

# LDC

Induced Draft Cooling Tower  
Heavy Duty Counter Flow Type



LIANG CHI INDUSTRY (THAILAND) CO.,LTD.





## PURCHASER'S SPECIFICATIONS

### ADVANTAGES AND FEATURES :

#### 1. HIGHEST PERFORMANCE

Provide with more wetted surface for uniform water distribution and higher heat transfer efficiency.

The filling and drift eliminator allow the maximum air volume through the cooling tower.

#### 2. LOWEST MAINTENANCE

Construct with durable materials for Cooling Tower like preservative treated wood, fiberglass reinforced polyester and asbestos cement boards. The steel is hot dip galvanized after fabrication to be anti-corrosive.

#### 3. ECONOMICAL OPERATION

Optimize with special axial fans, speed reducer and drift eliminator etc. It is maximized the cooling performance at lower energy.

#### 4. NOISE LEVEL

Design with large fans at low speed operation to minimize noise pollution. The venturi fan cylinder will be added on larger Cooling Tower for low noise level.

Purchaser's specifications must clearly outline all conditions which are applicable to the installation so that economical Cooling Tower selection can be made based on a total cost evaluation including not only capital investment but also operating costs. Items which should be given consideration for inclusion in specifications are listed below.

#### DESIGN CONDITIONS

1. Total Heat Load : Kcal/Hr
2. Circulating Water Flow : M<sup>3</sup>/Hr
3. Pump Head Required : M
4. Water Inlet Temp : °C
5. Water Outlet Temp : °C
6. Ambient Wet Bulb Temp : °C
7. Average Wind Velocity and Direction
8. Available Installation Area
9. Electrical Voltage and Frequency
10. Conditions of Area Surrounding installation site.

#### MATERIALS TO BE USED

1. Mechanical Equipment Material Including fan, Reducer & Drive Shaft
2. Materials of Framework and Casing
3. Materials and Treatment of Structure Connectors
4. Materials and Treatment of Piping System

#### OTHER ITEMS

1. Purpose of Tower Usages
2. Location of Piping
3. Capacity of Cold Water Basin
4. Quality of Circulation Water
5. Time of Delivery

# COOLING TOWER STRUCTURE SELECTED LIANG CHI INSTALLATIONS

Liang Chi LDC towers are field erected, heavy duty, counter-flow Cooling Towers, custom designed for individual site and thermal requirements. LDC Cooling Towers are widely used in all branches of industry such as the chemical industry, power plant, refineries, petrochemicals industry, steel industry, large HVAC application, paper pulp industry etc. LDC field erected Cooling Tower structures can be constructed using a variety of materials, HDGS steel, concrete, treated wood or pultruded fiberglass.

## HDGS COOLING TOWER



Galvanized steel structural frames are typically assembled with galvanized fasteners, we also provide an option for stainless steel, The Steel frame structure are very strong and non-corrosive. The consumption of time for construction and installation of steel cooling towers are very less in comparison to the conventional Cooling Towers such as RCC and wooden Cooling Tower.

## TREATED WOOD COOLING TOWER



Liang Chi wooden cooling towers are designed for the highest efficiency at the lowest operating cost with main structural components of selected preservative timber. Wood was treated with preservative acid chromate copper arsenate (CCA) to prevent micro-organisms attack to wood structure, fan deck, stair ways are of treated wood.

## REINFORCED CONCRETE COOLING TOWER



Reinforce Concrete Cement (RCC) cooling towers designed for heavy industrial applications such as oil plants, power plants, fertilizer and chemicals plants for higher thermal efficacy and compactness, RCC counter flow Cooling Tower is acknowledged for the following attributes, compactness, easy maintenance, robust construction, easy installation and low noise.

