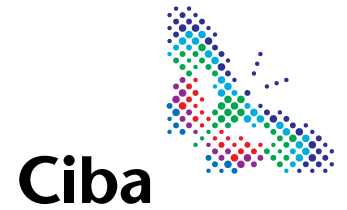


Ciba Specialty Chemicals



Ciba[®] IRGAPHOR[®] / *Laserviolet DVDR*

The DVDR Solution



Coating Effects

Value beyond chemistry

Contents

General Information	3
Media Performance	4
Preparation of Dye Solution*	8
Process Guidelines	9
Safety	10
Contacts	11

Acknowledgement

The content of this document was compiled in collaboration with Plasmon Data Systems Ltd.



As with all chemicals, suitable precautions should be taken when handling these materials and all personnel should be made aware of the Safety Information provided in the MSDS.

*Contains amendments to earlier versions.

General Information

Laserviolet is a new, advanced, cost efficient recording dye for both DVD-R and DVD+R formats, delivering media recordable at all the currently available speeds.

Laserviolet Dye

- new advanced metal complex dye formula – patent applied by Ciba Specialty Chemicals
- a single dye powder
- virtually unlimited shelf life
- quality assured on disc manufacturing equipment

Laserviolet Media

- offer multispeed recording performance compatible with the latest specifications
- deliver wide power margins for high speed recordings
- offer excellent recorder compatibility at all speeds

Laserviolet Media Manufacturing Process

- offers low cost per disc
- optimized groove geometries, ensuring very low Pisum8 error rates
- fast and efficient deposition of the dye layer
- runs with high yields and short cycle times
- offers simple recycling on an unlimited basis
- wide production tolerances
- supported by professional process engineers

Laserviolet Support Services

- optimized stampers ensuring excellent performance and recorder compatibility available from Plasmon OMS
- full process documentation supplied
- free of charge process training at Plasmon Data Systems, UK
- media and process troubleshooting and technical support
- media evaluation services on state of the art test equipment
- site visits where required

Regular updates on process improvements and new peripheral materials are provided to all customers free of charge.

