



Thermoforming Systems LLC  
A Davis-Standard Company

# LOW FLEX (LF) THERMOFORMERS

LF3.0, LF4.0, LF5.0,  
LF5.1, LF 6.0 & LFX



[tslusa.biz](http://tslusa.biz)

## Benefits

- Deep & shallow draw applications
- Frame & drive linkage
- 3rd Motion - plug speeds up to 39"/sec
- Heat Tunnel - control a multitude of individual heater circuits

# Low Flex (LF) Formers

## LF3.0, LF4.0, LF5.0, LF5.1, LF6.0 & LFX

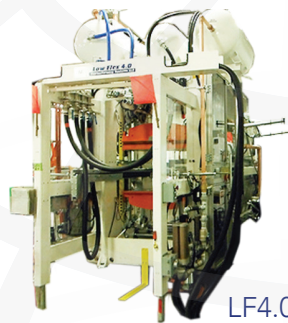
The Low Flex® thermoforming system is a durable and reliable machine for deep and shallow draw applications. The Low Flex® Series comes in four models with forming areas ranging from 33.5" x 52" to 65" x 67". The Low Flex Series can readily process a number of plastic resins: HIPS, PP, TFPP, PET, CPET, PLA, PVC, HDPE, and ABS. The machine can run roll fed or inline with extrusion processes. The Low Flex thermoformer features many technologically innovative and customer driven features that result in an edge over your competitors.

The Low Flex frame technology (Patented) is the key to reducing the frame flex allowing the 190 Ton LF5.0 machine to handle 100 psi air pressure in full sized molds.

The side frame and doubler plates straddle the platen toggle assemblies on both sides. The yoked toggle design transfers the load to the frame and reduces deflection in the toggle support shaft.



