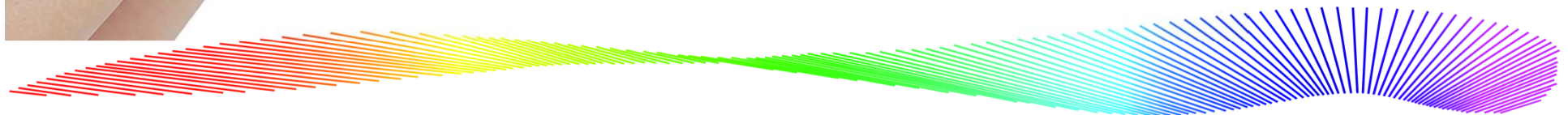




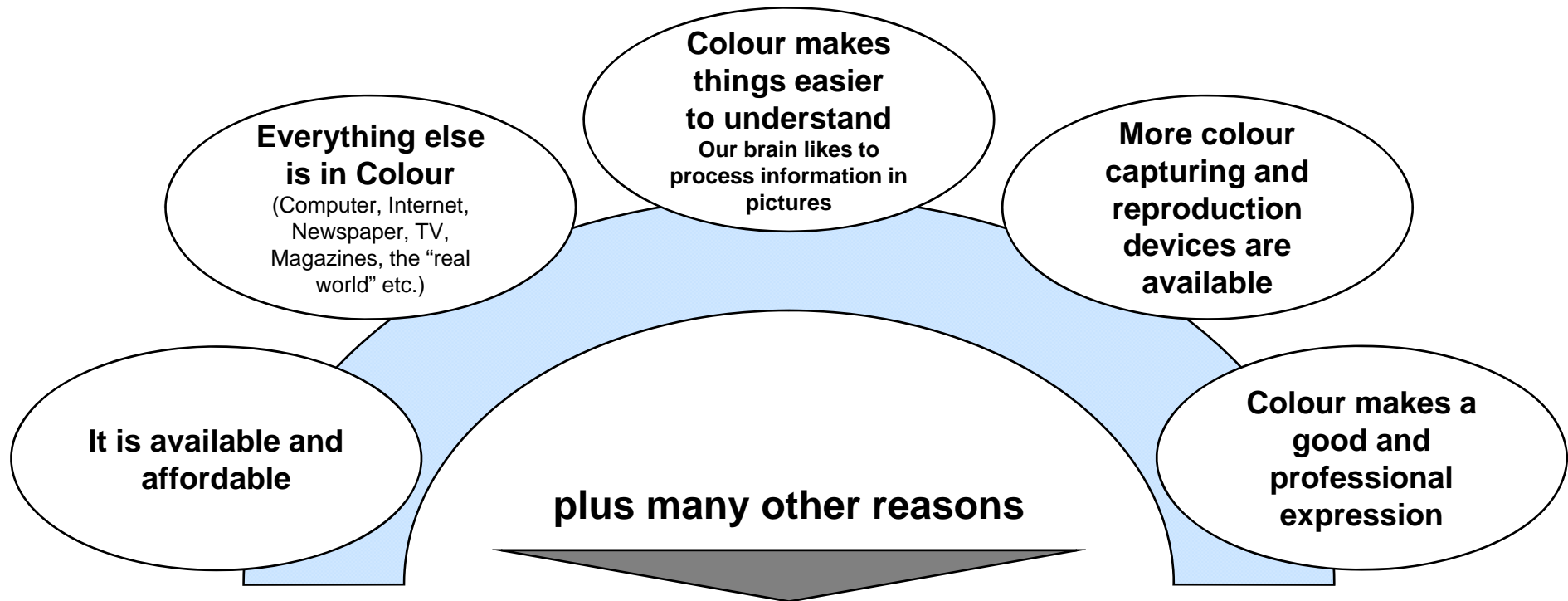
# Advances in aftermarket colour printing performance

Volker Kappius, COO DELACAMP

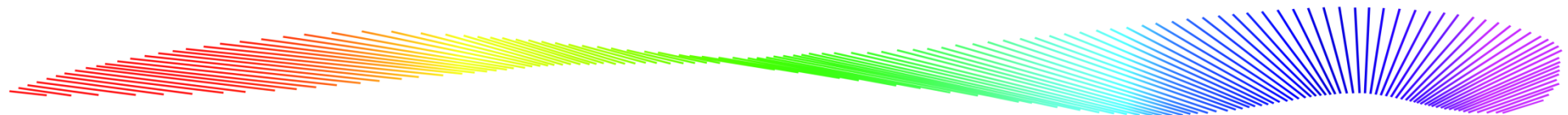


# Why colour printing?

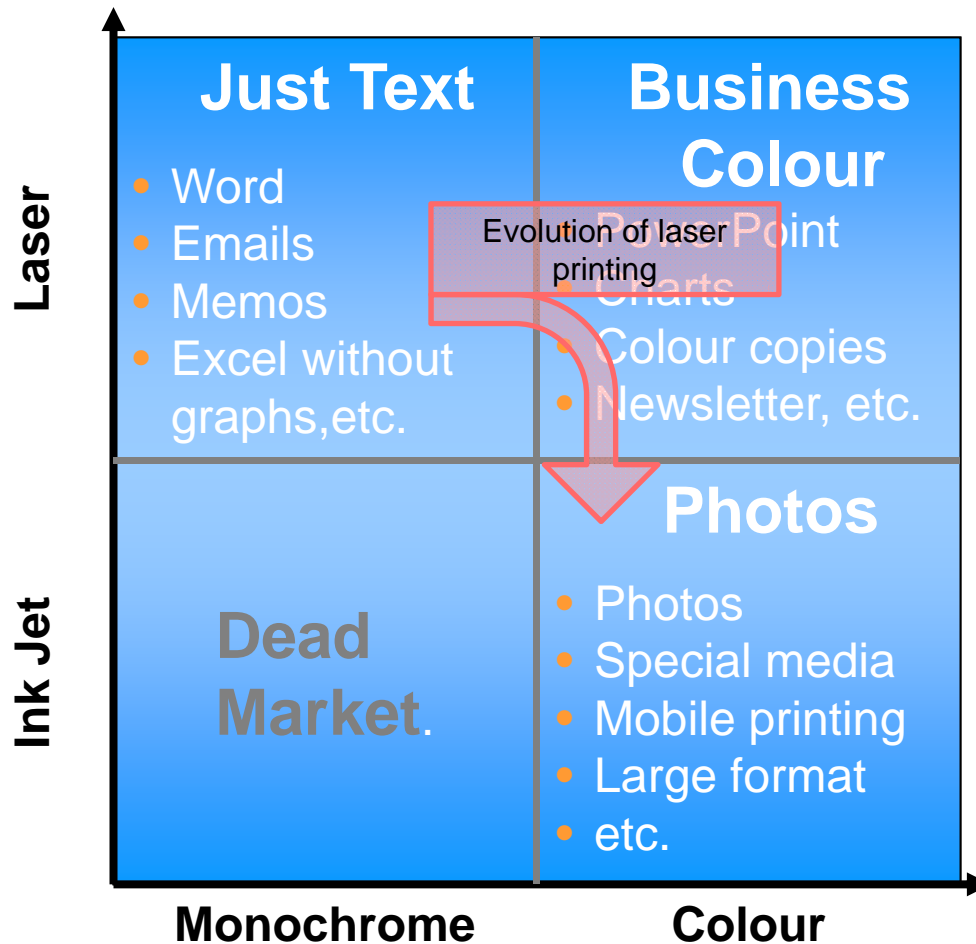
## Because people love colours!



