HAVER, Inc.

SCREEN PRINTING SUPPLIES

SCREEN PRINTING MESH.
MAKING QUALITY VISIBLE.

A MEMBER OF THE HAVER® GROUP

THE WIRE WEAVERS

For many years Haver & Boecker has been developing and producing special wire mesh for the screen printing industry, whose quality and function have set standards throughout the industry. In continuing the further development of screen printing technology, we work closely with the screen printing industry and its suppliers throughout the world. As a result of this collaboration one of the important benefits is the continuous development of new metal mesh types.

Our expertise and comprehensive portfolio of innovative, high quality screen printing mesh make us one of the leading industry partners for all who demand the highest accuracy in screen printing. This includes industry sectors ranging from the solar industry and electronics to decorative ceramic products, hollow glassware and container glass.

Reproduction of the finest detail.
Haver & Boecker manufactures Haver metal mesh exclusively for screen printing in our own factories on state of the art weaving machines. Our specially developed calendering process makes it possible to achieve a thinner mesh thickness with more defined tolerances and therefore printing results of exceptional precision.

The stainless steel wires are inspected and tested in our own laboratory for compliance with the technical specifications developed between Haver & Boecker and the wire suppliers.
We have developed our own testing criteria and procedures that are leading in the industry. Our strict quality control is maintained throughout production, cleaning and further processing of the mesh through the final inspection.

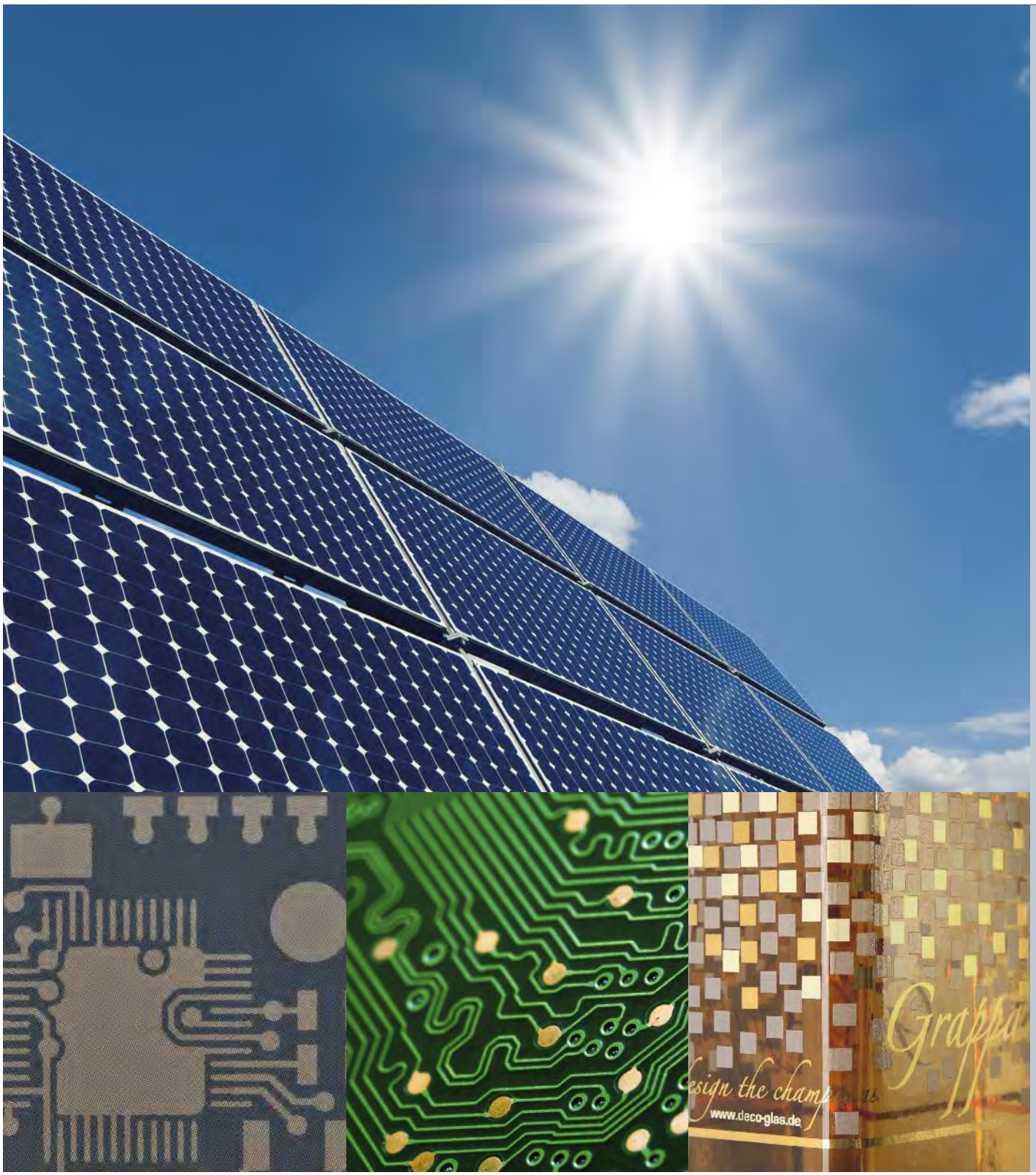
Because of the tight thickness tolerance of Haver metal mesh, an electronic measuring device is used to check the defined fabric thickness. Using our calibrated measuring instruments to evaluate and summarize the data, we then record it in a detailed test certificate. This ensures that every mesh leaving our factory meets the highest standards; the stainless steel mesh ensures the most accurate registration and reproduction of detail in screen printing. The thickness of the ink deposit can be determined with great precision and its consumption accurately calculated.

