Consolidating Platemaking Production Through Automation

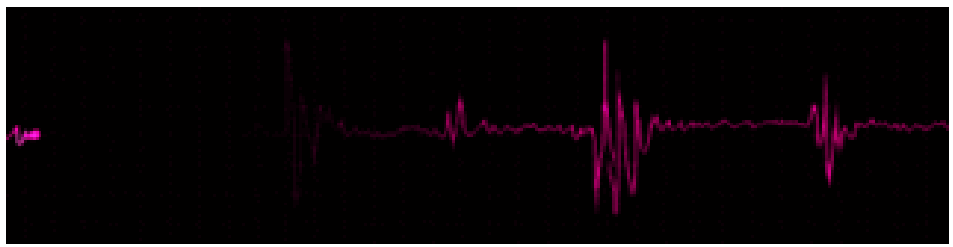
Rely on us.

Flexographic Pre-Press Platemakers Association

FlintGroup Flexographic Products

The Packaging Industry

Checking the pulse of the industry...



The Packaging Market

EXECUTIVE SUMMARY

The total U.S. flexible packaging industry is estimated to be about $25.5 billion in annual sales for 2010. This $25.5 billion includes packaging for retail and institutional food and non-food, medical and pharmaceutical, industrial materials, shrink and stretch films, retail shopping bags and consumer storage bags and wraps and trash bags.

This report covers the entire flexible packaging $25.5 billion industry including the segment of the industry that adds significant value to the flexible materials, usually by performing multiple processes. This segment of the industry is estimated to be about $19.8 billion for 2010, and does not include retail shopping bags, consumer storage bags, or trash bags.

The industry has shown steady growth over the last nineteen years with two exceptions, the downturn of 2001 and the 'Great Recession' which ended in 2009. This achievement has often been a struggle with converters having to use their increasingly lean organizations to meet and overcome a variety of challenges. This steady growth and expansion has been aided by innovation in technology and products, growth in new and existing markets and an ability to adapt to the ever changing environment of today's marketplace.

For 2009-2010, FPA estimates an annual growth rate of 7.3 percent based on information provided by FPA members in the FPA State of the Industry Survey, by non-members in the FPA Industry Wide Converters Survey, the Census Bureau's latest Annual Survey of Manufactures and FPA's long-term historical model of flexible packaging industry growth. Over the period, 2000-2010, flexible packaging has grown at a compound annual rate of 2.6 percent per year.

The U.S. flexible packaging industry employs approximately 79,000 people in the United States and encompasses a wide variety of manufacturing methods, materials and resources. The average flexible packaging converter is a small to medium-size company with annual sales totaling about $60-65 million. The top 100 flexible packaging companies (out of the estimated total of 407) account for nearly 77 percent of total industry revenue with an average size of about $190 million. The top 10 flexible packaging companies account for nearly half (48%) of flexible packaging industry revenue and with average sales of about $1.1-1.2 billion. The majority of flexible packaging plants are concentrated in the Midwest, although many plants exist in the Southeast and in California.

"For 2009-2010, FPA estimates an annual growth rate of **7.3 percent** based on data provided by FPA members."

Flexible Packaging Association 1

"For 2009-2010, FPA estimates an annual growth rate of 7.3 percent based on data provided by FPA members."

- FPA Industry Report 2011

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The Packaging Market

US corrugated and paperboard demand will rise 2.4% annually through 2014.

http://www.freedoniagroup.com/Corrugated-And-Paperboard-Boxes.html

Freedonia

info@freedoniagroup.com PH:440.684.9600 FAX:440.646.0484

Corrugated & Paperboard Boxes to 2014 - Demand and Sales Forecasts, Market Share, Market Size, Market Leaders
Study #: 2598
Published: 03/2010
Pages: 303
Full Study Price: US$ 4,800
Per Page Price: US$ 35.00 (text) | 60.00 (table)

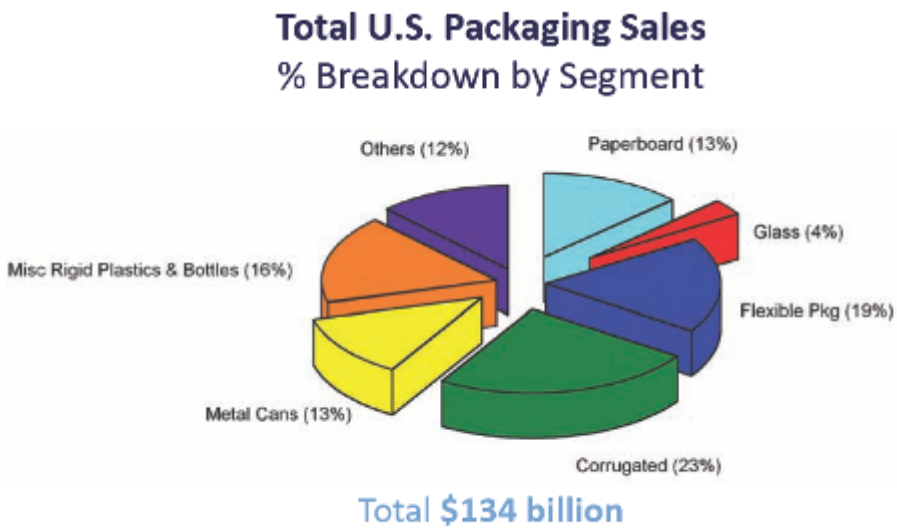
Corrugated & Paperboard Boxes to 2014 - Market Research, Market Share, Market Size, Sales, Demand Forecast, Market Leaders, Company Profiles, Industry Trends

US corrugated and paperboard box demand will rise 2.4 percent annually through 2014. Gains will be driven in part by higher value types with better graphics capabilities, including folding cartons and corrugated boxes. Internet-based shopping will also support box demand. Durable goods will be the fastest growing market.

This study analyzes the $32.3 billion US corrugated and paperboard box industry. It presents historical demand data for the years 1999, 2004 and 2009, and forecasts for 2014 and 2019 by material, product (e.g., corrugated and solid fiber boxes, folding paperboard boxes, set-up paperboard boxes) and market (e.g., food and beverages, nonfood nondurable goods, durable goods, nonmanufacturing).

The study also considers market environment factors, details industry structure, evaluates company market share and profiles 26 industry players, including International Paper, Smurfit-Stone and Georgia-Pacific.

Together, Corrugated & Flexible Packaging are almost ½ of the Packaging market.



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The Packaging Industry

Consolidations continue…

The Acquisitions & Consolidations Continue…

Green Shoots in the U.S. Economy…

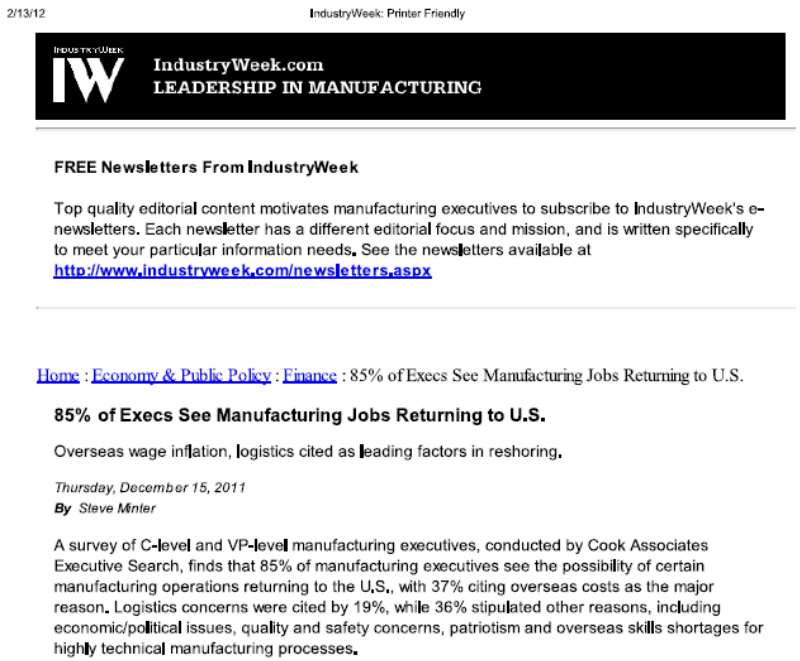
"Green Shoots" In The News

"Growth in manufacturing is currently twice as strong as GDP."