## FRP PULTRUSION COOLING TOWER



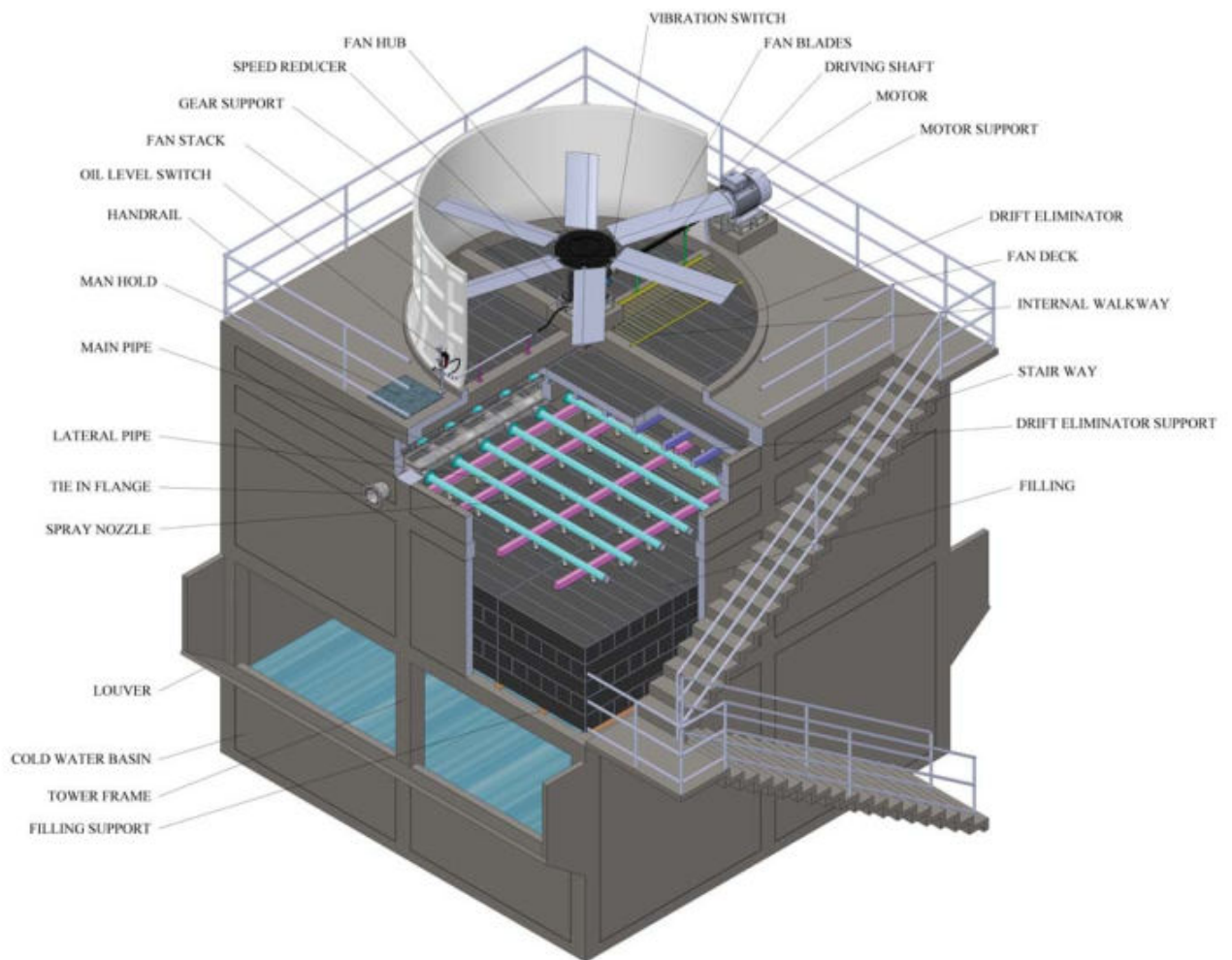
Pultruded FRP is now recognized as the best structural material for cooling tower construction because it offers, cost competitiveness with wood, metal, concrete, etc., design innovations, high strength, light weight, corrosion/rot resistance, consolidation of parts, ease of erection.

# LDC SERIES FEATURES

Liang Chi proudly offers our industrial grade, site erected counter flow towers design that provide maximum cooling performance and can be supplied in a variety of structural and equipments to meet your specific cooling needs, we offers the most effective and efficient cooling solutions. Every equipments offers are made with high-quality field tested components and the counter flow design within a perfect in a variety of industrial application for power plants, petrochemical industry to large HVAC application.

All equipments are customized by individual customers specification and engineered to provide long and reliable service even in the most demanding condition. We access to the widest range of brand products, with supply, install, and maintain hardware from manufacturers. For example Howden Fan, Hudson Fan, Cofimco Fan, ADDAX Drive shaft, Amarillo Gear, Murphy Vibration Switch, Hansen Gear, Motor ABB, Motor Brook, Motor Siemens, Motor TECO and more.

