



PACO 3 BASICS 3

Screen Printing Cloths



PACO:

Economy Through Quality and Precision

PACO is among the worldwide quality leaders on the screen printing cloth market. One of the key reasons for this success is exclusive concentration on stainless steel as the basis material. A further factor is that the cloths are processed using dedicated high precision looms built by the company's own mechanical engineering team. Together with over sixty years experience, continuous product development and innovation, PACO is a dependable partner that can ensure success through particularly cost-effective solutions and optimum printing results.

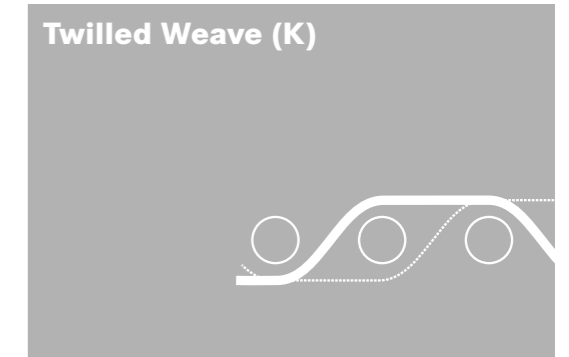
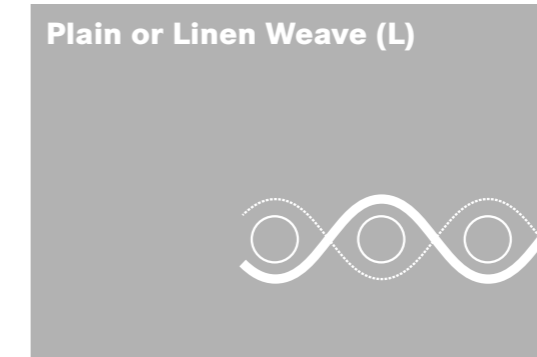
The advantages of PACO stainless steel screen printing cloths:

- thin to ultra-thin wires with close diameter tolerances and extremely high tensile strength
 - high precision through a strong weave
 - large open screen area
 - low distortion with minimum distance between screen and substrate
 - superior register accuracy, no elongation through squeegee movement
 - excellent dimensional stability even at high temperatures
 - clean, homogenous cloth surfaces
 - high tension values
 - high resistance to abrasion: can be used with aggressive inks (e.g. ceramic pastes)
 - can be electrically heated
 - no creeping, no electrostatic charging
 - no absorption of moisture and solvents
 - no change of volume, loss of tension or shrinking in contrast to plastic cloths
 - media is easily released from the screen, easy to clean
 - long lifetime, more printing cycles with long service life
 - dependably high printing quality and cost-effectiveness
- Leading-edge measuring technology and sophisticated methods of testing consistently ensure the high quality of PACO screen printing cloths. All of the agreed specifications are reliably met. It goes without saying that PACO quality management for screen printing cloths is also certified according to all relevant standards.

The Range:

Weaves and Characteristics

The most important types of weave for screen printing cloths made of stainless steel wire are:



The pattern of the plain weave is formed by the weft wire which alternately passes over and under each warp wire. This produces either a square or a rectangular mesh. For screen printing applications, however, perfect square meshes are the cloth of choice.

The twilled weave is characterized by the filling threads being alternately woven over one and then under two or more threads. This method of weave can relate to either warp or weft threads, thereby giving a large variety of different twills. In conjunction with PACO's precision weaving technology, even the standard twilled weaves provide good weave stability, but – depending on the combination of wire and aperture – produce a slightly diagonal pattern.

The relationship between the mesh size and wire diameter of wire cloths is described in detail in ISO 4783-1, 2, 3.



Cloth Parameters

It is absolutely essential to define the cloth parameters when selecting the most suitable screen printing cloth for a specific application. Keep in mind that the wires of the screen printing cloth keep the template in place. But the openings in the mesh between them allows the ink to flow onto the medium being printed. And it is the optimum interaction between these two that provides the desired printing results.