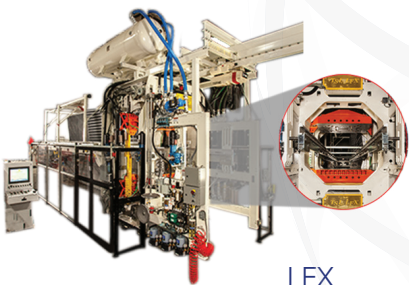
LF3.0



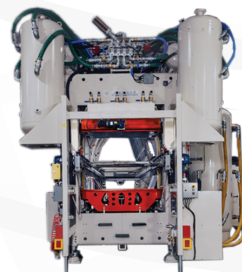
LF4.0



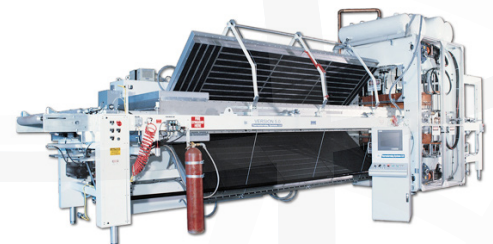
LF5.0



LFX



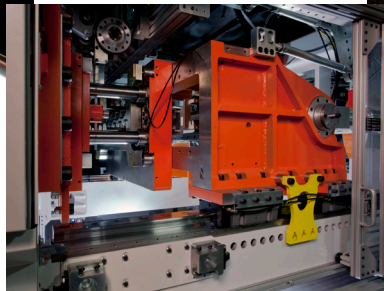
LF6.0



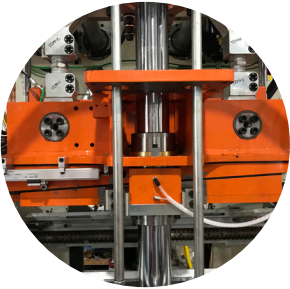
LF5.1

# Version Specification Comparison

Versions	LF3.0	LF4.0	LF5.0	LF5.1	LF6.0
Max Sheet Width	36.5"	48"	57"	57"	74"
Max Mold Size	33.5"x52"	45"x52"	52"x56"	52"x56"	65"x67"
Max Solid Sheet Gauge	0.200"	0.200"	0.200"	0.200"	0.250"
Max Depth of Draw	7.5"	7.5"	7.5"std/9"max	11"	10"
Max Former Tonnage	120	120	190	190	260
Servo Platen Drive	Independent top/bott.	Independent top/bott.	Independent top/bott.	Independent top/bott.	Independent top/bott.
Top Platen Travel	8.5"	8.5"	8.5"std/10"max	12"	11"
Bottom Platen Travel	6"	6"	6.5"	6.5"	11"
Max Shut Height + Stroke	29" Top/20.4" Bottom Bot.	29" Top/20.4" Bottom Bot.	32.5" Top/23" Bottom Bot.	36" Top/29" Bot.	36" Top/29" Bottom Bot.
Servo Adjust Shut Height	Option	Option	Option	Option	Option
Max Shut Ht.+Stroke W/SASH	23" Top/20.4" Bottom	23" Top/20.4" Bottom	27" Top/23" Bottom	27" Top/23" Bottom	31.4" Top/29" Bottom
Former Dry Cycle Speed	40 cpm	40 cpm	36 cpm	36 cpm	30 cpm
Machine Control	Galil/Opto22 PAC	Galil/Opto22 PAC	Galil/Opto22 PAC	Galil/Opto22 PAC	Galil/Opto22 PAC
Heat Tunnel Length	210"Std, Options for Longer Lengths	210"Std, Options for Longer Lengths	210"Std, Options:220,230,240, 280, 320, 335	210"Std, Opt.-220,230,240,280, 320, 335	268"Std, Option:335"
Heater Elements	Quartz Panels	Quartz Panels	Quartz Panels	Quartz Panels	Quartz Panels
Chain Rail Type	Open Architecture Steel	Open Architecture Steel	Open Architecture Steel	Open Architecture Steel	Open Architecture Steel
Servo Sheet Index Speed	120"/sec	120"/sec	120"/sec	120"/sec	120"/sec
Former Electrical Service	*400 A/480V	*400 A/480V	*800 A/480V	*800 A/480V	*1000 A/480V
Compressed Air Usage	10cfm at 100psi excl. mold	10cfm at 100psi excl. mold	10cfm at 100psi excl. mold	10cfm at 100psi excl. mold	10cfm at 100psi excl. mold
Infeed Edge Pre-Heater	Option	Option	Option	Option	Option
Chain Rail Motor Adjusters	Option	Option	Option	Option	Option
Servo Vacuum/Bleed	Option	Option	Option	Option	Option
3rd/4th Motion Plug Drive	Option	Option	Option(13,000 lbf @30"/sec)	Opt.(24,000 lbf @40"/sec)	Option (36,000 lbf @40"/sec)
Former Tonnage Monitor	Option	Option	Option	Option	Option
Mold Cart	Option	Option	Option	Option	Option
V-Rail Mold Loading on Chain Rail	Option	Option	Option	Option	Option
Unwind Stands/Payouts	Option	Option	Option	Option	Option
PP Pre-Heater	Option	Option	Option	Option	Option
Extruder	**	**	**	**	**
Automation	**	**	**	**	**
Tooling	**	**	**	**	**
Rim Roller	**	**	**	**	**



## Features



### Sash

- +/- 0.100" vertical adjustment of the top platen for shut height sheet thickness, and/or seal compression adjustments via the HMI
- Eliminate risk of exceeding machine tonnage
- Can be adjusted while machine is running



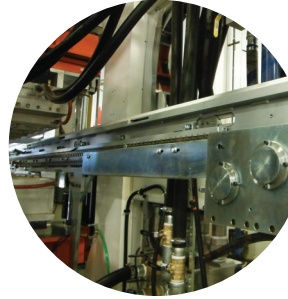
### Doubler Plates

- Patented frame reinforcing or doubler plates - enhanced strength and deflection resistance of the frame
- Independent set of frame bearings - reduce the flex or deflection in the shaft
- Process any sheet type without air leakage



