



KIRLOSKAR BROTHERS (THAILAND) LIMITED

HVAC SOLUTIONS

YOUR SUSTAINABLE PUMPING SOLUTION PARTNERS

Our Group Company



Enriching Lives
India



The UK



U.S.A.



The Netherlands

Visit us: www.kirloskarthailand.com

Content :

- CORPORATE PROFILE
- PRODUCTS AND SAVING ENERGY INNOVATION SERVICES
- CASE STUDIES
- BLYGOLD TEST RESULTS
- REFERENCES



Enriching Lives

CORPORATE PROFILE

ESTABLISHED 1888 | INCORPORATED 1920

Core Business : Centrifugal Pumps, Valves, Hydro Turbines, Pumping Projects

Kirloskar Brothers Limited (KBL) is a pump company involved in engineering, design and manufacturing of systems for fluid management. Established in 1888 and incorporated in 1920, KBL is the flagship company of the \$2.5 billion Kirloskar Group. KBL is a global market leader in fluid management.

KBL acquired famous pump brands like SPP Pumps UK and Rodelta Pumps from The Netherlands as well as started a joint venture cooperation with Ebara, Japan since 1988 under Kirloskar Ebara Pumps.



KIRLOSKAR GROUP JOINT VENTURES AND SUBSIDIARIES

01

KEPL (1988)
Pumps and steam turbines

02

KIRLOSKAR TOYOTA (1995)
Textile machinery and auto transmission components

03

KIRLOSKAR CHILLERS (1995)
Large air-conditioning systems on turnkey basis

04

TOYOTA KIRLOSKAR Motors Ltd. (1997)
Light motor vehicles Second largest manufacturer of utility vehicles in India

DENSO KIRLOSKAR (1998)
Engine radiators

TOYODA GOSEI (1998)
Non-metallic auto components such as steering wheels, dashboards, etc.

KIRLOSKAR TSUSHO (1998)
Steel supply to car companies and ancillaries

TOYOTA KIRLOSKAR Auto Parts (2002)
Metallic auto components such as transmissions, steering gears, front and rear axles

05

06

07

08

KIRLOSKAR BROTHERS (THAILAND) LIMITED

KIRLOSKAR THAILAND REGIONAL SETUP Including subsidiary SPP Pumps Asia & Singapore



Our head office :

50 Sukhumvit 21 Road (Asoke), GMM Grammy Place Office Building, 18 FL., Unit 1805, Khlongtoey-nua, Wattana, Bangkok 10110 Thailand.

Our factory :

Amata Nakorn Industrial Estate (Phase 8), 700/711 Moo 1, Phan Thong, Phan Thong, Chonburi 20160 Thailand.

Kirloskar Brothers (Thailand) Limited (KBTL) is the BOI promoted head quarter and assembly plant for the KBL Group of companies for the East Asia region based in Amata Chonburi for Kirloskar, SPP, Rodelta, Syncroflo and KEPL.

- BOI Promoted facility
- Total floor area : 9,600 m²
- Assembly shop with crane capacity up to 15.000 kg
- Hydrostatic testing up to 120 bar
- Repair and Service Area
- Meeting and Training rooms
- Pump sets and UL / NFPA 20 Fire Pump Systems
- Spare part warehouse / on-stock pump program
- Certified welding, fabrication, machining
- Paint Booth and coatings (including Blygold product)
- Engineering & Design
- Testing pump sets in our test lab up to 500 m³/h – 250 kW



OUR BRANDS AND JOINT VENTURES



Enriching Lives



Brand Origin

- India

Manufacturing

- India

Assembly/Packaging

- Thailand
- Europe

Standards

- ISO/ ANSI/ DIN
- FM/ UL
- N Stamp

Main Products

- End Suction
- Split Case
- Multistage
- Vertical Turbine
- CVP

Brand Origin

- United Kingdom

Manufacturing

- India
- UK
- USA

Assembly/Packaging

- Thailand
- ME

Standards

- FM/ UL/ LPC/ NFPA20

Main Products

- End Suction
- Split Case
- Multistage
- Vertical Turbine

Brand Origin

- USA

Manufacturing

- USA

Assembly/Packaging

- Thailand

Standards

- FM/ UL/ NFPA20

Main Products

- End Suction
- Split Case
- Multistage
- Vertical Turbine
- Booster Pumps

Brand Origin

- Netherlands

Manufacturing

- Netherlands

Assembly/Packaging

- Thailand

Standards

- API

Main Products

- OH2
- OH5
- VS4
- VS5
- CVP
- Engineered Specialized Solutions

Brand Origin

- Ebara Japan

(joint venture with Kirloskar)