Cloth Parameters

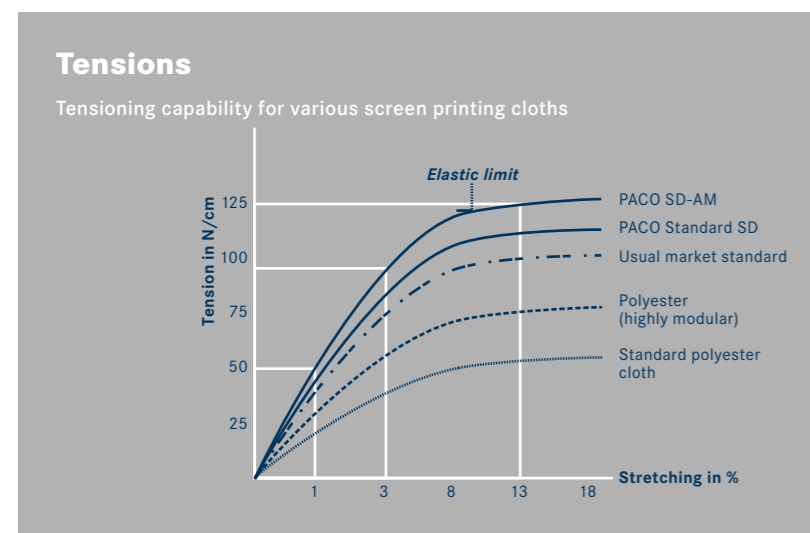
1. Amount of wires per cm in warp direction
2. Amount of wires per cm in weft direction
3. Mesh size
4. Open area %
5. Wire diameter

$D/\mu\text{m}$ = Mesh thickness . $t/\mu\text{m}$ = Division . $F_s (\mu)$ = Wire thickness (weft) .
 $F_k/\mu\text{m}$ = Wire thickness (warp) . $d/\mu\text{m}$ = Wire thickness . $w/\mu\text{m}$ = Aperture

Important parameters to be defined:

- Mesh count
- Wire thickness (warp wire, weft wire)
- Aperture
- Open area
- Theoretical coat thickness (V_{th})
- Mesh thickness
- Tension value
- Optimum template tension

Definition of the cloth parameters is an essential requirement for choosing the most suitable screen printing cloth



PACO screen printing cloths have extremely high stretching reserves and are able to return to shape if overexpanded. The overexpansion of polymer screen printing cloths is, on the other hand, irreversible.

Cloth Compression Through Calendering

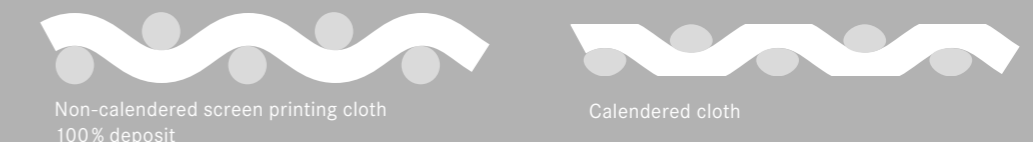
Reducing the thickness of metal wire cloths can further optimize screen printing results. Although the technique used creates a cloth with thinner dimensions, the mesh size remains unchanged. This reduces the amount of ink applied which is an important requirement for high precision applications, such as electronics and solar power technology.



The PACO calendering system applies a weight of 48 t to reduce screen printing cloths to half the width of a human hair. (The human hair has an average thickness of 50-70 μ .) State-of-the-art control technology ensures that this occurs with the utmost precision and accuracy.