Besides our extensive standard range of mesh specifications, we also provide customized solutions tailored to your special needs guaranteeing excellent results.

Haver & Boecker began producing wire cloth in Hohenlimburg, Germany, in 1887. Today, we are one of the world's leading wire weaving companies with a global network of branches and manufacturing facilities.

Our work is based upon experience, continuous research and development of our products and manufacturing processes, along with the knowledge and ability of our staff. This combination of tradition and innovation allows us to meet and exceed the high expectations of our customers.

ATTENTION TO THE SMALLEST DETAIL.



WOVEN WITH PERFECTION AND PRECISION.

Haver metal mesh is manufactured from high-performance stainless steel alloys which offers a number of distinct advantages. Extremely thin wires, defined cloth thicknesses, accurate mesh openings and tighter tolerances produce outstanding printing results with specific ink deposits. Without its physical properties being affected, the mesh is cleaned in a specially developed process developed by Haver & Boecker. Its dimensionally uniform and stable screen aperture size makes it far superior to polyester fabrics. Haver metal mesh exhibits a minimal amount of elasticity during printing, meaning that screen printing stencils have a very long service life when handled correctly. Despite their fineness and delicate appearance, all Haver & Boecker screen printing mesh is highly resistant to aggressive inks and pastes. In addition, because the wire is naturally conductive it thereby prevents any potential electricity build-up on the screen itself.

Innovative fabrics for innovative printing processes.

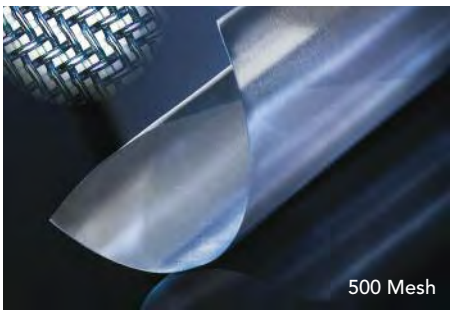
With our innovative screen printing mesh we have created a pre-requisite for developing increasingly productive screen printing processes.

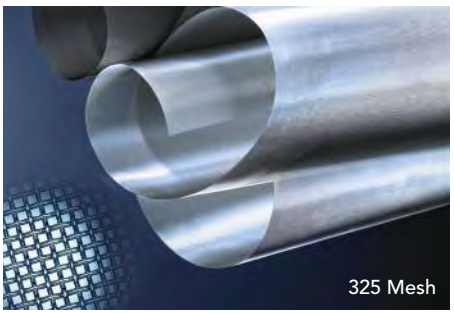
The developments by our research and development department for fine mesh include 3D mesh and the highly stable Haver Tensile Bolting Cloth (HAVER TBC).

