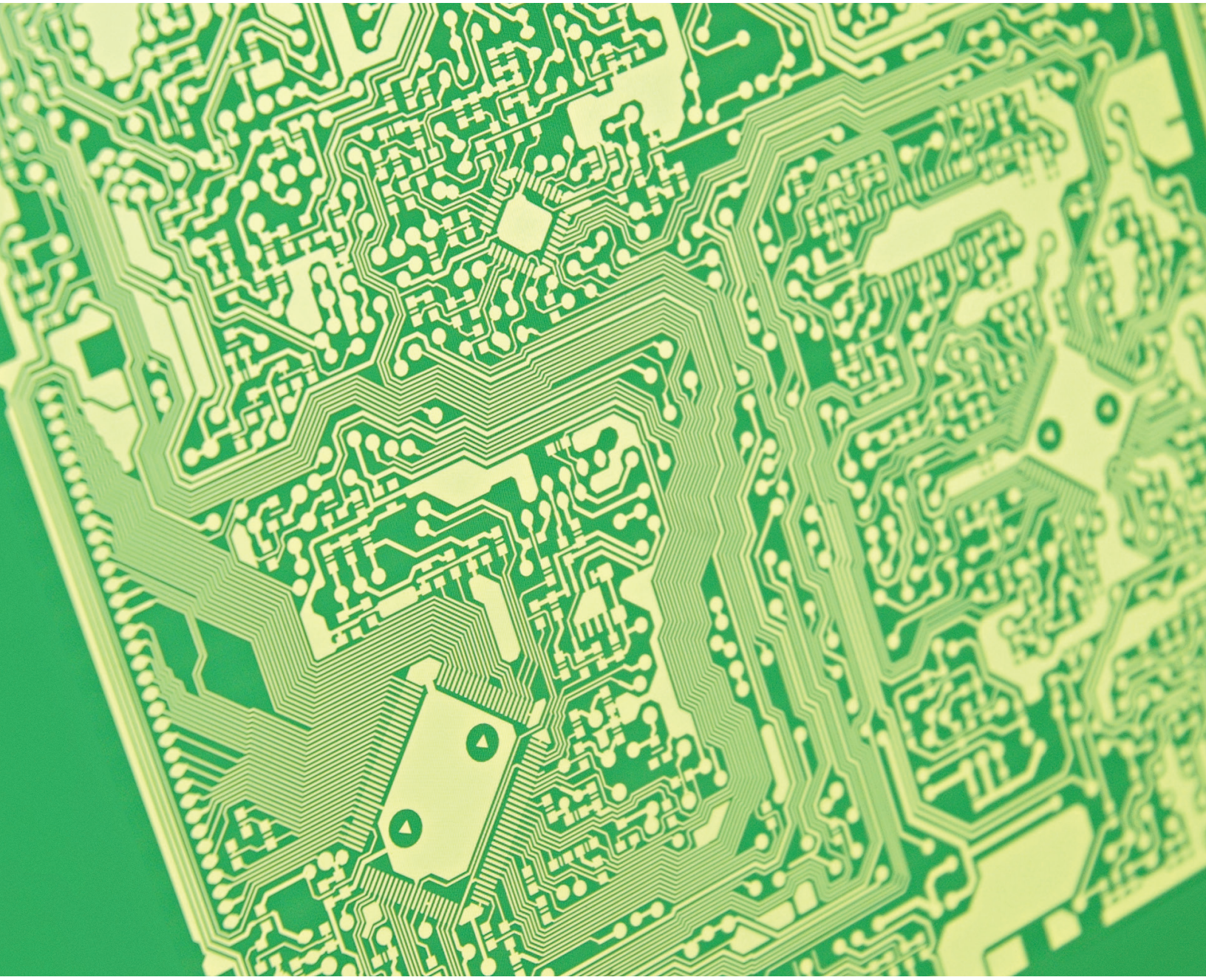
Guide for Precision Electronic Screens

Product Information



Sefar Inc.
111 Calumet Street | Buffalo, New York 14043

SEFAR

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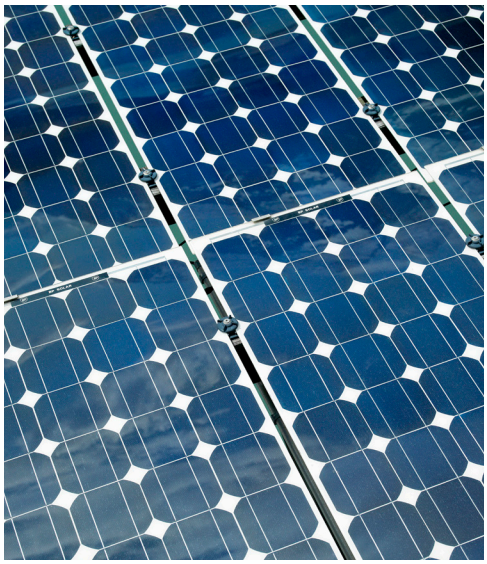
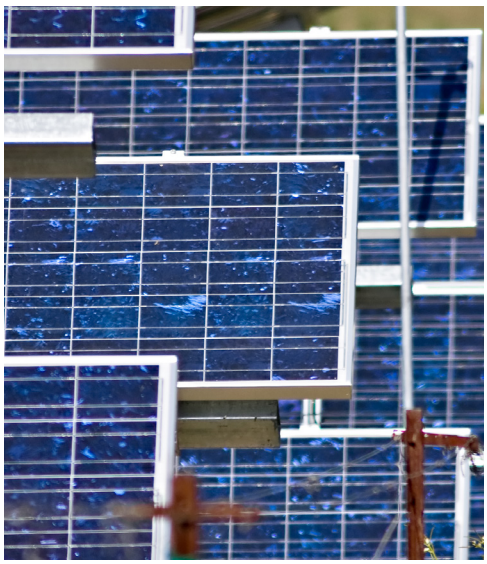
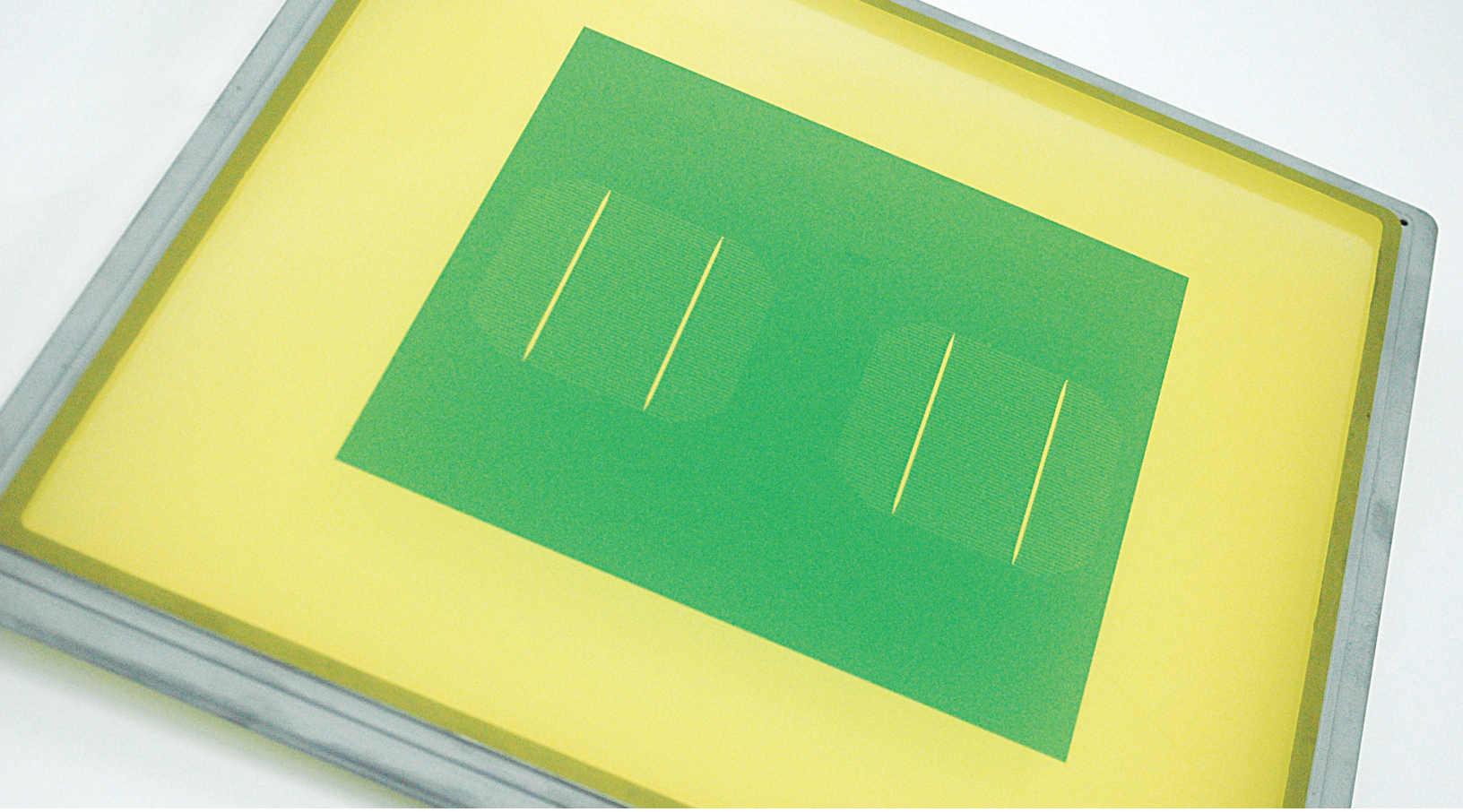