**Colour printing is a natural desire**  
**How many Black and White TVs and monochrome Cell Phone displays are still around?**



# Colour Laser Printing is growing



- Colour MFPs are driving the colour laser printing market because they offer colour printing and colour copying at affordable prices.
- In colour printing the end customer has to have the right expectations.
- Laser printing some constructional constraints in terms of picture quality to Ink Jet printing (3 colours and black against up to 5 colours + black and dpi against pico liters).

# European Market Overview

Plenty of room to grow, but ...

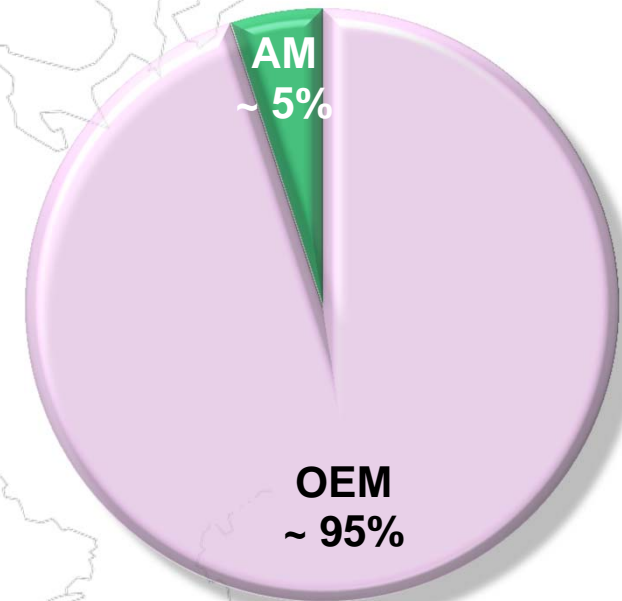


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- **Growth is limited by:**

- Poor quality of low priced cartridges available over the internet.
- Focus only on price (savings > 45% against OEM) rather than on quality at a fair and still good price (saving of 15-30% against the OEM).
- Applying the “monochrome” mindset to modern colour cartridges manufacturing and sales.
- Not moving with OEM technology trends: Use of conventional toner in cartridges and print engines designed for chemical toner.