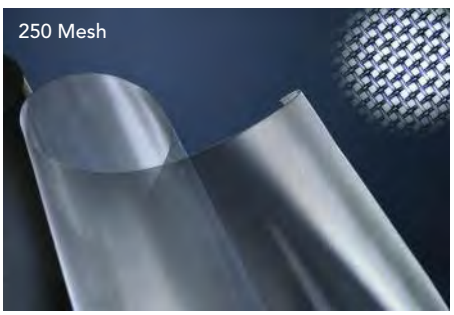
3D mesh is manufactured with the same mesh openings and wire diameter as conventional wire mesh but by modifying the weaving process. 3D mesh therefore achieves a higher theoretical ink volume resulting in a noticeable gain in opacity and brilliance.

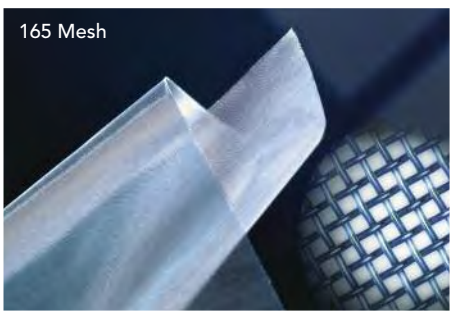
HAVER TBC – Tensile Bolting Cloth – is a highly stable stainless steel mesh for screen printing. Compared to standard Bolting Cloth (BC), TBC screen printing cloth is woven from stainless steel alloys. These alloys are somewhat elastic yet have great yield strength and stability due to complex annealing processes and their specific metal omposition.

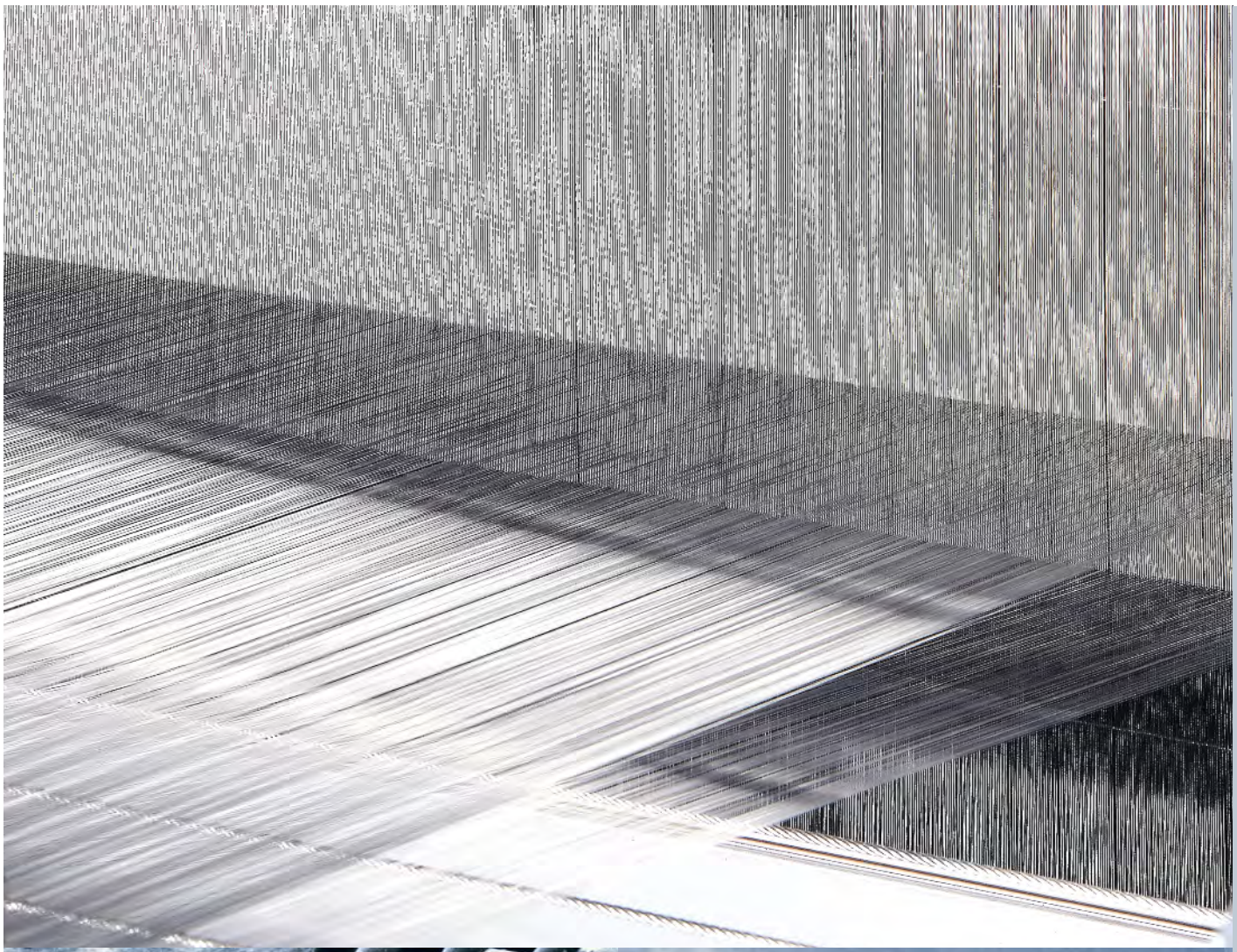
HAVER TBC was developed in close collaboration with its users throughout the world in order to meet the high requirements of precision screen printing. Optimized stretching properties ensure highly accurate registration and an improvement or reduction in off-contact printing, leading to a high reproducibility of prints. The high tensile strength of the wires results in a longer service life and maximum printing speeds. HAVER TBC stabilizes quickly during the stretching process and there is little tension loss during printing.