Calendering and deposit comparison

To enable the performance characteristics of screen printing cloths to be optimized according to the customer's requirements, PACO offers various cloth cross sections. Among other things, these enable different ink deposit thicknesses to be applied:



PACO Screen Printing Cloths

Technical Data and Order Numbers

Characteristics:

- Low thickness tolerances through innovative PACO weaving technology
- High packing densities
- Enables extremely precise printing results
- Smooth surface, no colour transitions
- Optimum flatness
- Easy further processing, e.g. high register accuracy for 24 colour printing
- Extremely high elastic limit for very high screen tensions
- Minimum distance between screen and substrate for optimum printing results, high speed and cost-effectiveness
- Possible screen widths up to 2350 mm
- Calendered cloths up to 1550 mm wide with reduction in thickness of up to 50% of the original thickness

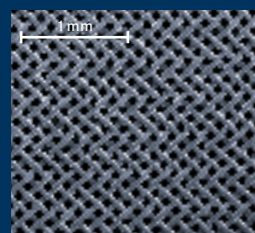
Industries:

- Telecommunications
- Industrial electronics
- Semiconductor industry
- Consumer electronics
- Motor / aircraft industry

Examples of applications:

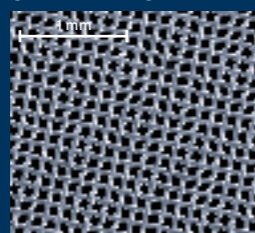
- PCBs: single-sided, double-sided
- Thick-film circuits
- Plasma screens
- LEDs
- Chip production
- LCD screens
- Membrane keyboards
- Decals
- Passive circuit elements (resistors, capacitors)
- RFIDs
- Touch panels
- Semiconductors
- and much more

PACO SD-HD



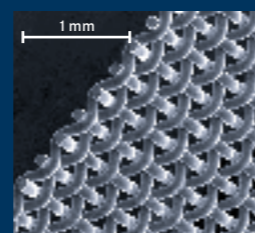
Close-up photograph
PACO SD-HD
Example twilled weave

**PACO SD-ED
(extra thin)**



Close-up photograph
PACO SD-ED
Example linen weave

PACO SD-AM



Close-up photograph
PACO SD-AM
Example linen weave

PACO Screen Printing Cloth SD-HD Stainless Steel 1.4301/1.4306 (Standard)

