



Tensioning Guide

SUPER STRONG PLUS LE

Tension of the screen plays a very important role for print quality and production control. Improper or poor tension results in stencil breakdown, registration problems, poor snap-off and higher off-contact, reduced printing speed, poor imaging and reducing the overall life of the stencil.

The objective in tensioning the screen is to achieve the **optimum tension** levels under given printing requirements and conditions. In most printing applications, optimum tension demonstrates lower elongation and higher tension of the screen which would deliver closest tolerance, minimum off-contact, better snap-off, consistent image reproduction and longer life of the stencil.

Tension Levels

Tension levels are recommended in three different categories; **Standard, Advanced and Maximum**. Levels are specific in use depending on various factors, such as stretching equipment or device, operator's skill, frame profile and materials, stretching method, type of printing and press equipment. In order to achieve higher tension than your current level, practice tensioning procedure recommended in this guide with your utmost attention and caution.

RECOMMENDED TENSIONING PROCEDURE

Loading the fabric

a) Load the fabric into stretching device, ensuring that the fabric is loaded as squarely as possible. If stretching device or frame is rectangular, we recommend to load the fabric in short sides first.

Make accurate markings on four corners when inserting or clamping. This will help operator in uniformly softening corners and keep the mesh in proper alignment to the frame.

For retensionable frames, locking strips or rods may be trimmed 1/4" or 1/2" shorter on each side without any sharply angled edges. This will prevent fabric from tearing in the corners.

b) Soften four corners uniformly approximately 2" to 6" depending on the frame profile.

For retensionable frames, the corners are properly softened if you are able to touch the table by pressing the center of the triangles formed by softening corners.

Stretching /Tensioning

1. Retensionable Frames

a) Beginning with long bars first, bring the fabric to 40% of the recommended tension level.

b) Turn short bars to reach 50% of the recommended tension level. There should be no tension in corners. Soften as necessary. Throughout tensioning process, corners should be checked constantly.

c) Go back to long bars. Using the bar that has been turned the least distance, bring the tension level to 65%.

d) Using the short bar that has been turned the least distance, bring the tension level to 75%.

e) Repeat step c, bring the tension to 90%.

f) Repeat step **d**, bring the tension to 100%.

g) Check the tension of both directions, and make any adjustments to reach even tension if necessary. In order to keep the mesh openings as square as possible, traveling distance of two bars on each direction should be even.

h) We recommend to allow the screen to sit for 3 to 4 hours, and retension to the recommended tension level. For maximum stabilization, allow the screen to sit for at least 12 hours before retensioning.

NOTE - Tension levels at each steps on long or short side bars may be slightly different depending on skill of operator and frame profile.

2. Murakami Screen Pneumatic Pro-Stretcher.

a) Stretch the fabric warp and weft directions simultaneously to the recommended tension level.

b) Raise the table up to the maximum height until the frame can touch and push the fabric upward.

c) Allow the screen to sit for approximately 15 to 20 minutes

d) Check the tension and restretch to the recommended tension level.

e) Adhere the fabric to the frame completely. After the adhesive is thoroughly cured, release the clamp cylinder.

f) Trim the fabric along the frame. The screen is now ready for stencil making.

3. Other Pneumatic/Mechanical Stretcher.

a) Stretch the warp and weft directions simultaneously to one half of the recommended tension level.

b) Repeat step a. and bring the tension three quarter ($3/4$, or 75%) of the recommended tension level.

c) Repeat the same step and bring the tension level fully to the recommended tension level.

d) Allow the screen to sit for at least 15 to 20 minutes.

- e) Check the tension and restretch to the recommended tension level.
- f) Adhere the fabric to the frame. After the adhesive is thoroughly cured, release the clamp cylinder.
- g) Trim the fabric along the frame. The screen is now ready for stencil making.

Technical Notes: Certain stretchers are designed to set the frame in very close contact with the clamp mouth. This will create excessive stress on the fabric between the edge of the frame and the end of the clamp mouth, which in turn may cause tearing of the fabric. We recommend to allow a minimum 3" distance between two points if the construction of the stretcher and the clamp cylinder is designed to allow this modification.

4. Advanced Method.

This method is not recommended unless the operator is fully experienced and equipped with the Murakami Stretcher or other stretcher that is designed to stretch the fabric only, free from direct contact with the frame.

- a) Stretch the fabric approximate 110% to the recommended tension level.
- b) Release tension.
- c) Repeat the steps a and b five times. No stabilizing is required.
- d) Stretch to the recommended tension level.
- e) Raise the table up to the maximum height until the frame can touch and push the fabric upward.
- f) Trim the fabric along the frame. The screen is ready for stencil making now.