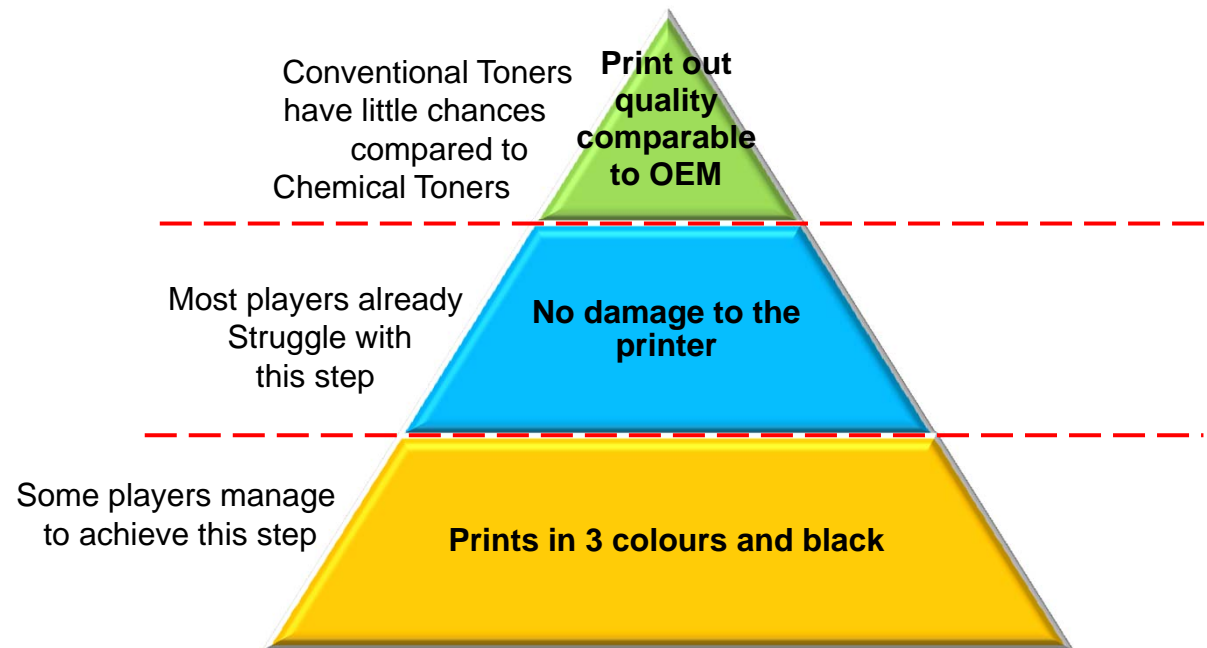
## Laser Colour Cartridge Market



# Technical print performance is only half the story



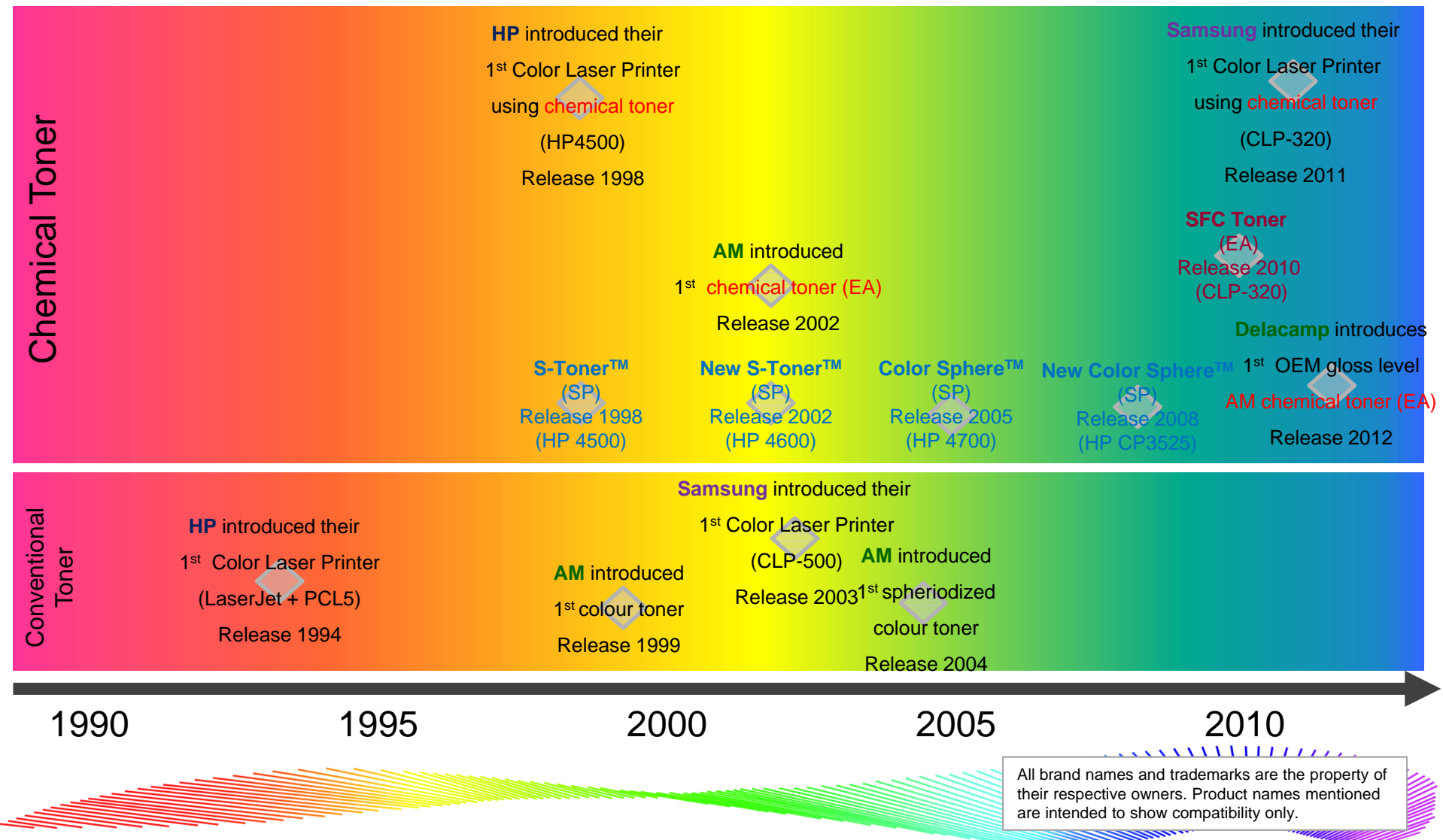
- ISO print performance is only the door opener and NOT an USP!
- Color Cartridges are being purchased for various colorful reasons and should be sold on actual print performance in comparison to the OEM in terms of:
  - Color Match
  - Picture quality
  - Detail definition
  - Gloss level
  - Toner consumption
  - Fusing capabilities
  - etc.





# Colour Toner Evolution

Canon/HP and Samsung marketed LBP  
(together over 50% Market Share)



24/01/2012

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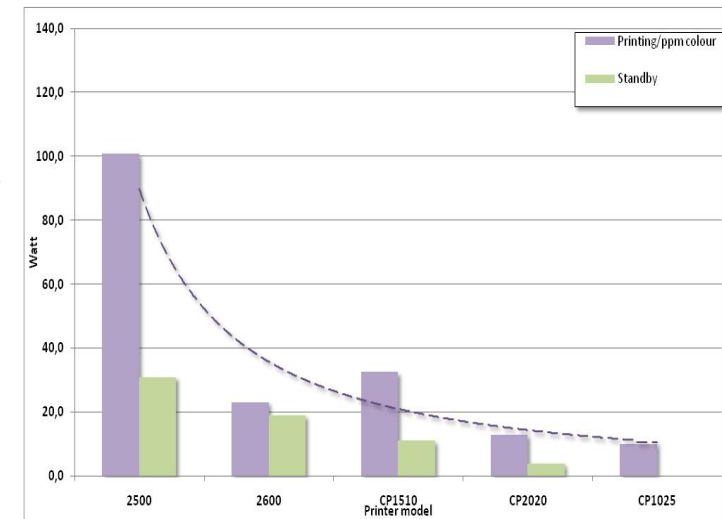
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# Chemical Toner is the future in colour laser printing



## Why are the OEMs turning to Chemical Toner?

- In order to print at 1200 dpi control of particle size and shape is critical – this is virtually impossible with conventional toner. Chemical Toner is much more consistent → consistent particle size and shape equals consistent charging properties.
- The higher yield of Chemical Toner allows for smaller cartridges resulting in smaller footprint printers.
- Encapsulation permits good fusing at low energy levels (allows for Energy Star® qualification).
- Less V.O.C.s and CO<sub>2</sub>.



Smaller footprint colour printers

## Which OEMs use Chemical Toner?

- All major LBP OEMs! Oki, Canon/HP, Samsung, Xerox, Ricoh, Konica Minolta, Brother, etc.

## Why the Aftermarket is clinging to Conventional Toner?

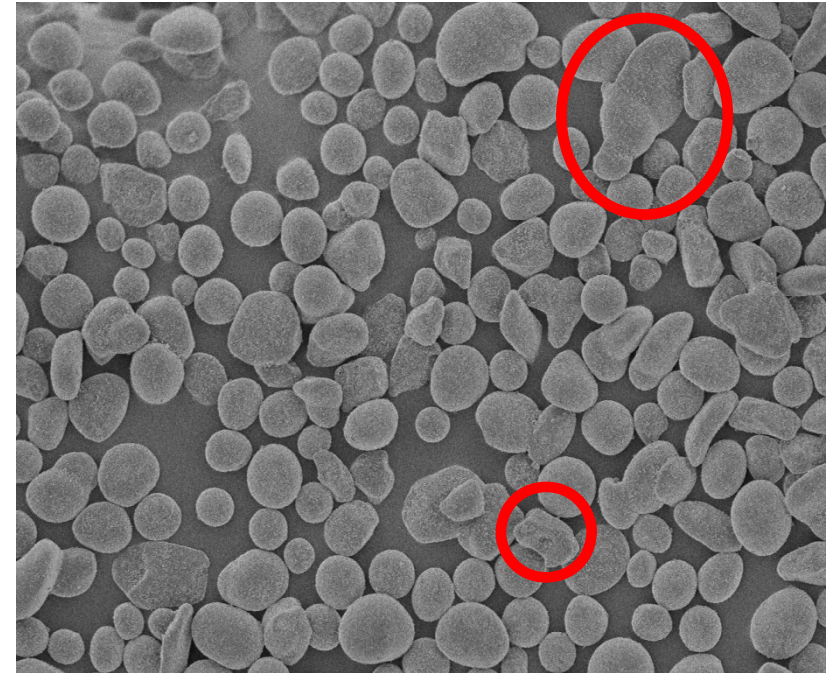
- Cost of Technology
- Intellectual Property