PACO order no.	No. of cloth	PACO code	Opening (µm)	Opening (inches)	Wire ø (mm)	Wire ø (inches)	Open area (%)	Weight (kg/m ²)	Thickness (µm)	Standard thickness (µm) +/- 1µ	Theor. Inkvol. cm ³ /m ²	Cal. (25%) (µm) +/- 1µ	Theor. inkvol. (cm ³ /m ²)
1001124	50 L	HD 200/315	0,315	.012	0,200	.0080	38,0	0,96	480 - 510	485	181,4	300	110,2
1004064	80 L	SD 93/225	0,225	.0089	0,093	.0036	50,0	0,35	200 - 220	210	105,5	140	70,0
1005332	90 L	SD 90/190	0,190	.0075	0,090	.0035	44,0	0,37	190 - 210	200	90,8	135	62,6
1003027	94 L	SD 90/180	0,180	.0071	0,090	.0035	47,0	0,39	190 - 210	200	88,8	135	60,0
1002483	105 L	SD 76/165	0,165	.0065	0,076	.0030	47,0	0,31	165 - 185	175	81,3	114	53,6
1001359	120 L	SD 65/146	0,146	.0057	0,066	.0026	48,0	0,26	135 - 160	150	71,4	98	46,4
1002118	120 L	HD 90/120	0,120	.047	0,090	.0035	33,0	0,50	190 - 215	205	66,0	135	44,6
1005989	135 L	SD 60/130	0,130	.0052	0,060	.0023	47,0	0,25	125 - 140	135	64,6	90	41,8
1005990	145 L	SD 56/120	0,120	.0047	0,056	.0022	45,0	0,23	122 - 138	128	60,2	84	38,9
1004868	150 L	HD 65/104	0,104	.0041	0,065	.0026	38,0	0,33	140 - 160	150	56,8	98	37,2
1001062	165 L	SD 50/105	0,105	.0041	0,050	.0019	46,0	0,21	110 - 120	115	53,5	75	34,2
1001158	180 L	SD 45/96	0,096	.0038	0,045	.0018	46,0	0,18	100 - 115	108	50,1	67	31,1
1004951	180 L	SD 50/91	0,091	.0036	0,050	.0020	42,0	0,24	109 - 124	115	47,9	75	31,3
1001801	200 L	SD 40/87	0,087	.0034	0,040	.0016	47,0	0,16	88 - 100	94	44,1	60	28,2
1005004	200 L	HD 50/77	0,077	.0030	0,050	.0021	38,0	0,25	108 - 120	114	41,9	75	27,6
1001482	200 L	HD 53/74	0,074	.0030	0,053	.0022	33,0	0,26	110 - 125	116	39,4	80	27,2
1001100	230 L	SD 35/75	0,075	.0030	0,035	.0014	46,0	0,15	76 - 86	81	37,8	56	26,1
1000856	250 L	SD 35/66	0,066	.0026	0,035	.0014	42,0	0,16	77 - 90	84	36,1	54	23,2
1001349	250 L	HD 40/61	0,061	.0024	0,040	.0016	37,0	0,20	88 - 100	94	34,6	60	22,1
1000957	270 L	SD 36/59	0,059	.0024	0,036	.0014	39,0	0,18	78 - 90	84	32,0	54	20,6
1002683	270 K	HD 40/54	0,054	.0022	0,040	.0016	34,0	0,22	90 - 103	96	31,7	62	20,5
1001061	280 L	SD 30/60	0,060	.0024	0,030	.0012	45,0	0,13	68 - 78	73	32,7	46	20,6
1001918	280 L	SD 35/55	0,055	.0023	0,035	.0014	38,0	0,17	80 - 95	88	33,2	55	20,7
1008555	300 L	SD 30/55	0,055	.0023	0,030	.0012	42,0	0,14	65 - 75	70	29,2	46	19,2
1005993	300 K	HD 35/50	0,050	.0020	0,035	.0014	34,0	0,19	78 - 88	83	28,6	26-30	18,6
1001050	325 L	SD 28/50	0,050	.0020	0,028	.0011	41,0	0,13	58 - 68	63	25,9	28-32	18,1
1001206	325 L	SD 30/48	0,048	.0020	0,030	.0012	39,0	0,14	60 - 74	65	24,7	28-32	17,5
1002456	325 K	HD 35/42	0,042	.0016	0,045	.0014	30,0	0,20	80 - 92	86	15,5	34-42	16,5
1001309	355 L	SD 30/41	0,041	.0016	0,030	.0012	34,0	0,17	65 - 75	70	23,6	25-29	15,5
1002970	370 L	HD 28/41	0,041	.0016	0,028	.0011	34,0	0,16	50 - 70	60	21,0	22-26	15,8
1001545	400 L	SD 23/40	0,040	.0016	0,023	.0009	41,0	0,11	50 - 60	55	22,8	22-26	28,5
1000945	400 L	SD 25/38	0,038	.0015	0,025	.0010	38,0	0,13	55 - 65	60	22,1	26-30	15,1
1004200	400 K	HD 28/35	0,035	.0014	0,028	.0011	35,0	0,16	65 - 75	60	18,8	14-18	14,4
1001267	425 K	HD 26/34	0,034	.00135	0,026	.0010	34,0	0,15	62 - 72	67	21,4	36-44	13,7
1005994	450 K	HD 26/30	0,030	.0012	0,026	.0010	30,0	0,16	58 - 68	73	21,2	12-16	12,8
1005995	500 K	HD 25/25	0,025	.0010	0,025	.0010	25,0	0,17	59 - 67	63	16,2	15-20	10,3

= heavy qualities for maximum deposit

L = plain or linen weave

K = twilled weave

Technical Data and Order Numbers

PACO Screen Printing Cloth SD-ED (Extra Thin) Stainless Steel 1.4301/1.4306 (Standard)

