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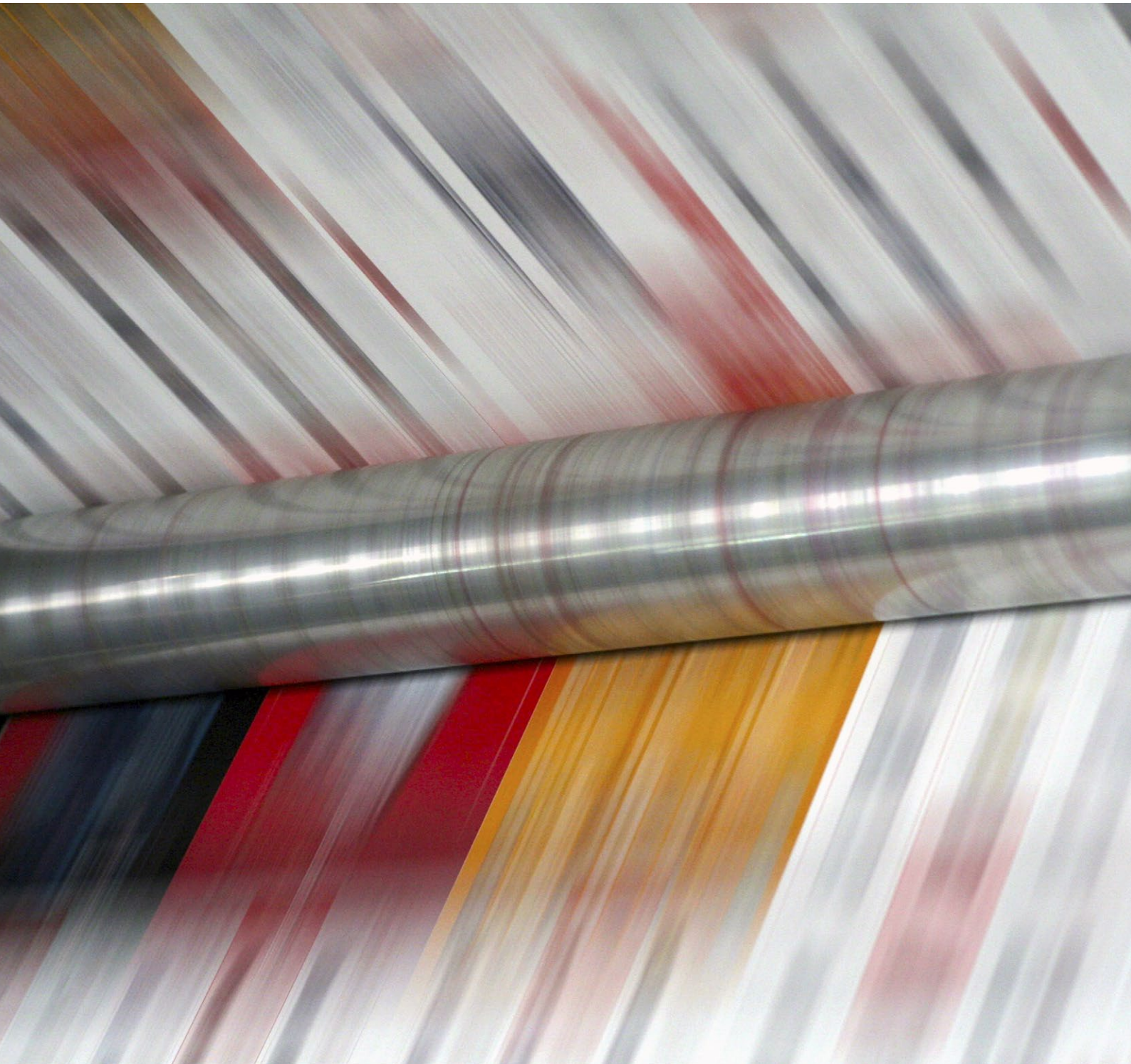
Solutions Flash

SinplexPro: The low risk solution to boost anilox roll production and coating quality

SF-0024.0 – September 2016



Today's situation

The growth of flexographic printing is projected at a healthy CAGR of 5.5% through 2020 [a], driven largely by the continued worldwide increase of printing for packaging applications.

As demand for flexographic printing rises, so does the need for quality anilox rolls to deliver precisely metered ink to the printing plate. The plasma-sprayed chromium oxide coating used on most anilox rolls has to meet stringent requirements to ensure successful laser engraving of the ink-metering cells.

The coating structure must be as dense and homogeneous as possible, exhibit proper hardness and without free metallic particles. A good bond coating is equally as important to protect the anilox roll from the corrosive effects of the ink.

The challenge for processors of anilox rolls is to maintain or improve the quality of their product while keeping up with the increase in demand. At the same time, an increasingly competitive market requires a cost-conscientious approach towards increasing both quality and production throughput.