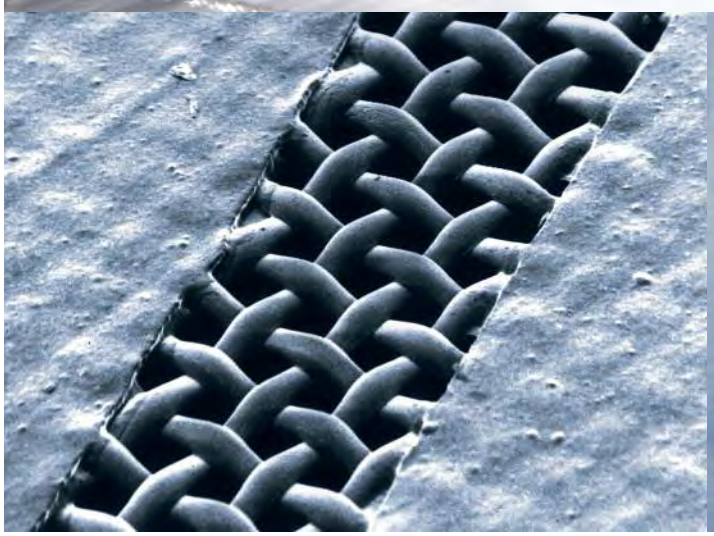


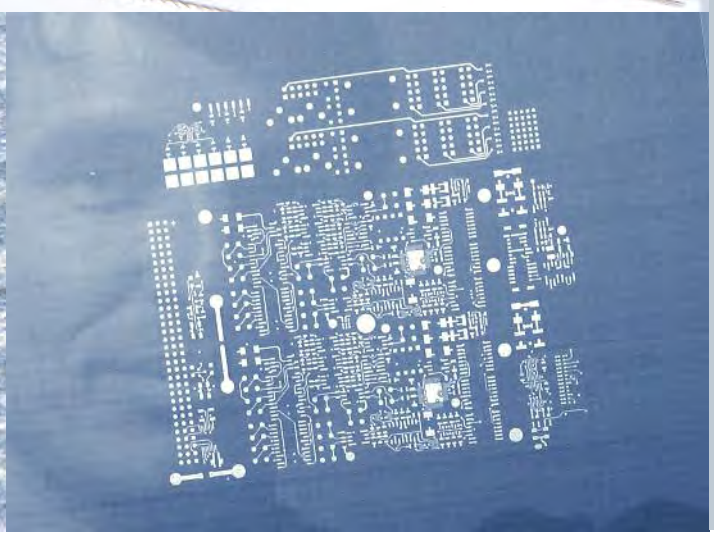








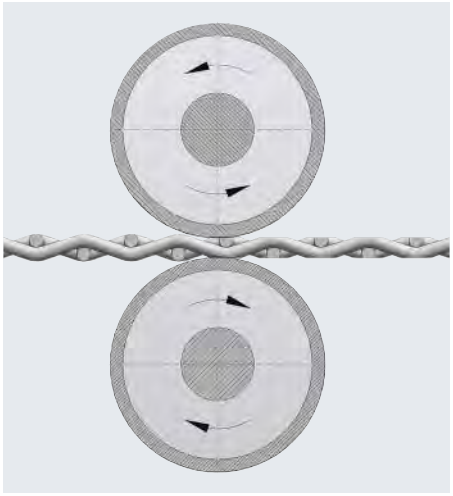




ALMOST INDIVIDUAL: CALENDERING (CT).

Haver wire mesh is manufactured from high-quality wires on looms which were developed and assembled by Haver & Boecker's engineering staff in Oelde. The calendering process first developed by Haver & Boecker, offers the ability of screen printing mesh to be optimized to meet the customers requirements.

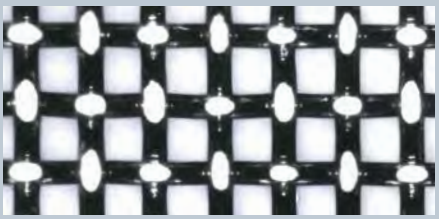
Calendering – Meeting the customers individual requirements.
As early as the 1950s Haver & Boecker developed a calendering process to meet the requirements of a specifically defined ink deposit.

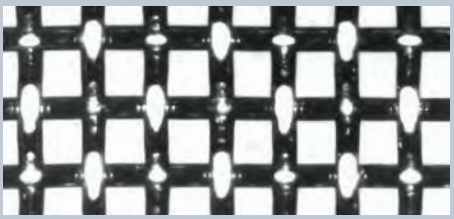


Calendering is a process whereby the mesh is placed between two steel rollers and reduced to a predetermined thickness, without the mesh openings being altered. This process stabilizes the mesh, while at the same time acquires a smooth and uniform surface.