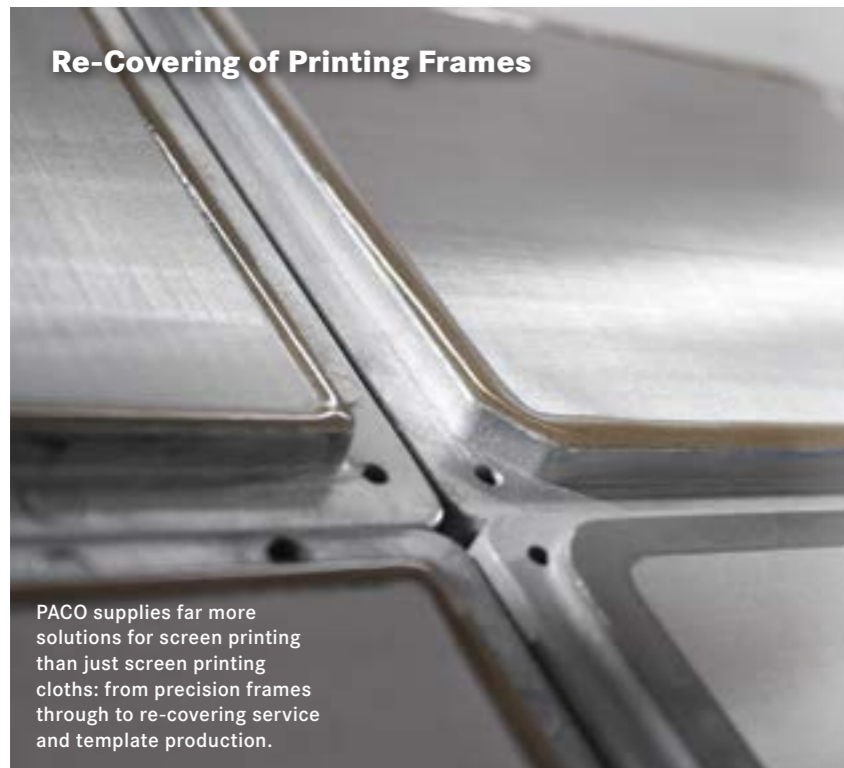
PACO order no.	Mesh per 25,4 mm	PACO code	Opening (mm)	Opening (inches)	Wire ø (mm)	Wire ø (inches)	Open area (%)	Weight (kg/m ²)	Thickness (µm)	Standard thickness (µm) +/- 1µ	Theor. ink vol. (cm ³ /m ²)	Recom. cloth tension (N/cm)
1005926	40 L	ED 76 /560	0,560	.022	0,076	.0028	77,0	0,12	160 - 170	165	127,9	18-22
1004088	60 L	ED 50 /370	0,370	.0145	0,050	.0020	76,0	0,08	110 - 125	118	91,8	14-18
1005927	70 L	ED 65 /300	0,300	.0118	0,065	.0026	68,0	0,15	130 - 145	138	93,0	22-26
1001996	80 L	ED 50 /265	0,265	.0104	0,050	.0020	71,0	0,10	110 - 120	115	81,6	16-20
1004952	165 L	ED 35/118	0,118	.0046	0,035	.0014	59,0	0,11	80 - 95	88	52,5	16-20
1001407	200 L	ED 35/92	0,092	.0036	0,035	.0014	52,0	0,13	75 - 90	84	44,1	18-22
1001913	230 L	ED 30/80	0,080	.00315	0,030	.0012	53,0	0,10	63 - 70	67	35,5	16-20
1005360	280 L	ED 25/65	0,065	.00256	0,025	.0010	52,0	0,09	54 - 64	56	29,2	12-16
1001487	325 L	ED 23/55	0,055	.00216	0,023	.0009	50,0	0,09	50 - 60	55	27,4	12-16
1005409	350 L	ED 20/52	0,052	.0020	0,020	.00078	52,0	0,08	42 - 52	47	24,7	12-16
1005928	370 L	ED 23/46	0,046	.0018	0,023	.0009	44,0	0,10	50 - 60	55	24,3	14-18
1001504	400 L	ED 18/45	0,045	.00178	0,018	.0007	51,0	0,07	42 - 52	47	24,1	12-16
1001545	400 L	ED 23/40	0,040	.0016	0,023	.0009	41,0	0,11	50 - 60	55	22,4	16-18
1000912	500 L	ED 20/30	0,030	.0012	0,020	.00078	36,0	0,11	46 - 52	49	18,0	10-14

These figures are intended as a guide. Assured characteristics cannot be derived from them.
The right to make technical changes is reserved.

