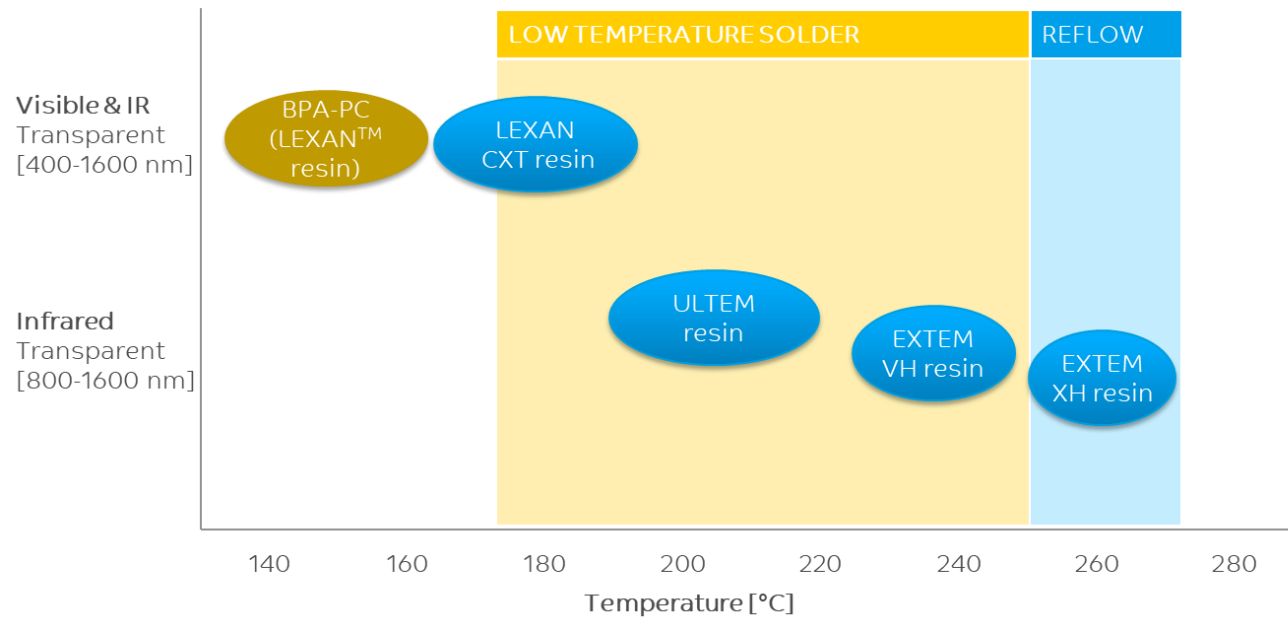


SABIC'S THERMO-OPTICAL PORTFOLIO

SABIC offers a wide range of solutions for optical applications that use soldering for mounting of parts and modules onto PCB's.

- Crystal clear LEXAN™ CXT resins for low temperature soldering, and
- IR transparent ULTEM™ and EXTEM™ resins for more demanding solder processes, including reflow soldering.



Optical Performance with Reflow Capability

Broad resin portfolio supported by data for light transmission, refractive Index (wavelength, temperature) and heat resistance for reflow soldering assembly / surface mounting.

Economy of Scale

Micro-injection molding of thermoplastics resin allows tight tolerancing and mass production of parts.

Design Freedom and Part Integration

Thermoplastics can allow for complex part designs and the integration of mechanical (such as fixtures) and optical features for simplified assembly.

SABIC RESIN PORTFOLIO FOR OPTICAL COMPONENTS

Optical Sensors Lenses

EXTEM™ resin can be the material of choice for optical lenses:

- High IR transmission (850 nm)
- Possibility for free form optics in mass production
- Withstands reflow temperatures (JEDEC J-STD-020D)