Calendered mesh offers a precisely defined ink deposit for each individual application. The smooth surface not only minimizes any differences in the thickness of the ink deposit from print to print and run to run but also squeegee wear.

Haver & Boecker supplies two different options of calendering and also offers customized calendering to meet the requirements of individual users.





Standard calendering
The mesh is reduced to the extent that it is 20% less in thickness than double the diameter of a single wire:
D = 2 x d x 0.8.
The mesh openings are not altered and the appearance becomes slightly shiny.

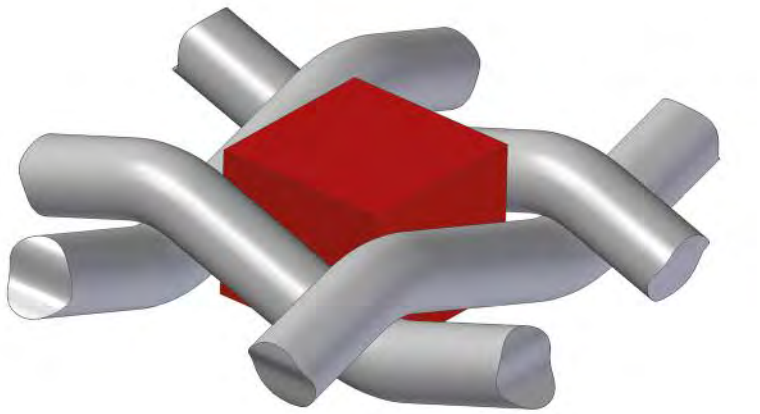
Maximum calendering
The fabric is reduced to a thickness up to 30% below double the diameter of a single wire:
D = 2 x d x 0.7.
This enables the maximum possible reduction in the thickness of the wire cloth without it being deformed. The mesh openings stay the same and the fabric appearance now resembles foil.


