

Tensioning

TENSION LEVELS I, II and III

Recommended Tension Levels I, II and III (listed in the table right) are specific in use, and take into account the type of screen tensioning device, the frame profile, the printing equipment and experience level of screen makers and printers. These factors are of the utmost importance when deciding which tension level will work best for your production requirements.

Higher tension levels will bring the mesh closer to its ultimate tensile breaking strength, which leaves less screen processing latitude. Higher tension also increases precision of the image transfer and can improve the quality and/or speed of the printing process. The following descriptions will provide further guidelines for choosing a correct tension level.

GUIDELINES FOR CHOOSING CORRECT TENSION LEVEL

Level I Standard screen makers and printers using tensioning/printing equipment of lower than state-of-the-art sophistication. Level I should be used for large format frames that are 50" in length or larger.

Level II Advanced screen makers and printing technicians using stable frames and state-of-the-art stretching devices with proper tensioning procedures. Level II requires caution when tensioning and reduced off-contact press settings during printing.

Level III Expert screen makers and printing technicians using stable frames (maximum size of 55" OD), and state-of-the-art tensioning units with proper tensioning procedures. Level III tensions are set at maximum, and should not be exceeded during the stretching process. Minimum off-contact press settings are required during printing.

Tension Level Quick Reference Table

	Frame Size	Stretching Equipment	Operator Experience	Off Contact	Frame Strength
Level 1	Large + 50"	Less than State-of-the- Art	Beginner	Low	Not As Durable
Level 2	Medium	Roller Frames Draw Bar	Advanced	Lower	Durable
Level 3	Small	Independent Pneumatic Clamps	Expert	Lowest	Very Durable

Product Description	Recommended Tensions		
	I	II	III
20-300	21	36	56
25-260	20	35	55
25-350	30	43	64
30-140	17	24	30
30-300	25	40	60
40-200	20	34	54
40-250	25	40	60
45-180	20	35	55
45-250	28	42	62
54-140	19	29	46
60-120	20	29	35
60-140	20	30	47
70-120	22	31	45
70-140	24	35	55
83-70	19	25	31
83-100	22	33	40
83-120	25	35	50
92-90	21	32	39
92-100	23	34	41
103-80	26	35	45
110-80	32	42	51
110-90	34	44	52
115-70	22	31	36
115-80	33	43	52
123-55	17	22	27
123-70	23	32	37
123-80	34	44	53
131-70	25	34	39
131-80	35	45	54
137-64	26	34	42
137-70	27	35	43
156-64	30	39	48
156-70	31	40	50
175-55	24	31	38
175-64	32	41	49
175-70 TW	33	41	50
180-55	25	33	40
186-55	26	34	41
195-48	21	27	34
195-55	27	35	43
195-64 TW	33	43	53
206-48	23	30	37
230-40	19	25	31
230-48	24	33	40
230-55 TW	28	38	47
240-40	20	25	31
255-40	20	26	32
255-48	27	35	43
280-34	16	21	26
280-40	21	27	33
305-31	16	21	26
305-34	17	22	27
305-40	23	30	37
330-34	18	23	29
355-31	17	22	27
355-34	19	24	30
355-34 TW	20	26	32
355-34 OSC	19	24	30
380-27	15	19	23
380-31	18	23	28
380-31 OSC	18	23	28
380-34	20	26	32
380-34 TW	21	27	34
420-27	16	21	26
420-31	19	25	31
420-34 TW	23	30	35
420-34 OSC	23	30	35
460-27	17	23	28
460-31	21	27	34
460-31 OSC	21	27	34
480-31	22	28	35

STANDARD SCREEN TENSIONING PROCEDURE

1. Start by locking the mesh into the stretching device or retensionable chase. To achieve optimum tension, it is required to adjust corners to avoid exceeding the tensile strength or yield point of the mesh.
2. Tension warp and weft thread directions to one-half recommended tension level.
3. Pause and stabilize for approximately 60-seconds.
4. Increase tension in warp and weft direction approximately 2-4 N/cm. Wait 60-seconds and check corners to assure over-tensioning does not occur. Repeat the 2-4 N/cm and 60-second stabilization intervals until recommended tension is achieved.
5. **Pneumatic Stretching Devices:** When utilizing a tensioning device that applies continuous force to the mesh (i.e. pneumatic clamps), allow the mesh to stabilize for 30-minutes.

Mechanical Stretching Devices: For mechanical stretching devices, allow the mesh to stabilize for 15-minutes and retension back to the recommended tension level. Stabilize the mesh for an additional 15-minutes and retension back to the manufacturer's recommended tension level.

6. The screen is now ready for further processing.

Additional Notes

Pneumatic Stretching Clamps:

Sefar Pneumatic Clamps are highly recommended to achieve Levels II and III.

Stabilizing/Retensioning: Further stabilizing and retensioning will provide slightly higher and more stable end screen tensions. The length of stabilization and number of retensioning stages should be governed by in-house production requirements.

Consistency: Regardless of the tension level or stabilization period chosen for production, it must be controlled and repeated consistently as a strict manufacturing process. Consistency is the "key" to mesh tensioning process control.

NOTE: Always use a tension meter, like the Sefar® Tensocheck 100, when tensioning mesh.

LARGE FORMAT TENSIONING PROCEDURE

This stretching procedure is to be used on stretching systems equipped with a dual circuit control. Use Diagrams 1 and 2 below for reference when reviewing the large format stretching procedures.

1. Lock the mesh into Side A, then into Side B.
2. Increase the air pressure to roughly half of what is normally required to reach the desired tension level.
3. Lock the mesh into Side C and then into Side D. Note, do not "stretch" the mesh into the clamps on Sides C and D—just pull taut.
4. Increase the air pressure on Sides C and D until the tension matches the tension of Sides A and B.
5. Continue to increase air pressure in both directions until the desired tension level and tension balance is achieved.
6. Use a consistent relaxation or stabilization period on each screen.

Diagram 1: Step 1

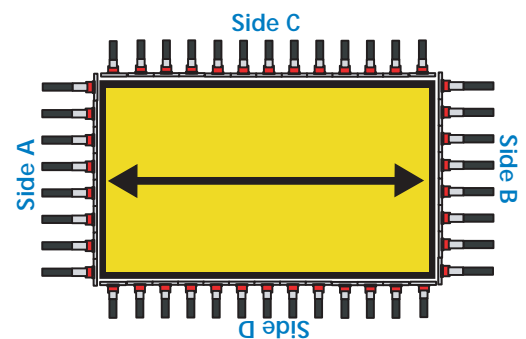


Diagram 2: Step 4