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# Conventional Toner

- **Spheridising**

- **Conventional toner is produced and then smoothed by heat and mechanical process.**
- **PRO**
  - Less expensive than Chemical Toner
- **CONTRA**
  - Old technology
  - Wide particle size distribution
  - Higher pile heights
  - Interaction with OEM
  - Poorer fusing
  - Non-uniform shape
  - Wax on surface – poor flow





- **Suspension Polymerisation**

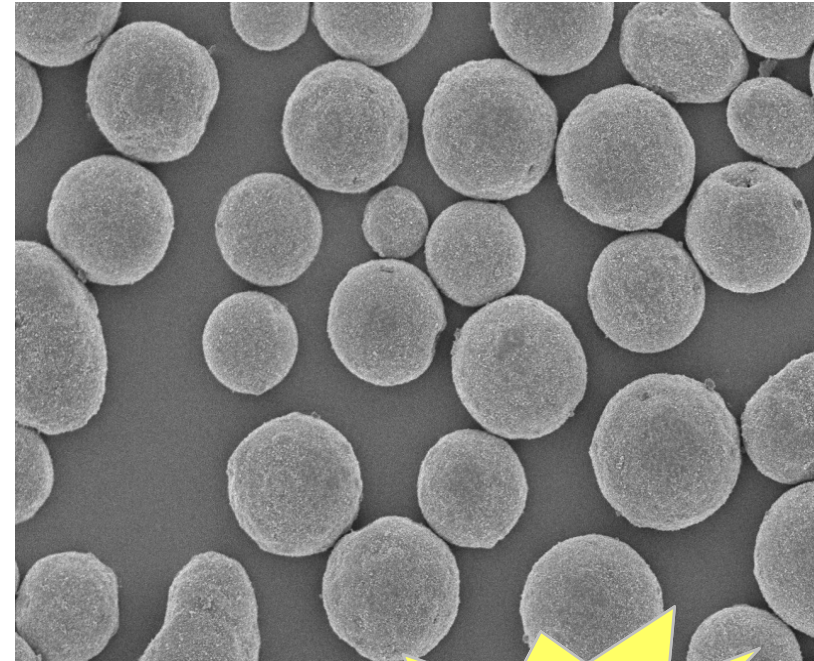
- **High-speed Dispersion**

- **PRO**

- Round
    - Good Charge Control, Flow and Transfer
    - Tight particle size distribution
    - Good fusing
    - Glossy or matte finish

- **CONTRA**

- Limited to Spherical Shapes
    - Difficult Cleaning
    - Heavily Patented



**Canon/HP  
Process**

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- **Emulsion Aggregation**

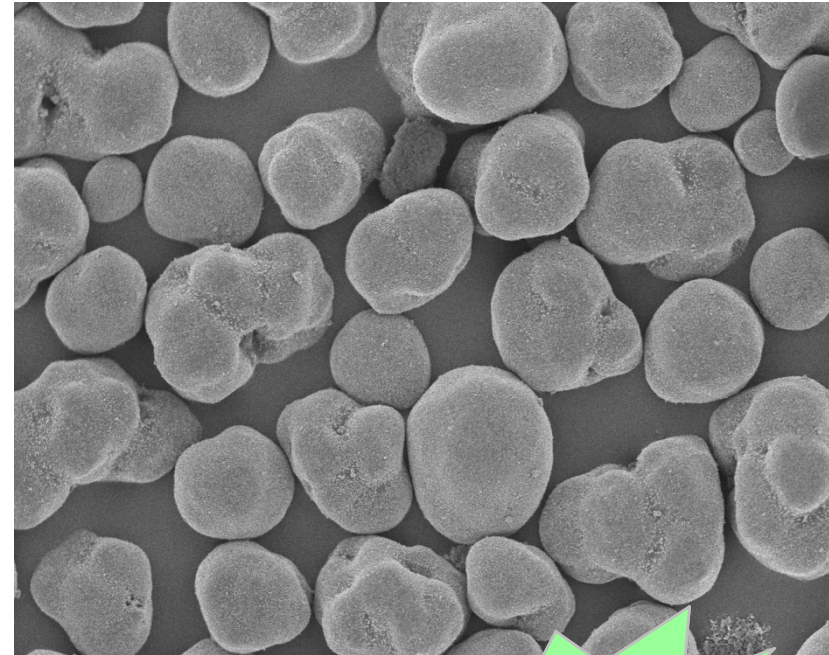
- **Coagulation**

- **PRO**

- Smooth potato shaped
    - Cleans easier
    - Tight particle size distribution
    - Good fusing
    - Wider colour gamut
    - Better control of particle shape
    - **Glossy** or matte finish

- **CONTRA**

- Complex process
    - Difficult to use polyesters



**MK  
Process**

# Spheriodized Toner

## Conventional Toner

Mixing of  
Raw Materials

Extrusion  
(melting together)