LG
THE IMAGING SOURCE

CALCULATING THEORETICAL INK VOLUME.

Besides ink viscosity, substrate surface, position and hardness of the squeegee and other factors, mesh openings and mesh thickness have a decisive influence on the quality of the printing results.

Calculating the theoretical ink volume V_{th} serves to determine which screen printing mesh specification is most suitable for the application.
By weaving with extremely thin wires, Haver & Boecker is able to manufacture especially thin screen printing mesh. This enables an optimum ink flow ensuring a highly uniform film of ink and a precisely defined ink deposit.



Calculating the theoretical ink volume is based on cubes whose size is determined by the mesh openings. The volume is determined by the aperture width w and cloth thickness D.

The formula in cm^3 per m^2 :

$$V_{th} = \left(\frac{w}{w + d}\right)^2 \times D$$

V_{th} = theoretical ink deposit in $\frac{cm^3}{m^2}$
w = aperture width in μm
d = wire diameter in μm
D = cloth thickness in μm

TECHNICAL SPECIFICATION LIST – HAVER & BOECKER STAINLESS STEEL WIRE CLOTH

Mesh Specification	Wire diameter (d)		Mesh opening (w)	Open Area (Ao%)	Cloth Thickness (D)		Cloth Thickness Tolerance	Theoretical Ink Deposit - (Vth)		Theoretical Maximum Tension
								As Woven	20% CT Foil*	
Threads/inch	inch	micron	micron	%	micron	inch	micron	cm^3/m^2		N/cm
Standard										
60	0.0045	112	315	54	224	0.0088	+/- 7	128	102	75
80	0.0020	50	265	71	107	0.0042	+/- 6	76	61	25
80	0.0037	95	224	49	190	0.0075	+/- 6	93	74	90
105	0.0030	80	160	44	165	0.0065	+/- 5	73	58	84
120	0.0026	67	140	46	140	0.0055	+/- 5	64	51	69
135	0.0022	56	132	49	132	0.0052	+/- 5	65	52	53
145	0.0022	56	118	46	120	0.0047	+/- 5	55	44	57
150	0.0026	67	100	36	152	0.0060	+/- 5	55	44	86
165	0.0020	50	106	46	109	0.0043	+/- 5	50	40	51
180	0.0018	45	95	46	102	0.0040	+/- 5	47	38	46
200	0.0016	40	85	46	89	0.0035	+/- 3	41	33	40
200	0.0021	53	75	34	114	0.0045	+/- 3	39	31	70
230	0.0011	30	80	53	63	0.0025	+/- 3	33	26	26
230	0.0014	36	75	46	80	0.0031	+/- 3	37	30	37
250	0.0014	36	63	40	79	0.0031	+/- 3	32	26	42
250	0.0016	40	63	37	85	0.0033	+/- 3	32	26	50
270TW	0.0016	40	53	32	85	0.0033	+/- 3	27	22	54
270	0.0014	36	56	37	80	0.0032	+/- 3	30	24	44
280	0.0010	25	67	53	50	0.0020	+/- 3	27	22	22
280	0.0012	32	60	43	67	0.0026	+/- 3	28	22.4	35
300	0.0012	30	56	42	68	0.0027	+/- 3	29	23.2	34
325	0.0009	24	56	49	52	0.0021	+/- 3	25	20	23
325	0.0011	30	50	39	63	0.0025	+/- 3	25	20	32
325TW	0.0014	36	42	29	81	0.0032	+/- 3	23	18.4	53
400	0.0007	18	45	51	40	0.0017	+/- 3	20	16	16
400	0.0008	20	45	48	45	0.0018	+/- 3	22	17.6	20
400	0.0010	25	38	36	53	0.0021	+/- 3	19	15.2	32
500	0.0007	18	34	43	38	0.0015	+/- 3	16	12.8	20
500TW	0.0010	25	25	25	60	0.0022	+/- 5	15	11	40
TBC High Tensile										
200	0.0016	40	85	46	80	0.0031	+/- 3	37	29.6	52
250	0.0014	36	63	40	72	0.0028	+/- 3	29	23.2	53
250	0.0011	30	71	49	60	0.0024	+/- 3	30	24	36
270	0.0014	36	56	37	72	0.0028	+/- 3	27	21.6	58
280	0.0012	32	60	43	64	0.0025	+/- 3	27	21.6	45
280	0.0010	25	67	53	50	0.0020	+/- 3	27	21.6	28
290	0.0008	20	67	59	40	0.0016	+/- 3	24	19.2	19
300	0.0012	29	56	43	58	0.0023	+/- 3	25	20	40
325	0.0011	29	50	40	58	0.0023	+/- 3	23	18.4	43
325	0.0009	24	56	49	52	0.0021	+/- 3	25	20	26
350	0.0010	25	48	43	50	0.0020	+/- 3	22	17.6	35
400	0.0009	24	38	38	48	0.0019	+/- 3	18	14.4	38
400	0.0008	20	45	48	40	0.0016	+/- 3	19	15.2	25
500	0.0007	18	34	43	36	0.0014	+/- 3	15	12	25
635	0.0006	15	25	39	30	0.0011	+/- 3	12	9.6	23