TECHNICAL NOTES

*** Stabilizing.**

In order to achieve the maximum stabilization of the screen, we suggest you allow the screen to sit for at least 12 hours or longer prior to any further stencil making process. This will secure the consistent production, better registration, optimum off-contact with good snap-off.

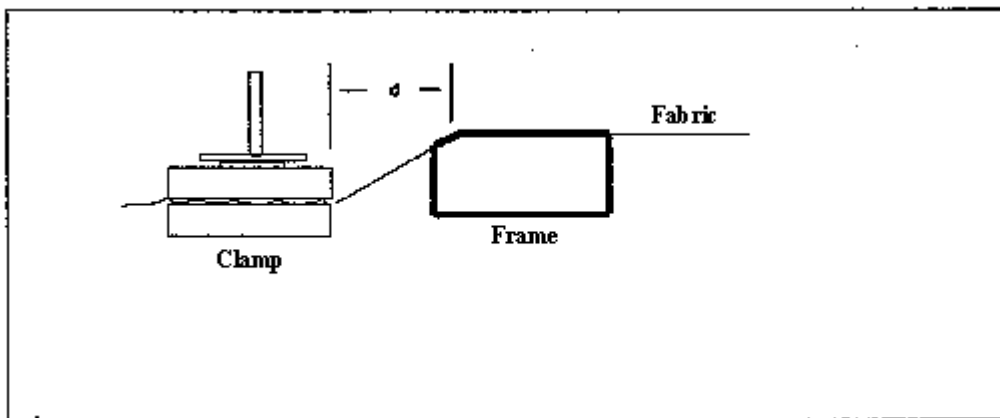
***Tension Drops.**

- Tension attained will be dropped approximately 2 to 5 N/cm two days after the stretching due to the characteristics of polyester threads. However, Murakami Screen's Super Strong Plus LE will be stabilized thereafter due to its excellent lower elongation features. Please refer to Super Strong Plus LE product brochure.

- Printers must take into consideration further tension drop during printing. It ranges typically between 2 to 4 Newtons/cm.

Summary

Stretching Equipment/Device	1 st Stretching	2 nd Stretching	3 rd Stretching	Stabilizing Time before Final Retension
Murakami Pro-Stretcher	50%	75%	100%	15-20minutes
Pneumatic or Mechanical Stretcher	50%	75%	100%	15 - 20minutes
Retensionable Chases or Self-Tensioning devices (L=Long Bar, S=Short Bar)	40% <i>L</i> 50% <i>L</i>	65% <i>IL</i> 75% <i>h/S</i>	90% <i>L</i> 100% <i>S</i>	3- 4 Hours
Advanced method with Pneumatic stretcher	110% Stretch & Release Repeat 5 times without any intervals.			None



Subject: TENSION RECOMMENDATIONS

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			TENSION LEVELS		
FABRIC NUMBER	THREAD DIAMETER (microns)	FABRIC THICKNESS (microns)	I STANDARD	II ADVANCED	III MAXIMUM
LE-150SS	48	73	17	22	28
LE-180S	48	73	20	26	33
LE-200S	48	73	22	29	36
LE-225T	48	72	24	32	40
LE- 250T	40	59	20	27	34
LE-270T	34	51	17	22	28
LE-270HD	40	59	22	29	36
LE-300T	34	52	19	25	31
LE-300HD	40	62	24	32	40
LE-330S	30	43	16	22	27
LE-330T*	34	58	20	27	34
LE-350S	30	44	17	23	29
LE-350T*	34	60	20	29	36
LE-390S	30	44	19	26	32
LE-390T*	34	62	24	32	40
[*] Twill Weave/ 2:1.					

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	Tension Levels
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FABRIC NUMBER	THREAD DIAMETER (microns)	FABRIC THICKNESS (microns)	I STANDARD	II ADVANCED	III MAXIMUM
SS-25T	250	400	33	44	55
SS-40T	200	380	31	42	52
SS-60T	120	220	23	30	38
SS-74T	120	230	27	36	45
SS-86T	100	165	25	34	42
SS-110S	71	110	22	29	36
SS-125T	71	115	22	30	37
SS-135HD	71	120	25	33	41
SS-150S	55	82	18	24	30
SS-160T	64	97	26	35	44
SS-180T	55	84	22	29	36
SS-200T	55	87	23	30	38

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