Cooling

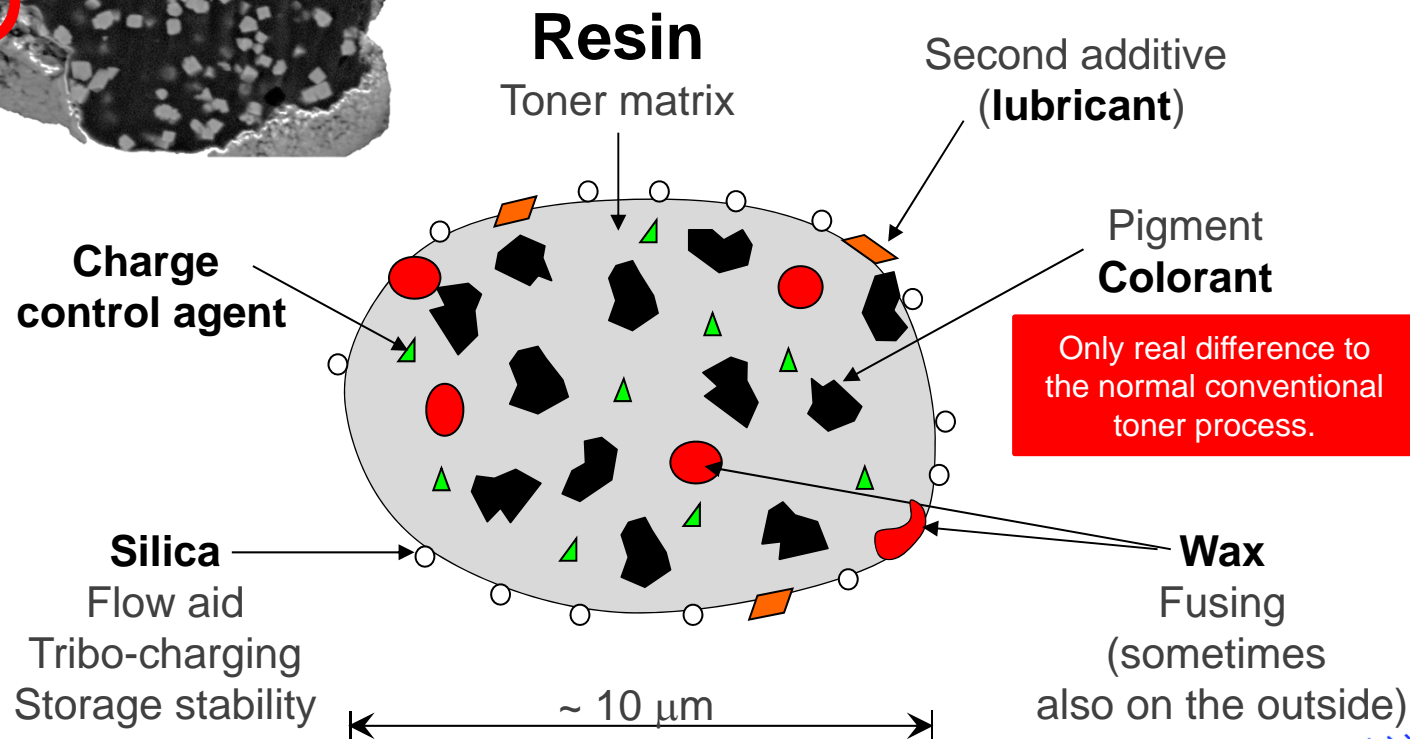
Crushing  
(e.g. jet- or  
Hammer mills)

Classification

Heat  
Treatment

Additive  
Blending

High Energy consumption



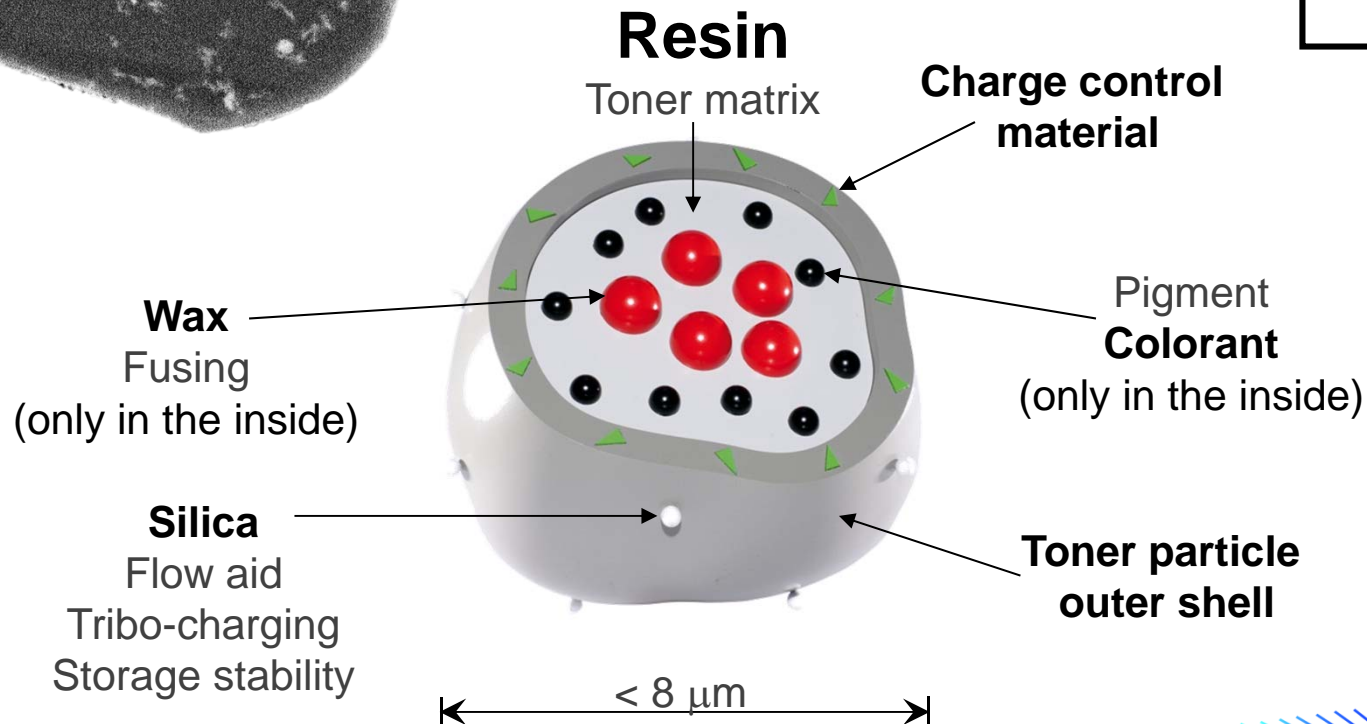
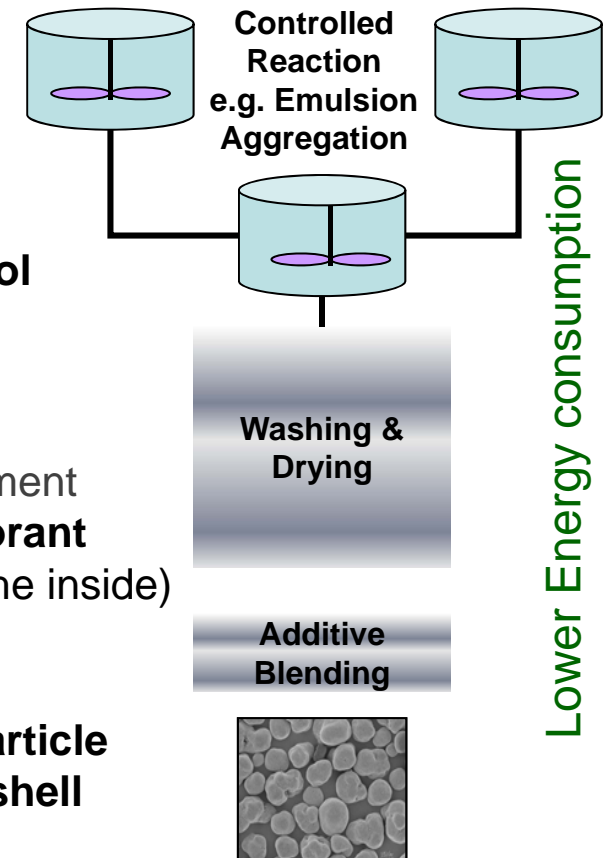


