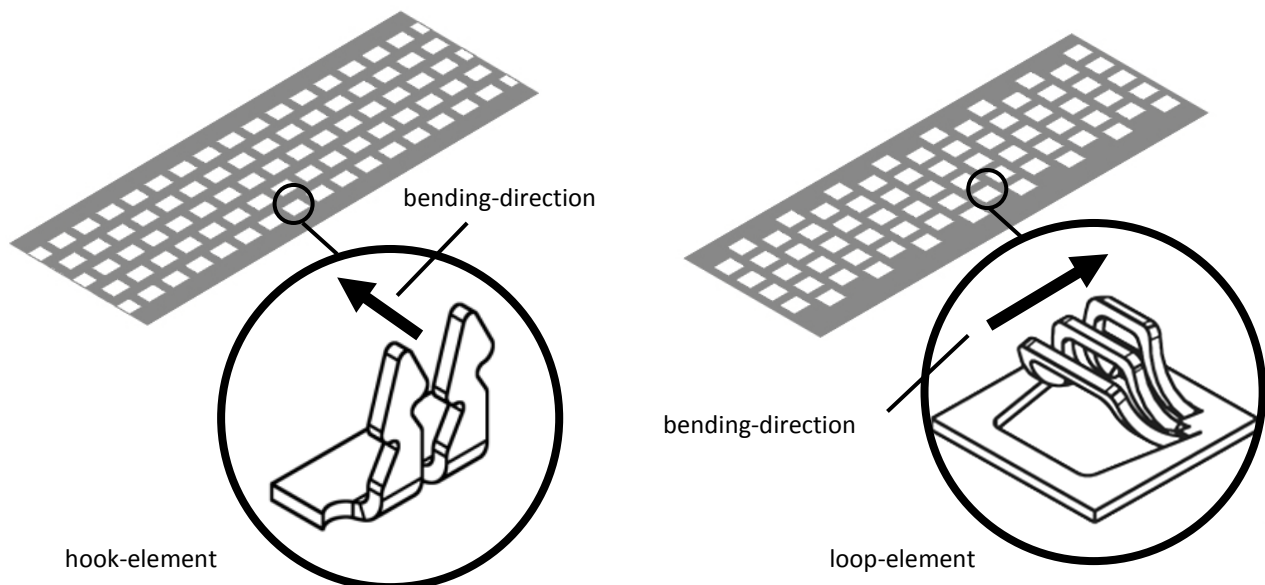
METAKLETT is a multiply mountable and dismountable metallic hook-and-loop fastener which can be applied in environments where synthetic materials lose their practicality. The hook-loop device consisting of the hook-element Entenkopf "HE1" and the loop-element Stanzflausch "SF1" can be assembled manually in varying angles at any position and disassembled by peeling or pull-out tension.



Material

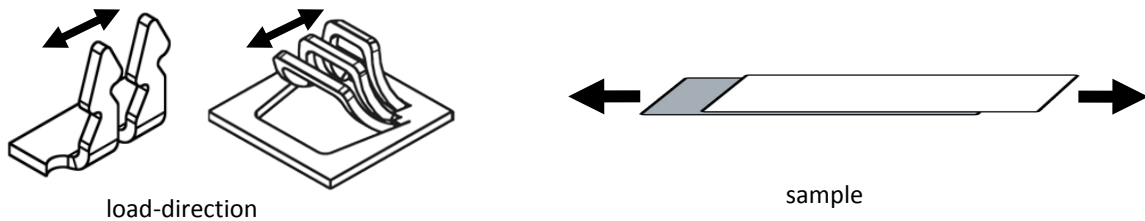
Hook "HE1":	1.4310
Complement "SF1":	1.4310
Sheet thickness t:	0.2 mm
Sheet width b:	30 mm
Total height assembled:	2.5 mm
Sheet length l:	can be cut to variable length
Angle of assembling:	+ / - 20 ° in strip - direction 180 ° rotatable
Properties:	1.4310 according to DIN 10088 corrosion and acid resistant chromium nickel steel austenitic, high weldability

Geometrical definition



Shear strength of the connection in longitudinal direction***Test set-up***

With each of them clamped in a jaw chuck, the two hook and loop strips are joined in the center within an area of 15 cm². The device is loaded in strip-direction.