## TOWER STRUCTURE



# Filling & Drift Eliminator

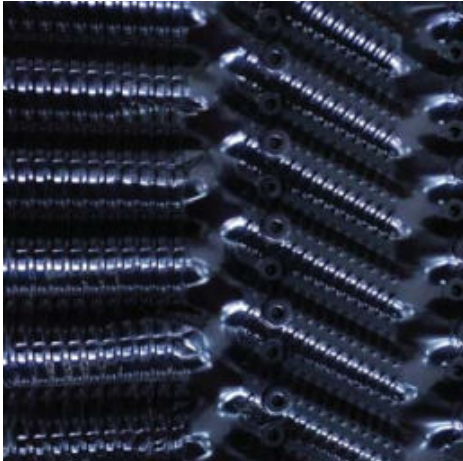


Fill Film Type LC-19

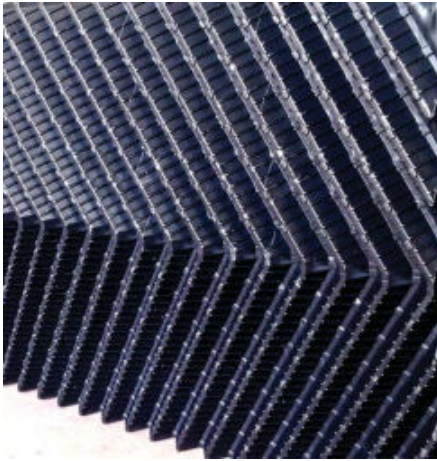
## FILLING (PVC/ PP)

High efficiency fills for LDC heavy duty counter flow type

All of Liang Chi's fill products have been engineered for maximum performance, our experienced engineers will work with you to determine the ideal film fill for your particular application. Liang Chi's standard fills shall be fabricated from rigid, corrugated PVC sheets that are conducive to cooling and resistant to UV, rot fungus, organic/inorganic solvents, acids, alkalis and chemicals commonly found in Cooling Tower waters. As an option, Opti-Bar is also available for counter flow towers, Opti type uses a patented floating hanger design that allows fill layers to float for excellent fit in slanted counter flow designs. This design offers reduced pressure drop, improved splash surface, non-fouling ability and maximum strength.



Vertical Offset LC-21



Fill Film Type LC-23



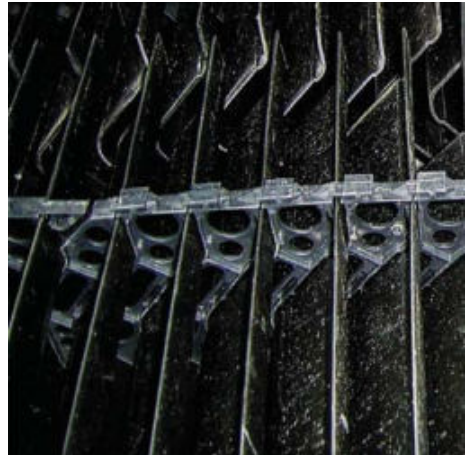
Fill Splash Type OPTI

## DRIFT ELIMINATOR (PVC/ PP)

Specifically-designed to achieve maximum drift removal efficiency in counter flow tower applications while keeping pressure drop significantly lower than cross flow Cooling Towers.



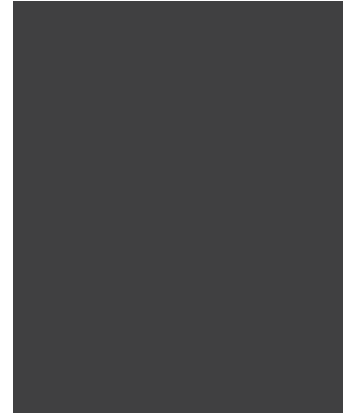
Drift LD-15



Drift LD-15W



# LDC SERIES - MAIN EQUIPMENT



- We supplies ABB Motor, TECO, Siemen Motor, Brook motors and more.

## FAN MOTOR

Cooling Tower motors is **the** most important component of Cooling Tower, thus it must be properly selected for long life and trouble free operation. Liang Chi's motors are specially designed for cooling tower applications, in totally enclosed **TEFC** construction to suit Cooling Tower industries in accordance with IEC standard, IP55, three phase, and equipped in series with a whole host of features for maximum profitability usable and through various options optimally adaptable to their respective task, at the same time the motors are very compact at a high efficiency.

## GEAR REDUCER

Liang Chi Cooling Tower performing brand name in the Cooling Tower industry, The **Gear** speed reducer we use are spiral bevel both single or double reduction **models**. **We provide** performance, reliability, and long life expectancy with proper care and maintenance.

### Durable Amarillo Gear Reducer

**Design** features and ratings are in accordance with or exceed the minimum requirements of AGMA (American Gear Manufacturers Association) and CTI (Cooling Technology Institute) standards.