PACO Screen Printing Cloth SD-AM for Solar Technology

PACO order no.	No. of cloth	PACO code	Opening (µm)	Opening (inches)	Wire ø (mm)	Wire ø (inches)	Open area (%)	Weight (kg/m ²)	Thickness (µm)	Standard thickness (µm) +/- 1µ	Theor. ink vol. (cm ³ /m ²)	Recom. cloth tension (N/cm)
1002874	80 L	SD-AM 50/265	265	.010	0,050	.0020	71,0	0,10	102 - 106	104	70	26-30
1000893	165 L	SD 50/105	105	.0041	0,050	.0019	46,0	0,21	110 - 120	115	50,2	28-32
1001158	180 L	SD 45/96	96	.0038	0,045	.0018	46,0	0,18	100 - 115	108	55,1	28-32
1002920	200 L	SD-AM 36/90	90	.0036	0,036	.0014	51,0	0,13	72 - 76	74	37,0	34-42
1001801	200 L	SD 40/87	87	.0034	0,040	.0016	47,0	0,16	88 - 100	94	47,7	25-29
1001913	230 L	ED 30/80	80	.00315	0,030	.0012	53,0	0,10	63 - 70	67	35,5	22-26
1000634	230 L	SD 35/75	75	.0030	0,035	.0014	46,0	0,15	76 - 86	81	37,8	22-26
1000866	250 L	SD 35/66	66	.0026	0,035	.0014	42,0	0,16	77 - 90	84	36,1	26-30
1002685	280 L	ED 25/65	65	.00256	0,025	.0010	52,0	0,09	54 - 64	69	36,2	14-18
1002741	280 L	SD-AM 25/67	67	.0026	0,025	.0010	53,0	0,09	52 - 54	54	31,5	36-44
1003336	300 L	ED 20/65	65	.00256	0,020	.0008	58,0	0,06	44 - 48	45	36,2	12-16
1000836	300 L	SD-AM 32/56	56	.0022	0,032	.0012	40,0	0,15	62 - 66	64	26,0	36-44
1001487	325 L	ED 23/55	55	.0022	0,023	.0009	50,0	0,09	50 - 60	55	27,4	22-26
1004883	325 L	SD-AM 29/50	50	.0020	0,029	.0011	41,0	0,13	60 - 64	63	25,4	38-48
1002688	325 L	SD-AM 30/50	50	.0020	0,030	.0012	39,0	0,15	60 - 68	64	23,0	38-48
1005409	350 L	ED 20/52	0	.0020	0,020	.00078	52,0	0,08	42 - 52	47	24,7	28-32
1005925	355 L	SD-AM 32/40	40	.0016	0,030	.0012	34,0	0,17	64 - 68	65	20,5	38-48
1002971	370 L	SD-AM 26/43	43	.0017	0,026	.0010	39,0	0,13	52 - 56	54	22,1	30-40
1001504	400 L	ED 18/45	45	.0018	0,018	.0007	51,0	0,07	42 - 52	47	24,5	13-18
1004558	400 L	SD-AM 23/40	40	.0016	0,023	.0009	31,3	0,11	45 - 49	46	19,5	28-38
1003427	400 L	SD-AM 25/38	38	.0015	0,025	.0010	37,0	0,13	52 - 56	54	19,5	32-42
1000913	500 L	ED 20/30	30	.0012	0,020	.00078	36,0	0,11	46 - 54	50	18,0	15-20

PACO high-tensile mesh SD-AM



Re-Covering On-Site

1. Tension the cloth to 20-22 N/cm
2. Allow to settle for 10 minutes
3. Tension the cloth again to 30-34 N/cm
4. Allow to settle for a further 5-10 minutes
5. Increase the tension of the screen to 42 + N/cm and for stabilization allow it to settle for a further 15 minutes
6. Stick the cloth to the frame and allow the adhesive to dry

PACO supplies far more solutions for screen printing than just screen printing cloths: from precision frames through to re-covering service and template production.