The Oerlikon Metco solution

Oerlikon Metco's cascading arc technology has long been a proven solution for anilox roll coatings. Cascading arc technology provides excellent throughput (spray rate and deposition efficiency), minimal process drift over long coating campaigns and produces coatings of exceptional quality.

Until recently, the only path to the benefits of cascading arc technology was the Oerlikon Metco TriplexPro™ plasma spray gun. While TriplexPro remains the best option for process efficiency, coating quality and long spray campaigns [b], it requires a specialized controller and a power supply that can handle its triple-cathode design in addition to the TriplexPro spray gun. For many processors, this is a significant investment.

Now, however, there is a new path to the benefits of cascading arc technology: Oerlikon Metco's SinplexPro™ plasma spray gun. With its single cathode design, the SinplexPro can be installed into an existing anilox roll coating system for a minimal investment that pays for itself within several months. A cascading arc upgrade using the SinplexPro spray gun benefits anilox roll processors with:

- A minimal investment by using an existing spray system controller and power supply
- Minimal production disruption as the upgrade is quickly installed
- Low risk as existing spray guns can still be used
- Increased production throughput resulting from higher spray rates
- Improved quality resulting from reduced process drift and tighter adherence to spray process windows
- Easier standardization of coating results across multiple spray booths — even when those spray booths are in different facilities
- Proven technology for anilox roll coating production

In addition, Oerlikon Metco is an anilox roll processor's one-stop-shop for coating equipment, materials and support, enabling simplification of the supply chain:

- Thermal spray equipment and systems
- Spare parts
- Field service and system calibration
- Chromium oxide and bond coat materials of the highest quality
- Technical support
- Coating and parameter development

[a] Transparency Market Research, 2015
[b] Please refer to Oerlikon Metco's Solution Flash SF-0002, "Laser engraved Anilox Roll production benefits from high density coating solution with excellent economy"

Solution description and validation

1. Comparison of SinplexPro vs. TriplexPro

	SinplexPro	TriplexPro
Cascading arc	✓	✓
No of cathodes	1	3
Fixed arc length	✓	✓
Arc behavior isolated from gas flow & type	✓	✓
No. of powder injectors	2	3
Thorium free internal gun components	✓	✓
Reduced voltage oscillation [a]	✓	✓
Minimal process drift [a]	✓	✓
Specialized controller features required	✗	✓
Specialized power supply required	✗	✓
Ignition unit (CPI-500) required	✓ [b]	✗
Throughput improvement [a]	excellent	best
Process stability [a]	excellent	best
Standardize coatings across spray cells	✓	✓
Spray angles available	90°, 180°	90°
Nozzles available (mm)	6.5, 9	5, 6.5, 9, 11
Average time between gun overhauls [c]	60 h	200 h

[a] Compared to traditional plasma spray guns
[b] Not required with UniCoatPro Plasma
[c] Nozzle change, other components as much as 100 h

2. SinplexPro vs. TriplexPro decision process

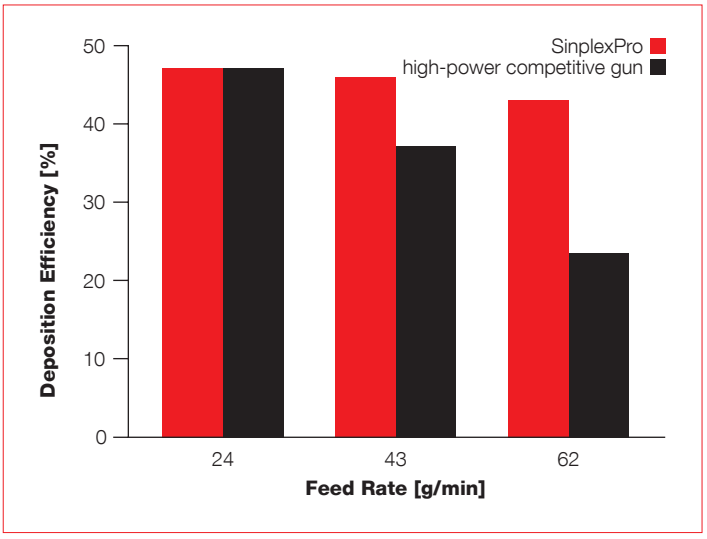
The decision to choose SinplexPro or TriplexPro is a unique process for each company that depends on a number of factors and goals.

Goals and Factors		Best Choice	
		SinplexPro	TriplexPro
Improve productivity	Significant	✓	
	Maximum		✓
Improve coating quality / repeatability	Significant	✓	
	Maximum		✓
Standardize coatings across disparate spray cells / facilities		✓	
System improvement path	Upgrade existing	✓	
	New		✓
Investment budget goal	Minimal	✓	
	Significant		✓
Time goal	1 to 4 months	✓	
	> 5 months		✓

While the TriplexPro spray gun is the best choice for productivity and quality improvement goals and the best choice for a new system. SinplexPro is an excellent system upgrade choice that provides significant improvements quickly at a minimal investment.