Combined Leaders

The individual requirements for high-end screen printing are rising in the manufacturing sector, whether in the automobile and machinery industry, in the solar energy sector, in the production of mobile communication components, or in consumer goods.

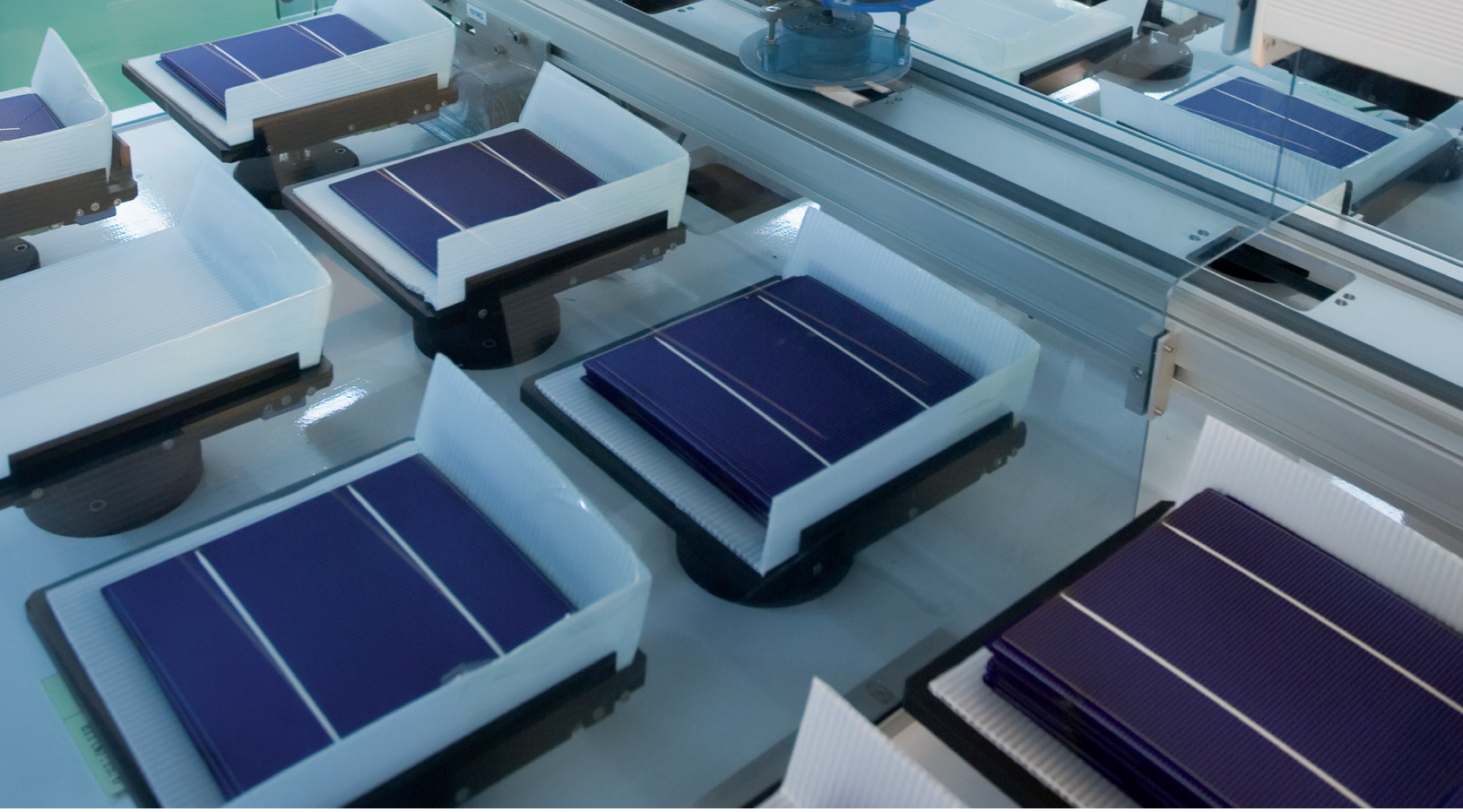
Industrial screen printers today are no longer looking for just a mesh supplier. These days, buyers prefer to have a partner–such as Sefar – who can cater to the special needs of the business, in particular, to the manufacturing specifications of their application. Armed with this experience, Sefar can produce both high quality mesh and high quality screens to meet the needs of your organization.

Sefar is a leading manufacturer of precision woven synthetic mesh, serving the screen printing and filtration industries. Headquartered in Switzerland, Sefar is globally present across five continents in more than 20 countries.

Sefar is world-renowned for offering the most comprehensive and diversified mesh line available, while continuing to develop new and innovative products. Sefar offers regional fabrication facilities for various industrial applications.

Sefar Inc. is the North American branch of the Sefar Group. In the United States, Sefar is the largest manufacturer of commercial thick film screens for the electronics industry. With more than 180 years of experience in weaving and over 45 years of experience in screen fabrication, Sefar offers customers the benefit of their knowledge in the development of product quality and the advancement in technology.

As leaders in the screen-printing industry, Sefar is committed to the assurance of quality, service, and technical support in all of its products. These products include pre-stretched screens, presensitized (coated) screens, and imaged screens. Sefar also provides an in-house laser plotting service and a CAD staff to plot, convert, or draw customer artwork. A complete list of screen-printing accessories is also available to support the needs of our customers.



Photovoltaic Screens

Tomorrow's Technology, Today

With the growing awareness for alternative power resources today, Sefar recognizes the importance for the solar cell and photovoltaic industries to work with dependable partners that ensure both manufacturing efficiency and the highest quality standards.

With over 45 years of combined experience and technical expertise in supplying solar and thick film screens to the industry, Sefar is dedicated to the advancement of this technology, and to providing the solar cell market with precision screens for their innovative and challenging designs.

Capacity for your Demands

Growth in the solar power industry has caused the customer demand for this technology to significantly increase over the last decade.

Our stretching facility, located in Onatrio, CA, makes it easy for us to serve you regionally– and nationally–if your need for screens increases with industry growth and expansion.