Maximum force per area (25 tests, 23 °C room temperature, joined area 15 cm²)

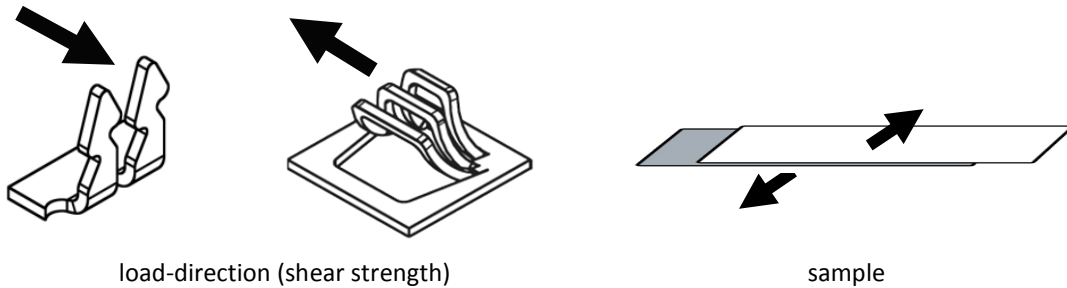
Clamp	N/cm ²			
	Min.	Ø	Max.	σ
Shear strength 0° against the bending-direction of loop-elements	71	97	120	15 %
Shear strength 0° in bending-direction of loop-elements	80	121	149	17 %

Data valid for mounting areas 15 cm² or larger.

Application values

Test set-up

In the shear tension tests, the stripes are loaded in crosswise direction. The hooks are loaded against their bending-direction. The angle of the load direction during the dismounting process is adjustable.



load-direction (shear strength)

sample

The data below shows how the maximum force per area depends on the different types of load* and temperatures** (10 tests, mounting area 6.6 cm²).

For shear loading, the force is applied transverse to the stripe direction.

Peel tension	pull-out tension	shear tension			
	90°	60°	45°	30°	0°

Clamp	N/cm ²							
	23 °C				50 °C			
	Min.	∅	Max.	σ	Min.	∅	Max.	σ
Pull-out strength	5	9	16	35 %	4	7	12	37 %
Shear strength 0°	28	41	50	19 %	22	40	60	23 %
Shear strength 30°	17	26	32	17 %	17	26	31	15 %
Shear strength 45°	13	19	23	17 %	10	19	33	38 %
Shear strength 60°	6	10	18	34 %	5	10	23	53 %
Peel strength	1	3	8	91 %	1	2	5	68 %

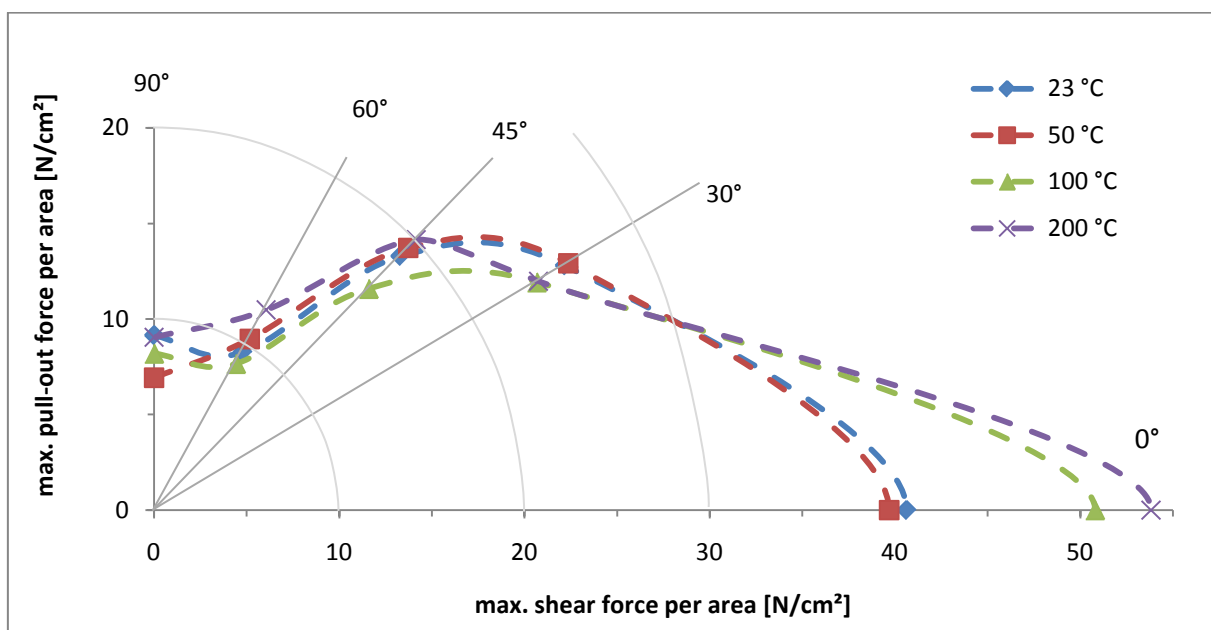
Clamp	N/cm ²							
	100 °C				200 °C			
	Min.	∅	Max.	Σ	Min.	∅	Max.	σ
Pull-out strength	5	8	15	34 %	5	9	15	33 %
Shear strength 0°	32	51	65	24 %	29	54	62	24 %
Shear strength 30°	17	24	37	28 %	18	24	29	28 %
Shear strength 45°	11	16	21	20 %	18	20	22	20 %
Shear strength 60°	5	9	13	34 %	9	12	16	34 %
Peel strength	2	3	5	35 %	1	4	10	35 %