– Bob Shrouds, Economist, DuPont Company

"…survey finds 85% of manufacturing executives see the possibility of certain manufacturing operations returning to the U.S."

– Cook Associates Survey



2/13/12 IndustryWeek: Printer Friendly

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LEADERSHIP IN MANUFACTURING

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Top quality editorial content motivates manufacturing executives to subscribe to IndustryWeek's e-newsletters. Each newsletter has a different editorial focus and mission, and is written specifically to meet your particular information needs. See the newsletters available at http://www.industryweek.com/newsletters.aspx

Home : Economy & Public Policy : Finance : 85% of Execs See Manufacturing Jobs Returning to U.S.

85% of Execs See Manufacturing Jobs Returning to U.S.

Overseas wage inflation, logistics cited as leading factors in reshoring.

Thursday, December 15, 2011
***By** Steve Minter*

A survey of C-level and VP-level manufacturing executives, conducted by Cook Associates Executive Search, finds that 85% of manufacturing executives see the possibility of certain manufacturing operations returning to the U.S., with 37% citing overseas costs as the major reason. Logistics concerns were cited by 19%, while 36% stipulated other reasons, including economic/political issues, quality and safety concerns, patriotism and overseas skills shortages for highly technical manufacturing processes.

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Automation Even Replacing Low Wage Workers

just viewed as big business but also as small business."

The Jobs Factor

With new technology like artificial intelligence, robotics and digital manufacturing changing the game, "the manufacturing of the past is gone," Wadhwa said. "And so are those repetitive, boring factory types of jobs. They won't exist. Manufacturing is coming back to the United States because we have the most skilled, creative, innovative people in the world."

Because of these advancements, Mark Perry, professor of economics at the University of Michigan-Flint, foresees a "pending renaissance in U.S manufacturing," including an insourcing of "Manufacturing 2.0" jobs.

"The U.S. is still the world leader in terms of innovation, engineering design and patents," Perry explained. "China is good at assembly, the labor intensive parts, but the creativity happens here. We still have the advantage in entrepreneurship and innovation. This won't be like Michael Moor in 'Roger & Me.' 21st century manufacturing is headed away from heavy machinery and more toward robotics, design and high tech."

According to Perry, 109,000 net new manufacturing jobs were added in 2010 — the first net additions since 1997. The turnaround continued in 2011 with another 225,000 net new manufacturing jobs added, although the current count of 12 million manufacturing jobs is still down about 7. million from its peak level in 1979.

The recent job growth has a lot to do with the narrowing of wages between the United States and China. "Until a few years ago, we had a manufacturing wage bubble in the U.S. that was clearly unsustainable," Perry says. "Those wages were out of line with the rest of the world, but because of the recession, the U.S. is much more competitive from a wage standpoint."

While wages in China are increasing by 15 to 20 percent a year, and have doubled in the past four or five years, U.S. wages rose 1.4 percent from December 2010 to December 2011. Though the gap is shrinking, it is still substantial — U.S. Bureau of Labor Statistics estimates peg average U.S. manufacturing wages at $19.13 per hour in December 2011, while Perry estimates the average manufacturing wage in China is $2.18 per hour. But "there have been significant productivity gains for U.S. workers," Perry said, "so adjusted for worker productivity, the $19 might be a better value."

"…manufacturing is heading away from heavy machinery and more toward robotics, design, and high tech…wages in China are increasing by 15 to 20% a year, U.S. wages rose 1.4% 12/10 – 12/11.

– Mark Perry, professor of economics, University of Michigan

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Working Smarter Is The Answer

2/13/12 BCG - Press Release - Made in the USA, Again: Manufacturing Is Expected to Return to America as Chi...

Home > Media Center > Press Releases

Press Releases

May 05, 2011

Made in the USA, Again: Manufacturing Is Expected to Return to America a China's Rising Labor Costs Erase Most Savings from Offshoring

Reinvestment During the Next Five Years Could Usher in a 'Manufacturing Renaissance' as the U.S. Becomes a Low-Cost Cou Developed Nations, According to Analysis by The Boston Consulting Group

CHICAGO, May 5, 2011—Within the next five years, the United States is expected to experience a manufacturing renaissance as the wage gap with China shrinks and certain U.S. states become some of the cheapest locations for manufacturing in the developed world, according to a new analysis by The Boston Consulting Group (BCG).

With Chinese wages rising at about 17 percent per year and the value of the yuan continuing to increase, the gap between U.S. and Chinese wages is narrowing rapidly. Meanwhile, flexible work rules and a host of government incentives are making many states—including Mississippi, South Carolina, and Alabama—increasingly competitive as low-cost bases for supplying the U.S. market.

"All over China, wages are climbing at 15 to 20 percent a year because of the supply-and-demand imbalance for skilled labor," said Harold L. Sirkin, a BCG senior partner. "We expect net labor costs for manufacturing in China and the U.S. to converge by around 2015. As a result of the changing economics, you're going to see a lot more products 'Made in the USA' in the next five years."

After adjustments are made to account for American workers' relatively higher productivity, wage rates in Chinese cities such as Shanghai and Tianjin are expected to be about only 30 percent cheaper than rates in low-cost U.S. states. And since wage rates account for 20 to 30 percent of a product's total cost, manufacturing in China will be only 10 to 15 percent cheaper than in the U.S.—even before inventory and shipping costs are considered. After those costs are factored in, the total cost advantage will drop to single digits or be erased entirely, Sirkin said.

- **2.5 times more goods were produced in the U.S. in 2011 than in 1972 with <u>30% less labor</u>**
- **U.S. productivity is 3.4 times higher than China**

- Harold Sirkin, Boston Consulting Group

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Automation Allows for Cost Reduction

- Automation… =
- Increased Productivity… =
- Consolidation... =
- Labor Reduction… =
- **Cost Reduction**

Automation Allows for Cost Reduction

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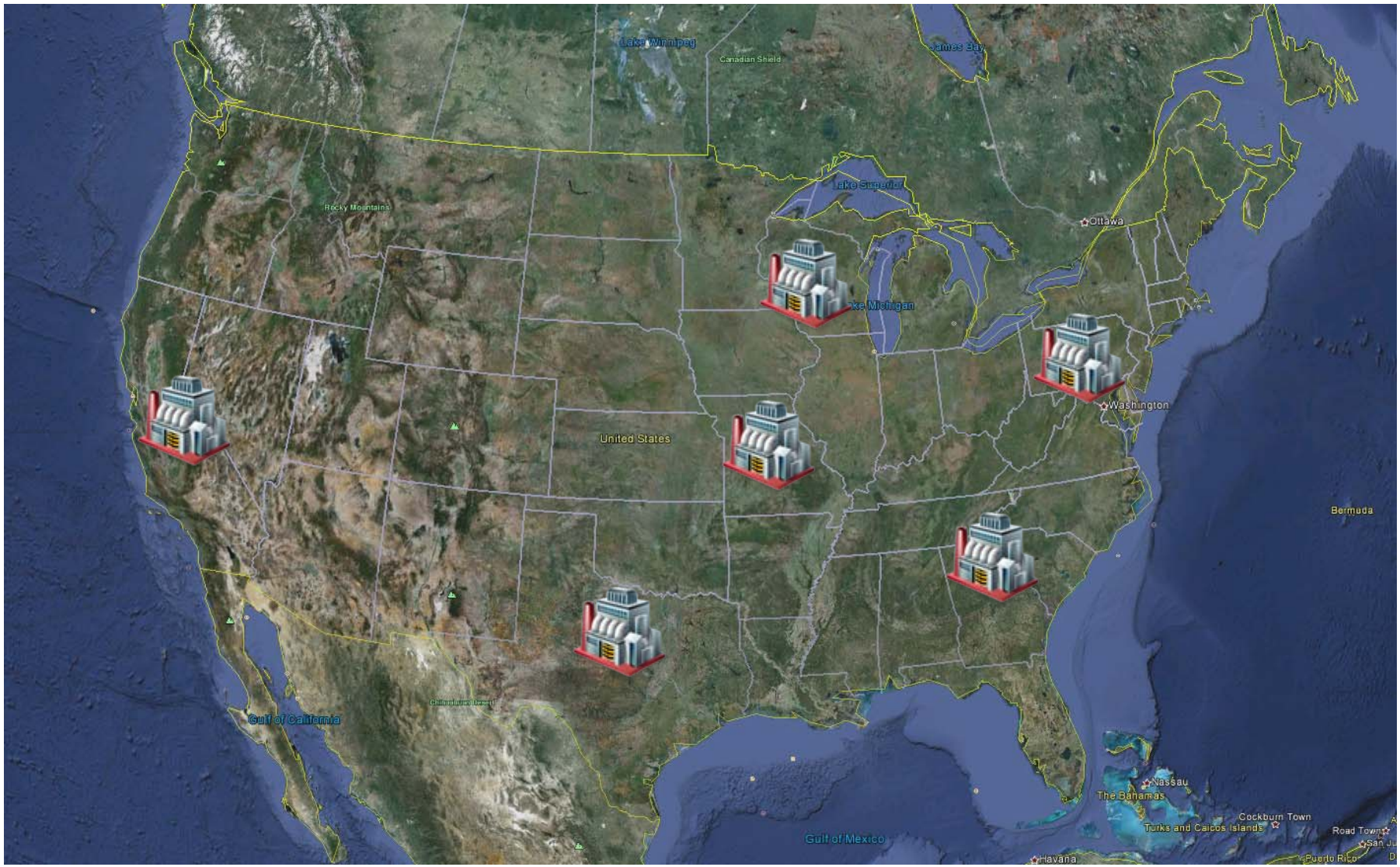
- **Cost Reduction**