Manufacturing

- India

Assembly/Packaging

- Thailand

Standards

- API

Main Products

- OH
- VS
- BB
- Steam turbines
- Hydraulic Power Recovery Turbine

Brand Origin

- Netherlands

Manufacturing

- Netherlands

Application

- Thailand

Standards

- ASTM
- ISO 92144

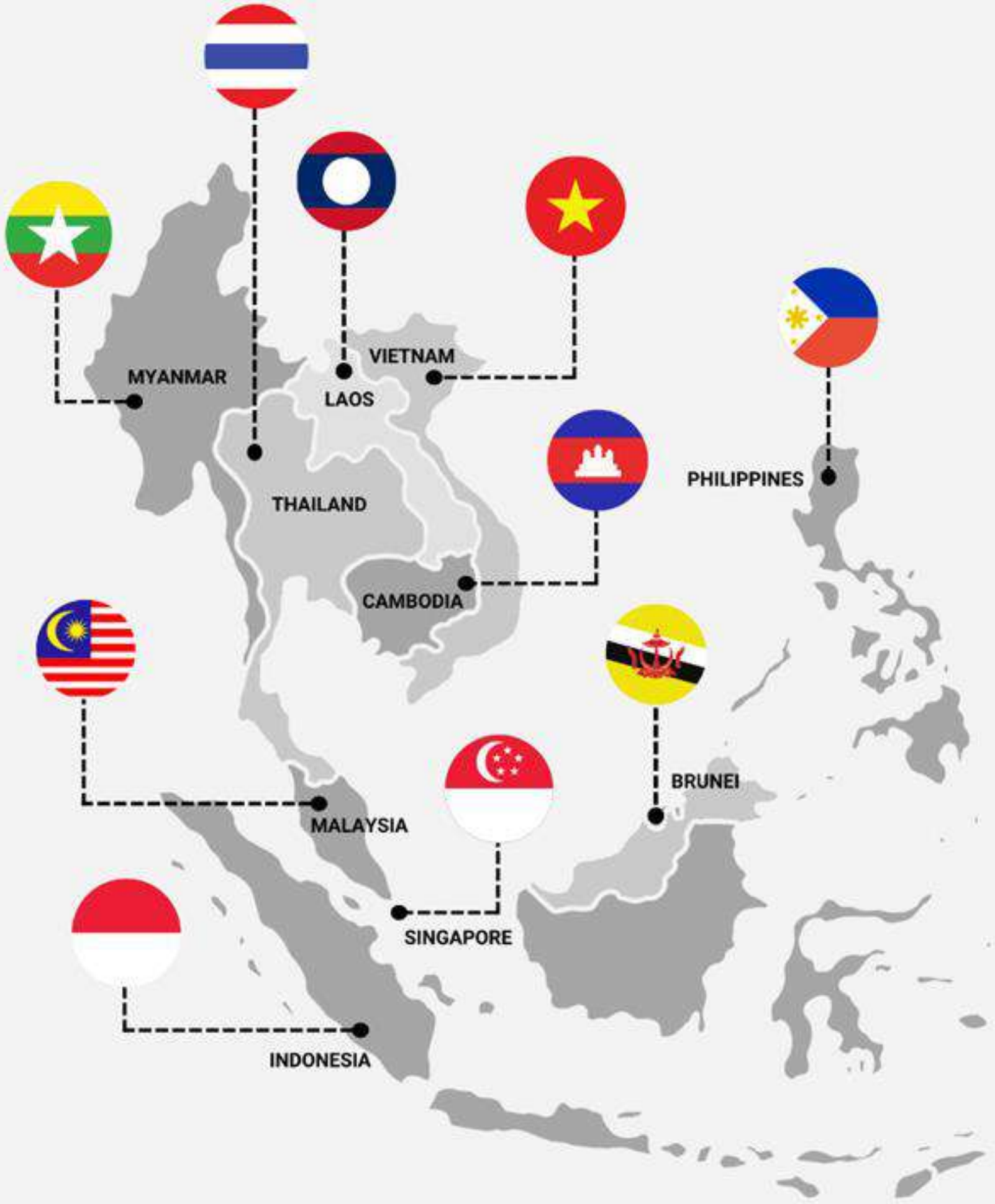
Main Products

- Air Cooled HX protection
- Water Cooled HX protection
- Casing & Cabinet Coating
- Refurbishment & Rejuvenation
- Efficiency improve coating

KIRLOSKAR THAILAND REGIONAL SETUP

Including subsidiary SPP Pumps Asia & Singapore

				
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Thailand

- Kirloskar Brothers Thailand – Bangkok HQ for the ASEAN region for Kirloskar and SPP
- SPP Pumps Asia – Bangkok
- Kirloskar Brothers Thailand – Manufacturing Amata Chonburi common factory for all group brands:
 - Kirloskar
 - SPP Pumps
 - Rodelta
 - SyncroFlo
 - Blygold Thailand

Malaysia

- SPP Pumps Asia – Representative Office Malaysia KL

Singapore

- SPP Pumps Singapore

Indonesia

- SPP Pumps Asia - Representative Office Indonesia Jakarta
- Further we have an extensive dealer network throughout the Asian Region*

OUR KEY COMPETENCE SECTORS



Oil & Gas



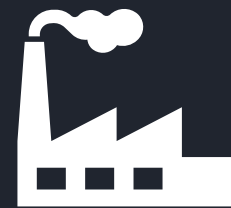
Marine &
Defence



Power



Building &
Construction



Industrial



Irrigation &
Agriculture



Water Resource
Management



Services

Large & Medium Flow
pumping solutions
for complex fluid management system

Small pumps
for day-to-day use at
households and farms

Valves
for industrial and large-
scale applications

Hydel /PAT/PICO
turbines





PRODUCTS AND SERVICE SAVING ENERGY INNOVATION

- HVAC Pumping Products
- Energy Enhance Pump Coating Technology
- Energy Audits
- IoT monitoring
 - Waterpup.ai
 - Firepump.ai

- Corrosion Protection and energy enhance coating
 - Air Cooled HX protection
 - Water Cooled HX protection
 - Casing & Cabinet Coating
 - Refurbishment & Rejuvenation