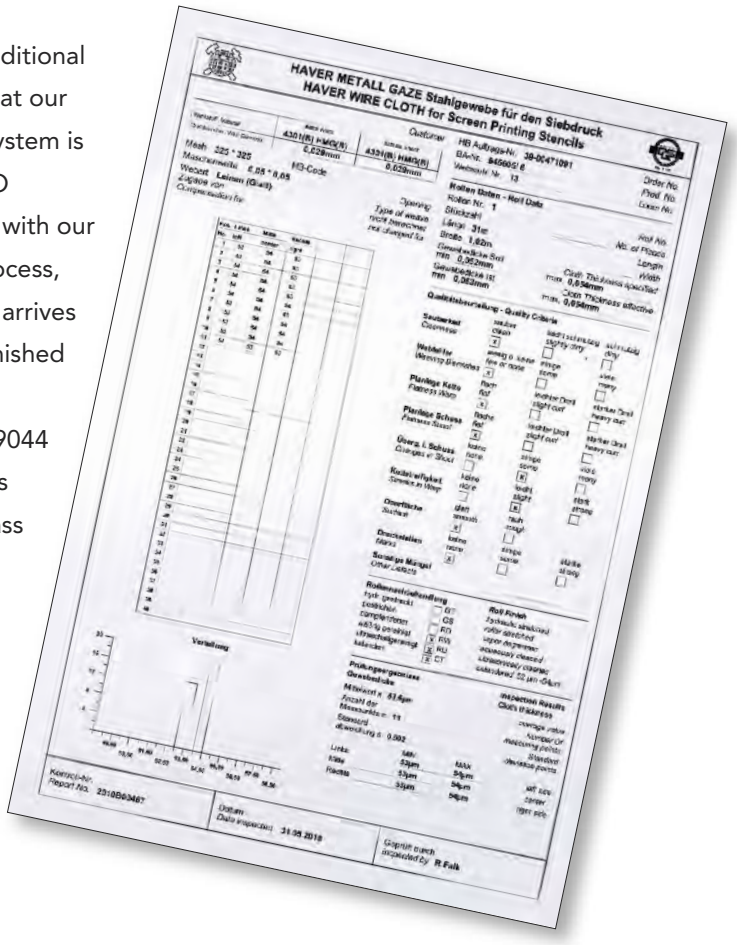
Standard widths: 40", 48" & 60" - Wider widths available upon request - please inquire.
Standard roll length: 100'
"Cut-to-Size" sheeting program available.
™ *CT Foil: Available calendered to a maximum of 30%

HIGH-QUALITY WIRE FOR OPTIMUM RESULTS.