**As companies who make plates for a living,
how can we achieve this?**

Consolidation: Multiple Production Sites



Consolidation: Minimal Production Sites

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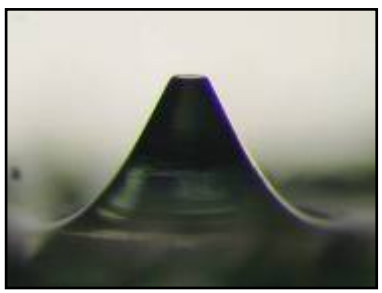
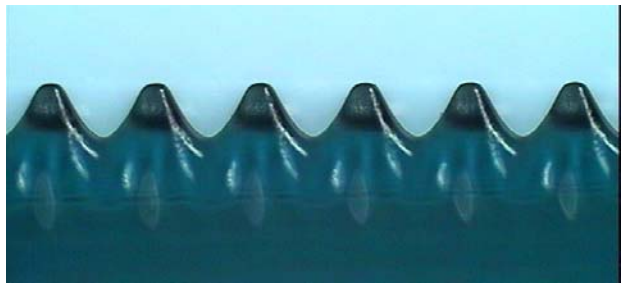
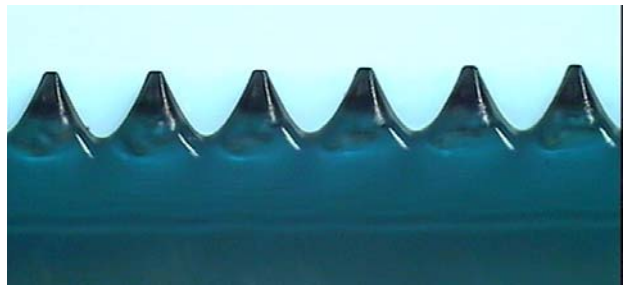
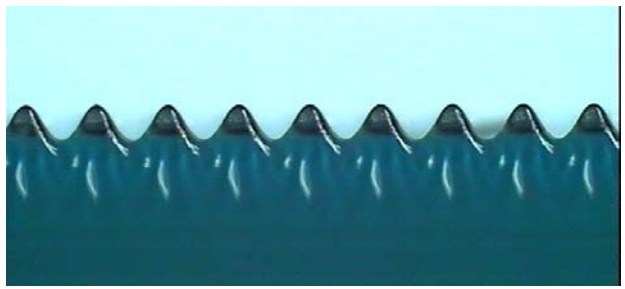
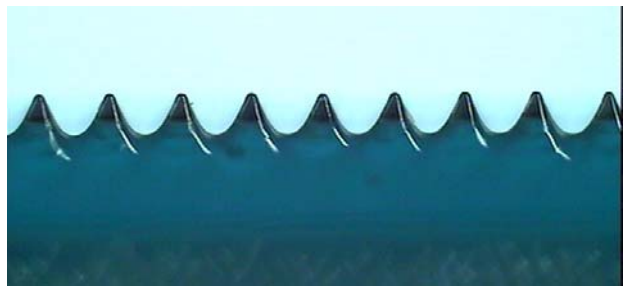
Automation in Imaging: nyloflex® NExT



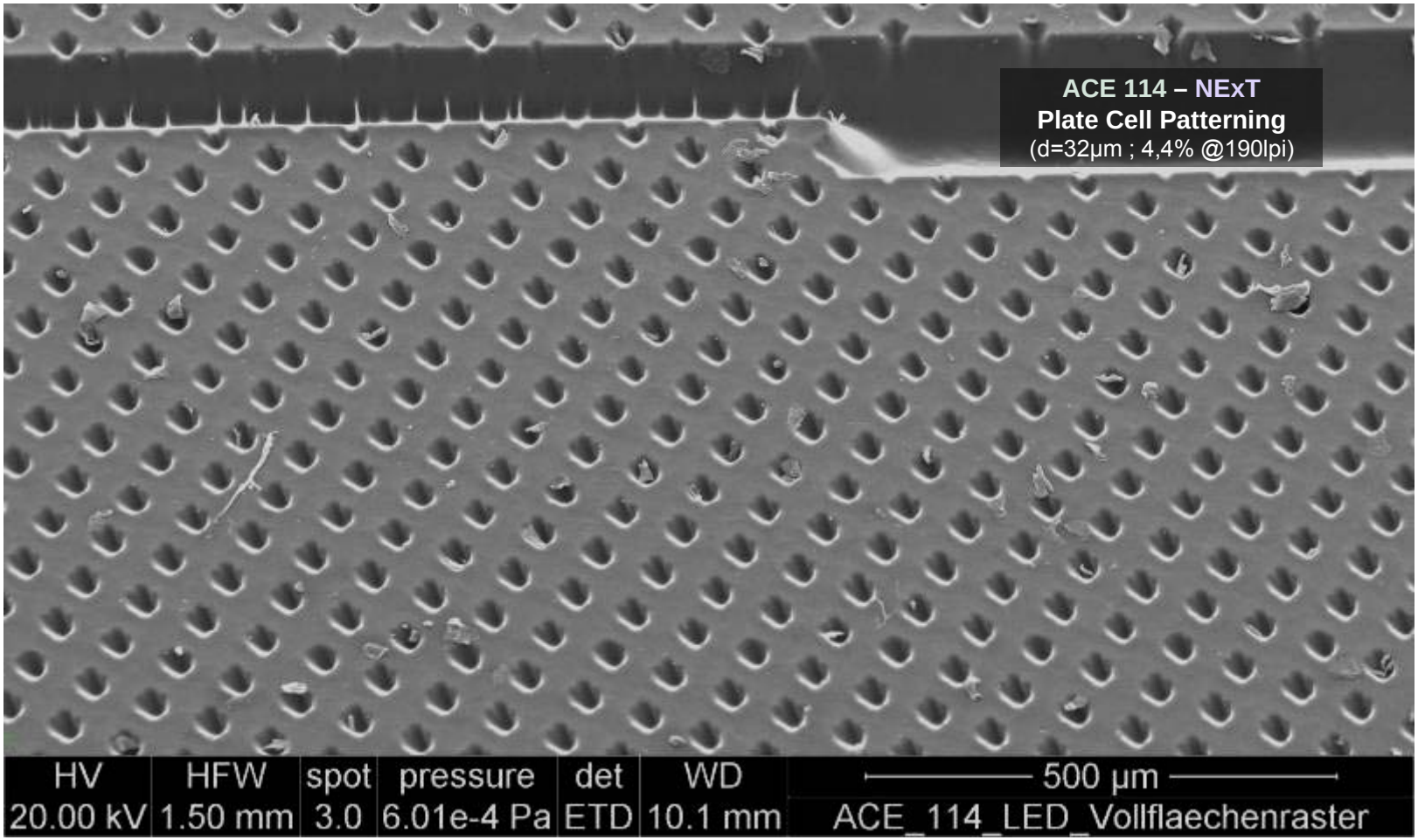
- **“Flat Top Dots”**
- **We need to supply it**
- **What about additional labor?**
- **What about cost?**