3. Throughput: SinplexPro vs. competition

The SinplexPro spray gun maintains coating quality and deposit efficiency as spray rates are increased, as can be seen here compared to a popular competitor's spray gun.

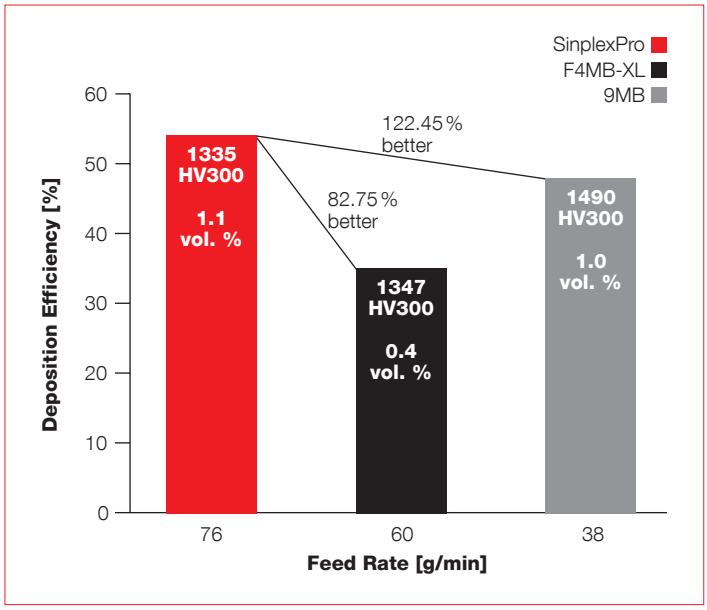


Conditions / Results:
System: All coatings sprayed on a competitive system
Powder: Competitive chromium oxide powder popular for anilox roll processing
Porosity: ≤ 2 vol. %
Hardness: > 1300 HV300 (without micro-cracking)

4. Throughput: SinplexPro vs. traditional Oerlikon Metco spray guns

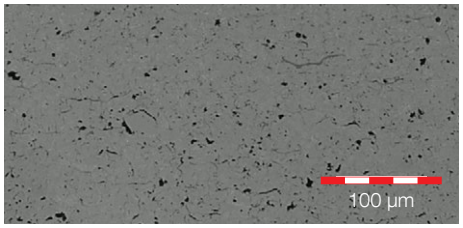
Compared to Oerlikon Metco's traditional plasma spray guns, SinplexPro produces coatings at higher throughput (feed rate vs. deposition efficiency).

These coatings were applied using an Oerlikon Metco MultiCoat spray system and Metco 6156 high purity chromium oxide powder.



SinplexPro produces high quality coatings, even at higher throughputs:

SinplexPro



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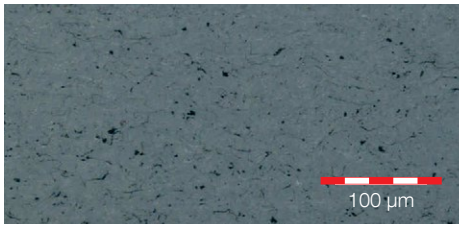

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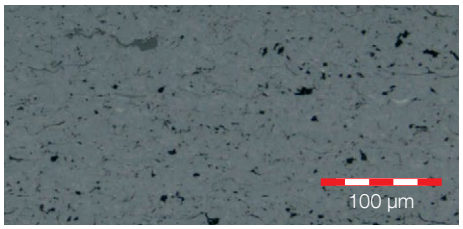
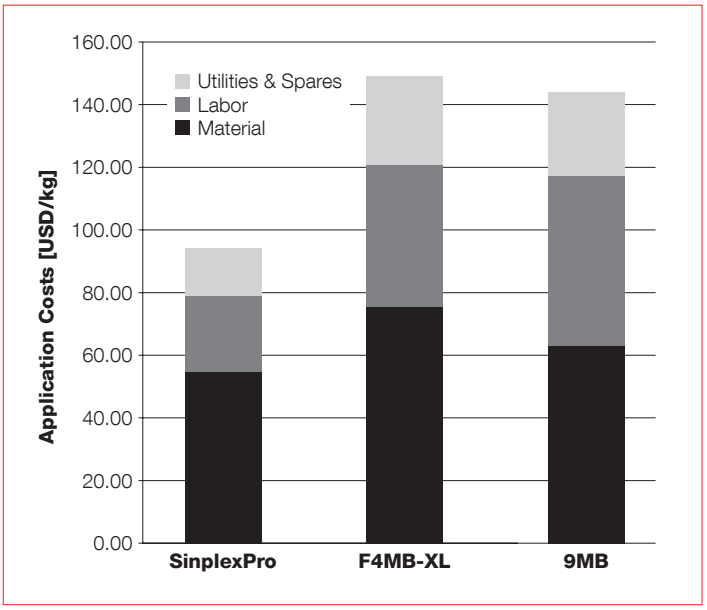