Optical Transceivers Lenses

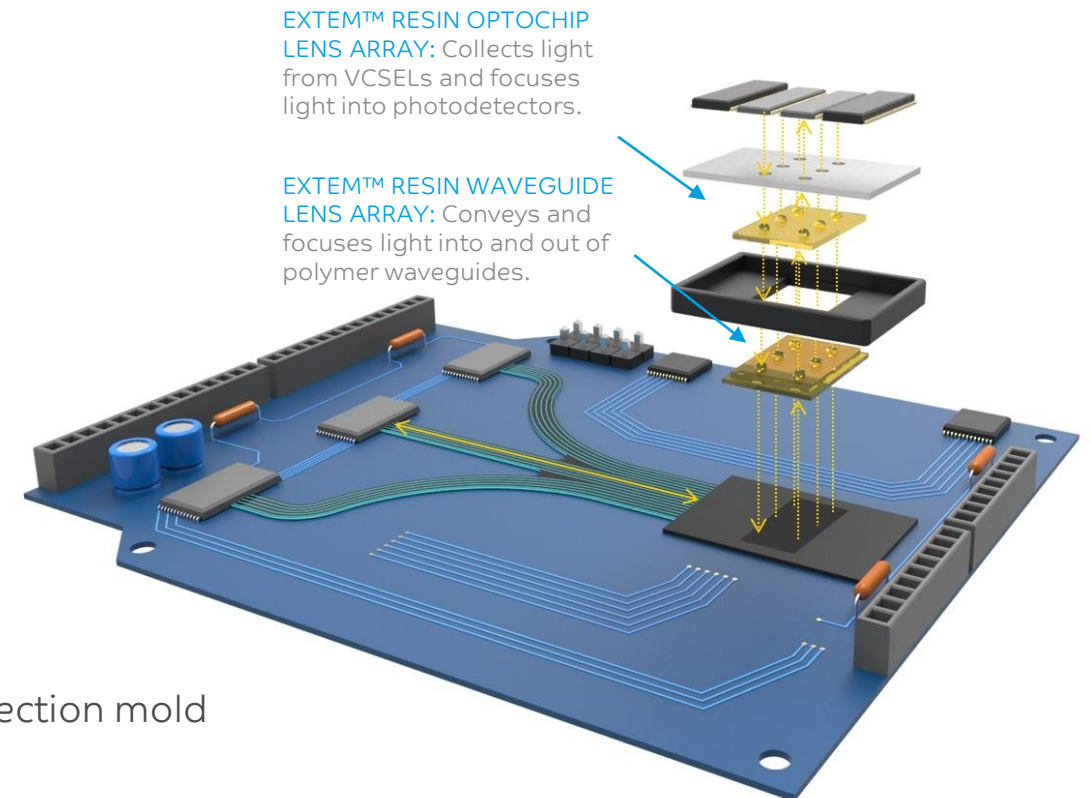
ULTEM™ resin has been a preferred resin since many years for both lenses (transmit and receive side) for multi-mode optics:

- High IR transmission (850 nm)
- Ability to mold lens and housing in 1 shot, for easy alignment/assembly
- Dimensional stability at wide temperature range

On Board/Co-packaged Optics Lenses

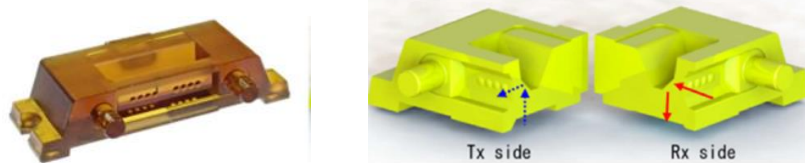
EXTEM™ Resin can be the material of choice for optical lenses:

- Ability to form complex shaped, lens array connectors, easy to injection mold
- Hermetically sealed light coupling (vs grating or butt coupling)
- Ability to withstands reflow temperatures (JEDEC J-STD-020D), signal loss will remain low after Surface Mounting



INTERCONNECTS FOR CPO / ON BOARD OPTICS – CAN WE COOPERATE?

Example of On Board/CO-package Optical Interconnect*



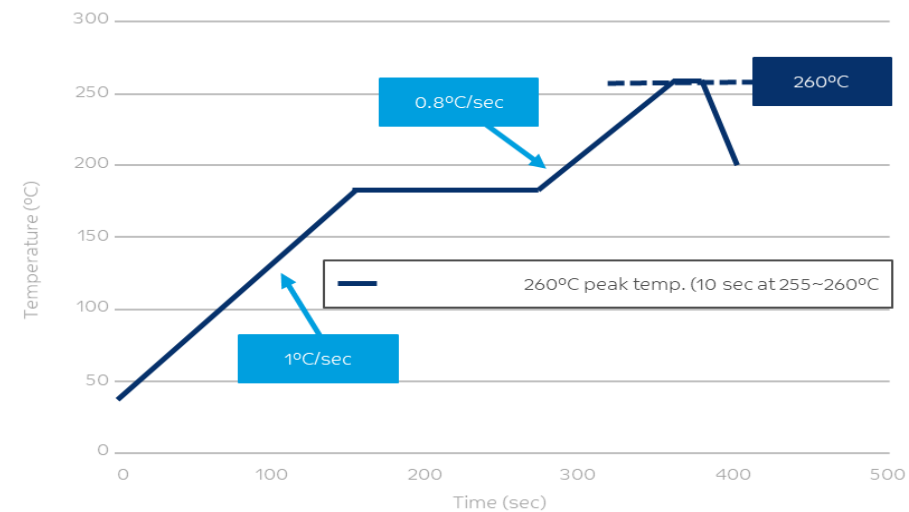
Transmitting from laser to fiber
Receiving from fiber to detector

Molded by NALUX Japan for OEM working on Multi Mode on board optics/CPO

- For VCSEL and photodetector single chip and arrays
- MT Ferrule connector with Tx/Rx integrated design
- Opportunity for use in lead free Reflow Soldering
- Operating wavelength : 850 nm
- W4.3 x L8.9 x H2.1 mm