# Emulsion Aggregation Toner

## Encapsulation:




Wax and colorant on the inside  
and additives on the outside shell

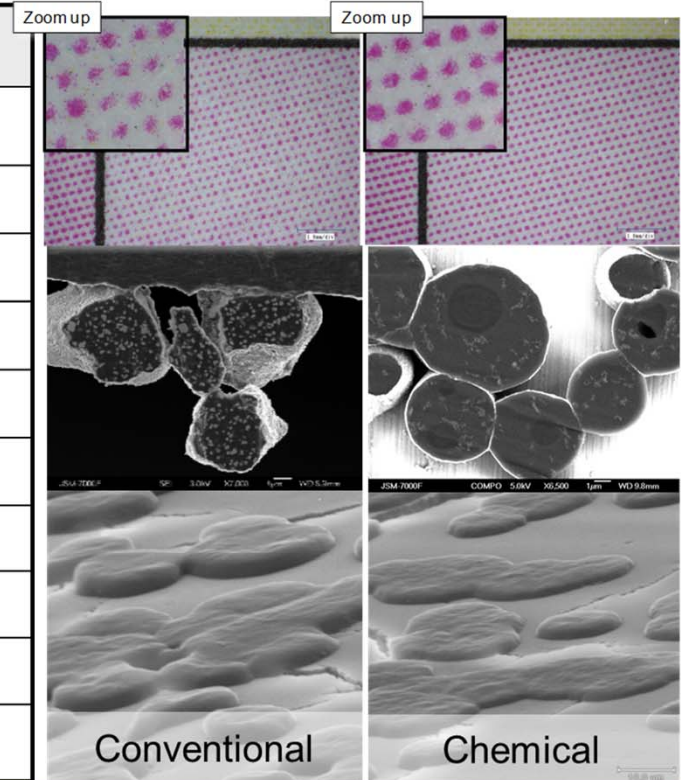
## Chemical Toner





# Chemical Colour Toner offers real advantages in print quality

Conventional Toner 	Spheriodized Toner 	Chemical Toner 
Benefits compared to conventional toner	Apply to spheriodized Toner	Apply to Chemical toner
Uniform particle size	☹️	😊😊
Uniform particle shape	☹️	😊
High transfer efficiency	☹️	😊
High flow	☹️	😊
Uniform charging	☹️	😊
Low pile height	☹️	😊
Good Fusing	☹️	😊
Wide colour gamut	☹️	😊
Sharp half tones	☹️	😊
Minimal batch to batch variations	☹️	😊



**Consequence: Chemical Toner offers better yield, better fusing, crisp colours and more consistency and less stress.**

# Chemical Toner produces well defined letters

## Chemical Color Toner

4-point

This is 4-point font

## Conventional Color Toner

4-point

4-point Font in a HP 3600

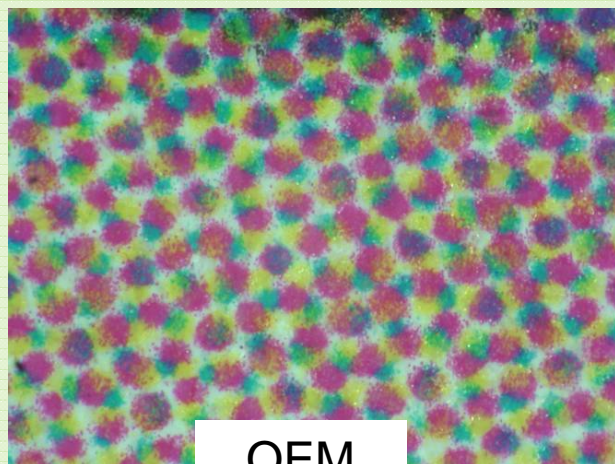
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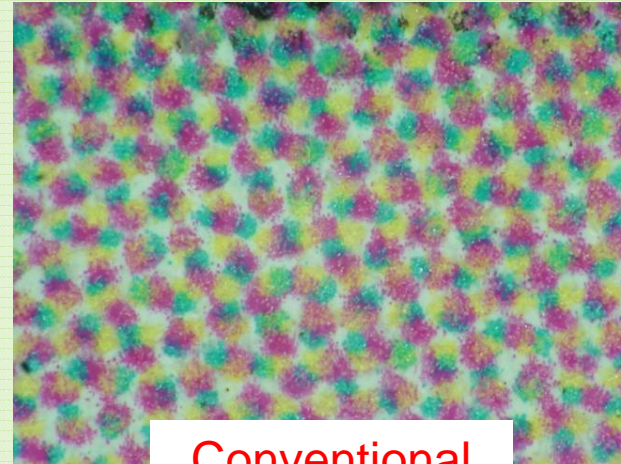
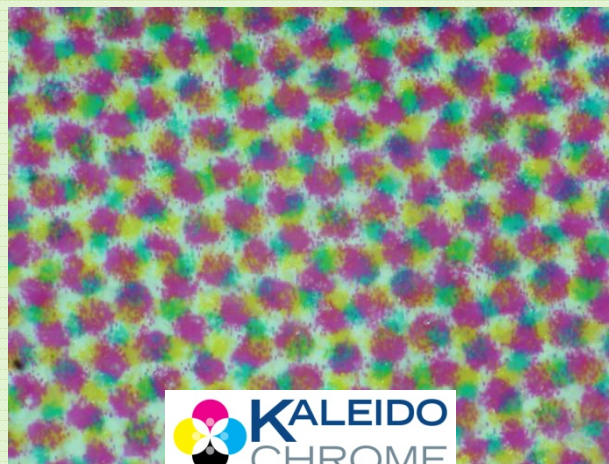
# Colour Quality only with Chemical Toner – well defined half tones



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OEM



Conventional

HP CP3525

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# Chemical Toner offers superior transfer efficiency



FOR A BETTER IMPRESSION

- **Chemical Toner allows for:**
  - Lower Fill weights.
  - Higher Yield.
  - Less Waste Toner = no waste bin overflow issues.
  - OEM like print performance and print quality.