HVAC Pumping Products



End Suction

- Flow- up to 2200 m³/hr
- Head- up to 150m



Vertical Turbine

- Flow-up to 4500 m³/hr
- Head: Up to 218 psi



Vertical Inline

- Flow- up to 450m³/hr
- Head- up to 45m



Vertical Split Case

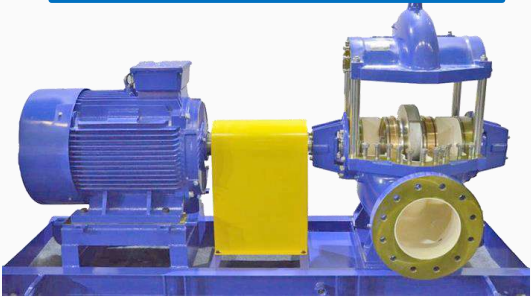
- Flow- up to 1800m³/hr
- Head- up to 280m



Split Case

- Flow- up to 40000m³/hr
- Head- up to 240m

Lowest Lifecycle pumps



LLC™ Pump Set

- Flow- up to 3400m³/hr
- Head- up to 210m



Booster Sets

- Flow-up 0.7 to 200 m³/hr
- Max Pressure 33 bar

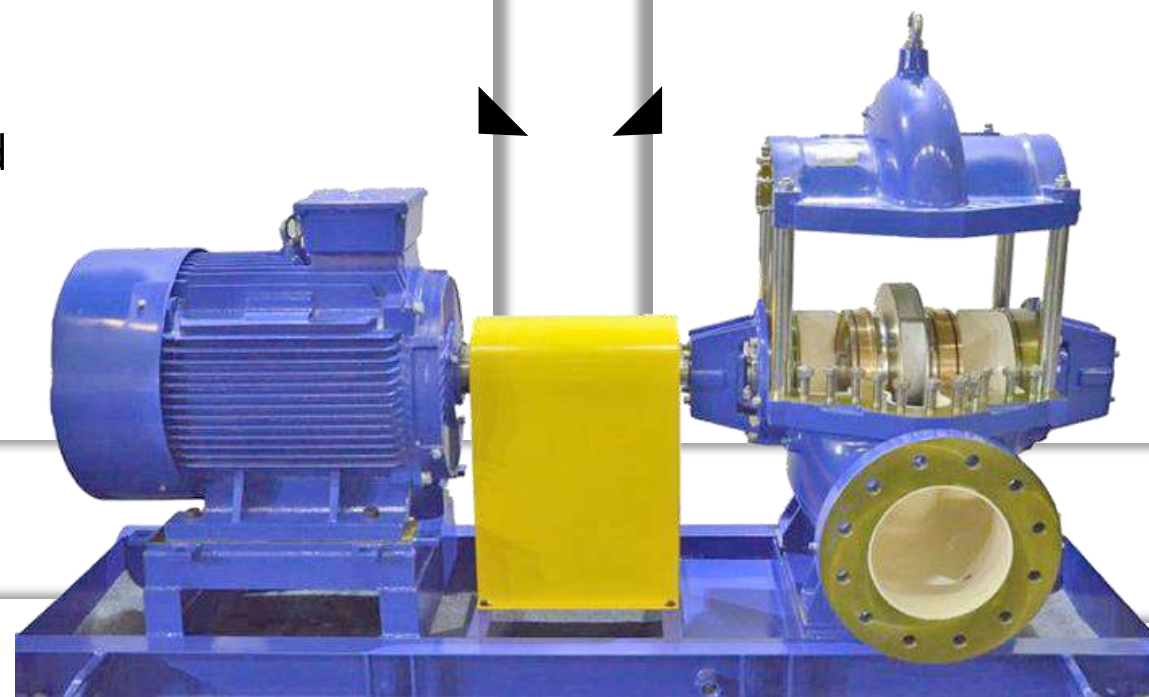
LLC™- HVAC Pumping Products

Lowest Lifecycle Cost pumps - High efficiency and low maintenance

Efficiency drop 1% in 3 years and conventional pumps efficiency drop every year 1%

System Details:

5000 Tonnage system
One pump of 2000 US gpm, 40m head
Working pumps = 75 kW 10 nos.



Product and Benefits

LLC™ Pumps HVAC System results in saving of USD 1 Mn. and 2000 tons reduction in CO2

Saving opportunities

75 kW x 10 Pump x 10 years
USD 7.2 Mn. is only energy cost
Maintenance, Service and Spares extra
+ 22,600 tons of CO2

Pay Back

Pay Back period up to
18 Months

ENERGY ENHANCE PUMP COATING TECHNOLOGY



According Hydraulic Institute pumps loses 1% efficiency every year. By coating your pump, we can achieve:

- Reduce down time (Increase MTBF)
- Improve Efficiency leads to high Energy Savings over a longer period
- Extend Equipment Life as it has higher corrosion resistance
- Reduce Capital Expenditure

We offer a enhance solution for both new and damaged equipment using superior advance technology combined with anti-corrosion technology to provide sophisticated equipment with corrosion resistance tailored solutions

Specialist In Anti Corrosion

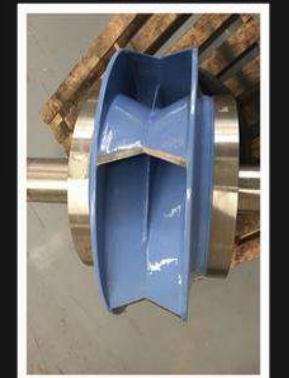
We can apply coatings for the following industrial segment :

- Power generation
- Oil and Gas , Petrochemicals
- Mining & Mineral Process
- Steel Manufacturing
- Marine & Offshore
- Water and Waste
- General Industry

Before



After



ENERGY AUDIT CHECK'S



- 1 Avoid Oversizing
- 2 Impeller Trimming
- 3 Variable Frequency Drives
- 4 Parallel Pumping Systems
- 5 Limit Pipework Pressure Loss
- 6 Eliminate Unnecessary Use
- 7 Maintenance

WISH TO SAVE YOUR ENERGY?