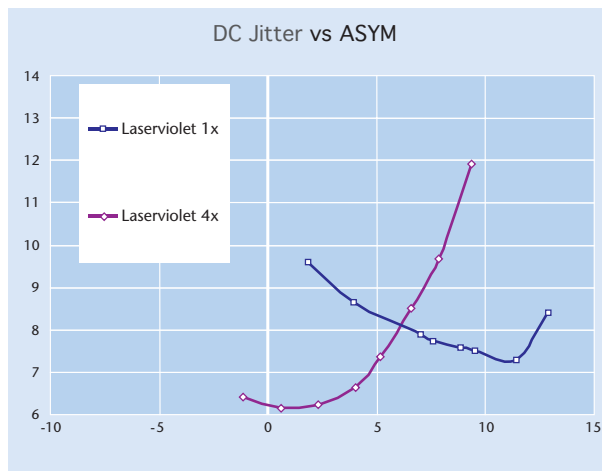


Media Performance

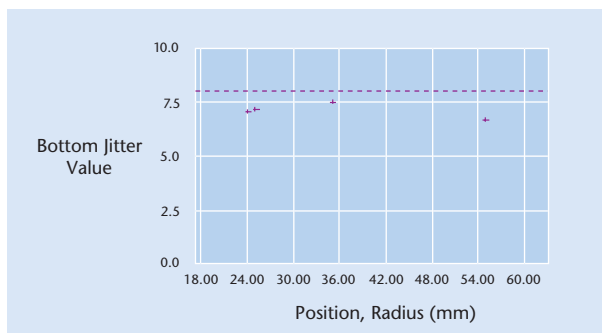
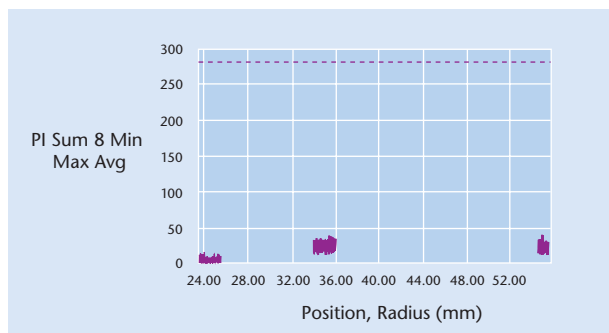
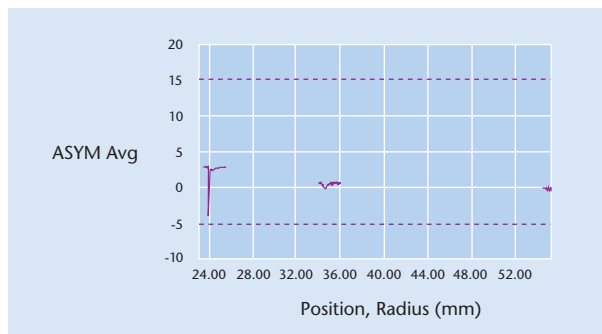
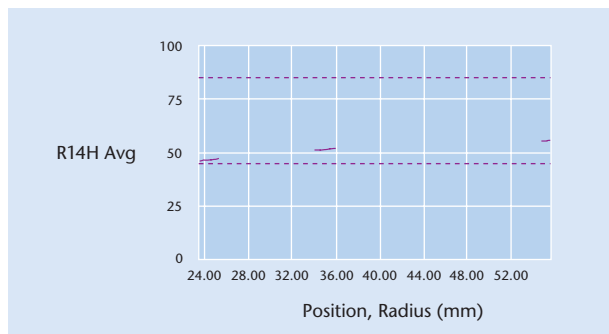
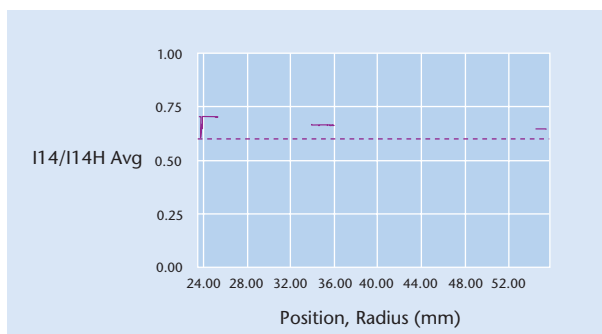
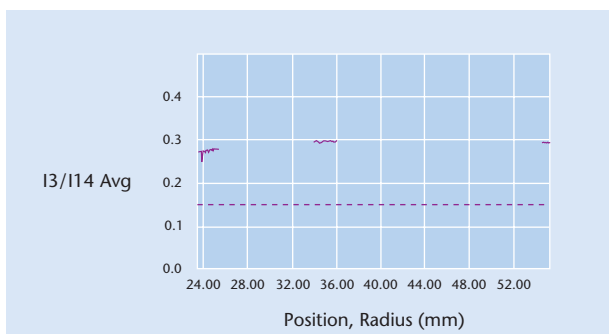
DVD-R

1x – 4x Jitter Power Margin recorded with Pulstec RDC tester, based on Pioneer A05 recorder, and then read tested in Audio Development DVDPro.

Laserviolet displays wide power margins at appropriate asymmetry values, indicating the inherent compatibility of Laserviolet media with commercial drives.