Halftones: Digital & Flat Top Dots

	Standard Digital	“Flat Top Dot“
120 lpi		
175 lpi		

2% screen @ 100X manification

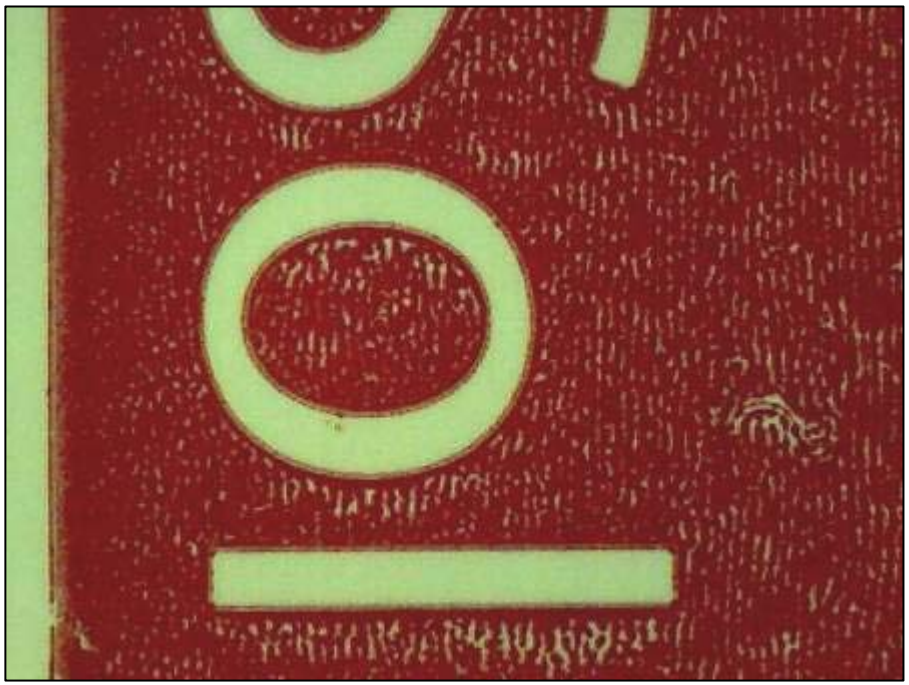
SEM Images: Solid Screening



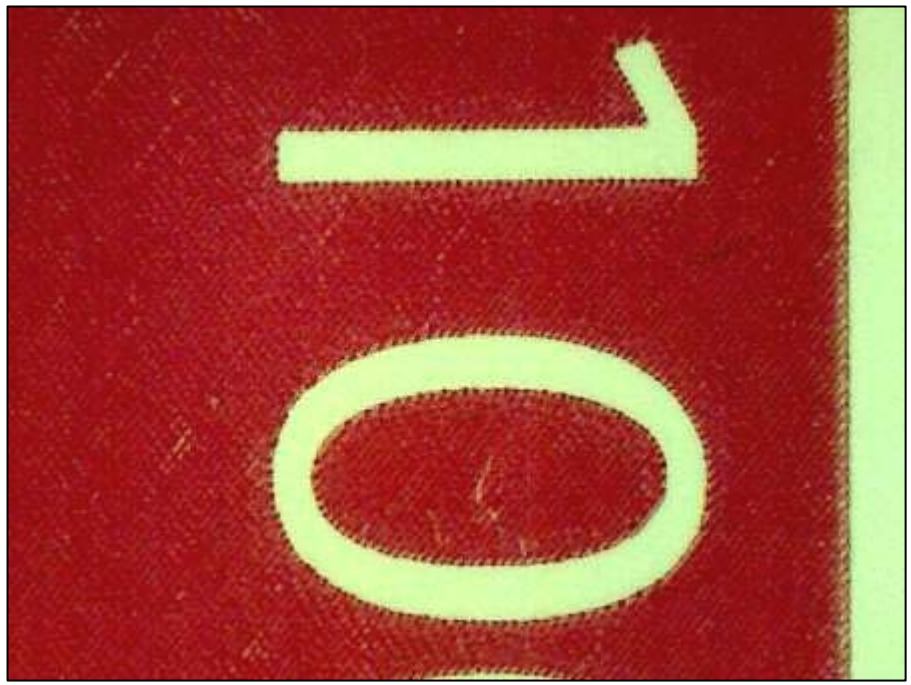
Improving Ink Laydown & Solid Ink Density

Screening improves appearance of solid laydown and reverse print

No Screening



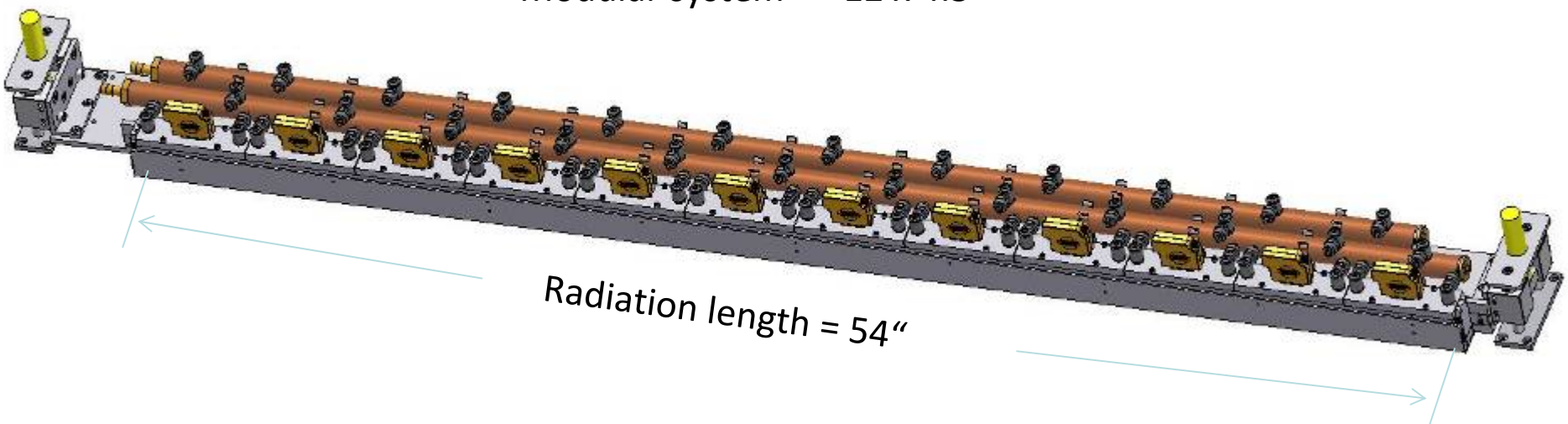
w/ Surface Screening



nyloflex® NExT Exposure Process for Flexo Plates

new high power UV-LED source
(modular concept)

Modular system ⟶ 12 x 4.5“



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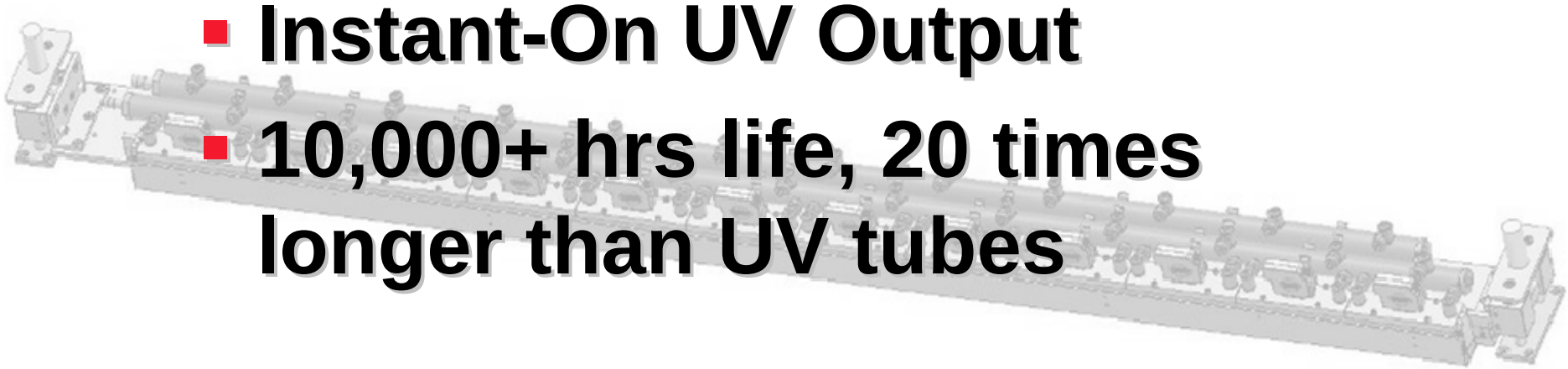
nyloflex® NExT Exposure Process for Flexo Plates