### Servo Plug Drives

- Servo plug drive provides uniform wall thickness in product development
- Available in a variety of configurations
- Available with one or two motors and two types of screws
- The 4th motion is located on the top platen for formed down products



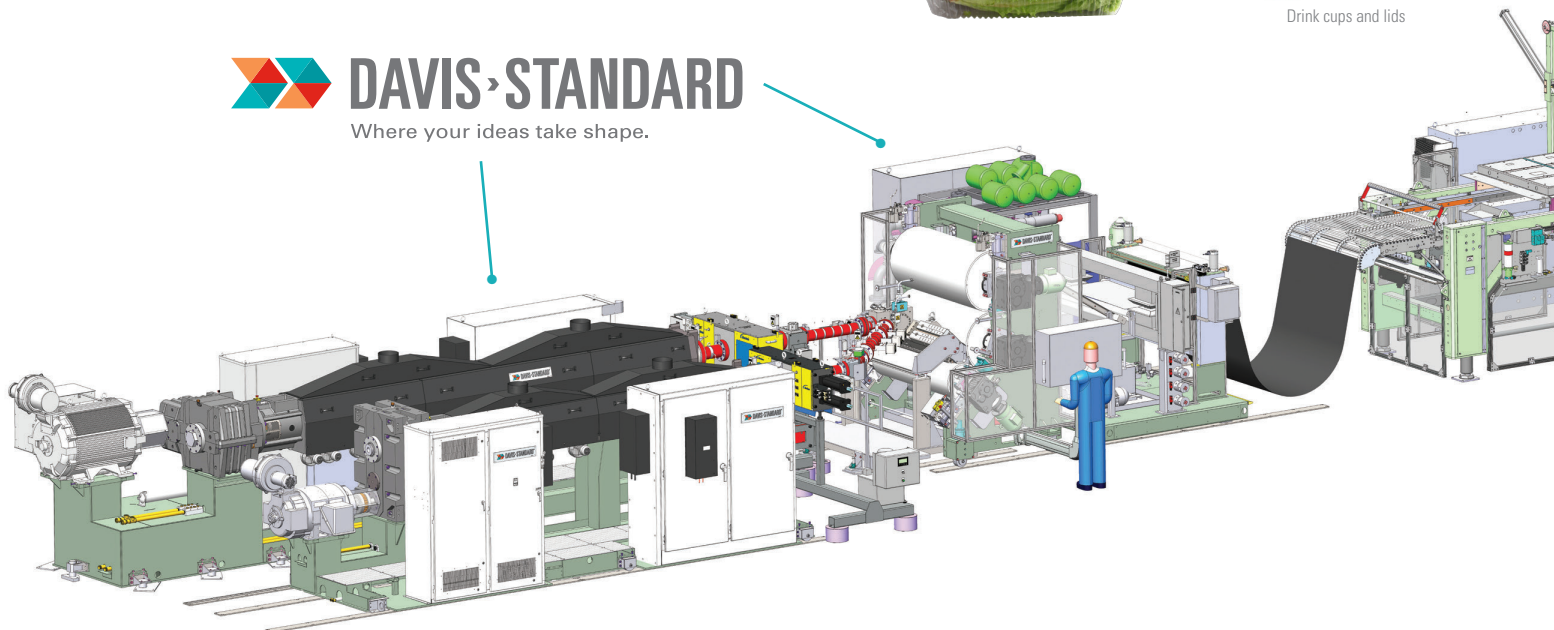
### Heat Tunnel & Chain Rail

- Energy efficient quartz panel heaters
- Easy to clean aluminum pan-faced heaters on bottom
- Up to 170 degrees opening for ease of access to all heaters and safe clearing of sagging plastic
- Available in lengths up to 335"
- The chain rail has motorized adjust option for sheet sag control