Clamp	N/cm ²											
	400 °C				600 °C				800 °C			
	Min.	∅	Max.	σ	Min.	∅	Max.	σ	Min.	∅	Max.	σ
Shear strength 0°	17	59	96	43 %	42	55	75	24 %	25	30	35	13 %

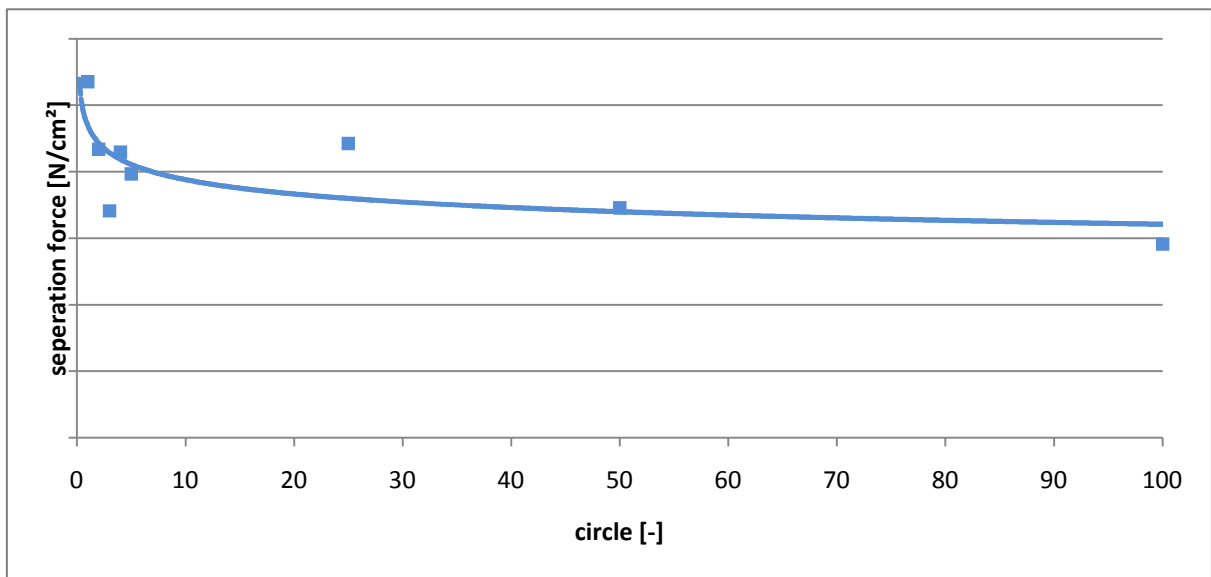
*: Test specification: LWF KS-2-specimen, Laboratory for Materials and Joining Technology, University of Paderborn

** : Due to the experimental set-up above 400 °C only verification in shear direction possible

Maximum force per area as function of the loading angle



Polar diagram – averages of 10 tests, depending on loading angle and temperature

Trend of separation force per area for multiple fastening

*Decrease of joint strength for manually mounting and dismounting one hundred times,
Averages of 10 tests at 23 °C room temperature with trendline*

The decrease of strength after disassembling one hundred times averages out at ca. 45 %.

Chemical and thermal resistance

According to DIN 10088, material: 1.4310

Fastening

Preferably by welding or riveting

Further possibilities depending on the application; customers' decision