



中国感光学会辐射固化专业委员会
RadTech China

Markets Overview and Progress of UV/EB Curing Technology in China

Jun Nie, Fenfen Bao, Wenfang Shi

RadTech NA, May 2014, Chicago, USA



Outline

- **UV Products Manufacture**
- **Tech. Advances of UV Raw Materials**
- **New Trends of UV-curing Applications**



中国感光学会辐射固化专业委员会
RadTech China

UV Products Manufacture

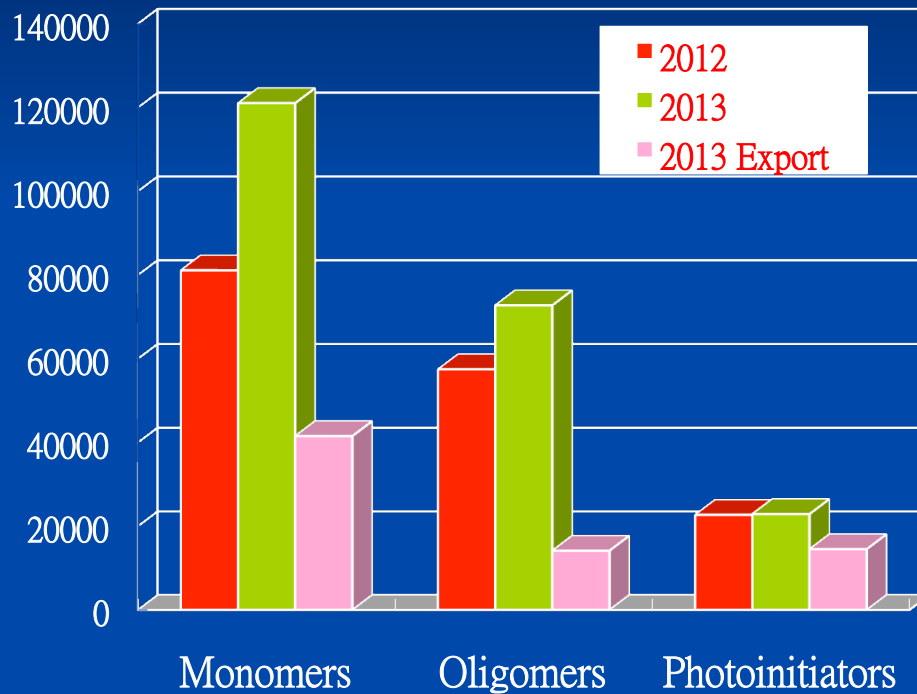
Including **Raw Materials & Formulated Products**

2013 Data from 81 manufacturing companies

2012 Data from 83 manufacturing companies



Radcuring Raw Materials Market in China

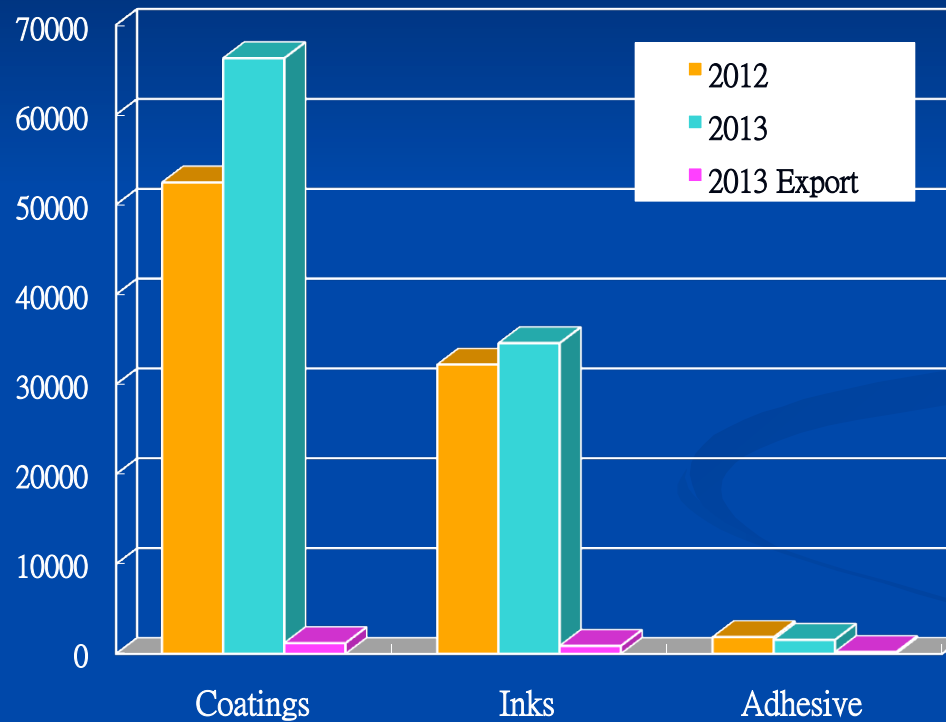


Companies	2013	2012
Monomers	10	14
Oligomers	15	24
Photoinitiators	18	9

Products	Monomers (10)	Oligomers (15)	PI (8)
2013/2012 increase ratio (%)	49.2	26.6	—



