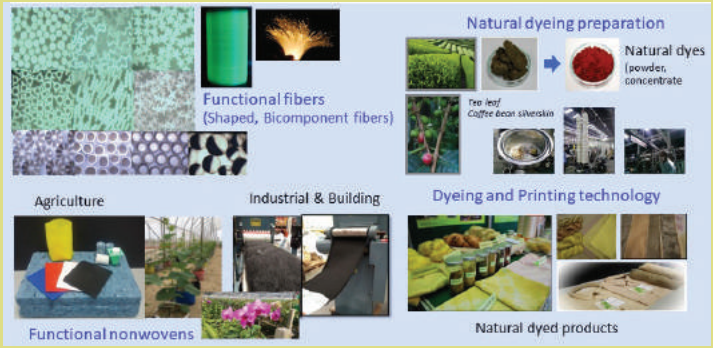
Textile laboratory: TTL (Lab Head: Dr.Chureerat Prahsarn)

This laboratory conducts research and development on textile materials and technology. The research activities focus on three main areas: 1. Fiber Technology: Fiber structural design and spinning for special features and functions (New polymers/new additives, Shaped fibers, Bicomponent fibers, Bio-based fibers) 2. Nonwoven Technology: Structural design and fabrication for specific applications (Agriculture, Lightweight materials, Health &Hygiene) 3. Natural dyes Technology: Dye preparations (powder, concentrated) and applications (dyeing, printing), Eco-textiles

PLATFORM TECHNOLOGY

- Fiber structural design & processing
- Natural dye preparation
- Nonwoven design & fabrication
- Bicomponent fibers
- Natural dyeing and Printing



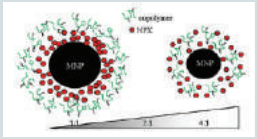
Polymer chemistry laboratory: PCL (Lab Head: Dr. Doungporn Sirikittikul)

Polymer chemistry laboratory conducts research and development in chemistry of polymer synthesis, especially environmentally friendly polymers, from upstream to downstream. Our research works focus on plastic films for agricultural applications such as greenhouse films, nursery bags, and biodegradable fruit bagging film during growth, in order to increase the quality of the agricultural produces. In addition, our research and development also concentrate on the functionalized copolymers for using in food, medical and cosmetics applications.

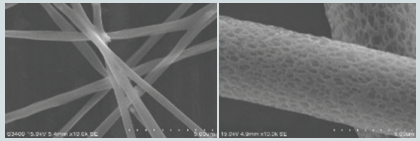
Multifunctional Plastic Film

- UV Filter
- NIR Reflection
- Wavelength Selection
- Light Disfussion
- etc.

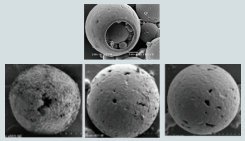
Bio-based materials



Copolymers Coated Magnetic Nanoparticles (NMP)



Bio-based nanofiber



Hollow microbeads

POLYMER RESEARCH UNIT
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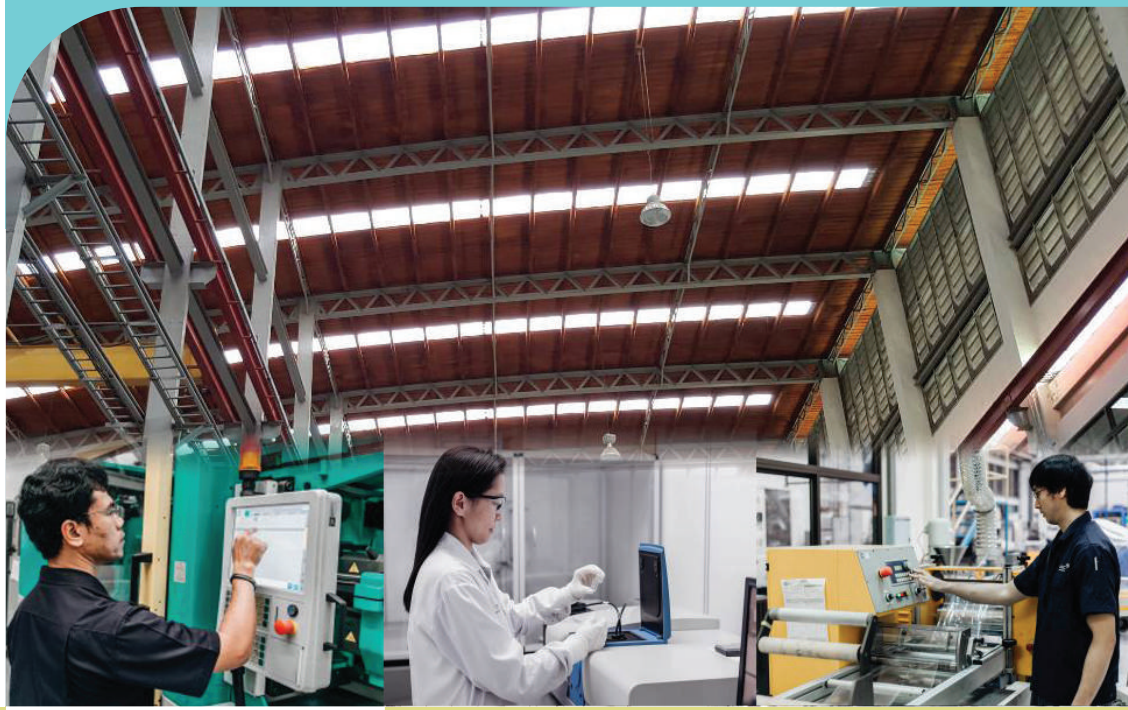
www.mtec.or.th