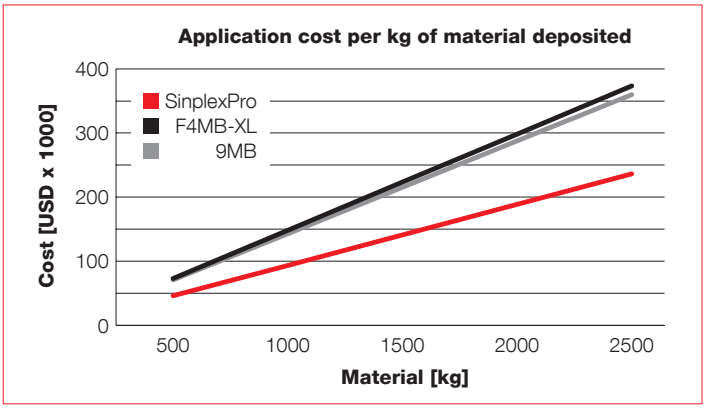
5. Cost and time savings

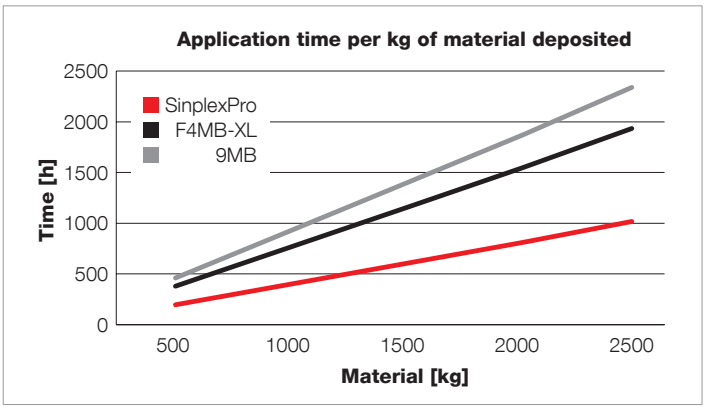
SinplexPro saves costs in these important areas:

- Labor (higher productivity)
- Electrical utilities (reduced power consumption)
- Media (reduced gas consumption)
- Reduced spare part costs

For many anilox roll coating shops, SinplexPro will show a positive return on the investment in just a few months.







6. Reduction of spitting

The SinplexPro thorium-free cathode has been optimized for very low spitting behavior and typically achieves a remarkably low weight loss of only 0.2 mg/h. This ensures spit-free coatings that do not contain any free metal as a result of the deterioration of the gun components.

7. Quality anilox roll coating materials

In addition to excellent application technology, Oerlikon Metco also offers a complete portfolio of chromium oxide and bond coat materials for anilox roll coatings. Therefore, anilox roll processors can obtain all their needs from a single source. Our most popular materials are listed here:

Product	Chemistry	Particle Size	Remarks
Metco 6416	Cr_2O_3 99.8+	-30 +10 µm	Premium coatings
Metco 6156	Cr_2O_3 99.7+	-35 +15 µm	Premium coatings
Amdry 6420	Cr_2O_3 99.5+	-45 +22 µm	High quality coatings
Diamalloy 1010	Fe 28Cr 16Ni 4.5Mo 1.5Si 1.75C	-45 +16 µm	Superior corrosion resistant bond coat
Amdry 510	Ni 22Cr 10Al	-44 +22 µm	Highly corrosion resistant bond coat

Customer benefits

Effective

- A proven, go-to technology for processing of anilox rolls
- Very stable process ensures consistent coating results
- Standardize coatings across spray cells and facilities — even for different types of plasma systems
- Applies dense, homogeneous anilox roll coatings

Efficient

- Significantly increase production throughput with higher application rates
- Improved process control and run-to-run consistency
- Eliminate free metal in the coating as a result of low spitting characteristics
- Delivery and installation is quick and with minimal disruption to production activities

Economical

- Save production time with higher spray rates, higher throughput and a stable process that does not require constant adjustment
- Easily upgrade existing plasma spray systems
- Low investment with rapid return that is low risk as existing spray guns can still be used

Environmental benefits

- High efficiency process reduces gas usage and power consumption
- Thorium free components

Contact your Oerlikon Metco sales representative for more information about the benefits of SinplexPro for your anilox roll production!

Information is subject to change without prior notice.

SF-0006.0 – SinplexPro™ for Anilox Roll Coatings

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