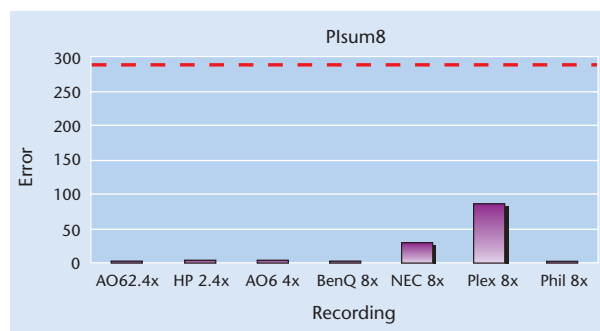
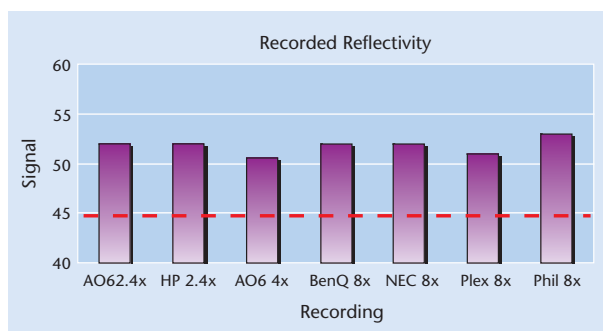
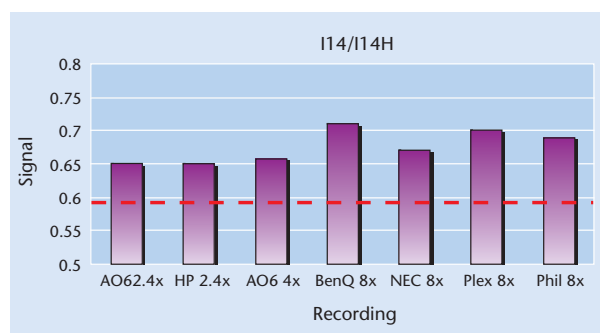
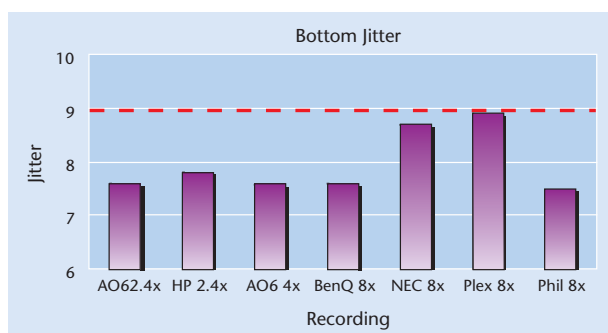
Pioneer A07 8x



Laserviolet DVD+R Performance in Commercial Burners¹

Laserviolet media tested at Plasmon, surpass key +R performance criteria even without the adoption of an optimized Write Strategy. Recording data from several commercial burners is shown below.

Data analyzed in Audio Development DVDpro +R module.