Your Request:

What We Both Need to Know

Frame screening

PACO recommends that, where possible, screen printing cloths with a plain or linen weave (L) are secured diagonally to the squeegee direction (22.5-45°).

Cloth widths

915 mm (36 inches)
1020 mm (40 inches)
1220 mm (48 inches)
1540 mm (60 inches)
maximum cloth width: 2350 mm (92 inches)

Other specifications

Specifications that are not indicated on pages 4 and 5 can be individually requested.

Cloth thicknesses

With the standard qualities SD/HD, depending on wire type and weave, a thickness tolerance of max. +/- 1,5µ will not be exceeded. With the quality ED, the maximum tolerance is +/- 1µ.

Cloth tension

The indicated tension values are guidelines that take into account the quality of the frames commonly available on the market. PACO screen printing cloths are capable of withstanding a higher load.

Information for Requests and Orders

- PACO order number
- Cloth thickness (where necessary)
- Material (if deviating from standard 1.4301/1.4306)
- Length in running metres
- Width in mm
- Cut size with specification of squeegee direction
- For screens to be assembled by PACO, specification of printing area size and inner dimension of frame
- Normal version or absolutely planar-oriented (special treatment)
- Calendered (rolled) with specification of required final thickness

PACO's screen printing know-how is based on years of experience. Looking at the developments in screen printing, however, proves that acquired knowledge is only of use when it is applied as the basis for optimized and innovative solutions.

Consultation:

Mutual Exchange of Know-How

To provide optimum screen printing solutions, the cloth manufacturer requires an extensive and detailed knowledge of each specific application. PACO screen printing cloths have not only found their way into most areas of screen printing, they have even made some applications possible in the first place. The key to this success is intensive innovation and development work on the basis of a close working relationship with our customers. It is the fulfillment of your needs and desires that ensures that we continue learning and focussing our know-how and potential to produce solutions that provide innovative, technically advantageous and, above all, cost-effective processes and procedures.

Whether it is the optimization of existing applications or the provision of completely new solutions, PACO specialists are on site to talk with our customers from the initial analysis of specific needs through to routine implementation of the required solution. By familiarizing themselves with the requirements and conditions of the exact process they can take the direct route to providing the desired results. This is a partnership in which they provide their specialist knowledge and, at the same time, benefit from the know-how and experience of the customer. Unresolved questions should not stand in the way of realizing a better technological and economic future.

And finally, whenever you ask a PACO customer what they appreciate most about working together with PACO, most of them say: the personal interest in the needs of the customer and unconditional identification with mutually agreed solutions. So if you would like to optimize your process or are faced with a completely new challenge, simply contact PACO. We will analyze, develop and fine tune on your behalf as if we were doing it for ourselves.



Comprehensive Service:

Providing Much More than Cloth

PACO screen printing cloth woven from the finest stainless steel wire is the material that qualitatively and economically superior applications are made of. And if you like, we can also take care of cutting-to-size, framing and screening to provide you with custom-made screen printing frames to your exact specifications. Here are some examples of the comprehensive PACO service range:

- Planar-oriented cloths
- Completely steam degreased and ultrasonically cleaned cloths
- Cut cloth
- Cloths with high resistance to abrasion, can be used with aggressive inks and pastes (e.g. ceramic pastes)
- Printing screen assemblies
- Bonded screens with borders of plastic cloth
- Aluminium frames (rigid)
- Electrically heated printing screens
- Precision frames made of die-cast aluminium for thick film and SMD technology
- In-house template manufacture with screen frame cleaning, covering, bonding, hardening, coating, copying, drying and retouching
- Re-covering service
- Other options available straightforwardly on request

**Whether cloth or complete solution:****we look forward to talking to you!****Telephone:** +49 (0) 66 63-97 8-0**Telefax:** +49 (0) 66 63-91 91 16**E-Mail:** info@paco-online.com**Internet:** www.paco-online.com**Mail address:**

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