Comparison - HP CP3525

		Delacamp Kaleidochrome Toner				Convventional Color Toner			
		OPC - MK				OPC - Non MK			
Toner Load	g	140	140	140	220	185	185	185	290
Toner consumption	(mg/page)	10	11	11	12	15,9	14,1	18,4	20,1
Theoretical Yield	pages (load/consumption)	14000	12727	12727	18333	11635	13121	10054	14428
OEM theoretical yield		11300	11700	10800	22100	11300	11700	10800	22100
OEM stated yield		7000	7000	7000	10500	7000	7000	7000	10500
Transfer Efficiency	%	91,4	92,6	95,2	93,8	88,4	91	90,9	87,2
Theoretical Waste	g (load-(load*TE))	12,0	10,4	6,7	13,6	21,5	16,7	16,8	37,1

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# Chemical Toner offers better OEM color match and similar gloss level





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Printed using a HP CP2025

Toner	Avg. dE
Conventional	6,663
 (current)	4,778
 (improved gloss)	4,755

dE < 4 not really visible by untrained human eye



Toner	Glossiness 80gr/m <sup>2</sup> plain paper	Glossiness 128gr/m <sup>2</sup> gloss paper
OEM	37,1	41,1
Conventional	18,6	16,3
 (current)	38	35,2
 (improved gloss)	37,8	39,2
Closest Competitor AM Chemical Toner (EA)	27,3	26,4

Gloss meter: Nippon Denshoku VG2000 taken at 75°

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1/24/2012

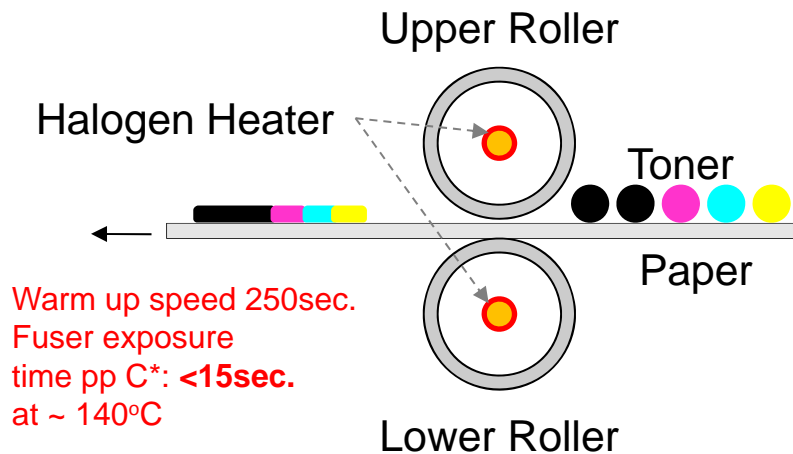
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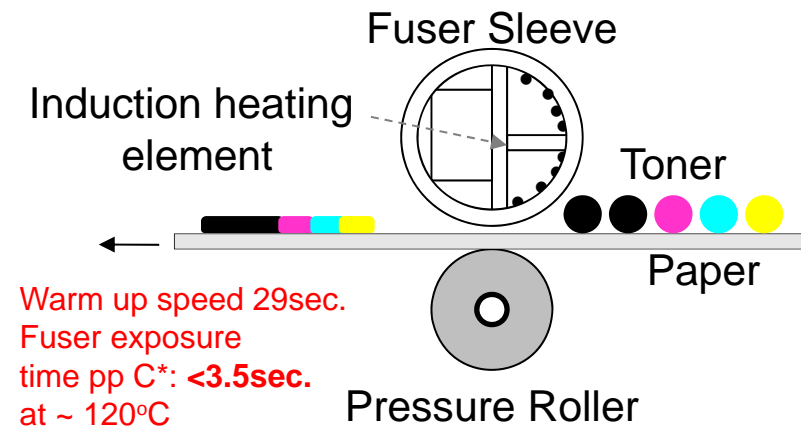
17

# Chemical Toner offers better fusing

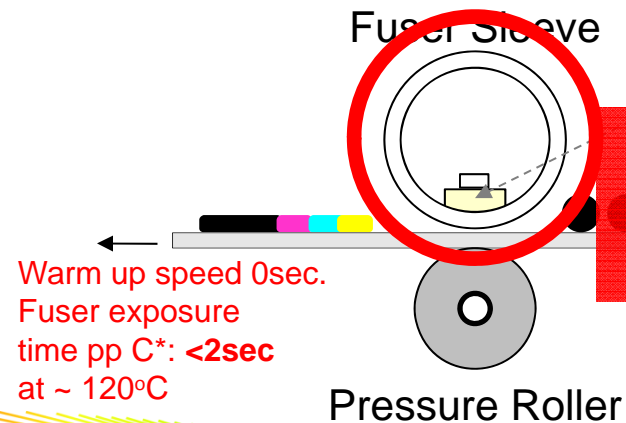
## Old Style Fuser (HP 4500)



## „Intermediate“ Style Fuser (HP 4600)



## New Style Fuser (HP CP3525)



Non Chemical toners can  
produce build up on the  
fuser sleeve

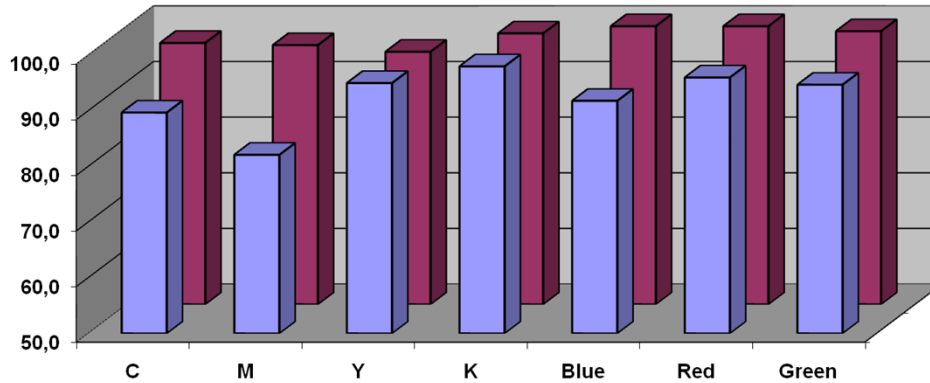
\*minus time in between pages

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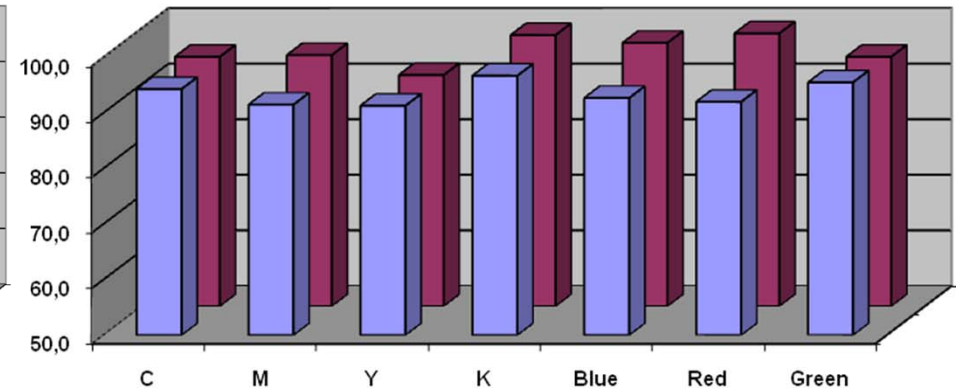
# Chemical Toner offers better fusing