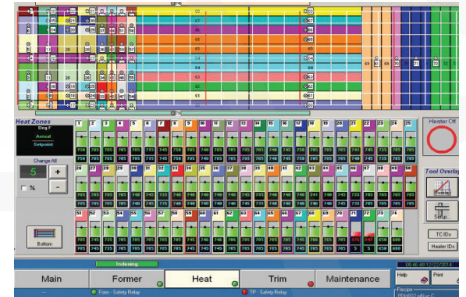
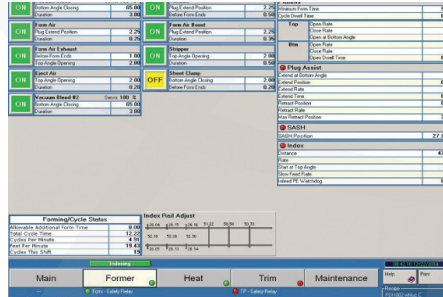
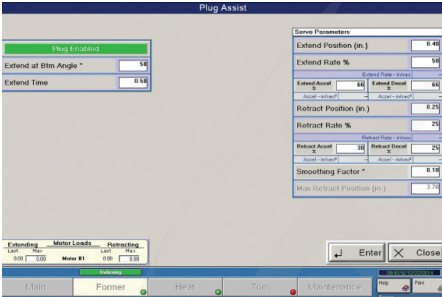
Drink cups and lids

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# Machine Controls

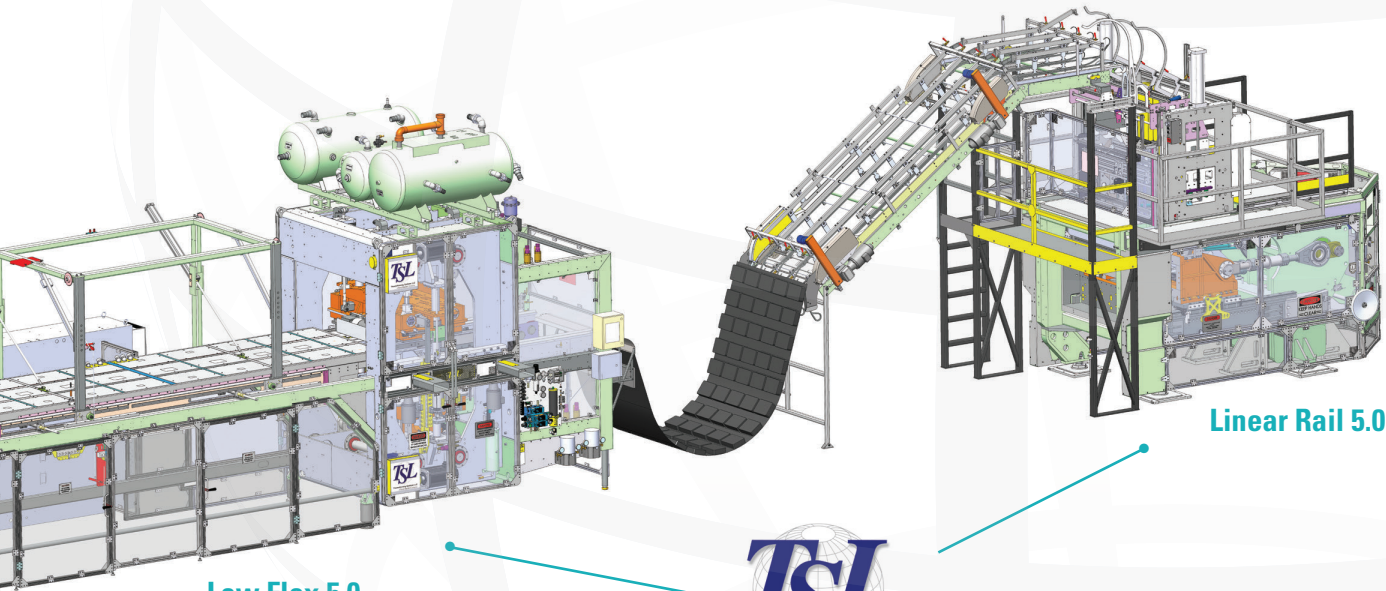
The TSL machine control is a user friendly, state of the art system that incorporates non-proprietary hardware and machine specific software developed by TSL.