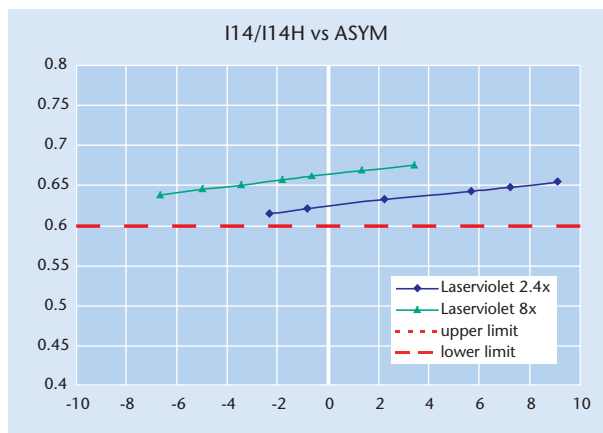
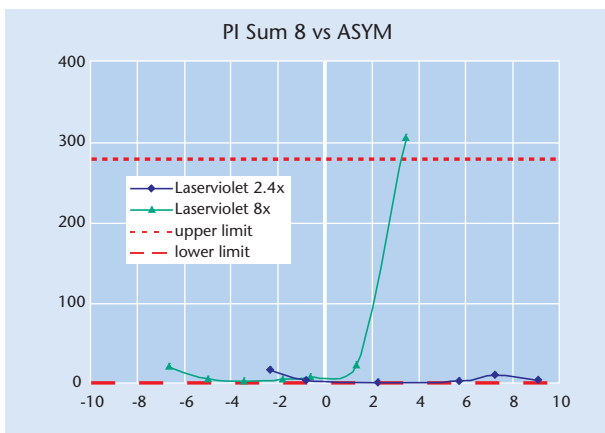
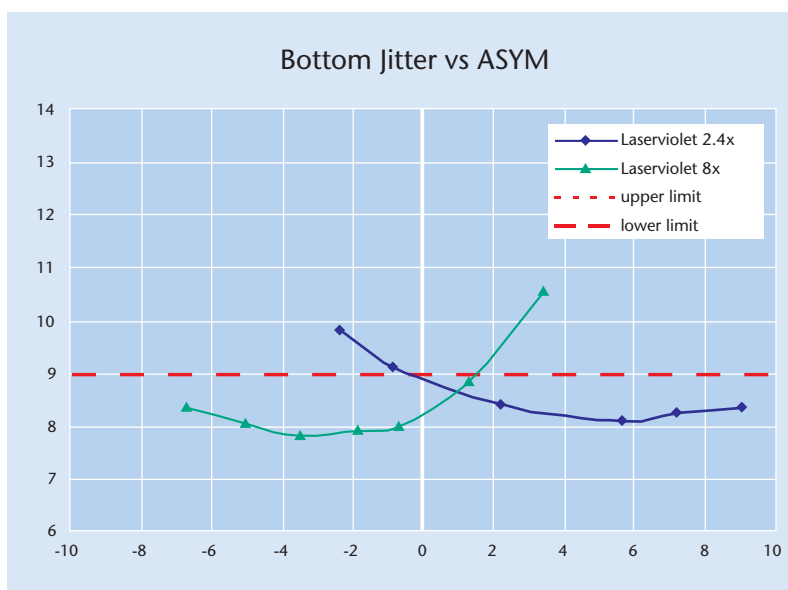
¹Note, at present these burners do not apply an optimized write strategy.

2.4x and 8x Recording Power Margin Tests

Data presented from media recorded with BenQ 8x commercial recorder and software tool.

+R Results demonstrate that Laserviolet is a multispeed media recording solution. Wide power margins are achieved at both low and high speeds, with PISum8 and Modulation falling well inside specification for the +R format.

Data analyzed in Audio Development DVDpro +R module.