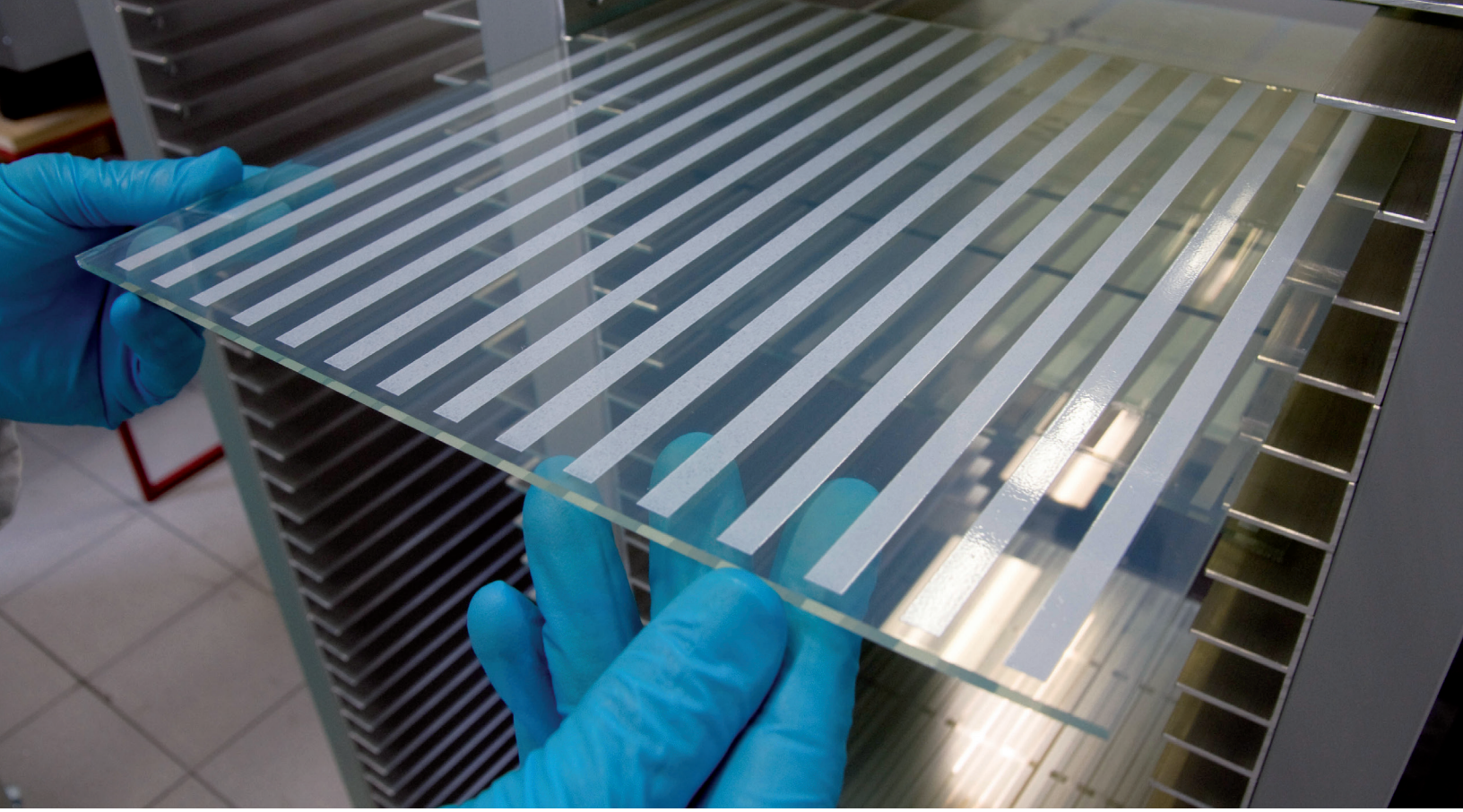
Having the largest capacity for stretched screens in the US, Sefar is capable of providing large volumes of solar screens on-demand.

Screen Making Services

Artwork
The Sefar CAD department is capable of designing and supplying precision film positives for our customers containing fine line widths to below 25 microns (tolerance of +/- 3 microns). Our experience in providing films to the industry for over a decade and our dedication to working closely with the customer ensures that we can help you best achieve the desired target line thickness for your specific application.

Screens
Equipped with state-of-the-art stretching equipment and technology, Sefar is capable of stretching any frames of any size or type to a desired tension using our wide variety of mesh. As the largest supplier of stretched screens in North America, Sefar can accommodate any screen parameter that your application needs, and deliver the precision that your process requires.

Coating and Imaging
Capable of providing screen coating and imaging services that excel above industry standards, Sefar is well equipped to be your full-service partner for screens. We offer a wide variety of emulsions that are capable of producing the 40 micron and finer finger widths necessary for specialized applications. With the help of our technical experts, the correct emulsion can be selected for your application based on variables such as solvent resistance, fine line requirements, and screen durability against abrasive materials.



Products & Services

Fabricated Screen Applications

- Solar and photovoltaic applications
- Thick Film micro-electronics
- Hybrid circuits
- Ultra-fine lines
- Low temperature co-fired ceramics
- Membrane switch circuits
- MCM's
- Solder paste & adhesives
- Microelectronic packaging
- Electronic display systems
- Printed circuits

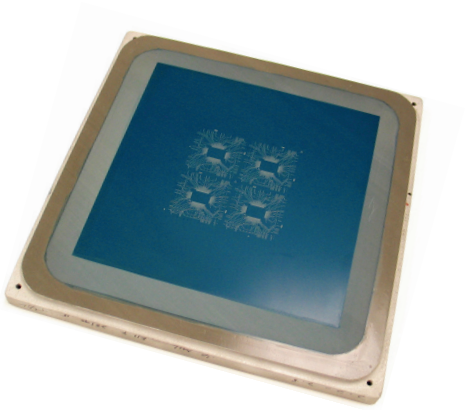
Screen Fabrication Options

- **Frames for Purchase**
  Precision cast aluminum screen frames from 5x5 inch up to 24x24 inch are available from Sefar.
- **Mesh Only Screens**
  The foundation of Sefar's high quality screens begins with Sefar mesh products. Premium stainless steel and Sefar polyester mesh are properly stretched and balanced to optimal tension across our (or your) frames at the specified angle (± 3°).
- **Pre-sensitized Screens**
  Our high performance emulsions are uniformly coated onto our stretched screens from 0.0001 inches thick or greater. Sefar's cleanroom coating environment eliminates image defects, providing screens ready for quick exposure in your facility.
- **Imaged Screens**
  Screens arrive at your facility ready to print. Highly skilled quality-conscious Sefar technicians image and develop your screens from film positives that you supply or we generate from your supplied drawing or electronic file.

Related Products & Services

- **Screen Tension Meters**
  Digital and mechanical tension meters
- **Large Chases & Tubular Frames**
  Custom sizes available. See page 14 for more information.
- **CAD Artwork Generation & Laser Photoplotting**
  Precision, high resolution plots. CAD artwork generation and modification including image reduction, step and repeat, editing, and Gerber® file conversion.
- **Precision Machined Squeegee Blades**
  Various squeegee blades in durometers to fit any Thick Film or Electronics printing application.
- **Exposure/Drying/ Developing Equipment**
  Screen exposure units, pattern alignment fixtures, screen developing, automation, and drying equipment.

Cast Frames

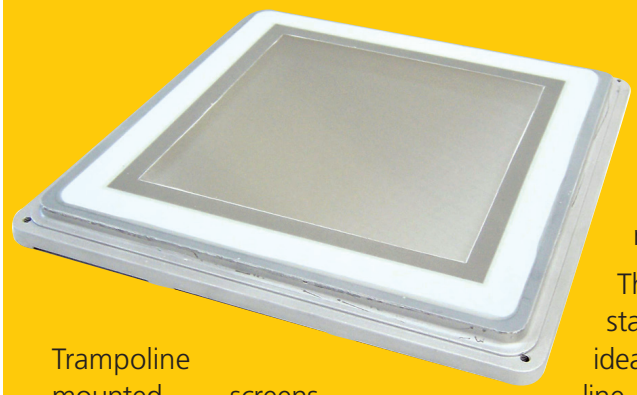


Sefar's cast aluminum screen frames are designed for dimensional stability and tension-retaining properties. Each new Sefar cast frame is precision ground and inspected for flatness, parallelism, thickness, mounting hole location, and thread size. We offer all industry standard cast frame sizes from 5x5 inch up to 24x24 inch to fit most thick film screen printers today. Should larger frames be required, custom tubular extrusion frames or self-tensioning chases are available. (Please consult Sefar for recommendations and availability.)