Studying the process & finding the requirements



Analyzing the existing Energy Consumption



Measurement of flow, Power, and head of the present system



Efficiency calculations of present system



Explore option to enhance operating efficiencies of pumps either by refurbishment or through replace of high efficiency pumps



Recommendations based on cost/benefit analysis along with guaranteed energy savings and ROI.

IoT Solutions

Any time, Any where with Monitoring System



Fire Pump Monitoring System

Connected to onsite controllers via a secure gateway, you will be able to keep an eye on everything you need, 24/7. With Firepump.AI you will know exactly when any anomalies, before they become critical and proactive. Monitor crucial data including water supply, fuel supply for diesel engine drives, battery voltage for diesel engine, pump room altitude and temperature according FM 1330.



Water Pump Monitoring System

Help you to ensure reliability through real-time monitoring, predictive maintenance. It enhances cost savings via energy efficiency, reduced operational cost. Operational optimization enables efficient water distribution with data-driven insights. Remote accessibility allows timely issue responses anywhere. This system's environmental impact curbs energy consumption, promotes water efficiency, aiding sustainability.



ADVANTAGES

- 24/7 MONITORING -
- REMOTE ACCESS ANYWHERE -
- SECURE DATA STORAGE -
- INSTANT ALERTS -
- INSPECTION REPORTS IN THE CLOUD -
- REDUCE HUMAN ERROR -
- NO LOST DATA & RECORDS -
- NEVER DISCONNECTED -

CORROSION PROTECTION

HEAT EXCHANGER AND COILS

Blygold is a specialist in corrosion protection, energy saving and lifetime extending services. These activities can be divided into 4 categories:

Air Cooled HX
Coating

Water Cooled HX
Coating

Casing & Cabinet
Coating

Maintenance &
Refurbishment



CORROSION PROTECTION

HEAT EXCHANGER AND COILS

Air Cooled HX protection

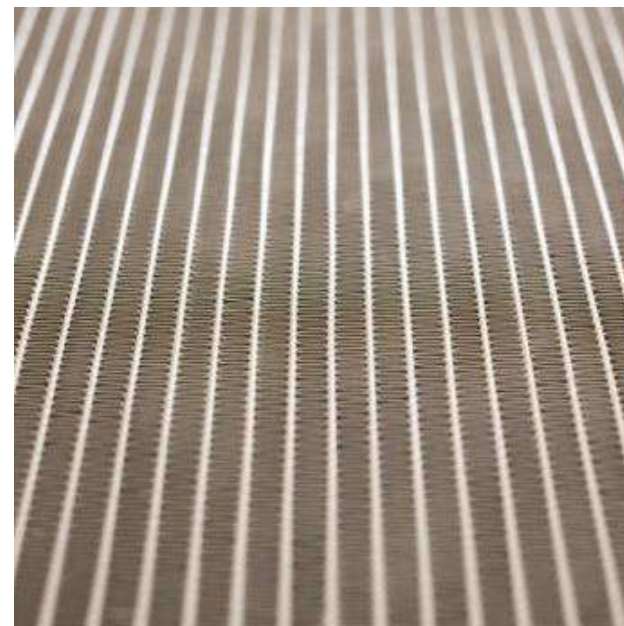
Applicable to various types of HX:

Fin and Tube

Microchannel

Spiral Tubes

Specials



CORROSION PROTECTION

HEAT EXCHANGER COIL

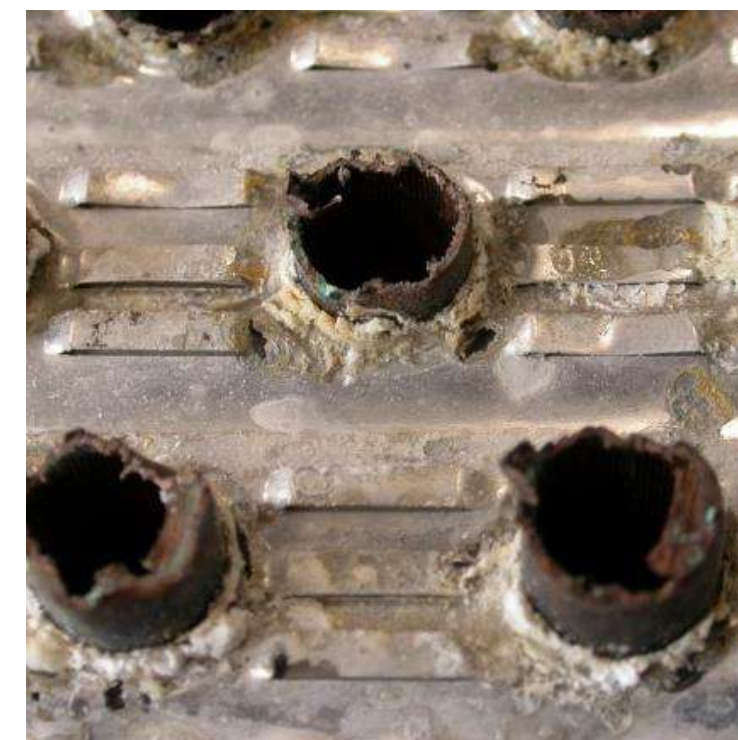
Air Cooled HX Protection

Blygold treatment:

- Prevents corrosion
- Triples the lifetime
- Saves up to 30% on energy cost
- All types of air cooled HX
- Factory & Field application

Without
Blygold

With Blygold



CORROSION PROTECTION

HEAT EXCHANGER COIL

Water Cooled HX Protection

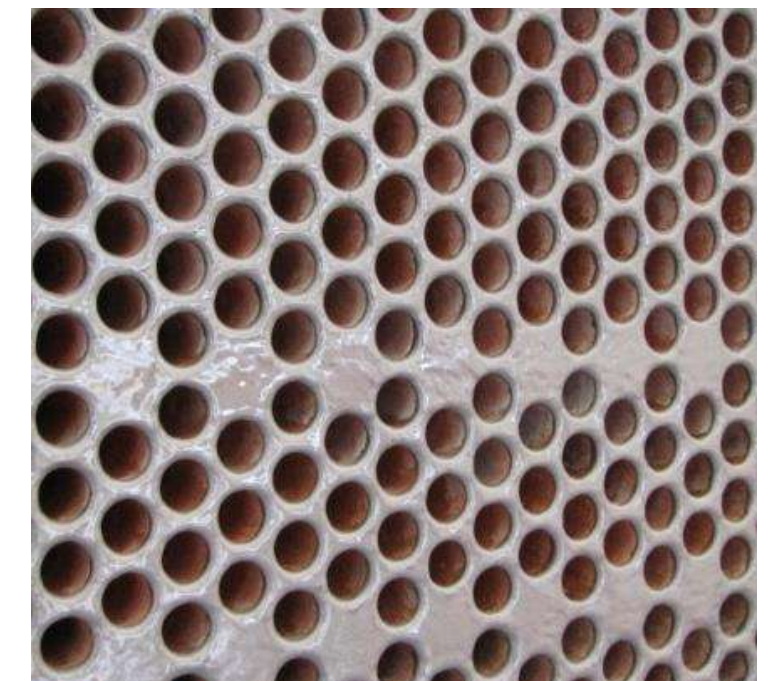
Blygold treatment:

- Prevents corrosion on tube sheet and waterbox
- Unique products and application
- Seals off dissimilar metals
- High chemical and mechanical resistance
- Preventive on new equipment
- Corrective rebuilding of affected surfaces

Without
Blygold



With Blygold



CORROSION PROTECTION

HEAT EXCHANGER COIL

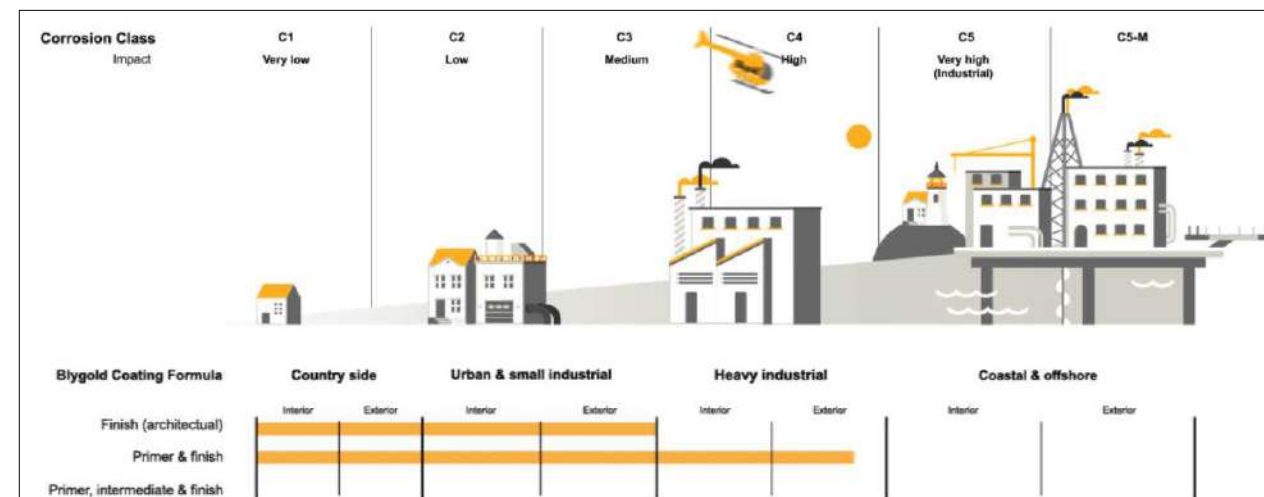
Casing & Cabinet Coating

Blygold treatment:

- Protection up to corrosion class C5-M
- Extends the lifetime
- Casing, cabinets, supports, piping, flooring, etc.
- Meeting architectural demands
- Factory & Field application