Radcuring Formulated Products in China



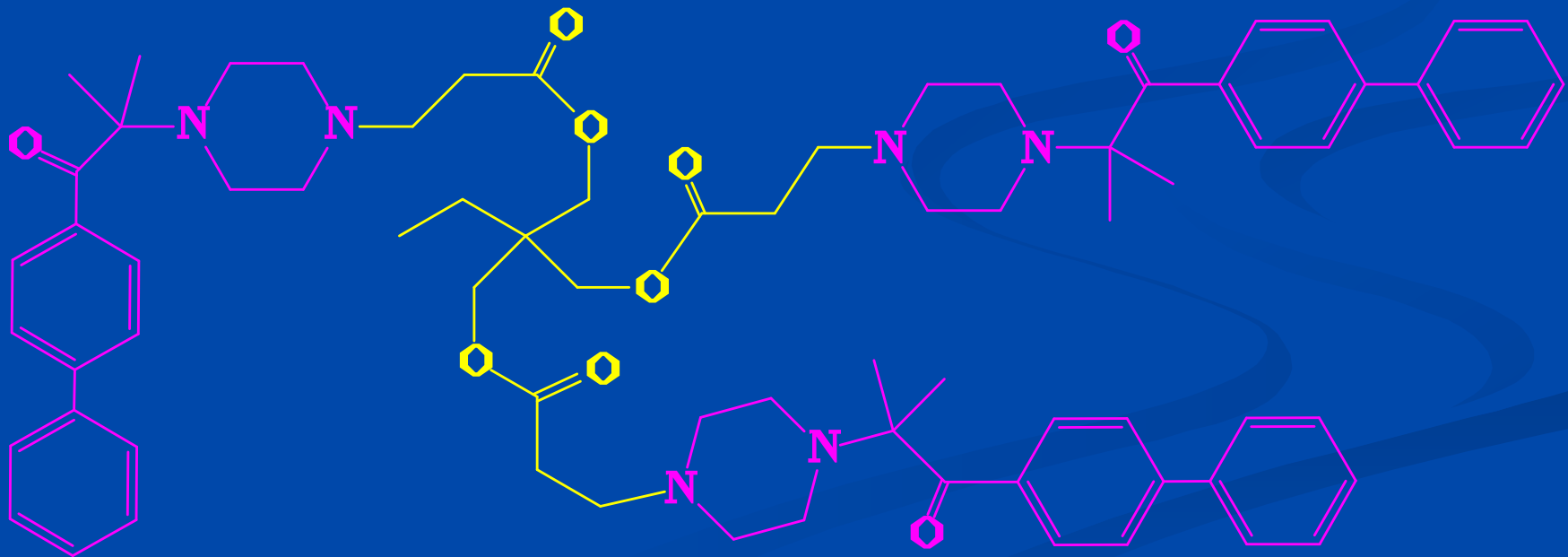
Products	Coatings (20)	Inks (20)	Adhesive (8)
2013/2012 Increase ratio (%)	26.3	7.4	-16%



Tech. Advances of UV Raw Materials in China

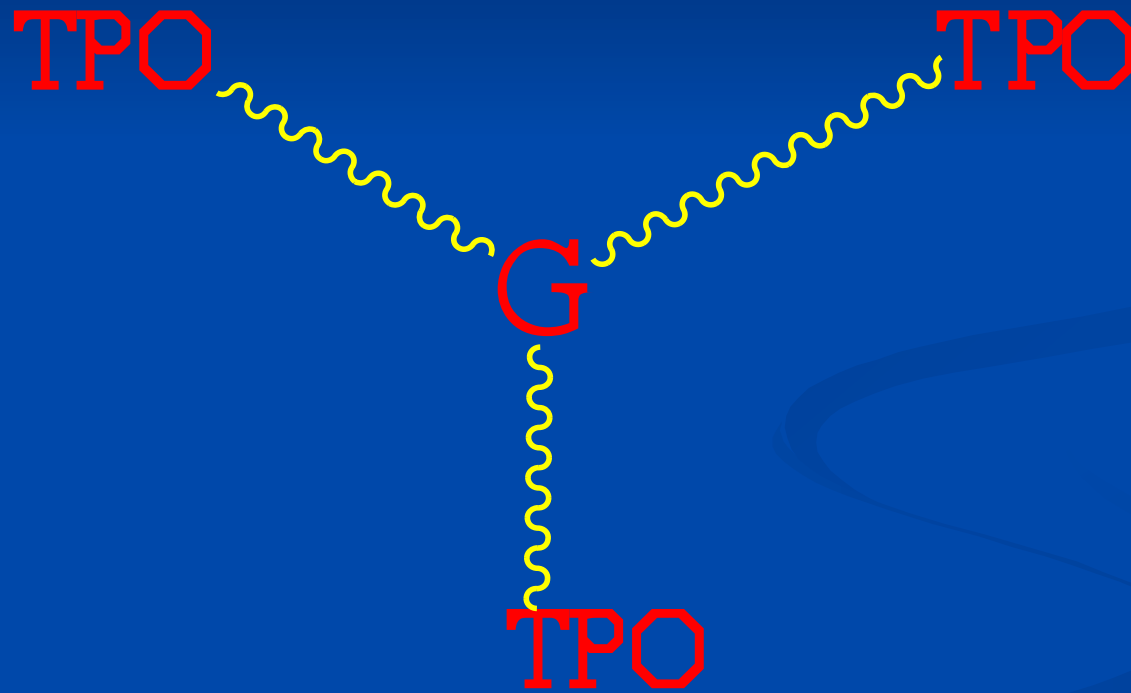
Photoinitiator:

Macro-Photoinitiator: multi-functional aminoalkyl phenyl ketone





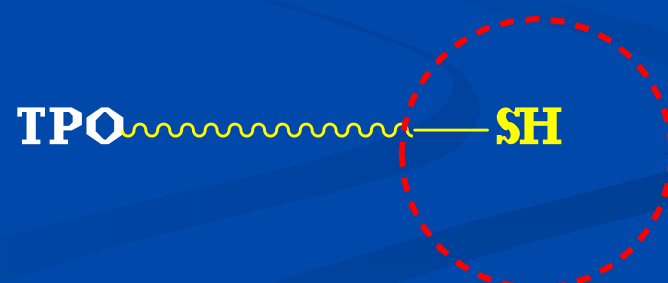
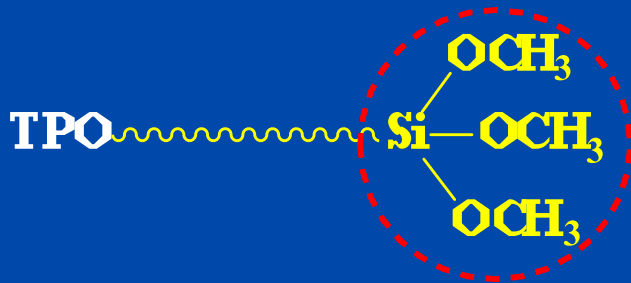
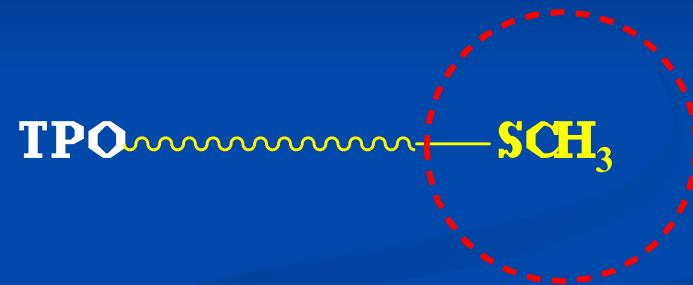
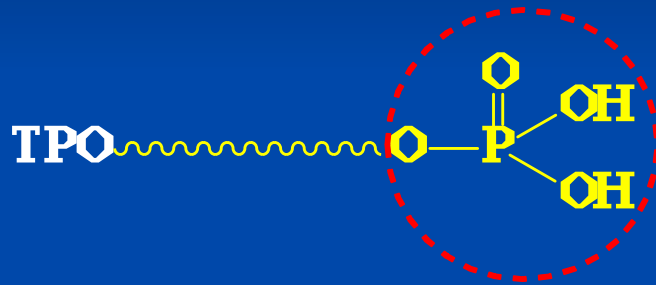
Multi-end-functional Macro-TPO





Substrate Anchoring Photoinitiator

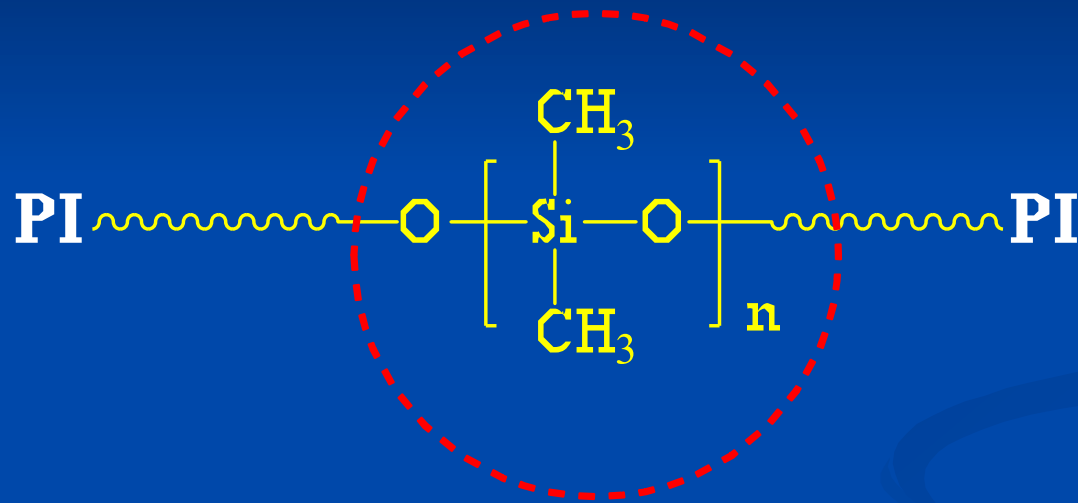
Anchoring Photoinitiator with Long Wavelength Absorption



Absorption wavelength at 370 nm

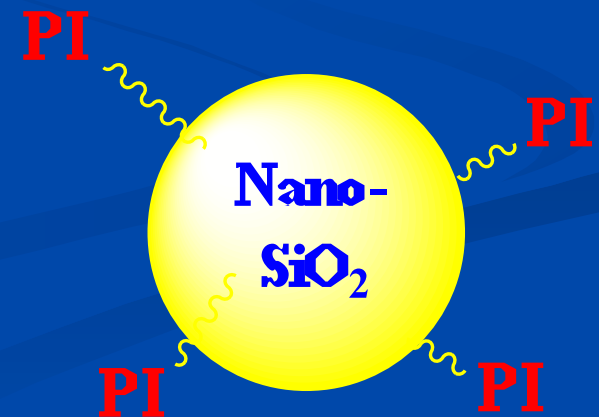


Floating Photoinitiator



Low surface tension

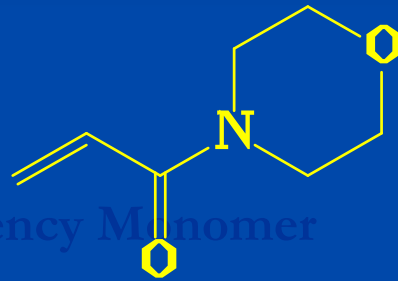
Nano-Photoinitiator





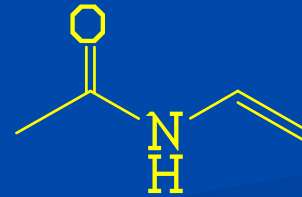
Monomer:

Amide monomer

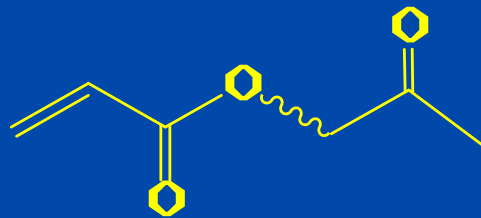


Powerful Solvency Monomer

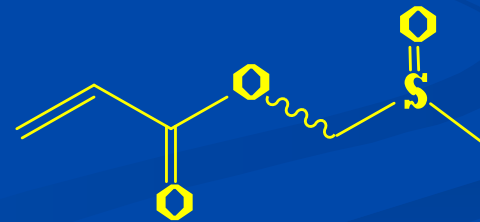
ACOMO



NVF



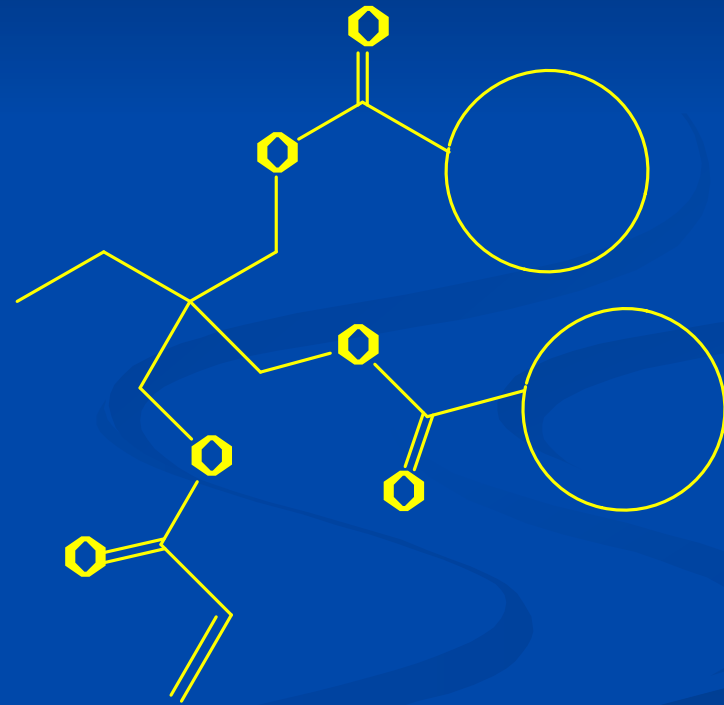
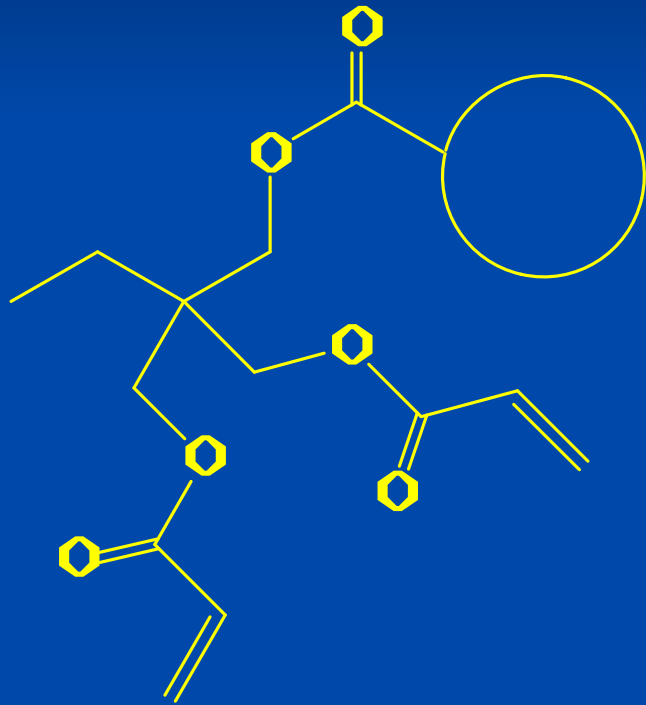
Ketonyl Acrylate



Sulfinyl Acrylate



Alicyclic monomer



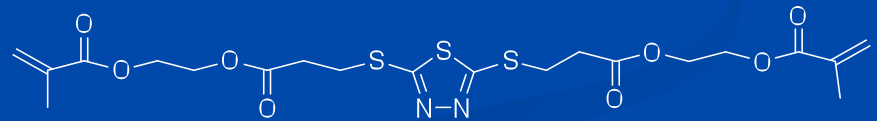
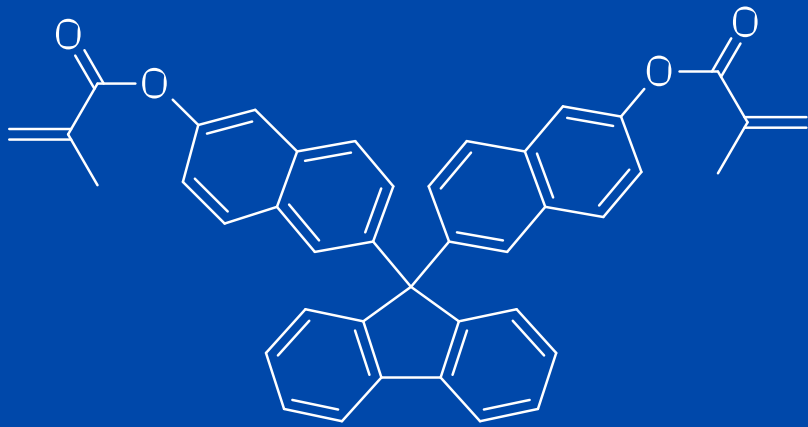
Fluorenyl Epoxy Acrylate



中国感光学会辐射固化专业委员会

RadTech China

High refractive index monomers





Oligomer:

Bio-based UV-curable oligomer

Vegetable
oil

Creative
Technology

Bio-based UV materials

High Performance

Good Bio-compatibility

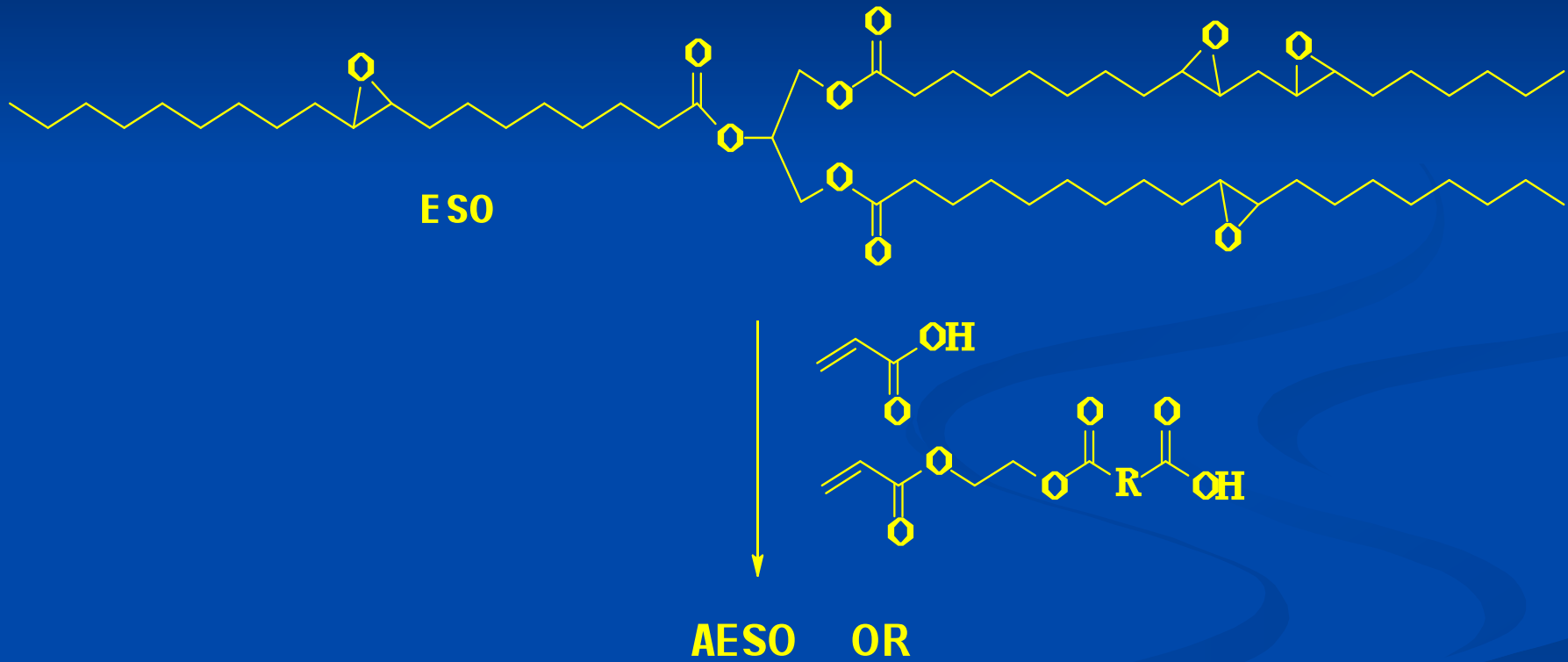
Renewable Source

UV-curable printing ink





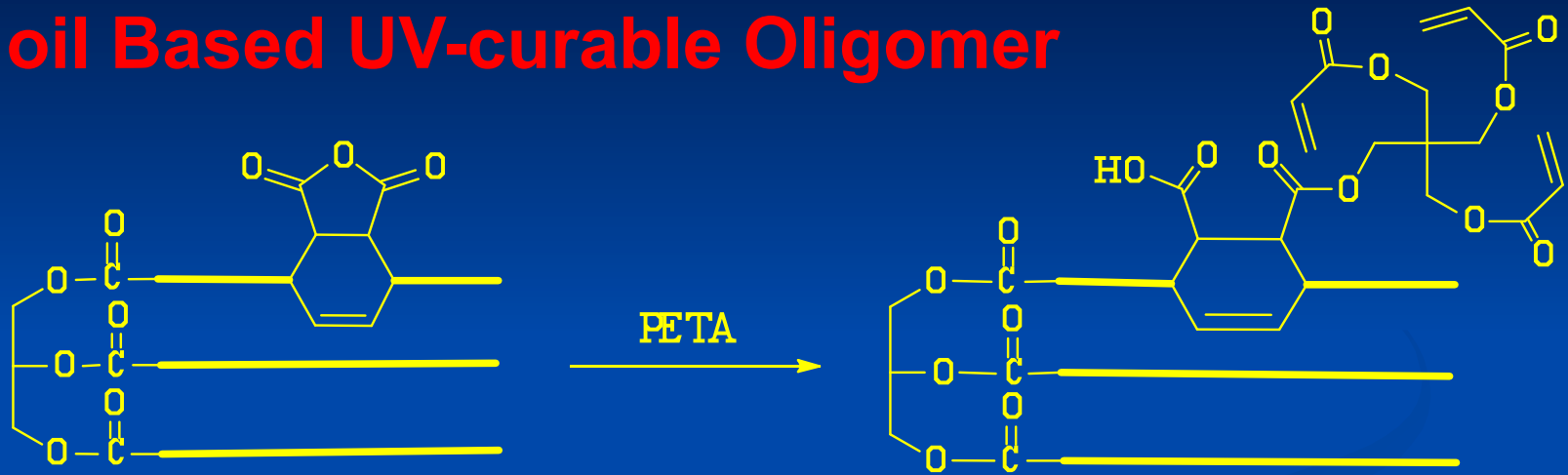
AESO



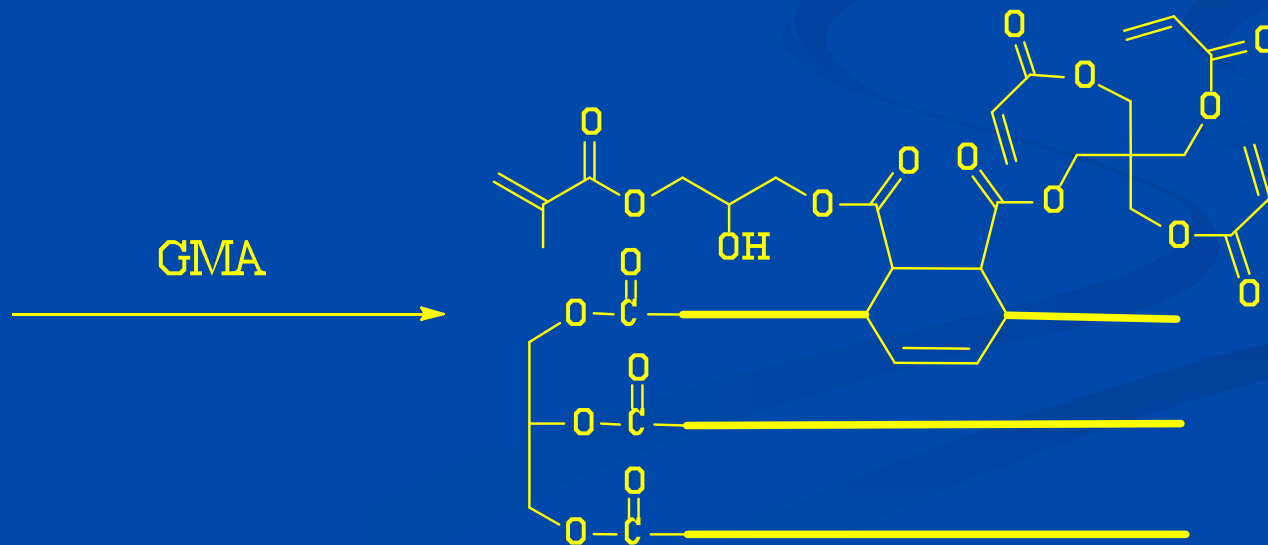
Modified with polycarboxylic anhydride to improve performance