Sefar Cast Aluminum Screen Frame Parameters

I. D. (inches)	O. D. (inches)	Corner Hole Locations (centers, in inches)	Hole Size (thread size)	Frame Thickness (inches)	Flat & Parallel ± (inches)
5 x 5	6.70 x 6.70	5.875 x 5.875	10/32	0.735 ± 0.002	0.003
8 x 10	9.65 x 11.70	8.500 x 10.750	1/4 - 20	0.735 ± 0.002	0.003
10 x 10	11.70 x 11.70	10.000 x 10.000	1/4 - 20	0.735 ± 0.002	0.005
12 x 12	14.10 x 14.10	13.000 x 13.000	1/4 - 20	1.000 ± 0.002	0.003
12 x 17	15.00 x 20.00	13.000 x 18.000	1/4 - 20	1.000 ± 0.002	0.005
15 x 15	17.70 x 17.70	16.000 x 16.000	1/4 - 20	1.000 ± 0.002	0.003
20 x 20	23.10 x 23.10	21.000 x 21.000	1/4 - 20	1.000 ± 0.002	0.005
24 x 24	28.10 x 28.10	26.000 x 26.000	1/4 - 20	1.000 ± 0.002	0.005

Trampoline Mounted Screens from Sefar



Trampoline mounted screens from Sefar can be a cost-effective and wise alternative for fine line, high resolution, high mesh count applications.

Consisting of stainless steel wire mesh supported by a border of polyester mesh, a trampoline screen combines the best properties of both mesh types.

The high mesh count stainless steel mesh is ideally suited for fine line, high resolution printed line applications (these printing characteristics are difficult to achieve with other types of mesh). Polyester mesh has superior elasticity properties that are well suited for high volume printing, tension consistency, and the flexibility required for the constant deformation associated with off contact printing.

In combination, these two mesh types create a screen that has excellent print performance, long screen life, and higher process yields. For this reason, trampoline screens are an excellent choice if you are looking to reduce the financial burden associated with expensive, fine line printing applications.

Wire Mesh

Sefar uses the finest stainless steel wire cloth in our screen manufacturing process, which offers higher strength, better tension-retaining properties and exceptionally uniform mesh thickness. Calendered stainless steel mesh is also available. A calendered mesh is slightly flattened between two heavy rollers to create a thinner, smoother, and more uniform mesh (the mesh opening size and open area are unaffected). As a result, calendered wire typically is 20% thinner than standard wire mesh, resulting in a thinner ink deposit during printing.

Sefar Precision Stainless Steel Wire Cloth Specifications

Mesh Count (wires/inch)	Wire Diameter (inches)	Mesh Opening (inches)	Mesh Opening (µm)	Weave Thickness (inches)			Weave Thickness (µm)			Open Area (%)	Recommended Tension (N/cm)	Wet Print Thickness (Inches)	Wet Print Thickness (µm)
30	0.0065	0.0268	681	0.0115	-	0.0140	292	-	356	64.8	42-52	0.0083	210
50	0.0055	0.0145	368	0.0094	-	0.0106	239	-	269	52.6	42-52	0.0053	134
60	0.0045	0.0130	330	0.0081	-	0.0095	206	-	241	58.3	42-52	0.0051	130
80	0.0020	0.0105	267	0.0037	-	0.0046	94	-	117	70.5	18-24	0.0029	74
80	0.0037	0.0088	224	0.0070	-	0.0089	178	-	226	49.5	26-42	0.0039	100
105	0.0030	0.0070	178	0.0060	-	0.0067	152	-	170	46.9	26-42	0.0030	76
120	0.0026	0.0065	165	0.0045	-	0.0058	114	-	147	47.3	26-42	0.0024	62
135	0.0023	0.0057	145	0.0052	-	0.0058	132	-	147	47.3	26-42	0.0026	66
145	0.0022	0.0047	119	0.0045	-	0.0050	114	-	127	46.4	26-42	0.0022	56
150	0.0026	0.0041	104	0.0052	-	0.0058	132	-	147	37.2	26-37	0.0020	52
165	0.0020	0.0041	104	0.0038	-	0.0046	97	-	117	44.9	26-37	0.0019	48
180	0.0018	0.0038	97	0.0036	-	0.0043	91	-	109	45.7	26-37	0.0018	46
200	0.0014	0.0035	89	0.0029	-	0.0034	74	-	86	51.8	26-34	0.0016	41
200	0.0016	0.0034	86	0.0031	-	0.0038	79	-	97	46.2	29-35	0.0016	40
200	0.0021	0.0029	74	0.0041	-	0.0046	104	-	117	33.6	26-37	0.0015	37
230	0.0011	0.0032	81	0.0023	-	0.0026	58	-	66	54.0	18-24	0.0013	34
230 cal	0.0011	0.0032	81	0.0017	-	0.0020	43	-	51	54.0	18-24	0.0010	25
230	0.0014	0.0029	74	0.0028	-	0.0034	71	-	86	45.9	22-34	0.0014	36
230 cal	0.0014	0.0029	74	0.0021	-	0.0025	53	-	64	45.9	22-34	0.0011	27
250	0.0012	0.0028	71	0.0023	-	0.0025	58	-	64	49.7	19-25	0.0012	30
250	0.0014	0.0026	66	0.0028	-	0.0033	71	-	84	43.0	26-34	0.0013	33
250	0.0016	0.0024	61	0.0033	-	0.0037	84	-	94	36.0	26-37	0.0013	32
270	0.0014	0.0023	58	0.0029	-	0.0034	74	-	86	38.6	26-36	0.0012	31
280	0.0010	0.0026	66	0.0018	-	0.0022	46	-	56	53.0	17-23	0.0011	27
280	0.0013	0.0024	61	0.0025	-	0.0029	64	-	74	42.0	21-33	0.0011	29
290*	0.0008	0.0027	69	0.0016	-	0.0019	41	-	48	60.0	18-27	0.0011	27
300*	0.0008	0.0026	66	0.0014	-	0.0017	36	-	43	60.0	18-27	0.0009	24
300 Cal*	0.0008	0.0026	66	0.0012	-	0.0016	30	-	41	60.0	18-27	0.0008	21
325	0.0009	0.0022	56	0.0019	-	0.0022	48	-	56	50.1	15-21	0.0010	26
325 Cal	0.0009	0.0022	56	0.0012	-	0.0016	30	-	41	50.1	15-21	0.0007	18
325*	0.0009	0.0022	56	0.0018	-	0.0021	46	-	53	50.1	27-33	0.0010	25
325 Cal*	0.0009	0.0022	56	0.0012	-	0.0016	30	-	41	50.1	27-33	0.0007	18
325	0.0011	0.0020	51	0.0022	-	0.0026	53	-	66	41.3	21-32	0.0010	25
325 Cal	0.0011	0.0020	51	0.0017	-	0.0020	43	-	51	41.3	21-32	0.0008	19
360*	0.0006	0.0022	56	0.0012	-	0.0016	30	-	41	60.0	14-20	0.0008	21
360 Cal*	0.0006	0.0022	56	0.0008		0.0011	20		28	60.0	14-20	0.0006	14
400*	0.0007	0.0018	46	0.0014	-	0.0017	36	-	43	51.0	14-20	0.0008	20
400 Cal*	0.0007	0.0018	46	0.0011	-	0.0013	28	-	33	51.0	14-20	0.0006	16
400 Heavy Cal*	0.0007	0.0018	46	0.0009	-	0.0011	23	-	28	51.0	14-20	0.0005	13
400 Cal	0.0009	0.0016	41	0.0015	-	0.0017	38	-	43	40.0	18-25	0.0006	16
400	0.0010	0.0015	38	0.0018	-	0.0022	46	-	56	38.0	20-30	0.0008	19
400 Cal	0.0010	0.0015	38	0.0015	-	0.0018	38	-	46	38.0	20-30	0.0006	16
500*	0.0007	0.0013	33	0.0014	-	0.0018	36	-	46	42.3	14-20	0.0007	17
500 Cal*	0.0007	0.0013	33	0.0009	-	0.0011	23	-	28	42.3	14-20	0.0004	11