- 300 mw UV power, 15 times higher than tube power
- Variation of only +/- 1 10th mw
- Instant-On UV Output
- 10,000+ hrs life, 20 times longer than UV tubes



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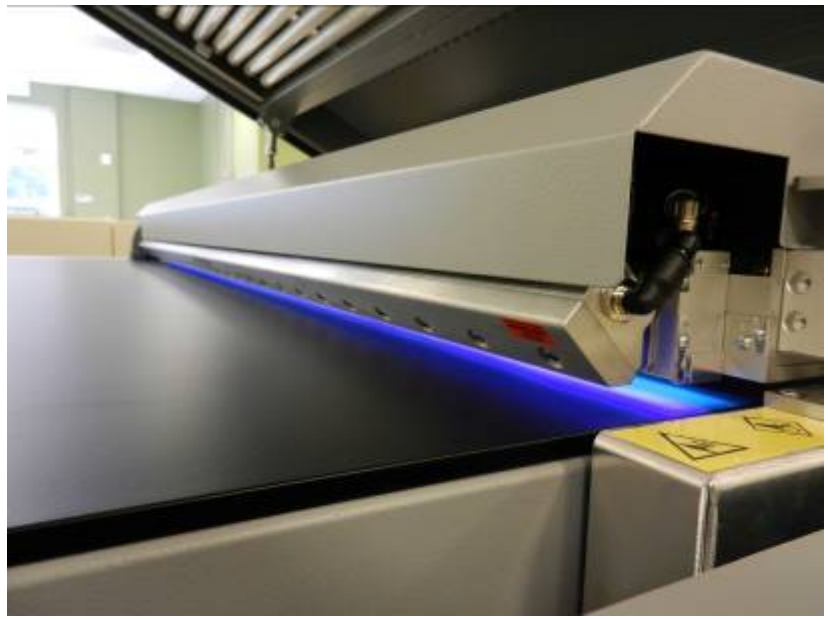
nyloflex® NExT

Flat Top Dots by efficient polymer crosslinking with LED technology



- Works with any digital plate
- Just press the button and walk away
- Yields are near 100% with no purging of gas, no film laminations
- UV uniformity and intensity is exponentially better than tube exposure

Video Demo: nyloflex® NExT

What Are the Facts?

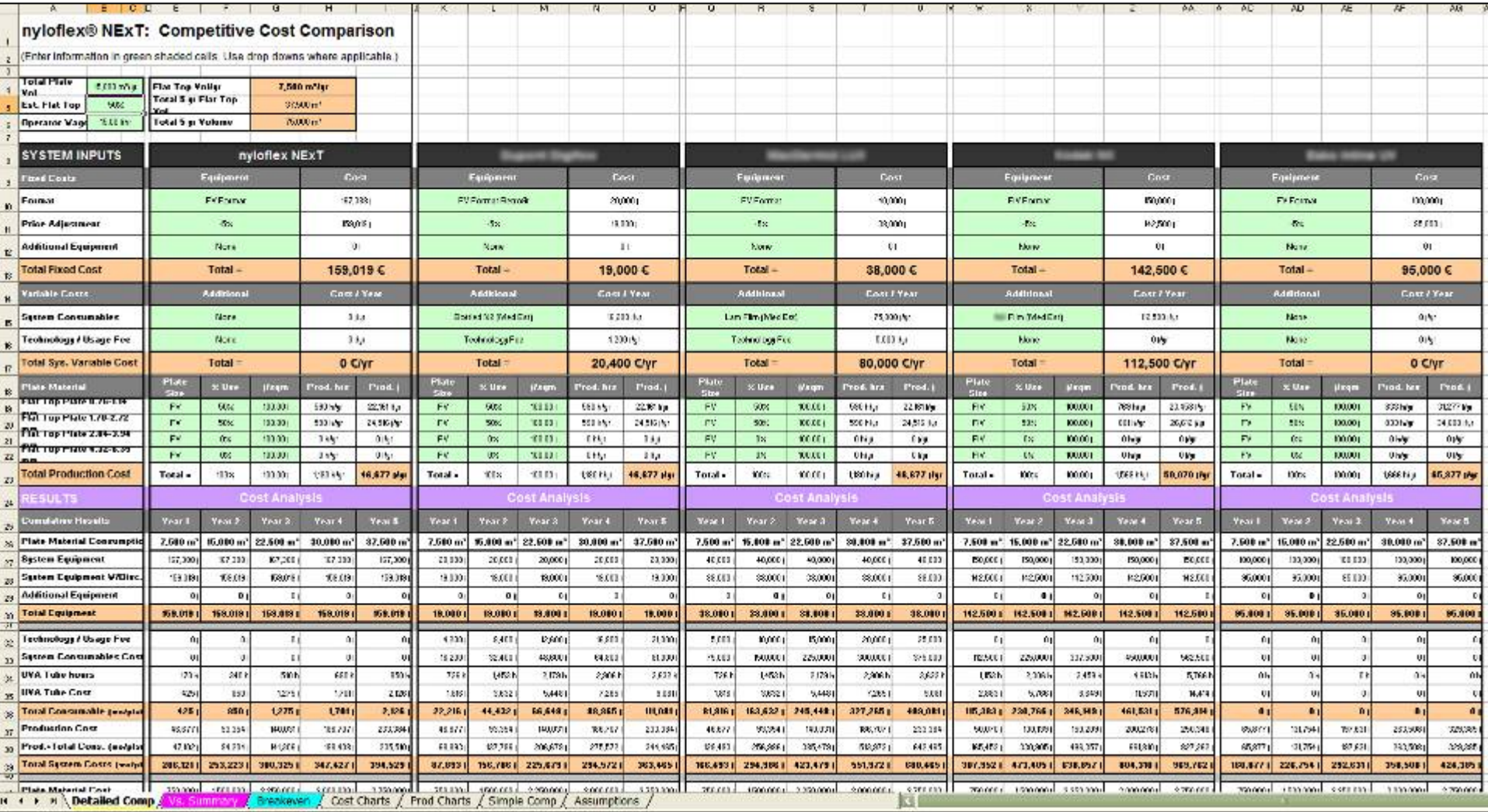
- Combination of LEDs and Tube exposure is used
- Total main exposure time is about 12 minutes for a 36x47” plate
- Total main exposure time is about 18 minutes for a 50x80” plate
- LEDs last ~ 10,000 hrs vs. 500 hrs for tubes. Cost savings of tube reduction helps pay for LEDs over 10,000 hours.
- Does it make weird shaped, golf tee shaped, malformed dots – we’ve heard that’s what LED exposure will do?

- **No, it does not.**

Cost Factors: Total Cost of Ownership

- It is a new exposure unit; if you already need a new one, this is a big plus
- Cost is approximately twice that of a regular exposure unit
- As compared to other flat top dot systems, the total cost of ownership is competitive with the options in the market
- To help with this analysis, we're providing a detailed cost analysis tool…

Cost Factors: Cost Analysis Tool Example



nyloflex® NExT: Competitive Cost Comparison

(Enter information in green shaded cells. Use drop downs where applicable.)