Tung oil Based UV-curable Oligomer



Tung oil modified with maleic anhydride





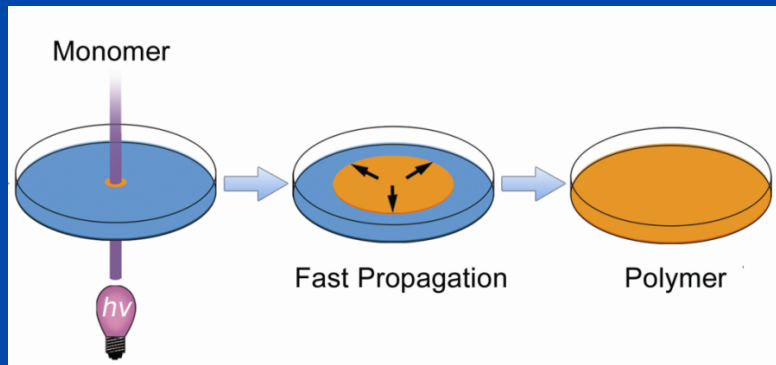
New Technology – Photo-triggered Domino Curing

By Photobase generator & Amine proliferation

Local Area Irradiation

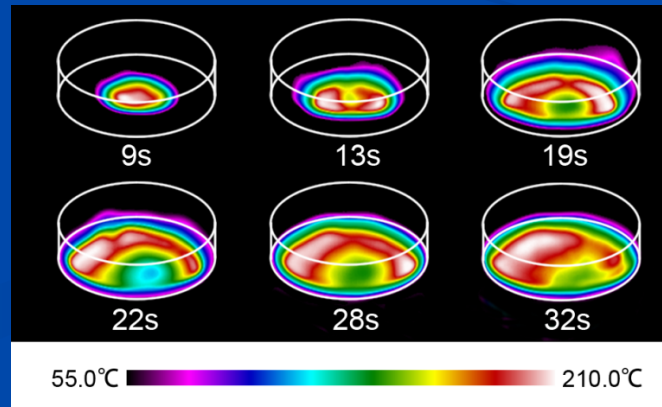
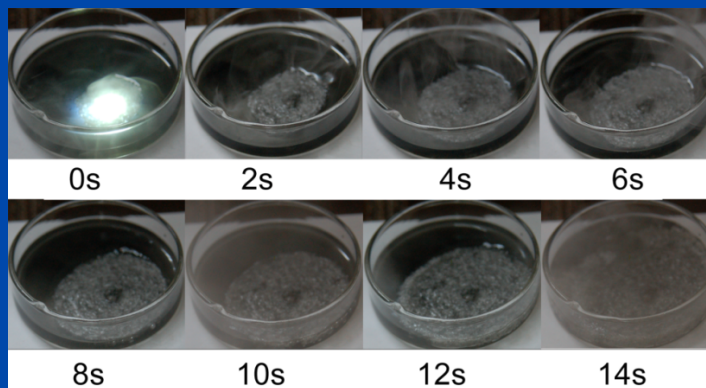


Wide Area Curing



Potential Application:

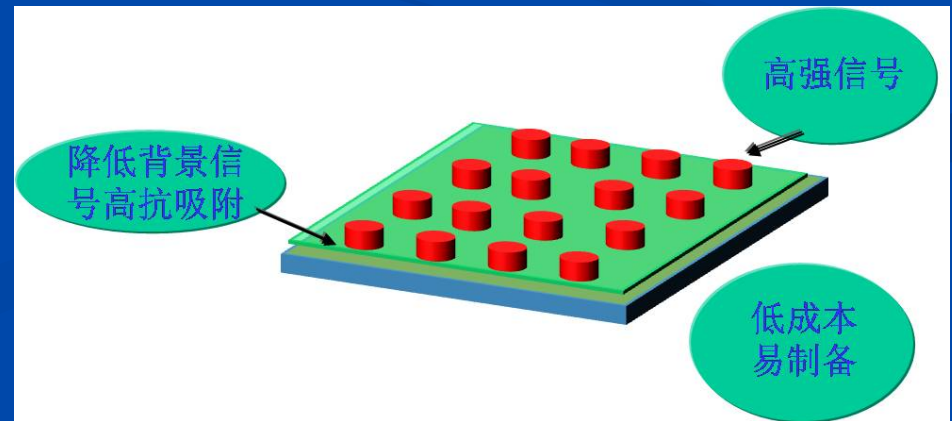
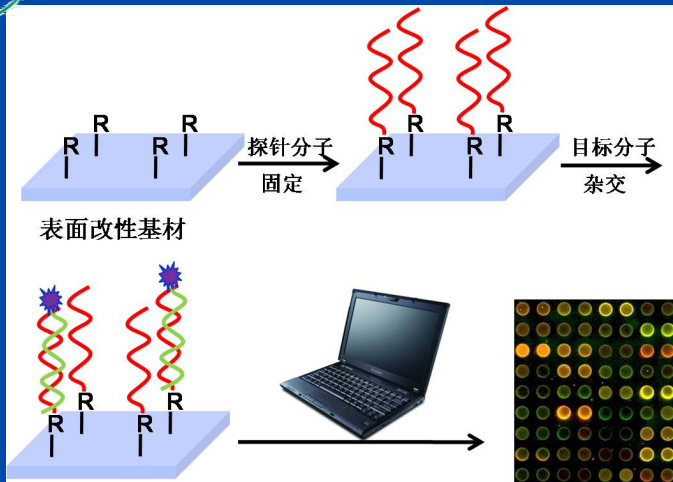
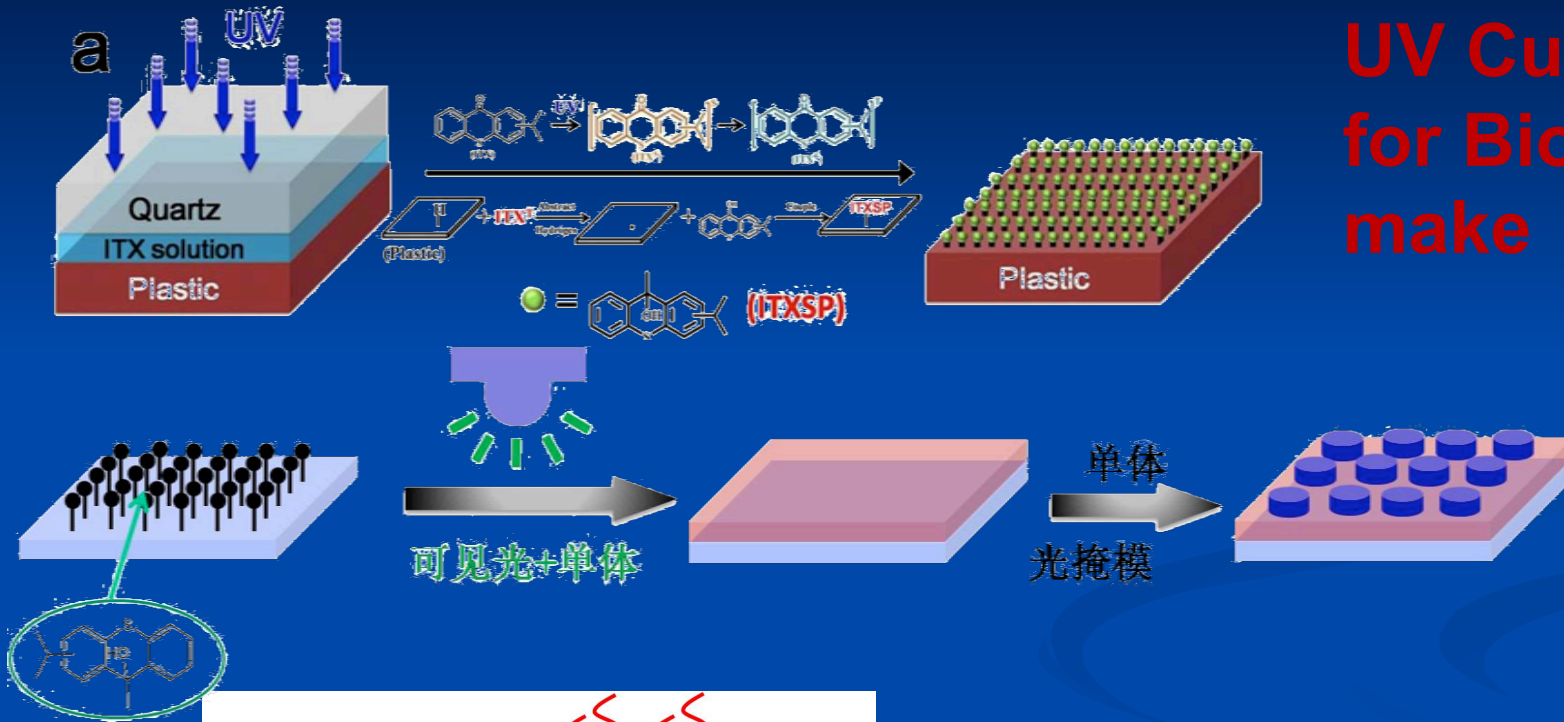
- Heavy pigmented formulation
- Bulky Photocuring
- Remote Photocuring
- Photoinitiated Shadow Curing





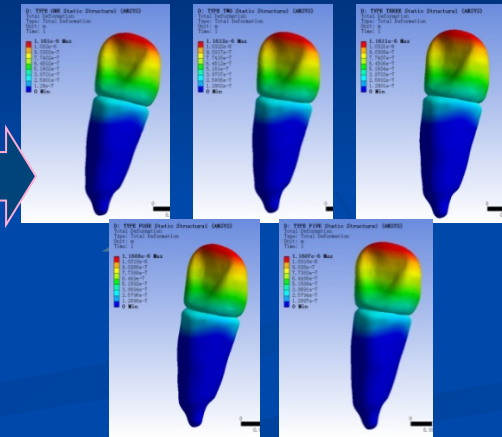
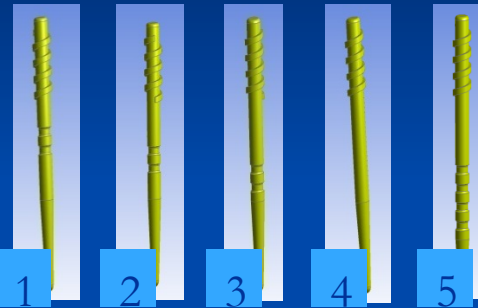
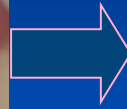
中国感光学会辐射固化专业委员会 RadTech China