* Indicates higher strength version Cal = calendered mesh Note: Special calendared thicknesses and other meshes available upon request

High Performance Polyester Mesh – SEFAR® PME

SEFAR® PME has been specially developed and engineered by Sefar to meet the needs of the industrial screen printer. SEFAR® PME allows for:

- Higher screen tensions with lower elongation
- Minimal loss of tension
- Greatest possible dimensional stability
- Shorter exposure time

SEFAR® PME – Precision mesh for high-end industrial screen printing

Mesh Specification	Mesh Count (t.p.i.)	Mesh Opening (µm)	Thread Diameter (µm)*	Open Area (%)	Mesh Thickness (µm)	Theoretical Ink Volume (cm3 / m2)
180-48	180	90	48	41	75	31
255-35	255	61	35	37	51	19
255-40	255	57	40	32	61	20
280-35	280	53	35	34	52	18
305-35	305	42	35	25	51	13
330-30	330	44	30	33	46	15
355-30	355	35	30	24	42	10
380-30	380	30	30	20	42	9

All above product descriptions are plain weave unless designated TW (twill weave).
**Nominal Value*

Note: Other meshes available upon request

Standard Polyester Mesh – SEFAR® PET 1500

SEFAR® PET 1500 is the industry's leading low elongation polyester mesh, which features improved stencil adhesion properties. It is available in the widest range of thread diameters and mesh counts.

SEFAR® PET 1500's increased mesh strength and durability combined with low elongation provide:

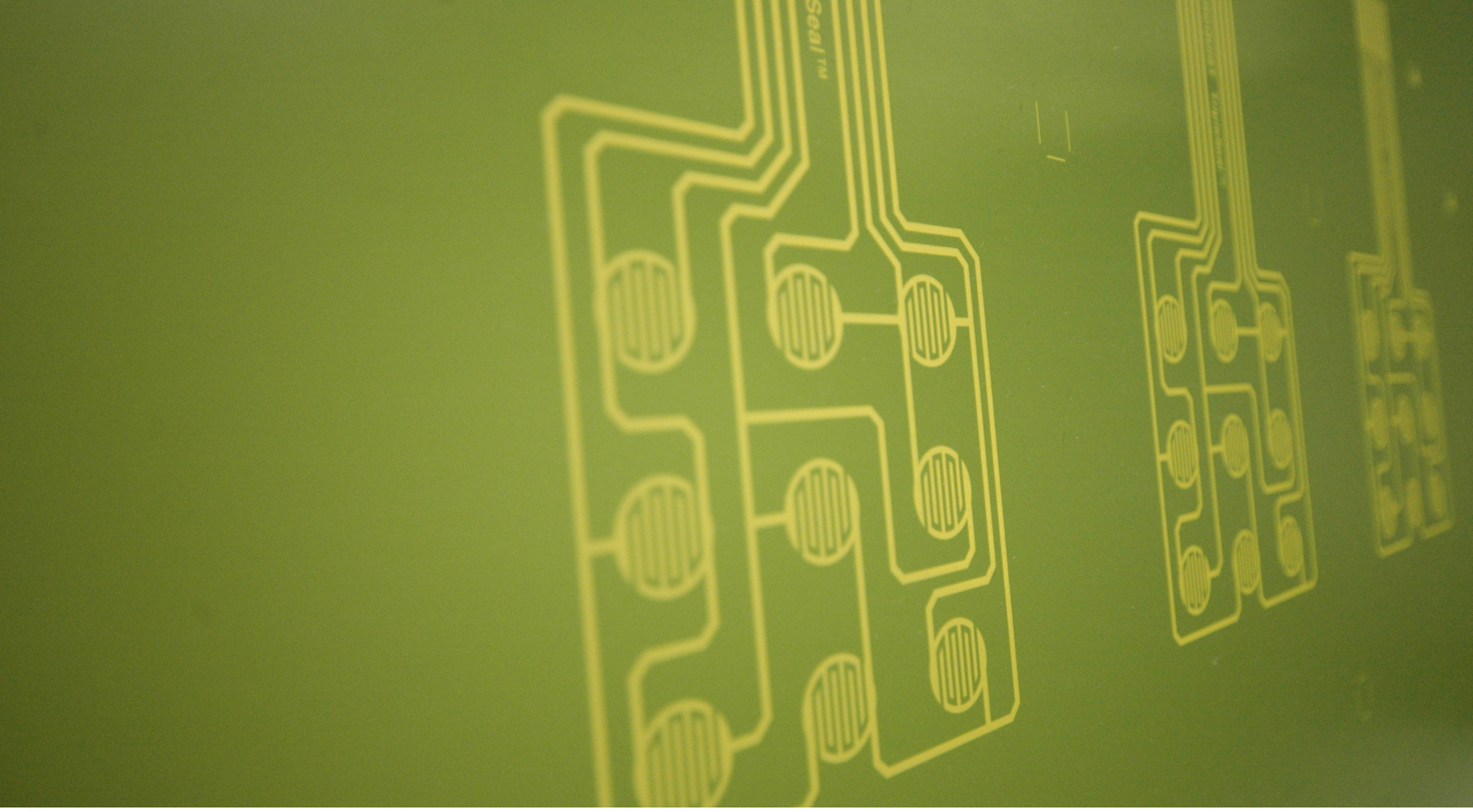
- Higher tension levels
- Increased durability
- Low elongation
- Consistent registration throughout the entire run
- Superior print quality
- Machine utilization

SEFAR® PET 1500 – Low Elongation Polyester Mesh

Mesh Specification	Mesh Count (t.p.i.)	Mesh Opening (µm)	Thread Diameter (µm)*	Open Area (%)	Mesh Thickness (µm)	Theoretical Ink Volume (cm3 / m2)
60-140	60	270	140	42	248	104
83-100	83	209	100	45	163	73
92-100	92	174	100	39	163	64
110-80	110	149	80	41	130	53
137-64	137	115	64	39	100	39
156-64	156	90	64	30	100	30
175-55	175	85	55	33	86	29
195-55	195	67	55	27	84	22
230-48	230	55	48	25	76	19
280-34	280	54	34	35	53	19
280-40	280	47	40	27	64	17
305-34	305	45	34	27	53	14
330-34	330	40	34	27	53	14
355-34	355	31	34	19	52	10
355-34 TW	355	33	34	20	59	12
380-31	380	32	31	23	45	10
460-27	460	22	27	16	42	7

All above product descriptions are plain weave unless designated TW (twill weave).
** Nominal Value*

Note: Other meshes available upon request



Emulsion Data

Sefar Screen Emulsions

DCE9: Specifically formulated for harsher solvents such as NMP, DCE9 provides an excellent option as an emulsion choice in aggressive chemical environments. Resolution features are the most favorable in thinner emulsion build-ups, but this emulsion gaskets well and is easily handled by a customer exposing the screen in-house.

E11: Excellent emulsion for features 70 microns and greater. E-11 has high quality gasketing characteristics and solvent resistance. High sensitivity to ultraviolet (UV) light allows for quick exposures. Use E11 for various microelectronic printing applications, especially when resolution and edge definition are critical.

E80: Excellent emulsion for features 70 microns and greater. E80 has outstanding resistance to cleaning solvents and ink/paste vehicles. Combined with its excellent gasketing and printing characteristics, E80 becomes a great choice for applications which involve printing or cleaning with aggressive materials.

PEF2: PEF2 is a standard film emulsion that combines precision emulsion thickness control with excellent substrate gasketing properties and good resolution imaging capabilities. An ideal choice for presensitized screens, this emulsion has a rapid exposure time and is easy for the customer to washout. PEF2 is best suited for applications with greater than 0.0003" EOM.

PE: An emulsion product with all of the same characteristics of PEF2, but ideally suited for very thin emulsion build-ups of equal to or less than 0.0003" EOM. A softer and more conforming emulsion to gasket multi-layer thick film applications in a non-aggressive environment.

S34: Specifically designed for ultra-resolution fine line printing. S34 is an excellent emulsion to maintain edge quality while reaching the extreme limits of fine line printing in the screen market today.