Stainless Steel Drive Shafts

## DRIVE SHAFT AND COUPLING

We can provide either epoxy composite carbon fiber / stainless steel driveshaft. Every driveshaft is **specified by engineering for specific applications** to achieve optimum performance.

Our custom made stainless steel drive shaft complete with spacers, couplings and hardware. **The** composite disc coupling provides the best value with corrosion resistance, high misalignment, fatigue resistance light weight and ease of installation.



Amarillo composite Drive Shafts



Addax composite Coupling



## FRP FAN STACK

Our fan stacks are manufactured from high quality hand-laid FRP. FRP fan stack are designs to suitable your Cooling Tower fan size and easy for assembly and dismantling. Access door and fire retardant are optional depend your requirement.

## ALUMINIUM FAN BLADES/ FRP FAN BLADES

The fans perform an important function in the operation of a Cooling Tower. It requires a lot of experience in the design and construction to ensure reliable **continuous** functioning of a cooling tower, offer efficient, quiet operation and long service life. Each cooling fan designs have its own unique characteristics in terms of efficiency, noise levels and application.



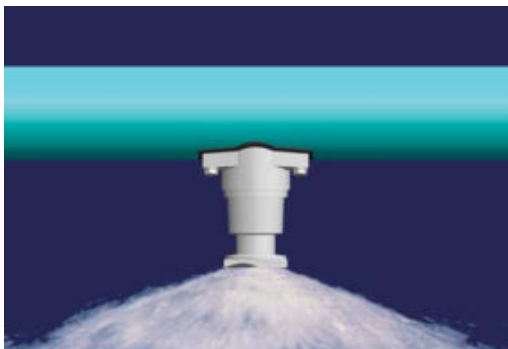
We also supplies Howden Fan, Hudson Fan, Cofimco Fan and more

## COOLING TOWER NOZZLES

Spray nozzle is an essential part of water distribution for large Cooling Towers, it ensures equal distribution of water to the cooling system. We offer a superior quality range of cooling tower **nozzles**. These nozzles are manufactured using optimum quality raw material, which is procured from the authentic vendors of the market, owing to their features like corrosion resistance, easy usage, high durability and optimum performance.



Low Pressure Type Nozzle LTS  
Turbulator Cooling Tower Nozzle



Gravity Type Nozzle LGT



## OIL LEVEL SWITCH

Oil level switch shall be provided and installed outside to protect for sudden loss of oil or low oil level in the gear **reducer**.

## VIBRATION SWITCH

Available in variety of models for applications on machinery or equipment where excessive vibration or shock damage the equipment or otherwise poses a threat to safe operation.



# RESEARCH & DEVELOPMENT

Operation Efficiency, Reliability Quality, Reliable Thermal Performance



Over 50 years of experience in cooling tower design, production and R&D work, Liang Chi has **earned strong** worldwide reputation as a reliable and top quality service provider, guaranteeing and enhancing the thermal performance according to customers' requirements. We always look for solution to provide best products **and services** to our clients; Our in-house R&D department is well equipped with advanced testing equipment controlled by **experience** engineers. They check the quality of incoming components and the finished products before they get dispatched. our engineers also conduct continuous research and development programs to develop new quality control & production techniques that can be adopted within our manufacturing premises. Liang Chi is committed to a Total Quality Management Process. Our goal is to

**"Creating Leading Quality, Providing Devoted Service"**





## SUPPORT & SERVICES

- Design & Engineering
- Tower inspection & Upgrading
- Field Erection
- Tower inspection & Upgrading
- Full range of services with:
  - Thermal upgrad
  - Structural repair
  - Performance testing
  - Performance analysis
  - Component replacement
  - Mechanical equipment
  - Construction supervision
  - Quality control



We build new and renovate old cooling towers our team of professionals is ready to provide a best of services to **you**. Liang Chi will provide you with a strong partner in the field of industrial cooling tower

Liang Chi engineers and technicians are backed up by highly experienced specialist engineers who can advise on construction, noise reduction and mechanical engineering. We maintain a complete installation and service from emergencies and troubleshooting through to training plant personnel, we offer the complete site service package. Our team of experts in charge for after sales activities are involved in maintenance, repair, revamping and modernization of existing cooling **towers**. **Our** service includes inspections, structural and thermal repairs, upgrade, refurbishment, addition of new cells and spare parts supply.