UV Curing for Bio-Chip make





Dental Composites



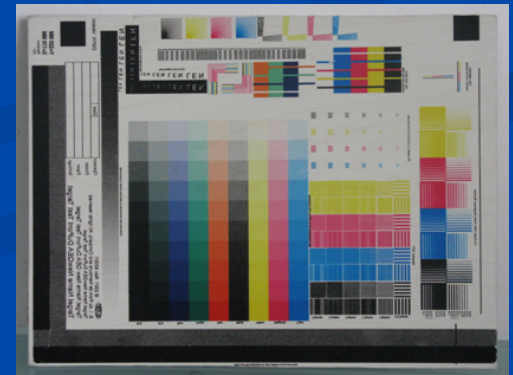
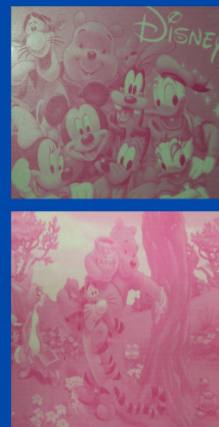


中国感光学会辐射固化专业委员会
RadTech China

Ink jet Printing

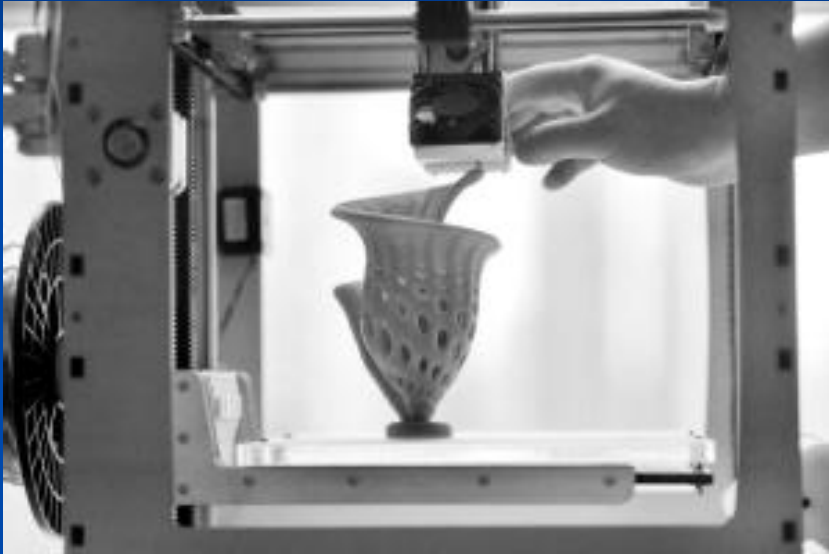


Printer and inks





UV 3D Printing



- ◆ Lower Viscosity monomers
- ◆ Fast curing speed

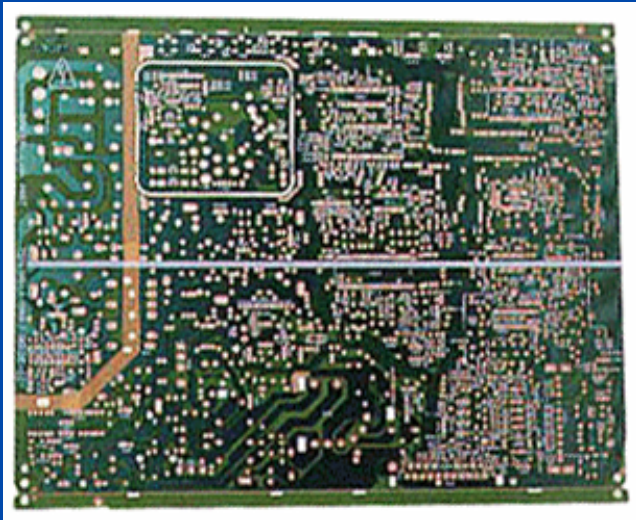
Inks: acrylate epoxy



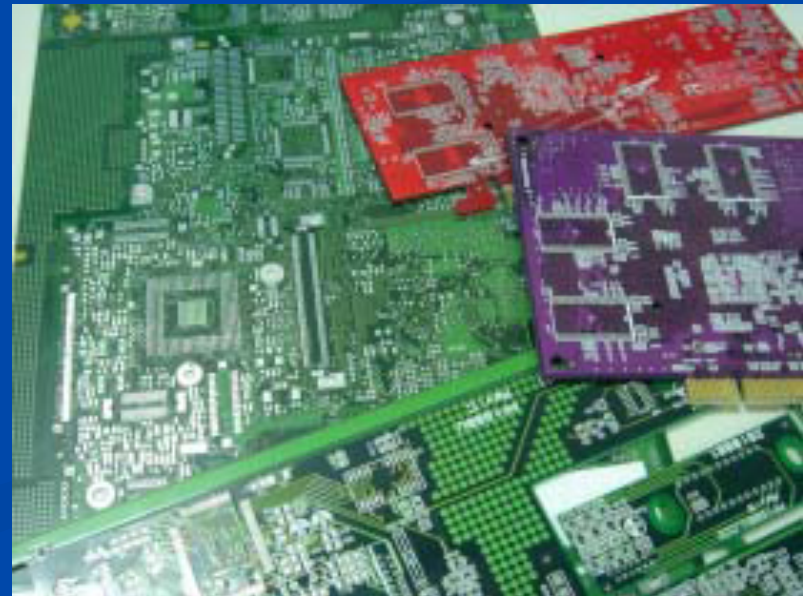


PCB ink cured by LED light

LED PCB



Light source and
formulations matching





中国感光学会辐射固化专业委员会
RadTech China

Thermal Transfer Films cured by UV





中国感光学会辐射固化专业委员会
RadTech China

THANK YOU

THANK YOU