Total Plate Vol	5,000 m²/yr	Flat Top Vol/yr	2,500 m²/yr
Est. Flat Top	50%	Total 5 yr Flat Top Vol	12,500 m²
Operator Wage	15.00 €/hr	Total 5 yr Volume	25,000 m²

SYSTEM INPUTS	nyloflex NExT																			
Fixed Costs	Equipment			Cost		Equipment			Cost		Equipment			Cost		Equipment			Cost		Equipment			Cost	
Format	FX Format			67,000		FX Format Retrofit			20,000		FX Format			50,000		FX Format			150,000		FX Format			100,000	
Price Adjustment	-5%			159,019		-5%			19,000		-5%			38,000		None			142,500		-5%			95,000	
Additional Equipment	None			0		None			0		None			0		None			0		None			0	
Total Fixed Cost	Total =			159,019 €		Total =			19,000 €		Total =			38,000 €		Total =			142,500 €		Total =			95,000 €	
Variable Costs	Additional			Cost / Year		Additional			Cost / Year		Additional			Cost / Year		Additional			Cost / Year		Additional			Cost / Year	
System Consumables	None			0 €/yr		Standard Kit (Med Cav)			5,000 €/yr		Low Film (Med Cav)			75,000 €/yr		Film (Med Cav)			12,500 €/yr		None			0 €/yr	
Technology / Usage Fee	None			0 €/yr		Technology Fee			1,200 €/yr		Technology Fee			5,000 €/yr		None			0 €/yr		None			0 €/yr	
Total Sys. Variable Cost	Total =			0 €/yr		Total =			20,400 €/yr		Total =			80,000 €/yr		Total =			112,500 €/yr		Total =			0 €/yr	
Plate Material	Plate Size	% Use	plates/m	Prod. hrs	Prod. $	Plate Size	% Use	plates/m	Prod. hrs	Prod. $	Plate Size	% Use	plates/m	Prod. hrs	Prod. $	Plate Size	% Use	plates/m	Prod. hrs	Prod. $	Plate Size	% Use	plates/m	Prod. hrs	Prod. $
FLAT Top Plate 0.76-1.14 mm	FX	50%	100.000	500 hrs	22,781 $/yr	FX	50%	100.000	500 hrs	22,781 $/yr	FX	50%	100.000	500 hrs	22,781 $/yr	FX	50%	100.000	750 hrs	23,938 $/yr	FX	50%	100.000	938 hrs	29,922 $/yr
FLAT Top Plate 1.70-2.72 mm	FX	50%	100.000	500 hrs	24,516 $/yr	FX	50%	100.000	500 hrs	24,516 $/yr	FX	50%	100.000	500 hrs	24,516 $/yr	FX	50%	100.000	625 hrs	26,672 $/yr	FX	50%	100.000	833 hrs	34,033 $/yr
FLAT Top Plate 2.84-3.94 mm	FX	0%	100.000	0 hrs	0 $/yr	FX	0%	100.000	0 hrs	0 $/yr	FX	0%	100.000	0 hrs	0 $/yr	FX	0%	100.000	0 hrs	0 $/yr	FX	0%	100.000	0 hrs	0 $/yr
FLAT Top Plate 4.32-6.99 mm	FX	0%	100.000	0 hrs	0 $/yr	FX	0%	100.000	0 hrs	0 $/yr	FX	0%	100.000	0 hrs	0 $/yr	FX	0%	100.000	0 hrs	0 $/yr	FX	0%	100.000	0 hrs	0 $/yr
Total Production Cost	Total =	100%	100.000	1,000 hrs	46,677 $/yr	Total =	100%	100.000	1,000 hrs	46,677 $/yr	Total =	100%	100.000	1,000 hrs	46,677 $/yr	Total =	100%	100.000	1,375 hrs	50,070 $/yr	Total =	100%	100.000	1,666 hrs	63,877 $/yr
RESULTS	Cost Analysis					Cost Analysis					Cost Analysis					Cost Analysis					Cost Analysis				
Cumulative Results	Year 1	Year 2	Year 3	Year 4	Year 5	Year 1	Year 2	Year 3	Year 4	Year 5	Year 1	Year 2	Year 3	Year 4	Year 5	Year 1	Year 2	Year 3	Year 4	Year 5	Year 1	Year 2	Year 3	Year 4	Year 5
Plate Material Consumption	7,500 m²	15,000 m²	22,500 m²	30,000 m²	37,500 m²	7,500 m²	15,000 m²	22,500 m²	30,000 m²	37,500 m²	7,500 m²	15,000 m²	22,500 m²	30,000 m²	37,500 m²	7,500 m²	15,000 m²	22,500 m²	30,000 m²	37,500 m²	7,500 m²	15,000 m²	22,500 m²	30,000 m²	37,500 m²
System Equipment	107,000	107,000	107,000	107,000	107,000	20,000	20,000	20,000	20,000	20,000	40,000	40,000	40,000	40,000	40,000	150,000	150,000	150,000	150,000	150,000	100,000	100,000	100,000	100,000	100,000
System Equipment W/Disc.	159,019	159,019	159,019	159,019	159,019	19,000	19,000	19,000	19,000	19,000	38,000	38,000	38,000	38,000	38,000	142,500	142,500	142,500	142,500	142,500	95,000	95,000	95,000	95,000	95,000
Additional Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Equipment	159,019	159,019	159,019	159,019	159,019	19,000	19,000	19,000	19,000	19,000	38,000	38,000	38,000	38,000	38,000	142,500	142,500	142,500	142,500	142,500	95,000	95,000	95,000	95,000	95,000
Technology / Usage Fee	0	0	0	0	0	1,200	2,400	3,600	4,800	6,000	5,000	10,000	15,000	20,000	25,000	0	0	0	0	0	0	0	0	0	0
System Consumables Cost	0	0	0	0	0	18,200	32,400	46,600	60,800	75,000	75,000	150,000	225,000	300,000	375,000	112,500	225,000	337,500	450,000	562,500	0	0	0	0	0
UVA Tube hours	125 hrs	250 hrs	375 hrs	500 hrs	625 hrs	725 hrs	1,450 hrs	2,175 hrs	2,900 hrs	3,625 hrs	725 hrs	1,450 hrs	2,175 hrs	2,900 hrs	3,625 hrs	1,813 hrs	3,625 hrs	5,438 hrs	7,250 hrs	9,063 hrs	0 hrs	0 hrs	0 hrs	0 hrs	0 hrs
UVA Tube Cost	625	850	1,275	1,700	2,125	1,813	3,625	5,438	7,250	9,063	1,813	3,625	5,438	7,250	9,063	2,813	5,625	8,438	11,250	14,063	0	0	0	0	0
Total Consumable (excl plate)	625	850	1,275	1,700	2,125	20,213	34,425	48,638	62,850	77,063	76,813	153,625	230,438	307,250	384,063	115,313	230,625	345,938	461,250	576,563	0	0	0	0	0
Production Cost	46,677	93,354	140,031	186,707	233,384	46,677	93,354	140,031	186,707	233,384	46,677	93,354	140,031	186,707	233,384	50,070	100,139	150,209	200,278	250,348	63,877	127,754	191,631	255,508	319,385
Prod. + Total Cons. (excl plate)	47,302	94,204	141,306	188,407	235,509	66,890	127,779	188,669	249,557	310,447	123,490	247,079	370,469	494,957	617,447	165,383	330,764	496,147	661,528	826,911	63,877	127,754	191,631	255,508	319,385
Total System Costs (excl plate)	206,321	253,223	300,325	347,427	394,529	85,890	146,779	207,669	268,557	329,447	161,490	306,079	450,469	594,957	737,447	307,852	473,405	638,857	804,778	969,762	158,877	226,754	286,631	350,508	414,385
Plate Material Cost	159,019	318,038	477,057	636,076	795,095	19,000	38,000	57,000	76,000	95,000	38,000	76,000	114,000	152,000	190,000	142,500	285,000	427,500	570,000	712,500	95,000	190,000	285,000	380,000	475,000

Detailed Comp | Vs. Summary | Breakeven | Cost Charts | Prod Charts | Simple Comp | Assumptions