- Standard industrial PC, 19" LCD touch panels
- Log of all machine events and faults
- Recipe management and storage
- Machine diagnostics
- Includes extensive configurable user security, password levels and online operations manual and help.
- The HMI developed by TSL, was written in Microsoft Visual Studio.

- The HMI is available in multiple languages
- An Opto22 PAC system manages all of the machine's generic I/O
- A Galil DMC-40x0 controller coordinates the motion control for all of the servomotors. This system synchronizes all the machine cycle timing.
- Machine data for data acquisition systems, can be provided via OPC.

- By request TSL can remotely connect to the control system to troubleshoot, modify, or add new features, via a secured internet connection.
- The oven temperature control via the Opto22 PAC system provides each zone its own PID loop control.
- The heater zone configuration is color coded for ease of use .



Low Flex 5.0

Linear Rail 5.0



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Berry baskets, consumer-safe fresh food containers



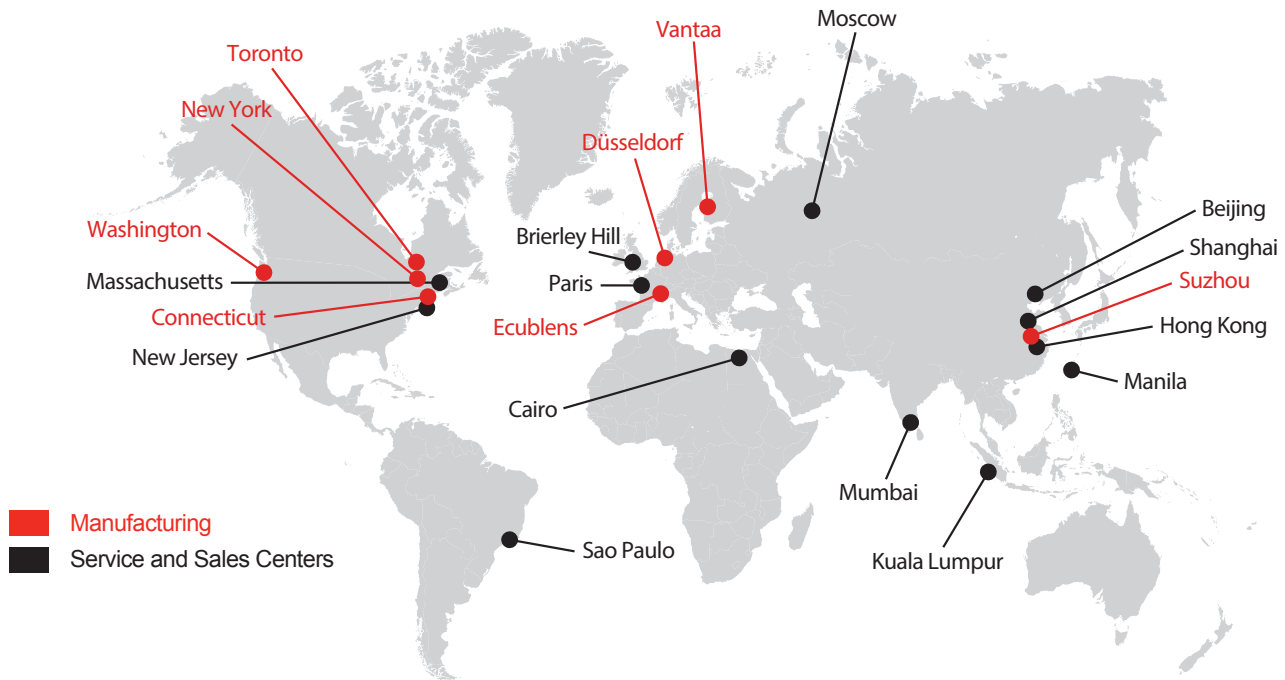
Tampered evident clamshells



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