* with permission of NALUX JAPAN

Reflow Soldering study of interconnect



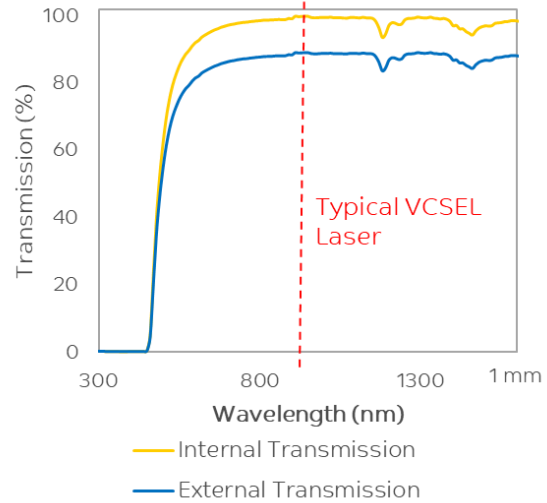
Results after 3 cycles REFLOW

- All critical dimension changes are sub micron
- Only 0.2 dB (~4 % of the light signal) loss can attributed to lenses made of EXTEM resins.

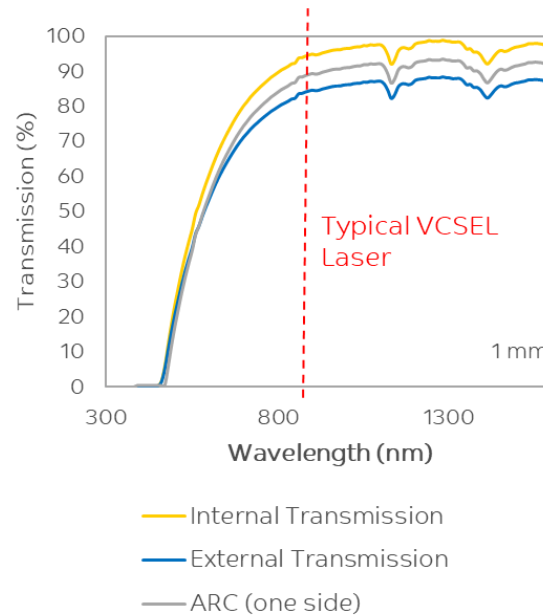
SABIC is looking for partners to work with us on Interconnects for CPO/On Board Optics.

OPTICAL DATA OF OUR THERMO-OPTICAL RESINS

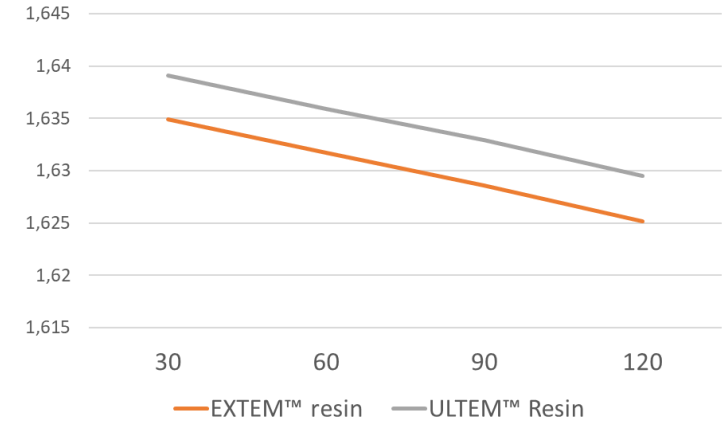
ULTEM™ 1010 (T_g 217°C)



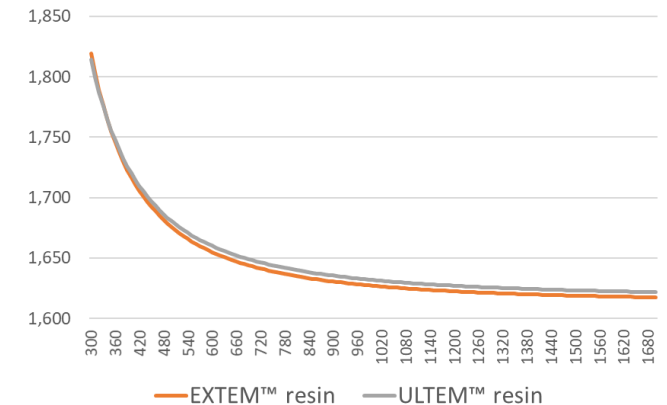
EXTEM™ XH1015 (T_g 267°C)



RI (825 nm) as f(Temp (°C))



RI (23C) as f(wavelength (nm))



Zemax OpticStudio®

Aiding designers in selecting the right material for their application, SABIC has added the thermo-optical resins in the materials database of the Zemax OpticStudio®, the industry-standard in software for designing optical systems.

INTRODUCING SABIC



WE MAKE INNOVATIVE SOLUTIONS

At SABIC we strive to do the things others believe impossible.

SABIC produces highly differentiated products with a distinct set of multi-function physical properties to serve a wide range of industries. The branded portfolio includes ULTEM™ resins and films, LNPT™ compounds, NORYL™ resins, LEXAN™ copolymers and EXTEM™ resins. SABIC also offers extensive material processing expertise, leveraging its product engineers and global application technology development centers.

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+31627080908



3rd
Largest global
chemical company*



33,000
Employees
around the world



50
Countries
of operations



64
World-class
plants worldwide



≈ 150
New products
each year



11,738
Global patent
filings