Sefar Emulsion Cross-Reference Chart

Emulsion

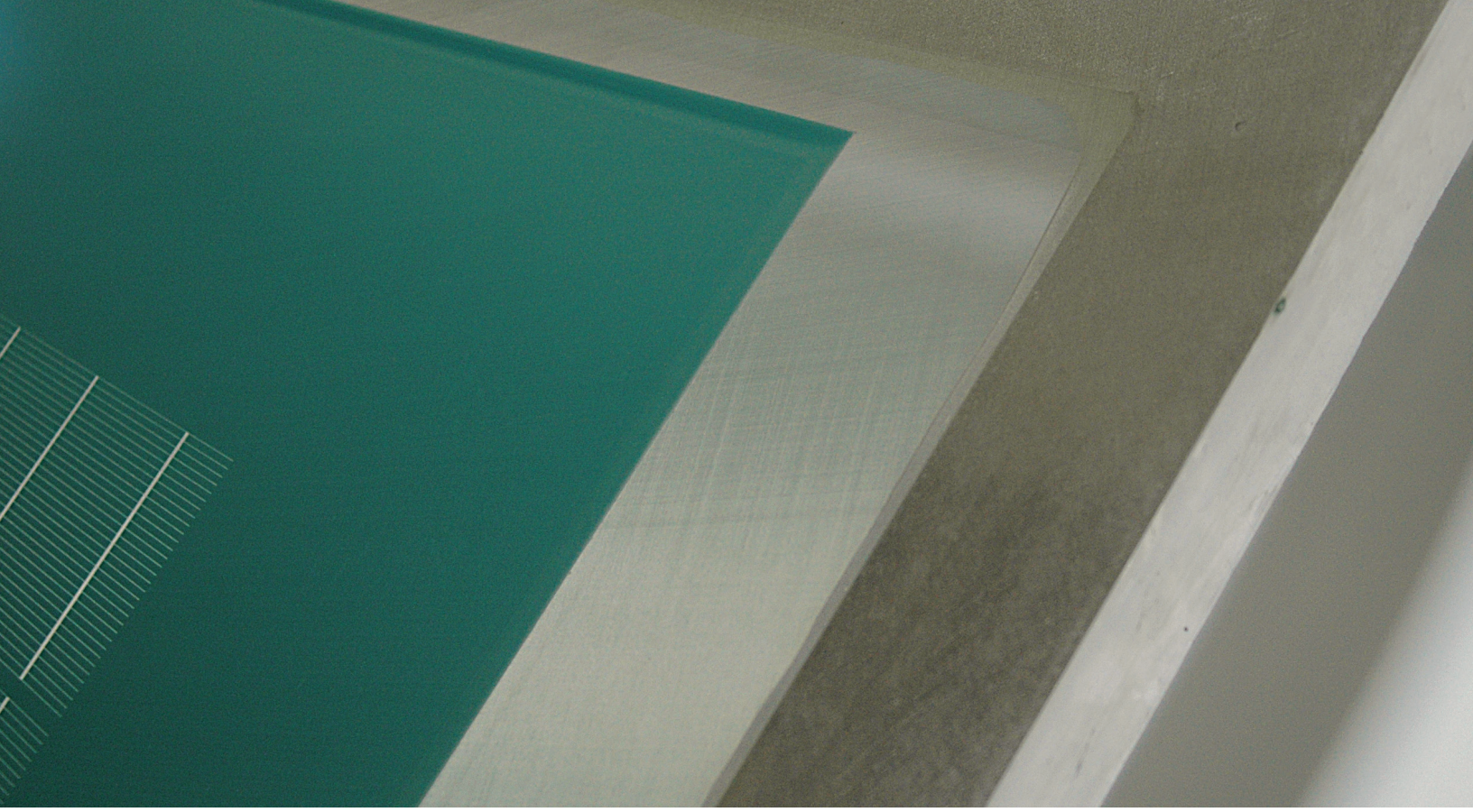
Solvent	DCE9	E11	E80	PEF2	PE	S34
Toluene	A	A	A	A	A	A
Xylene	A	A	A	A	A	A
NMP	B	D	C	D	D	C
Distilled Water	A	B	B	C	C	C
Butyl Carbitol	A	A	A	A	A	A
Butyl Cellosolve	A	A	A	A	A	A
Butyl Carbitol Acetate	A	A	A	A	A	A
Isopropanol	A	B	B	B	B	B
1,1,1 Trichloroethane	A	B	A	B	B	A
Terpineol	A	A	A	B	B	A
Methyl Ethyl Keytone	B	C	A	B	B	B
Acetone	A	B	A	A	A	B
Methanol	A	B	B	C	C	B
Rosstech 106 FE	A	A	A	A	A	A
Rosstech 133	A	A	A	A	A	A
Axarel 2000	A	A	A	A	A	A

A *Safe*

B *Reasonably safe*

C *Use with caution*

D *Not Compatible*



Emulsion Thickness Data

Sefar direct screen emulsions can be applied to our stretched screens in thicknesses from 0.0001 inch to 0.030 inch (increments of 0.0001 inch) to the following tolerances:

Emulsion Thickness Target (microns)	Tolerance Thickness
0 µm to 30 µm	+/- 3 µm
30 µm and greater	+/- 10%

Emulsion Thickness Target (inches)	Tolerance Thickness
0.0 to 0.0012“	+/- 0.00012“
0.0012“and greater	+/- 10%

Determining Screen Emulsion Thickness (EOM)

The emulsion thickness your screens require can be determined in a number of ways:

- Ask your paste or ink supplier for a recommendation based on your application.
- Contact Sefar’s support staff for a recommendation, based on current industry standards.
- Calculate the emulsion thickness you need based on the following formula:

Te = Tw – (Tm x Ao)

When:

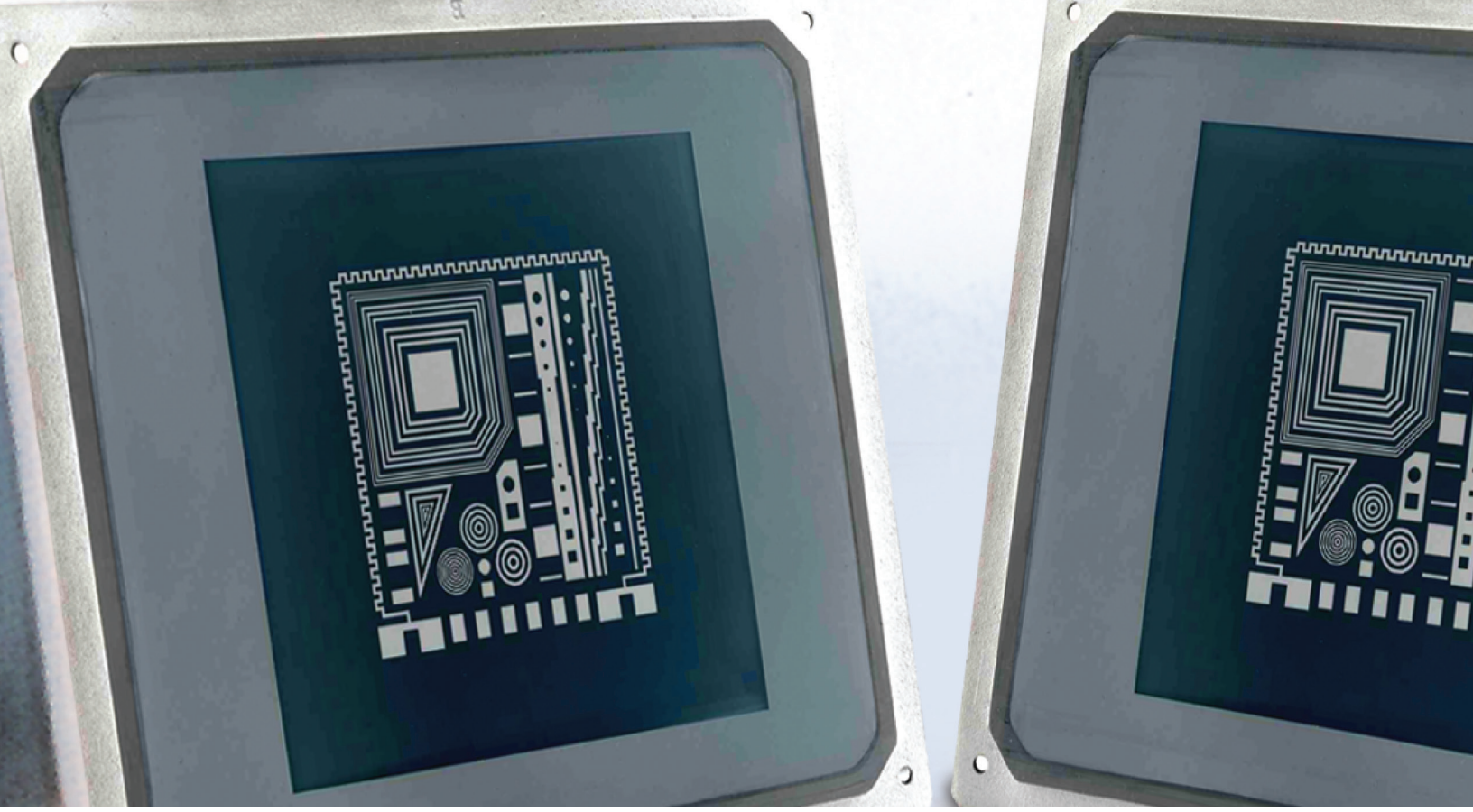
Te = emulsion thickness (EOM)
Tw = wet printed thickness
Tm = weave thickness
Ao = % of open area