Without Blygold

With Blygold



CORROSION PROTECTION

HEAT EXCHANGER COIL

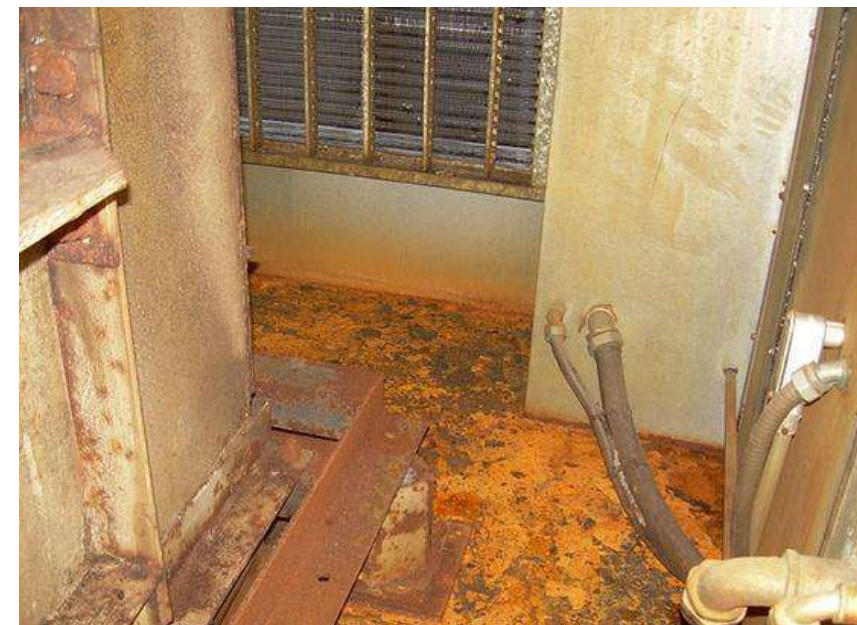
Refurbishment & Rejuvenation

Blygold treatment:

- Rejuvenation with minimal inconvenience
- Optimization of existing equipment
- Add on to standard maintenance
- Simplifies afterwards maintenance
- Lifetime extension up to 15 years!
- Usually less than 35% of replacement costs