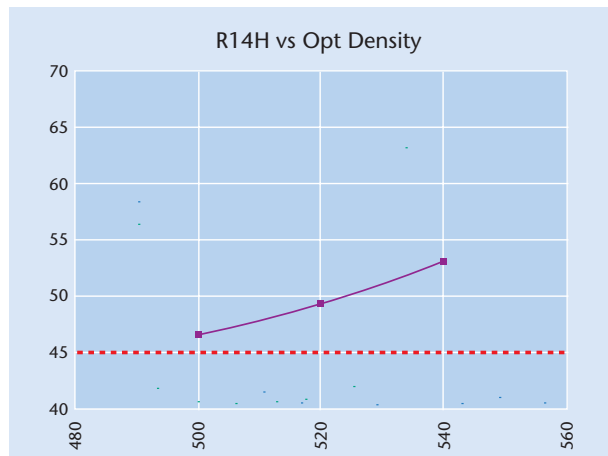
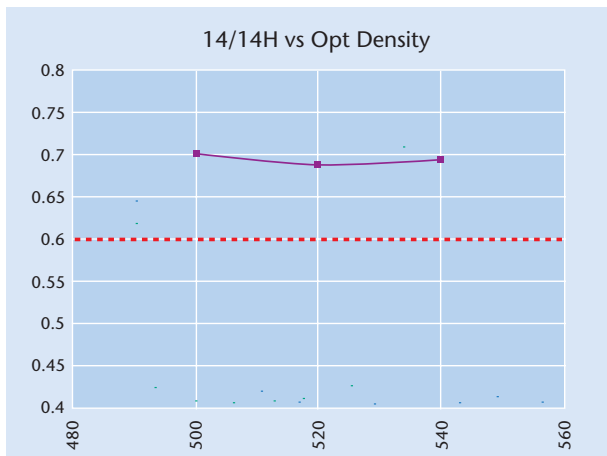
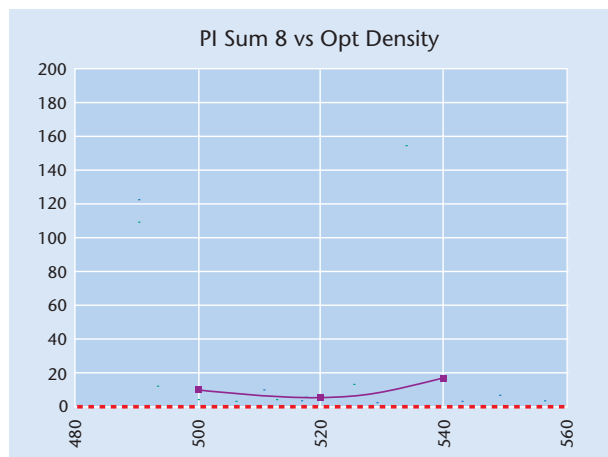
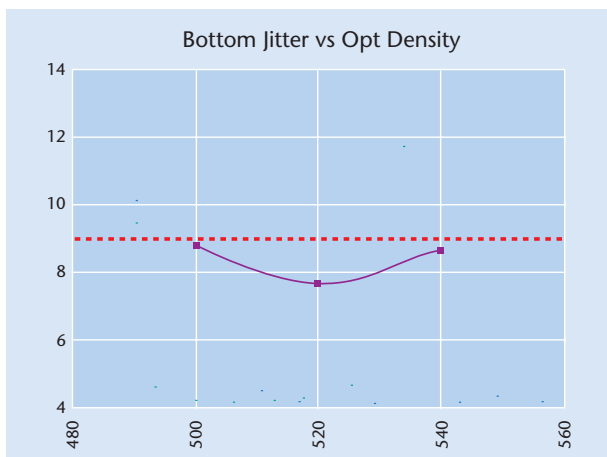
Laserviolet Media Tolerance to Dye Film Thickness

Laserviolet has a broad tolerance to dye film absorbance at 8x recording speed.

Media tolerance to variations in dye film thickness provides a broad manufacturing process window, keeping production stable in the event of changes to the dye deposition profile.

BenQ 8x recording performance with ADIP encoded write strategy.

Data analyzed in Audio Development DVDpro +R module.



Preparation of Dye Solution

Please ensure that safety instructions for handling dye and solvents as specified in relevant MSDS are followed.

Dye Solution Properties

Solvent:	Tetrafluoropropanol ² (TFP)
Dye concentration:	1.0% wt/wt
λ max in solution:	579.5–582 nm
Edgewash:	Diacetone alcohol (DAA)