You will need to know the wet printed thickness you are trying to achieve as well as the parameters of the screen mesh you will be using in order to complete the above equation. This equation can be modified for use in determining the theoretical wet printed thickness achievable from any screen mesh/emulsion thickness combination. The equation for determining theoretical wet printed thickness is shown below (the same conditions apply):

Tw = (Tm x Ao) + Te

(Factors affecting print thickness which relate to ink, screen printing equipment, setup parameters, etc., are not considered). As a result, those values are approximate. For precision, production testing is strongly recommended.

EOM: Emulsion Over Mesh



CAD & Photoplotting

Laser Photoplotter

Our Laser photoplotting system can accurately reproduce the high resolution and the sharp edge definition needed for today's precision electronic designs. Using this system, our staff of certified Gerber® trained photo technicians can generate sharp, accurate photoplots for a wide variety of imaging applications.

Performance Specifications

Output media
Silver-Halide Coated Film

Maximum film size
22X28 inch

Maximum film thickness
0.007 inch

Maximum film image size
21.5X 27.5 inch

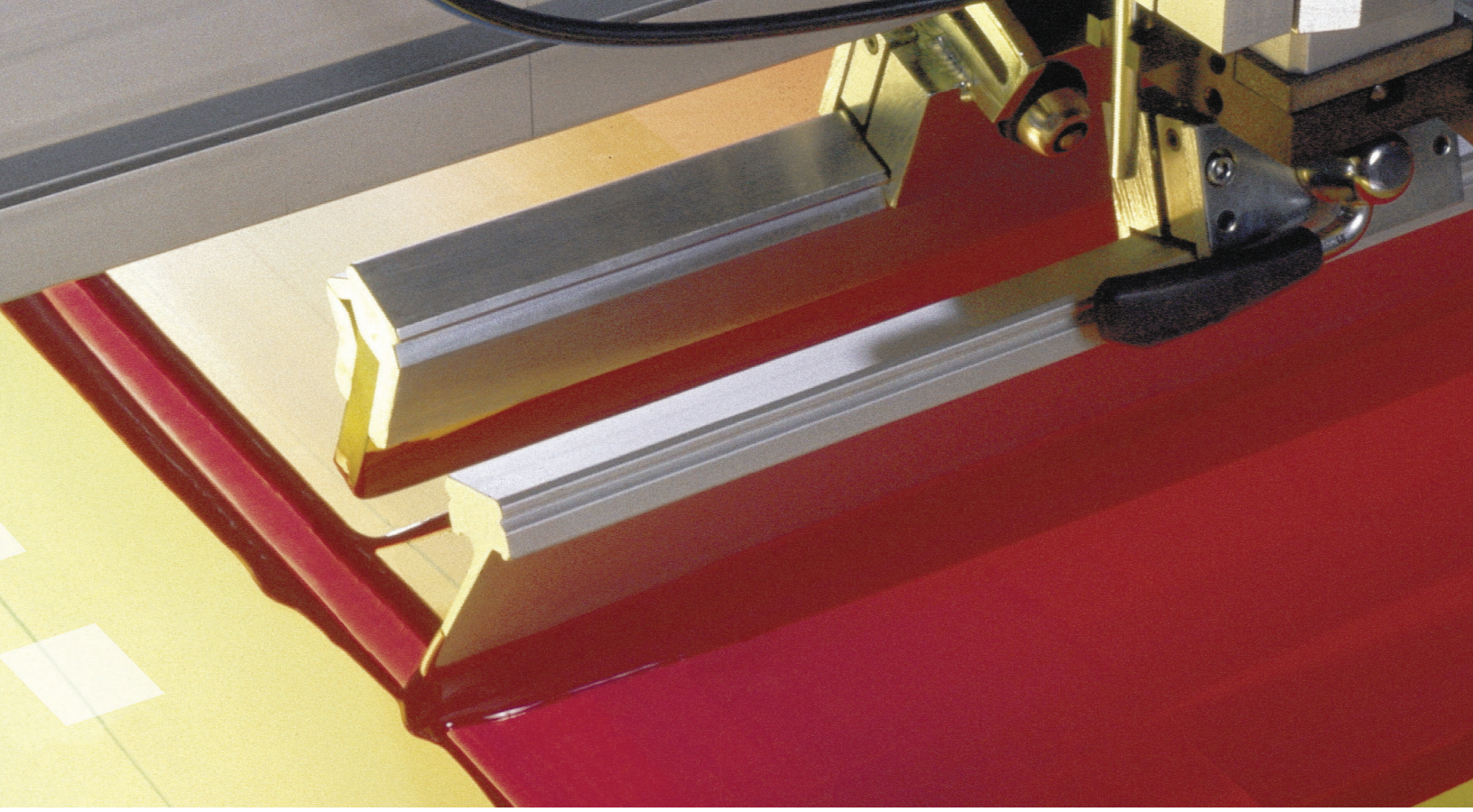
Accuracy
10 microns

Repeatability
± 0.5 mil

Resolution
20,000 DPI resolution

- Competitive pricing
- Formats:
  - Gerber® files
  - AutoCAD
  - .DWG and
  - .DXF files

Sefar features a complete range of CAD drafting artwork generation and file editing, using the latest version of AutoCAD software. Data for CAD service and/or photoplotting may be supplied either on disk, electronic file, or as a dimensioned drawing. Any electronic data supplied that is not in Gerber® format can be translated into a Gerber® file for a nominal charge.



Consumables

Squeegees

Sefar offers an extensive range of solvent resistant, polyurethane squeeges that are available in a variety of different durometers, colors, sizes, profiles, and composites. When ordering squeegees, it will be necessary to provide us with the following information:

Size – Squeegee is available in standard coil lenghths of 144" (to be cut by the customer). Additional sizes are available—contact your Sefar representative to inquire about our current inventory.

Durometer – Durometer refers to the hardness of the squeegee blade. Each durometer is designed to provide the printer with a different print effect. If you are not sure which durometer to use, feel free to contact Sefar support staff for assistance. Squeegees are typically color coded according to the durometer.

Squeegee Profile

The profile refers to the shape of the squeegee's printing edge. Common squeegee profiles for electronics are straight and diamond (see below).