Without
Blygold

With Blygold

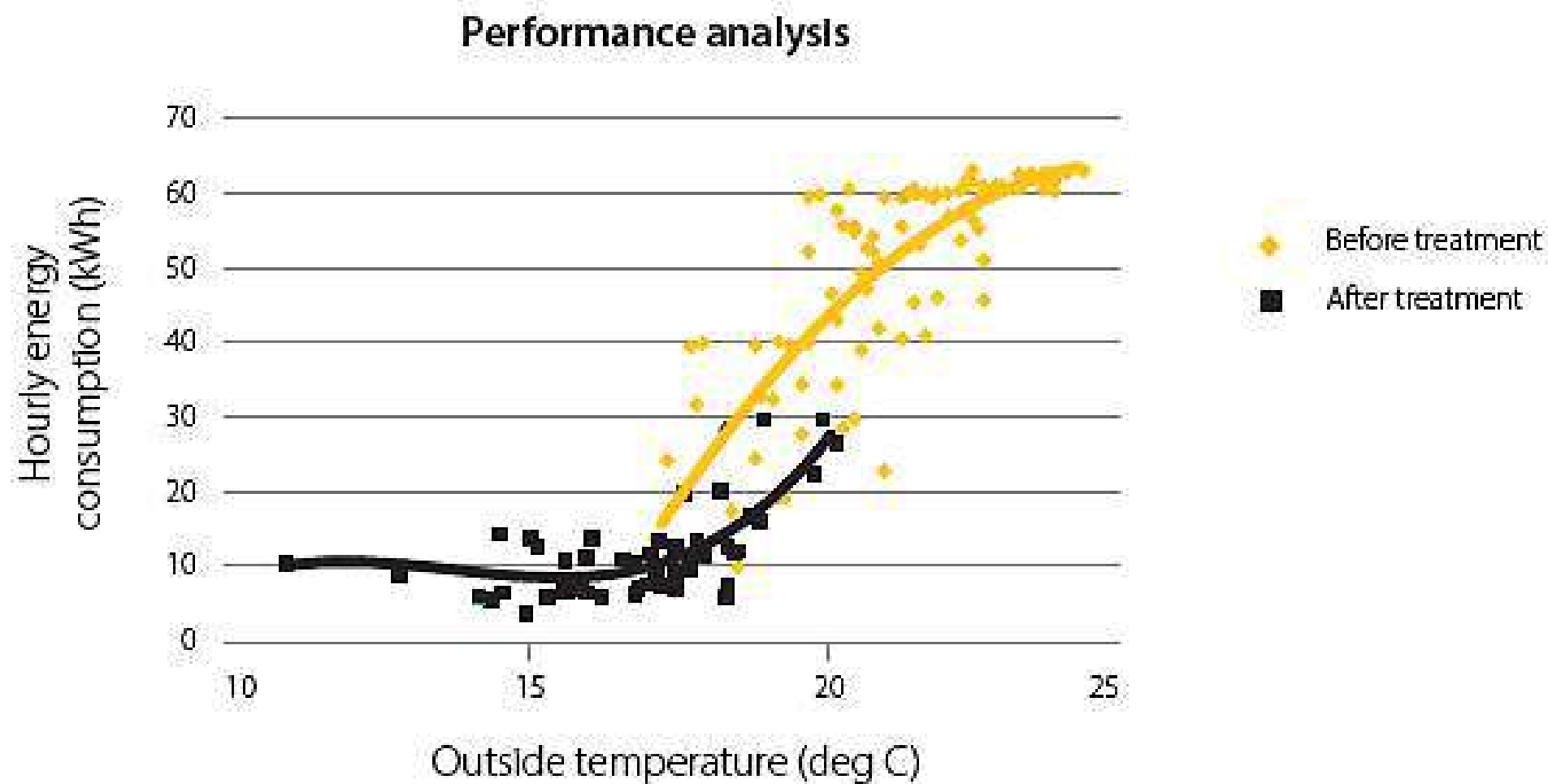


Case studies (1)
Reduces the electricity consumption

Case study - Reduces the electricity consumption

Energy Conservation Measure Blygold treatment to air-cool unit

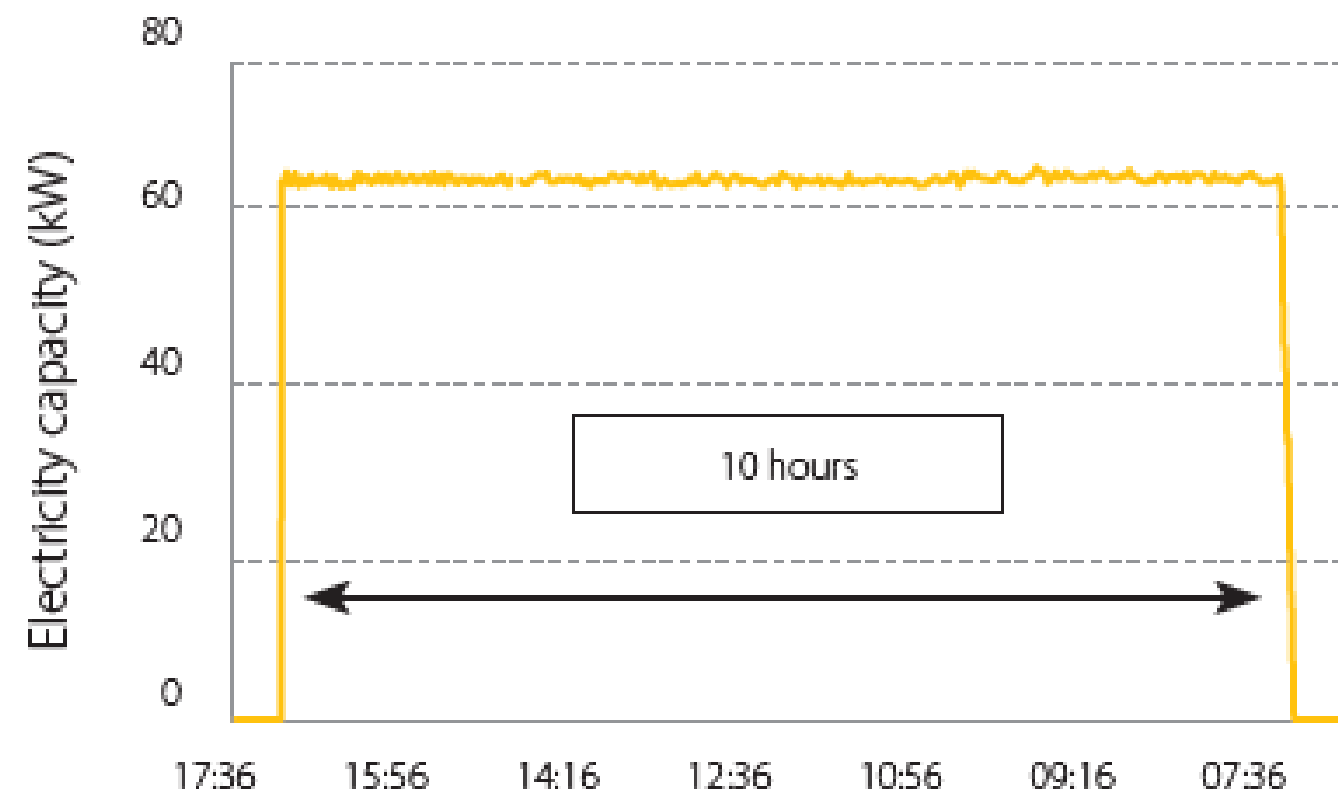
Blygold cleaning and coating enables a better exchange to the air flow in the air-cool unit. It improves the efficiency of the process and therefore reduces the electricity consumption of the fan and of the whole chiller plant.