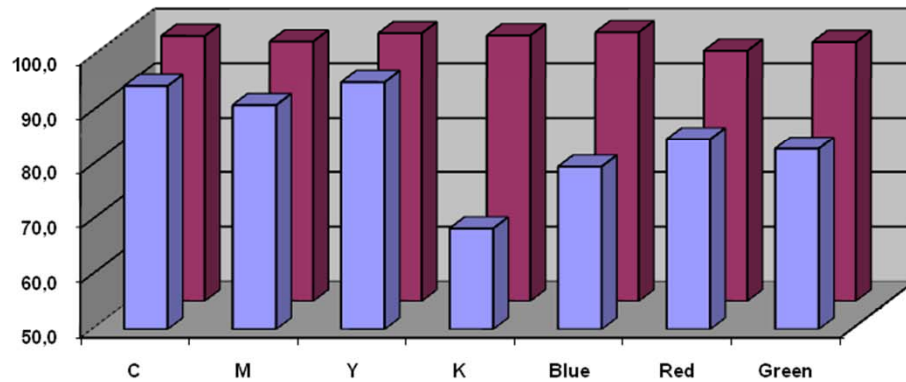
Percent Fusing - 75 gsm (20lb) Paper



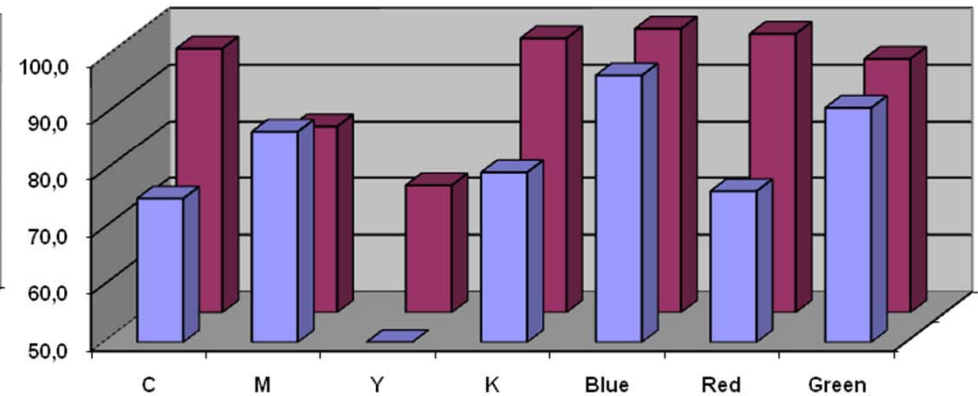
Percent Fusing - 160 gsm (60lb) Paper



Percent Fusing - Labels



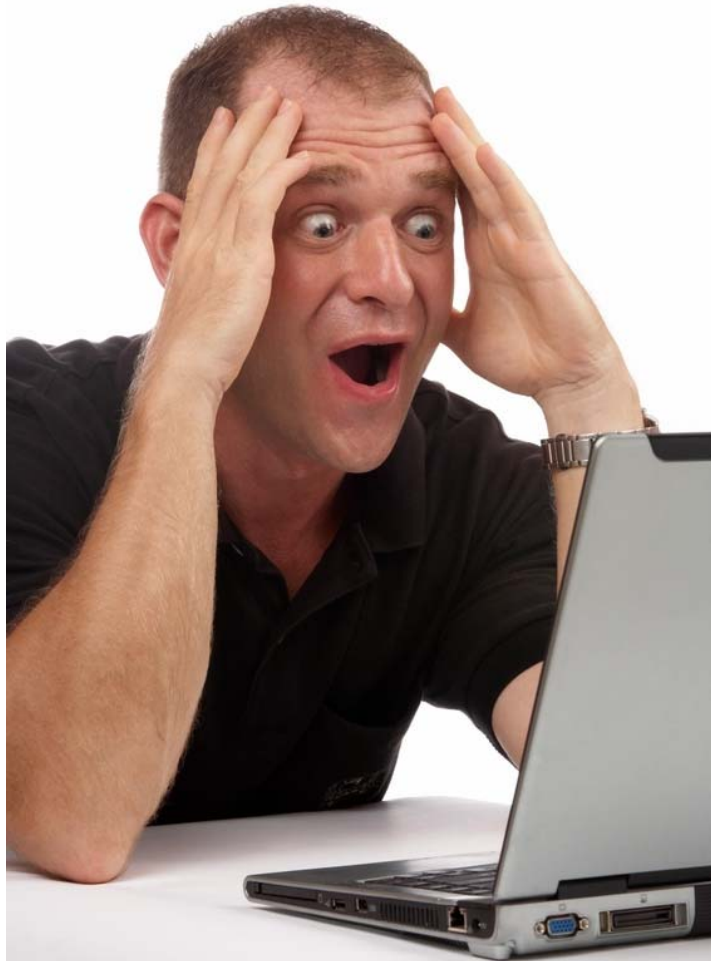
Percent Fusing - Photo Paper



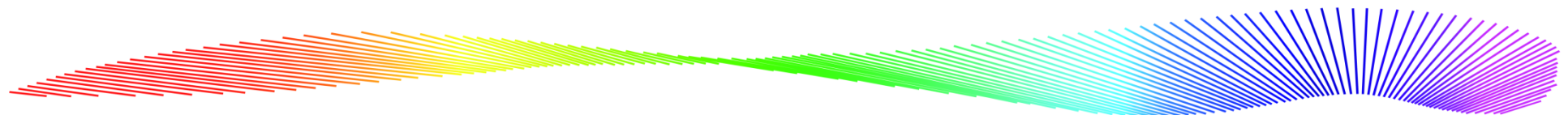
■ Conventional ■ Chemical

Tape Test in a HP 3600

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# Any Questions?







# Kaleidochrome: Leader in Print Quality and Print Performance

# Thank you