Dye Solution Preparation

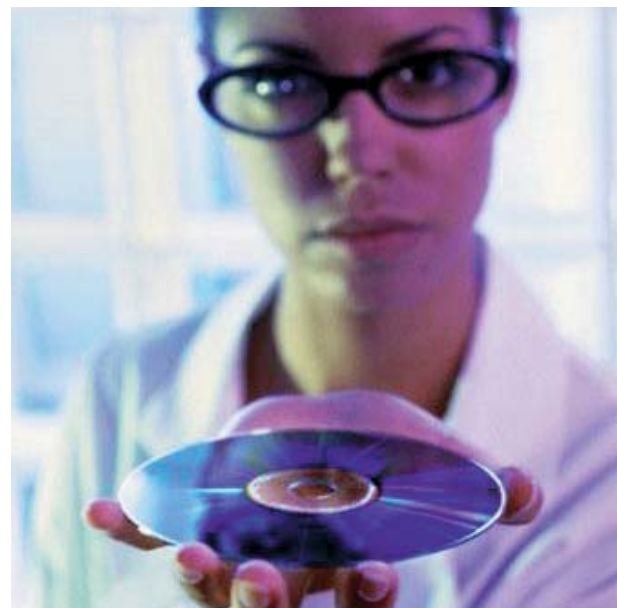
- Stir the TFP solvent and add the dye powder slowly.
- Continue stirring for 24 hours.
- Filter the solution through a 0.2 μ m PTFE (or UPE) membrane filter cartridge.

Dye Solution Analysis

Dye concentration

- Concentration is determined from the absorbance spectrum of the Laserviolet solution according to the Beer-Lambert Law.
- For correct analysis the prepared solution should be diluted 1000 x for 0.5 cm cuvette.
- A scanning double beam UV/visible spectrophotometer is recommended for this analysis.
- The correctly prepared dye solution should exhibit an absorption spectrum with the following characteristics:

λ max:	579.5–582.0 nm
absorbance at λ max:	1.33–1.43



² Fuji Photo Film holds patent rights for the use of tetrafluoropropanol as a solvent for coating recording dyes

Process Guidelines

Stamper

Laserviolet process optimized stampers ensuring recorder compatibility at all speeds, available from Plasmon OMS (see page 11 for contact).

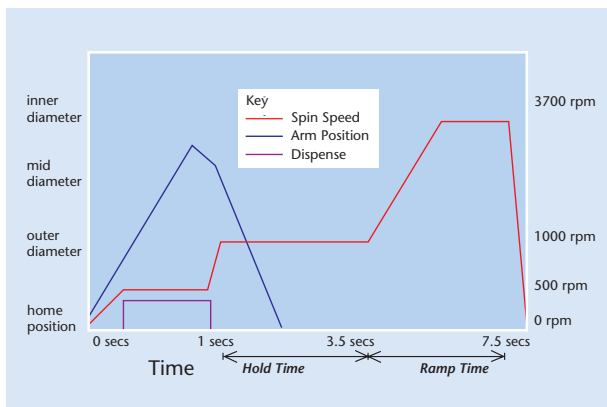
Substrate

Optimized groove geometry (AFM) – suitable for both +R and –R format.

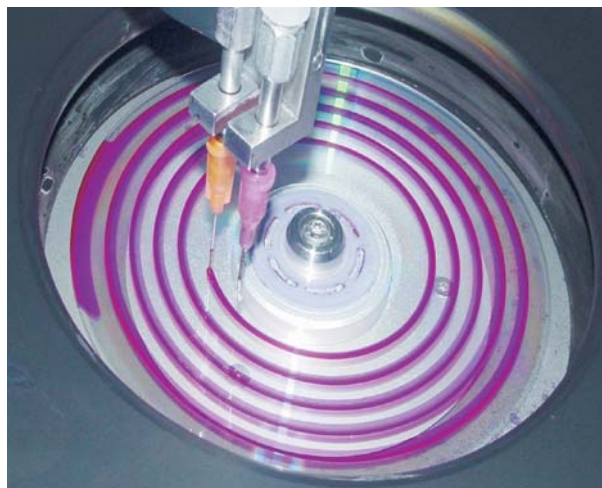
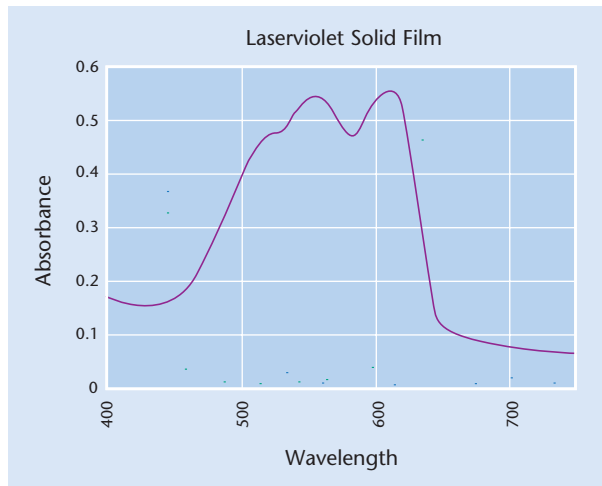
Groove depth (Dsub)	170–180 nm
Groove width (Wsub)	360–380 nm
Groove side wall angle	70–75°
Birefringence	–20 to +40 nm
Radial Deviation	–0.15° to +0.5°