Before



After



Before



After

# LDC COOLING TOWER PROJECT REFERENCE



Sricharoen Biomass Power Plant, Burirum



ES Power Plant



QTC, Samutprakarn



Chang Rak Biomass, Nakorn Srithamarat



Organo, Rayong



Kamalasai Biomass, Karasin



Bridgestone, Chonburi



Double A, Prachinburi



DG Khan Cement, Pakistan



TPT Petro, Rayong



The North Bangkok Combined Cycle Power Plant Block 1( NBCC 1) EGAT

TPT Petrochemicals PCL, Rayong  
LDC-42426T-C3  
44-34-29 °C, 9000 M<sup>3</sup>/hr./Cell  
Chemical Manufacturing

The North Bangkok Combined Cycle  
Power Plant Block 1 (NBCC1) (EGAT),  
Nonthaburi  
LDC-132667BT-RCC5  
41-31-28 °C, 42700 M<sup>3</sup>/hr./Set  
Power Plant

Thai Plastic and Chemicals PCL, Rayong  
LDC-42485T-RCC1  
40.1-32-29 °C, 2500 M<sup>3</sup>/hr./Set  
PVC industry and related businesses

Thai Bridgestone Ltd.  
LDC-30246T-FRC-4  
37-32-28 °C, 4,900 M<sup>3</sup>/hr./set  
Anti-vibration rubber, Automotive hose etc.

Tuntex Petrochemicals (Thailand) PCL,  
Rayong  
LDC-6500D-C4  
43-34-29 °C, 3500 M<sup>3</sup>/hr./Cell  
Petrochemical Products

U-Thong Biomass Ltd., Suphan-Buri  
LDC-24243T-RCC4  
45-35-28 °C, 3680 M<sup>3</sup>/hr./Set  
Biomass power plant

Vinythai PCL, Rayong  
LDC-18185FT-FRC1  
39.5-32-28.5 °C, 515 M<sup>3</sup>/hr./Set  
PVC Resin and related chemical

Advance Agro Effluent treatment plant  
LDC-23239SPT-FRC1  
55-36.5-28 °C, 500 M<sup>3</sup>/hr./Set  
PULP & PAPER MILL

Banpong Engineering Ltd., Suphanburi  
LDC-24243-RCC4  
45-35-29 °C, 3680 M<sup>3</sup>/hr./Set  
engineering works

Chang Raek Biomass Power Plant,  
Nakhon-Srithammarat  
LDC-24246T-RCC3  
46-34-29 °C, 2400 M<sup>3</sup>/hr./Set  
Biomass Power Plant

DG Khan Cement Company,  
Lahore, Pakistan  
LDC-36306T-FRC3  
44-32-28 °C, 2700 M<sup>3</sup>/hr./Set  
Power Plant

ES POWER phase 1, Sa-Kaew  
LDC-303042OPT-FRC4  
49.6-34-29 °C, 6000 M<sup>3</sup>/hr./Set  
Power Plant

General Motors, Rayong  
Eastern Seaboard Industrial Estate  
LDC-663B-C3,  
42-35-30 °C, 6698 M<sup>3</sup>/hr./Set  
Auto industry

Kamalasai Biopower 2010 Ltd.  
LDC-24244T-RCC3  
43-33-29 °C 2800 M<sup>3</sup>/hr/Set  
Bio-Power

Organo (Thailand)Ltd., Rayong  
LDC-30245T-RCC2  
43-33-29 °C, 1800 M<sup>3</sup>/hr./Set  
Waste filtration, Treatment systems

QTC Engineering  
LDC-20204T-RCC1  
40-32-29 °C, 450 M<sup>3</sup>/hr./Set  
Electrical related service

Sricharoen Biopower Ltd., Buriram  
LDC-24245T-RCC3  
44-33-29 °C, 3000 M<sup>3</sup>/hr./Set  
Bio-power

Samutprakarn Cogeneration Ltd. (SCC)  
LDC-886T-RCC3  
39.5-32-28.5 °C, 9100 M<sup>3</sup>/hr./Set  
Electric Power Unit



# LIANG CHI STRONG WORLDWIDE SALES AND SERVICE NETWORKS



*Together we cool*



บริษัท เหลียงชิวอุตสาหกรรม (ประเทศไทย) จำกัด  
**LIANG CHI INDUSTRY (THAILAND) CO.,LTD.**

36/172-173 ถ. มอเตอร์เวย์ แขวงคลองสองต้นนุ่น เขตลาดกระบัง กรุงเทพฯ 10520

36/172-173 Motorway Rd., Klong-song-ton-nun, Ladkrabang, Bangkok 10520

Tel: 02-171-7976-91 Fax: 02-171-7973

E-mail: [engineer@liangchi.co.th](mailto:engineer@liangchi.co.th)