Squeegee Profiles

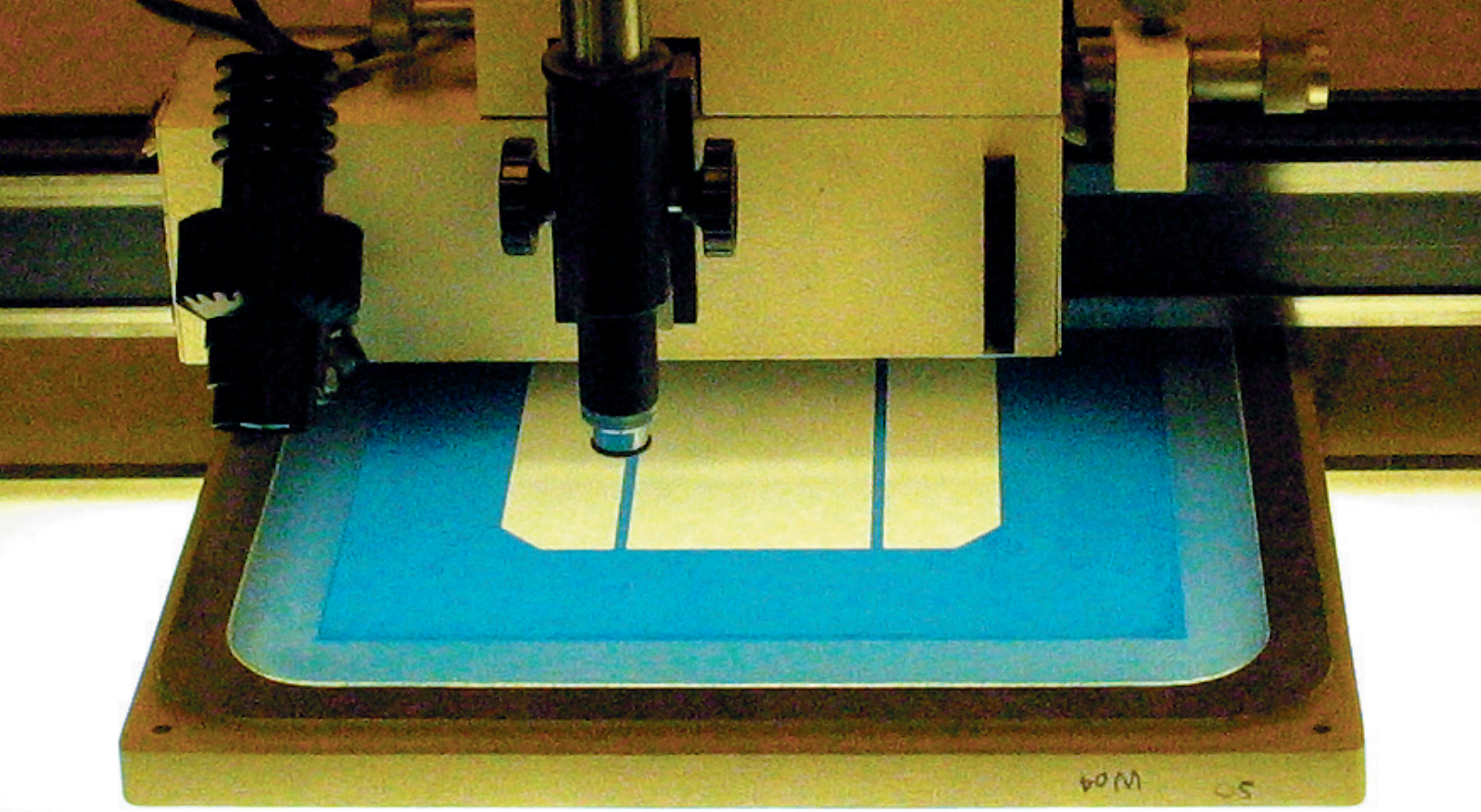
Extruded Aluminum Frames

Sefar offers a broad selection of rigid aluminum frames. Our rigid frames are built with the stringent requirements necessary for successful screen printing. Different options are available to provide you with a frame that can excel in high tension, superior mesh adhesion, easy cleaning, and life-long durability.

Our aluminum frames are lightweight for easy handling and have an optimum stability-to-weight ratio to maintain flatness and squareness throughout the life of the frame. Deep and controlled penetration welding provides strength and warp resistance. Every frame is hermetically sealed (liquid-tight) and sandblasted or roughened for excellent synthetic or wire mesh adhesion. Sefar's aluminum screen frames are available in multiple profile sizes, and custom sizes are available upon request.

Features of aluminum frames

- Lightweight for ease of handling, yet robust to withstand movement throughout the shop and years of service
- Optimum weight-to-strength ratio, engineered to help maintain high mesh tensions
- Deep-welded for strength, warp resistance, and liquid-tight seals for screen processing
- Finished on one side for optimum mesh adhesion properties



Ordering Screens

Contact us at **909.947.4180** to place an order for stretched screens.

To insure that your screens are made to your specifications, it is important for you to provide us with adequate information when placing an order. Please be prepared to provide the following screen parameters:

- **Frame Size –** If you need to purchase frames, please be sure to provide information on your frame requirements. For more information please see page 6. If you will be providing us with your frames, we will need to know the frame size for pricing purposes.
- **Mesh Specification –** When providing us with your mesh requirements, be sure to include both mesh count and wire diameter. For more information please see pages 7 through 9.
- **Mesh Tension –** Unless you require a special tension, all screens are stretched to established standards according to the cloth characteristics, such as mesh count and wire diameter.
- **Mesh Angle –** When determining mesh angle on your screens, it is important that none of the wires run parallel to the lines in your pattern (this can cause a reduction in the anticipated feature width and shape). Common angles are 30˚ and 22 ½˚.
- **Emulsion Thickness (EOM) –** If you would like your screens to be coated with emulsion, please provide your emulsion over mesh (EOM) build-up. You may also specify total screen thickness (including mesh thickness). For more information, see pages 7 through 9, and the Emulsion Thickness calculation on page 12.
- **Artwork –** If we are coating your screens, we can image them too! Artwork can be supplied, or we can output your electronic files in-house. We accept .DXF, .DWG and Gerber® files. Please provide artwork details during the submission process (positive or negative films, right or wrong-reading images, etc.).
- **Image Orientation –** When imaging screens that are on rectangular frames, please provide accurate instructions on image orientation to the frame.

Mesh selection Guide

Selecting the proper screen parameters for your specific printing application will help to ensure successful results.

Screen Frames

While all frames need to be flat, parallel, and structurally stable to maintain tension and dimensional accuracy, they must also be the appropriate size. The inside dimension of your frame should be at least 2 to 3 times the length of your squeegee blade as well as 2 to 3 times the anticipated squeegee travel distance. This provides enough margin for proper screen deflection, while minimizing possible distortion.

Screen Mesh

Screen mesh should be selected based on criteria directly related to your paste/ink and application. Initially, choose mesh count and thread diameter combinations that are capable of printing the wet paste/ink thickness your application requires. Wet ink thickness can be estimated for any mesh type using this formula:

WPT = (MT x OA) + EOM

when: MT = mesh weave thickness
OA = percent open area
EOM = emulsion over mesh

Additionally, the mesh type selected must also be capable of printing the smallest feature size in your artwork pattern. An easy method of determining resolution capability is to compare the smallest feature of your artwork to the width of two wire diameters plus two mesh openings of the mesh type you're considering. Your smallest artwork feature should be equal to, or larger than, this accumulated distance for optimal print quality.

Finally, to avoid clogging, the mesh selected must also contain openings between wires that are at least 3 to 5 times larger than the size of the largest particle dispersed in the ink you will be using.

Emulsion Coating

Screen emulsion reproduces your artwork geometry and acts like a gasket on the underside of the screen mesh to help prevent ink/paste bleed. The thickness of this emulsion coating or EOM ("emulsion-over-mesh") has direct influence on printed thickness when the artwork features are smaller than 0.100 inch (2.54 mm). EOM has less influence on wet ink thickness as pattern features increase in size beyond 0.100 inch.

Since EOM affects screen thickness, it also influences resolution capability. The smallest feature size of your artwork must be larger than the overall thickness of the emulsion coated screen. For most applications, 0.0005 inch (13µ) EOM is usually an appropriate emulsion thickness.

Sefar Inc.
111 Calumet Street, Buffalo, NY 14043
Phone: 800.995.0531 | Fax: 716.685.9469
sales@sefar.us | www.sefar.us

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Rev 12_2018