



**Specialty Chemical Products**

**Related Technologies |**

Development of 5G high-frequency PCB substrate resin materials, development of colloidal and solid electrolyte, development of hydrogenation catalyst, development of de-aromatized solvent, development of DCPD derivatives, research and development of process additives and technical services for preventing unplanned furnace shutdowns.

**Product Development |**

Trial production of 5G high-frequency PCB substrate resin materials (PPE), development of colloidal and solid electrolyte, development of polymer particles and cooperation with BASF for its application in LED lighting, development of environmentally-friendly plasticizers.

**Biotechnology**

**Related Technologies |**

- Special microorganism screening technology: selection of hydrocarbon utilizing bacteria, Chitin decomposers, lactics and PHA producer.
- Microbial fermentation technology: magnified production of microorganism.
- Active ingredients extraction and purification technologies.
- Efficacy analysis technologies: spectrum analysis, electrophoretic analysis, chromatographic analysis and cell analysis.

**Product Development |**

**Biodegradable plastics**

PLA , PHA and ethyl lactate.

**Cosmetic and Skincare Product Ingredients**

Moisturizing ingredient NAG, skin brightening ingredient MiBlancSol, new-generation chemical peeling ingredient (lactobionic acid) and the ingredient that improves skin absorption (liposome).

**Cosmetic and Skincare Products**

GSH Bio-Cellulose Mask, Molecular Anti-Wrinkle Essence and nano zinc protective anti-bacterial gel (hand sanitizer).

**Eco-friendly cleaning products**

See Clean cleaning products (eco-friendly laundry detergent, dishwashing detergents and bathroom cleaner).

**Car detailing products**

Coating agent and car window cleaner.

**Micro-organism agents**

Decomposition of oil, removal of ammonia and nitrogen, etc.



**Refining & Manufacturing Research Institute**





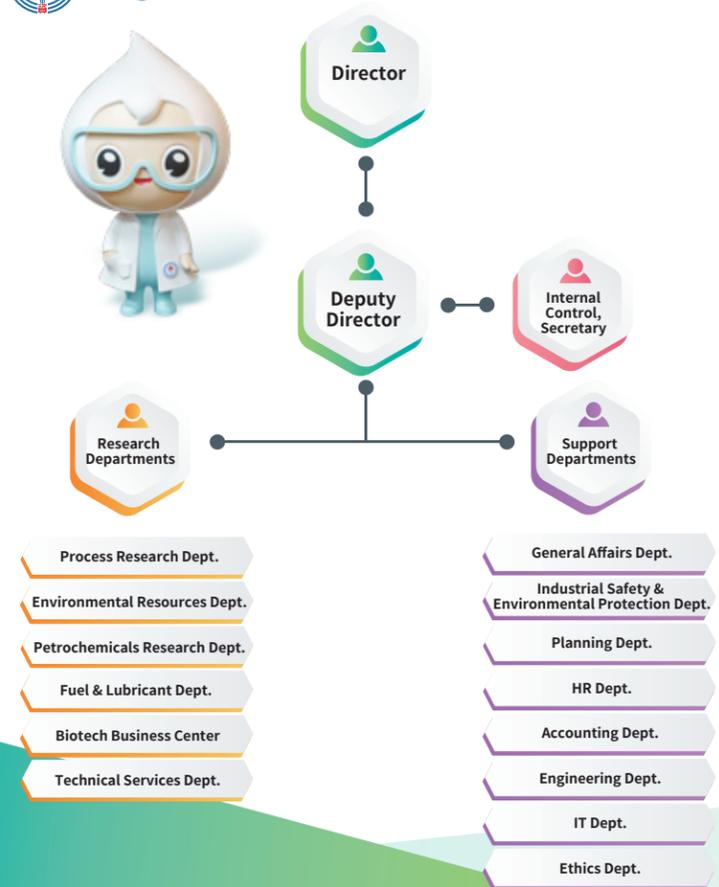
## Business Philosophy

The Refining & Manufacturing Research Institute applies its core technologies to support the production units of the CPC Corporation, Taiwan in order to maintain production stability, improve fuel quality, protect environmental safety, innovate on new products, etc.

- Focus on innovation/R&D and technical services.
- Improve core technologies to support the future development of other business divisions.
- Leverage strategic alliances and external partnerships to accelerate the commercialization of new products and technologies.
- Provide a variety of analysis and testing services to external clients.



## Organizational Chart



## Products, Technologies and Testing Services



### Fuels and Lubricants



#### Related Technologies |

Lubricating grease formulas, lubricating grease performance testing and analysis, wear and lubrication maintenance, lubricating grease product applications, full specification oil test instruments, standard engine and vehicle fuel economy test equipment, calibration of natural gas flow metering and electric car battery testing equipment.



#### Concrete Achievements |

Ensure domestic gasoline and diesel quality, provide fuel testing services, obtain national certification of mass-flow gas metering calibration experiment, develop new products of CPC lubricant, obtain API and related OEM certification for CPC lubricating grease and develop standard engine and vehicle fuel economy testing technologies.



### Technical Services



#### Related Technologies |

Lab analysis of organic and inorganic substances, pipeline operation improvement & energy conservation research for refinery and facilities, long-distance pipeline monitoring system, smart pipeline corrosion defect detection technology, development of batteries and energy storage materials, and development of composite materials for motor vehicles.



#### Related installations |

Smart green gas stations, Smart Energy Management System (EMS), smart pipeline corrosion defect detection system, production facility of battery materials and on-site pipeline safety technical service.



### Environment Resources



#### Related Technologies |

Treatment and recovery of waste/wastewater, advanced oxidation processes (AOP) technology for waste liquid, soil screening methods of Total Petroleum Hydrocarbons (TPH), VOC monitoring, vapor recovery condensing power generation and health risk assessment.

#### Environmental Testing Services ●●●●●

Analysis of ethylene and ethane in the air

C3

Analysis of VOC above C3 (included) in the air



### Manufacturing Process Improvement



#### Related Technologies |

Catalyst/adsorbent assessment and application, improvement of refining and manufacturing structures, economic assessment of manufacturing processes, development of new manufacturing processes, hydrogenation technologies, catalyst testing services, AI & Big Data technology applications and on-site technical service and troubleshooting.



#### Application Plans |

Pilot plant of soft carbon production, CO<sub>2</sub> capturing and utilizing technology, entry of CPC-made battery materials into the energy storage market, Advanced Catalysis Center (ACC), development of high-value ethylene products and setting up DCPD production factory.