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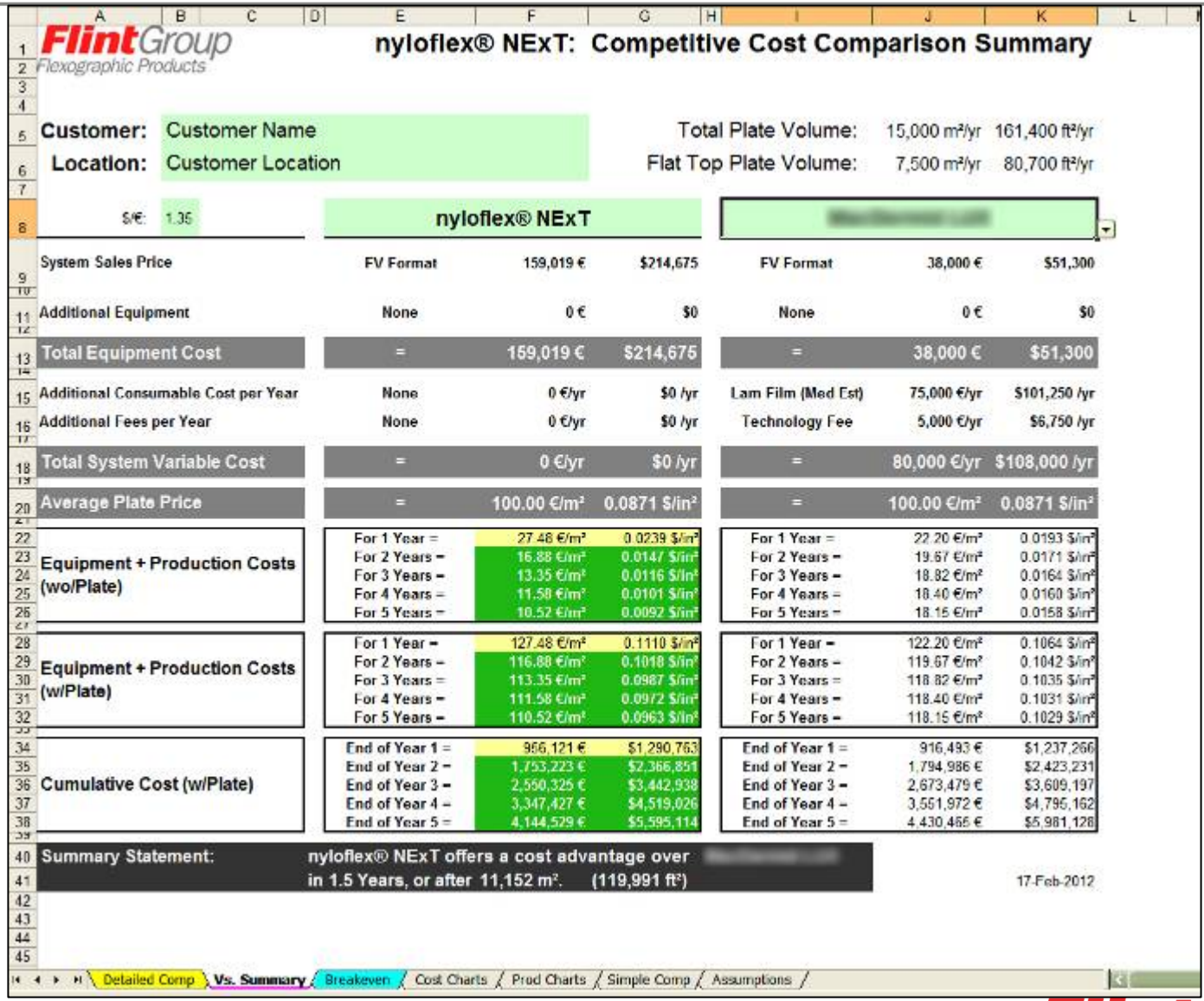
Cost Factors: Cost Analysis Tool Example



FlintGroup Flexographic Products

nyloflex® NExT: Competitive Cost Comparison Summary

Customer:	Customer Name			Total Plate Volume:	15,000 m²/yr	161,400 ft²/yr
Location:	Customer Location			Flat Top Plate Volume:	7,500 m²/yr	80,700 ft²/yr
$/€:	1.35					

	nyloflex® NExT			[redacted]		
System Sales Price	FV Format	159,019 €	$214,675	FV Format	38,000 €	$51,300
Additional Equipment	None	0 €	$0	None	0 €	$0
Total Equipment Cost	=	159,019 €	$214,675	=	38,000 €	$51,300
Additional Consumable Cost per Year	None	0 €/yr	$0 /yr	Lam Film (Med Est)	75,000 €/yr	$101,250 /yr
Additional Fees per Year	None	0 €/yr	$0 /yr	Technology Fee	5,000 €/yr	$6,750 /yr
Total System Variable Cost	=	0 €/yr	$0 /yr	=	80,000 €/yr	$108,000 /yr
Average Plate Price	=	100.00 €/m²	0.0871 $/in²	=	100.00 €/m²	0.0871 $/in²
Equipment + Production Costs (wo/Plate)	For 1 Year =	27.48 €/m²	0.0239 $/in²	For 1 Year =	22.20 €/m²	0.0193 $/in²
	For 2 Years =	16.88 €/m²	0.0147 $/in²	For 2 Years =	19.67 €/m²	0.0171 $/in²
	For 3 Years =	13.35 €/m²	0.0116 $/in²	For 3 Years =	18.82 €/m²	0.0164 $/in²
	For 4 Years =	11.58 €/m²	0.0101 $/in²	For 4 Years =	18.40 €/m²	0.0160 $/in²
	For 5 Years =	10.52 €/m²	0.0092 $/in²	For 5 Years =	18.15 €/m²	0.0158 $/in²
Equipment + Production Costs (w/Plate)	For 1 Year =	127.48 €/m²	0.1110 $/in²	For 1 Year =	122.20 €/m²	0.1064 $/in²
	For 2 Years =	116.88 €/m²	0.1018 $/in²	For 2 Years =	119.67 €/m²	0.1042 $/in²
	For 3 Years =	113.35 €/m²	0.0987 $/in²	For 3 Years =	118.82 €/m²	0.1035 $/in²
	For 4 Years =	111.58 €/m²	0.0972 $/in²	For 4 Years =	118.40 €/m²	0.1031 $/in²
	For 5 Years =	110.52 €/m²	0.0963 $/in²	For 5 Years =	118.15 €/m²	0.1029 $/in²
Cumulative Cost (w/Plate)	End of Year 1 =	966,121 €	$1,290,763	End of Year 1 =	916,493 €	$1,237,266
	End of Year 2 =	1,753,223 €	$2,366,851	End of Year 2 =	1,794,986 €	$2,423,231
	End of Year 3 =	2,560,325 €	$3,442,938	End of Year 3 =	2,673,479 €	$3,609,197
	End of Year 4 =	3,347,427 €	$4,519,026	End of Year 4 =	3,551,972 €	$4,795,162
	End of Year 5 =	4,144,529 €	$5,595,114	End of Year 5 =	4,430,466 €	$5,981,128

Summary Statement: nyloflex® NExT offers a cost advantage over [redacted] in 1.5 Years, or after 11,152 m². (119,991 ft²)

17-Feb-2012

Detailed Comp | Vs. Summary | Breakeven | Cost Charts | Prod Charts | Simple Comp | Assumptions

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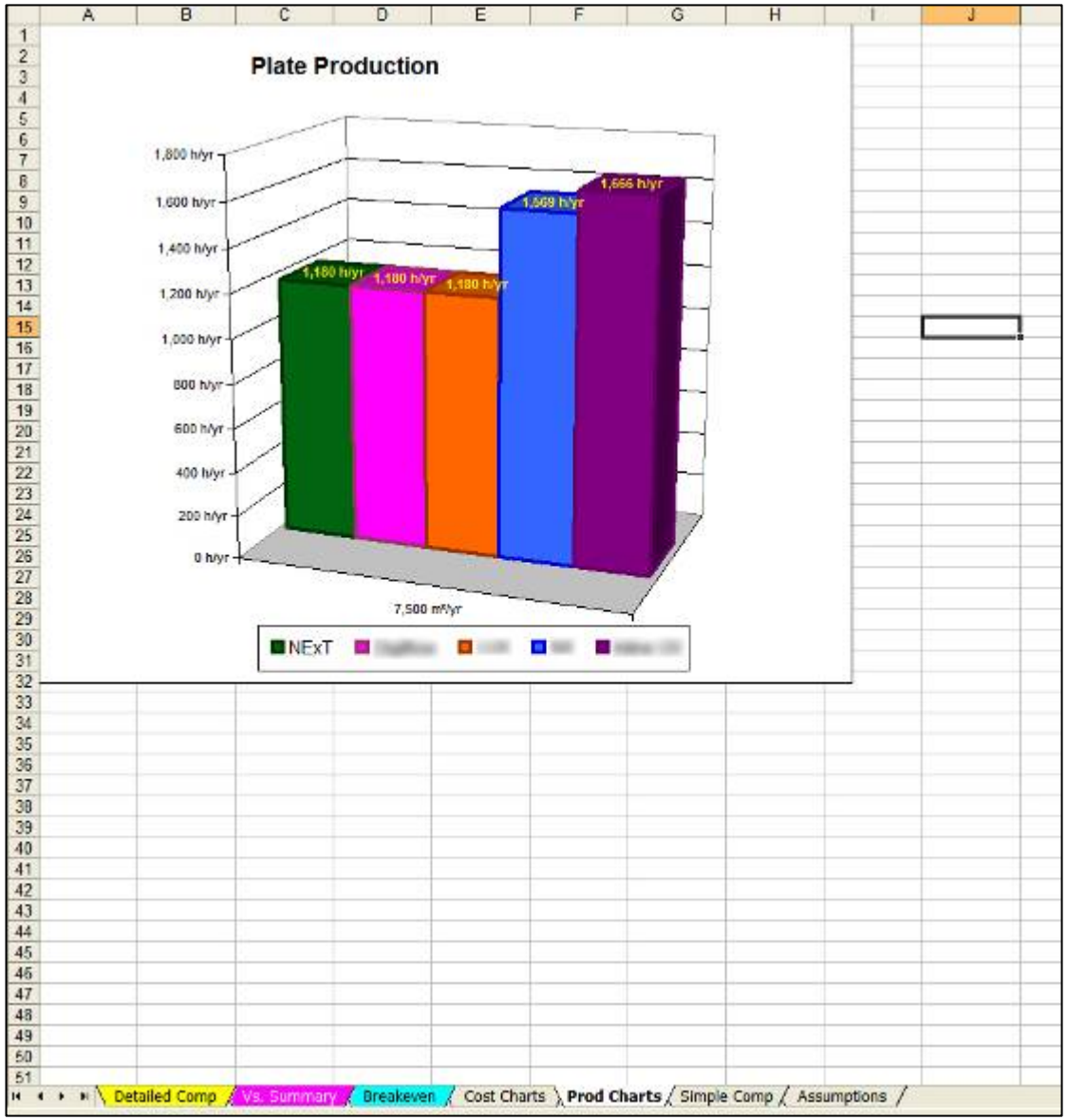
Cost Factors: Cost Analysis Tool Example