Dye Coating

The Laserviolet dye coating process was developed on a common spin coater. It is adaptable to any dye coating equipment. Typical dispense volume 0.15–0.20 ml per disc. Laserviolet spin coating cycle time approximately 8 seconds.



- Environmental Conditions 26 ± 0.5°C
- Humidity 45 ± 5%
- Dye dispense volume 0.18 ml
- Optical density of dye layer³ 0.460–0.480



Drying

Standard drying time is typically 10 minutes at 70–75°C.

Metallizing

Standard silver thickness recommendation = 120–130 nm.

³ Absorption as measured on Dr Schenk at 600 nm.

Safety

Laserviolet should be stored, handled and used in accordance with good industrial hygiene practices and in conformity with any legal regulation.

Laserviolet is presently undergoing detailed toxicological studies. Although no hazardous properties have been reported, skin and eye contact and ingestion should be avoided.

Please consult the IRGAPHOR® Laserviolet material safety data sheet (MSDS) for complete information. The MSDS accompanies each supply consignment. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not be construed as guaranteeing specific properties.



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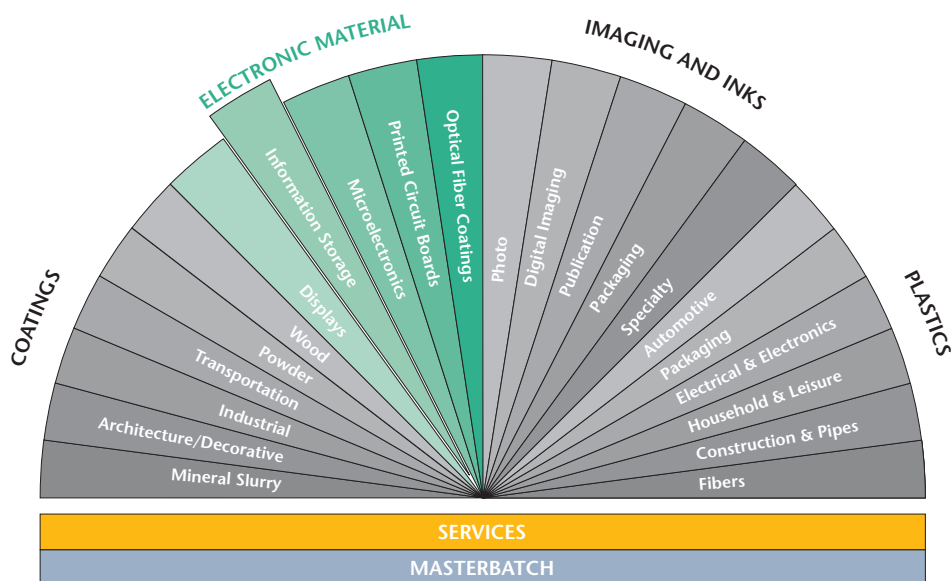
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Ciba Specialty Chemicals Worldwide

We do business in more than 120 countries and have sales representatives and technical expertise available for our customers around the world.

To find the representative nearest you, visit www.cibasc.com/find



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