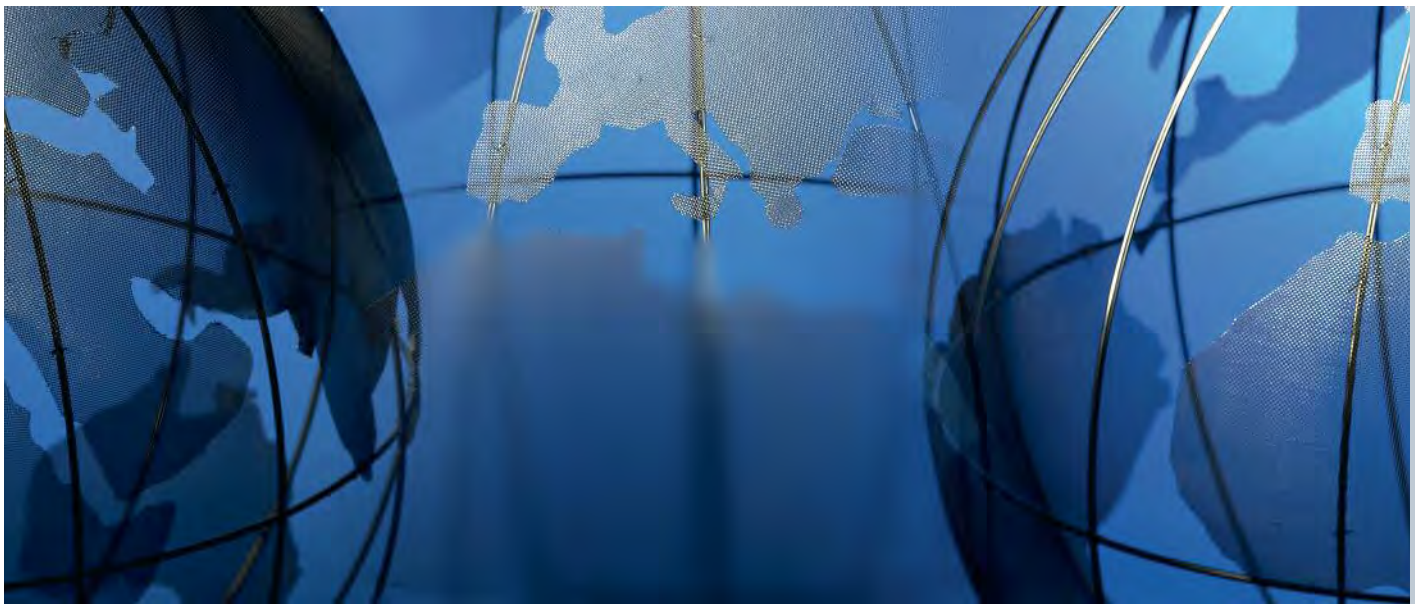
The production of fine stainless steel mesh has a long tradition at Haver & Boecker. Fine mesh counts made of 325 threads per inch were being woven at our plant for various applications in the aerospace industry as early as 1935. Since then numerous innovations in the development and manufacturing of the finest mesh made by our company have been patented and awarded certification.

Our highly skilled employees continue to use their expertise and creativity to develop impressive solutions for the individual and complex challanges given to us by our customers all over the world. With many years of experience in screen printing, they are always available to offer the highest standard of comprehensive technical advice.

Our customers gain additional confidence knowing that our quality management system is certified to DIN EN ISO 9001:2008. Combined with our own quality control process, from the time the wire arrives at our factory to the finished product it is certified according to DIN ISO 9044 and DIN ISO 9045. This guarantees the first-class quality of our material for optimum screen printing results.


HAVER METALL GAZE Stahlgewebe für den Siebdruck
HAVER WIRE CLOTH for Screen Printing Stencils

NO SITE IS OUT OF SIGHT.



From its very beginnings Haver & Boecker has made a decisive contribution to the technology of wire weaving. Based on a successful company history, Haver & Boecker today offers its customers more experience, technology and expertise pertaining to wire mesh than almost any other company.

Whether science and research, industry or architecture – wherever Haver & Boecker wire mesh is used, our customers benefit from a broad yet still unique individual service.

With our worldwide network, we provide the confidence to be your reliable partner at any time and any place. We will continue Weaving Ideas into the future.

In 2011 Haver & Boecker operates production sites in Germany, Great Britain, Belgium, the USA, Canada, India and Brazil.
More than 2,000 people work for the Group worldwide.

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