POLYMER RESEARCH UNIT

National Metal and Materials Technology Center



MTEC
a member of NSTDA

Laboratory

- Plastics Technology Laboratory
- Textile laboratory
- Polymer Physics Laboratory
- Polymer chemistry laboratory

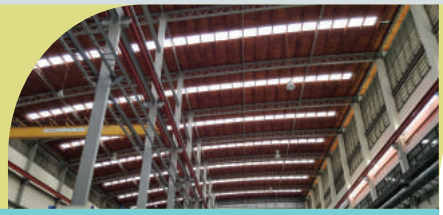
Mission

Our mission is to enhance technology adoptions & innovations of Thai polymer-related industries, especially plastics, textiles and agro- & food industries through application-oriented research activities. The activities include in-house & contract research works, technical services, consultancy, technology transfers and strategic collaborations.

Current Research

Our research works aim to achieve necessary fundamental knowledge, technology and commercial prototypes for the Thai industrial sectors. We also carried out in-house research to establish knowledge and continually develop R&D staff skills. Our current research focuses are synthesis of functional polymers and organic materials, development of functional films and plastic products, and biodegradable plastic processing. Moreover, numerous developments and designs of special fiber & nonwoven structures and natural dyes have been achieved; and applications of rheology in food structure design are now being extensively explored.

Director
Dr.Asira Fuongfuchat
e-mail: asiraf@mtec.or.th



PLATFORM TECHNOLOGY

- Plastics Film Technology
- Fiber Technology
- Natural Dye
- Injection Molding (Micro/Nano molding/ICM)
- Plastics Compounding
- Rheology
- Molecular Structure Design & Modification

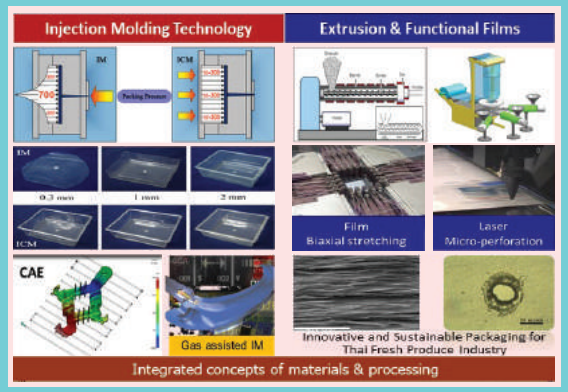
Plastics Technology Laboratory: PTL (Lab Head: Dr. Witchuda Daud)

This Laboratory conducts research and development as well as providing technical services, using the skills and expertise of its staff coupled with appropriate application of modern instrumentation. Cutting edge equipment and fundamental analysis tools form the basis for building up the knowledge and understanding required to develop materials and processing technology to better suit the needs of the end users.

The capability and activities conducted in this Laboratory include: Plastic Development, Design and Production Group, Plastic Mixing and Compounding Group, Plastic Film Technology for Packaging and Industries Group.

Plastics Product Development

- Materials Selection & Development
- Product Engineering
- Rapid Prototyping
- Product Testing
- Shaping Process Development



RESEARCH HIGHLIGHTS

Innovative and Sustainable Packaging for Thai Fresh Produce Industry ActivePAK™, ActivePAK™ Ultra

Snap-tie and HDPE Cable Spacer

Dispensing Closure for Glug-free Pouring

Polymer Physics Laboratory: PPL (Lab Head: Dr.Somboon Sahasithiwat)

The laboratory is an interdisciplinary research group which focuses on fundamental research and technological developments in polymer physics and functional materials. The capability and activities conducted in this Laboratory include

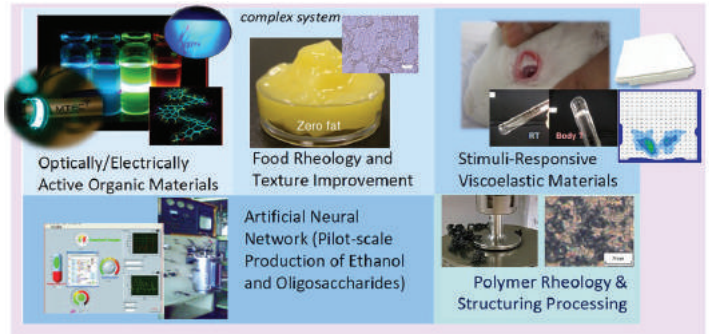
- The development of novel organic materials for optical and electronic applications
- Food rheology

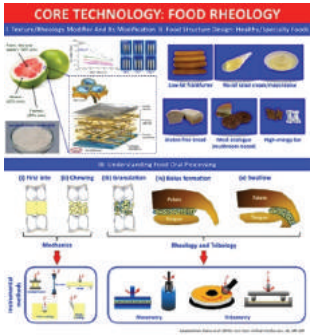
PLATFORM TECHNOLOGY

- Organic Synthesis
- Molecular Structure Design & Modification
- Food Mechanics
- Food Tribology
- Electrically/Optically Active Properties
- OLED/OFET Fabrication
- Polymer & Food Rheology

Rheology for Food Structure Design

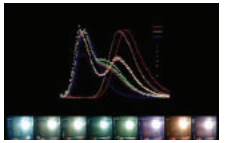
- Low-fat Sausage
- No-oil Mayonnaise & Salad Cream
- Gluten-free Bread & Pastries
- Mushroom-based Burger Patties
- High Energy Bar





RESEARCH HIGHLIGHTS

[5] helicene derivatives synthesized in our lab



White OLED fabricated in our lab