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Automation in Processing: nyloflex® APP

- New Equipment Is Needed
- Process More Per Shift
- Use Less Labor
- Reduce Energy
- More Capacity
- **Consolidation & Cost Reduction**

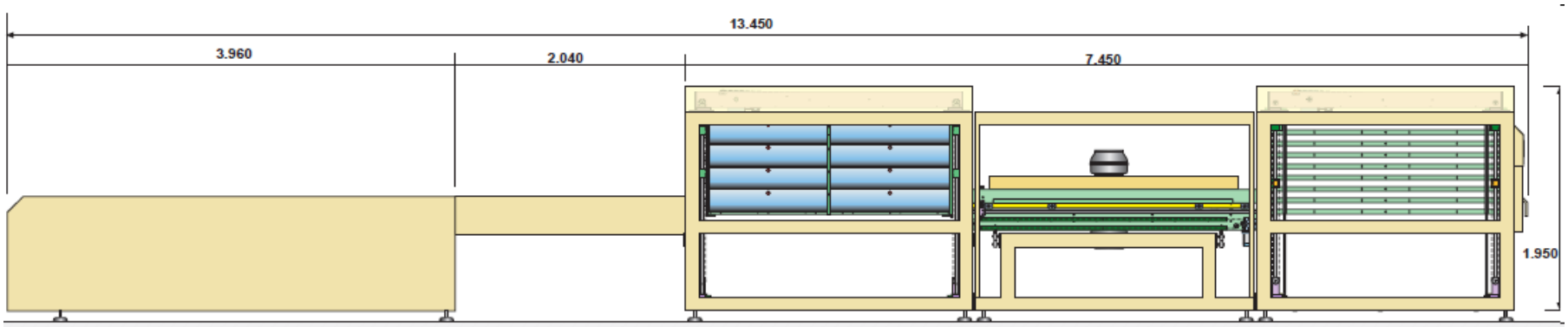
nyloflex® Automated Plate Processor (APP)

- Fully automated processing line combines premium equipment
- Outstanding productivity and consistency
- Minimal operator handling

nyloflex® APP: Linear Workflow

Product Design

Washer ➡ Dryer ➡ Finisher ➡ Stacker



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nyloflex® APP Capabilities

- Automated processing line includes 52x80” wash with digital layer pre-wash (2 solvent tanks), 8 drawer dryer, post-cure, 8 drawer stacker
- Plate thickness: .030” - .276”
- Productivity: up to 120 plates (3200 ft^2 .067” per day over 3 shifts)
- Automatically regulated solvent saturation (viscosity)
- Flowline mode for thin plates, batch wash mode for thick plates

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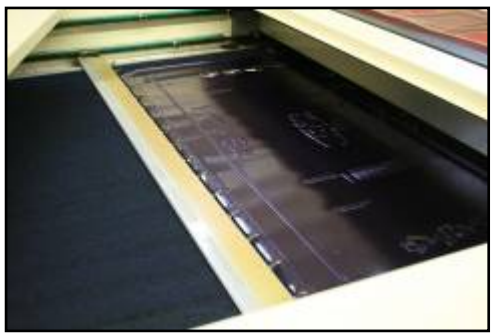
nyloflex® APP Innovations & Features








- Convenient color touch screens for setup and control of all operations
- Remote on-line diagnostics
- Pre-wash of laser mask layer
- Quick change of wash brushes without need for tools
- Inspection area post-wash
- Reliable, horizontal transport with drying oven having just 2 plates per temperature zone

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Video Demo: nyloflex® APP

Productivity Comparison in Numbers

Processing parameters APP

Plate gauge inches	Exposure time min	Washout time mm/min	Washout time 50x80" plate total min	drying time [min]	Light finishing (UV-A/UV-C simultanously) min	Total process min	Δ Time saved min
ACE .030 D	8	700	2.9	47	11.5	69.4	24.6
ACE .045 D	12	650	3.1	62	11.5	88.6	40.9
ACE .067 D	12	530	3.8	62	11.5	89.3	72.3
ACE .107 D	15	420	4.8	62	11.5	93.3	73.0
ACE .112 D	15	400	5.1	62	11.5	93.6	73.4
FAC .125 D	15	320	6.4	92	11.5	124.9	73.7
FAC .155 D	20	300	6.8	92	11.5	130.3	78.2
FAC .185 D	20	285	7.1	122	11.5	160.6	86.5
FAC .250 D	20	220	9.2	122	11.5	162.7	121.1

Processing parameters Stand-alone devices *

Plate gauge	Exposure time [min]	Washout time [mm/min]	Washout time 50x80" plate total min	Drying time [min]	Light finishing (UV-A/UV-C simultanously) [min]	Total process min
ACE .030 D	8	340	6.0	65	15	94.0
ACE .045 D	12	270	7.5	95	15	129.5
ACE .067 D	12	210	9.7	125	15	161.7
ACE .107 D	15	180	11.3	125	15	166.3
ACE .112 D	15	170	12.0	125	15	167.0
FAC .125 D	15	150	13.5	155	15	198.5
FAC .155 D	20	110	18.5	155	15	208.5
FAC .185 D	20	75	27.1	185	15	247.1
FAC .250 D	20	60	33.9	215	15	283.9

Note: based upon 50x80" plate size, flowline wash

* 5 minutes handling between washer to drying, drying to light finishing

Productivity & Cost Savings Key Factors

- Günter GmbH in Hamburg, Germany, has had over one year experience with the nyloflex® APP
- Plate Dept. headcount reduced by 2 persons, 3 shifts went to 2 shifts
- Reduced energy consumption, two 50X80 washers plus 1 dryer taken off line
- Dryer is much more efficient, separate drying chambers w/ smaller volume to maintain temperature
- Viscosity control of solvent quality allows for ~ 25% reduction in number of distillation cycles needed to reclaim their solvent

Key Performance Indicators	APP Automated Processing	Stand Alone Washer, Dryer, Finisher	Percent Change
Maximum productivity per day - 3 shifts	3200 ft2	2450 ft2	31% increase
Maximum productivity per year - 3 shifts	760000 ft2	611000 ft2	24% increase
Maximum productivity per day - 2 shifts	2310 ft2	1630 ft2	41% increase
Maximum productivity per year - 2 shifts	531000 ft2	407000 ft2	30% increase
Nominal current	25 A / 7 A	92.5 A / 60.5 A	73% / 88% decrease
Nominal power	12.5 kW	31.7 kw	60% decrease
Labor necessary for operation	1 person / shift	1.5 persons / shift	33% decrease
Notes: 8 hrs shift, 237.5 working days			

Thank You!

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