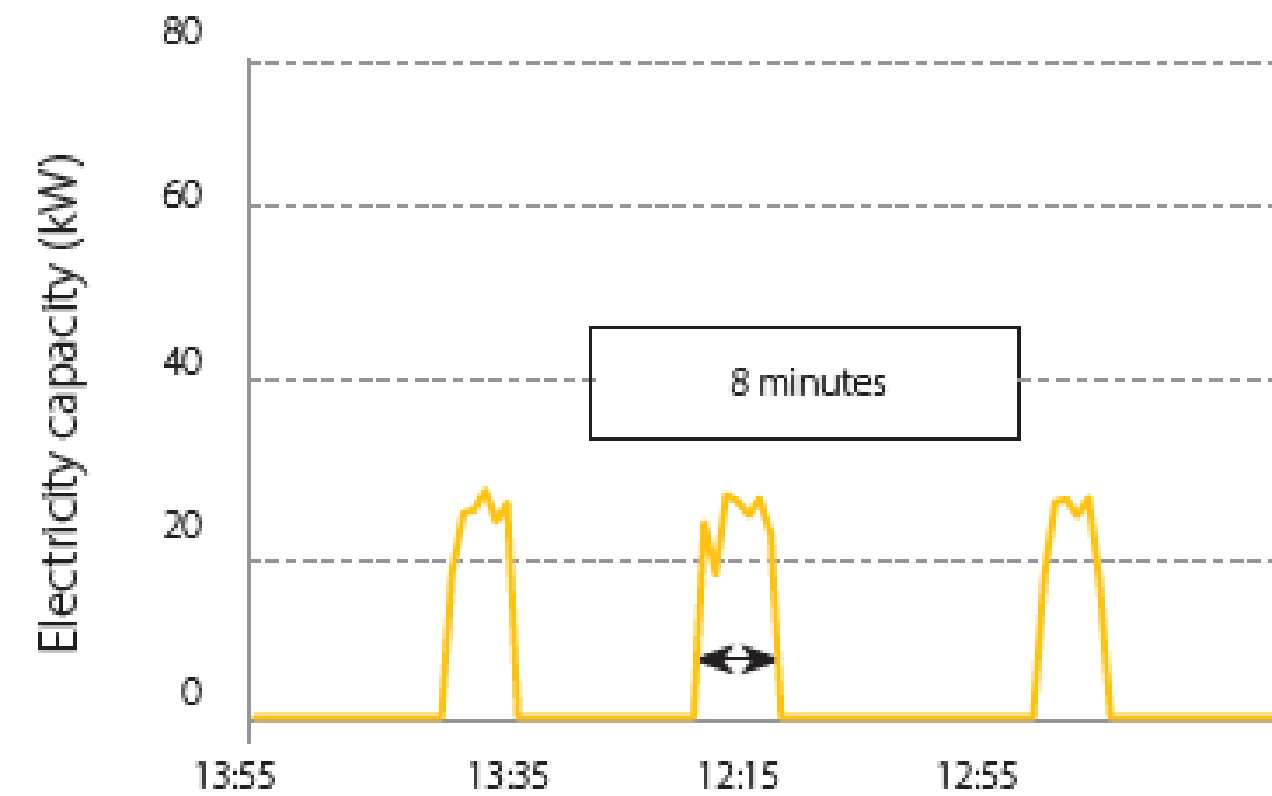
Case study - Reduces the electricity consumption

Energy Conservation Measure Blygold treatment to air-cool unit

Operating mode before treatment



Operating mode after treatment



Once a heat exchanger is corroding, it makes the compressor work a lot. Once it is treated, this is no longer the case. This means huge savings in energy.

Case study - Reduces the electricity consumption

Energy Conservation Measure Blygold treatment to air-cool unit

Yearly saving

Baseline

Total energy consumption	122,768 kWh
Electricity bill	18,170 \$ / 656,482.10 THB
Corresponding	15.8 tonnes

Savings

Energy	21,630 kWh
Financial	3,201 \$
CO2 emissions	2.8 tonnes

Post-retrofit period

Total energy consumption	101,137 kWh	-17.6%
Electricity bill	14,968 \$ / 541,046.75	
Corresponding CO2 emissions	13.0 tonnes	

Metering Specifications

Veolia Tracer Metering solution

- Caloeimetric flow meter - 45 mm probe
- NTC Strap-on Sensor
- Enercept energy meter
- Power Metering CTs



Case studies (2)
Reduces the electricity consumption

Case study - Reduces the electricity consumption

Impact of corrosion on air cooled

Regular air-cooled condensers are made of aluminum fins onto copper tubes. Due to this combination, galvanic corrosion will occur when an electrolyte is present (salt in water). The aluminum will dissolve around the copper tube and there will be a bad heat transfer from copper to aluminum. This results in a bad performance (exchange heat) of the coil



Practical example of two chillers at the same location with and without treatment

Chiller without Blygold treatment (100 R.T. chiller)

<i>Condensing temperature :</i>	56 °C (132 °F).
<i>Energy consumption :</i>	119 kW.
<i>Full load hours / year for 598 MW cooling capacity :</i>	2000 hours.
<i>Power consumption / year :</i>	238000 kWh

Chiller with Blygold treatment (100 R.T. chiller)

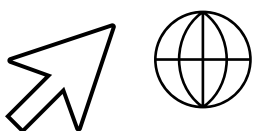
<i>Condensing temperature :</i>	48 °C (118 °F).
<i>Energy consumption :</i>	113.4 kW.
<i>Full load hours / year for 598 MW cooling capacity :</i>	1834 hours.
<i>Power consumption / year :</i>	207975 kWh

Energy saving per year:

$$238000 - 207975 = 30024 \text{ kWh}$$

=

$$30024 * 0.125\$ = 3753 \text{ US \$ per year} / 135595.89 \text{ THB per year}$$



Blygold test results (3)

For your reliability and reduce your maintenance cost

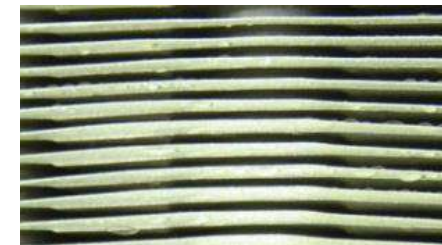
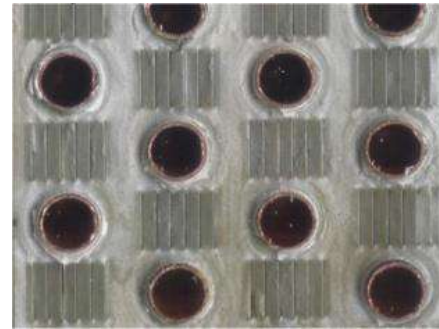
For your reliability and reduce your maintenance cost

Test Results*

Our treatment is tested by countless independent laboratories and some of the biggest manufacturers in the world.



Unprotected coil after 4000 hours acid spray test



Coil with PoluAl XT after 4000 hours acid spray test

ACID SPRAY TEST
ISO92144
ASTM B287

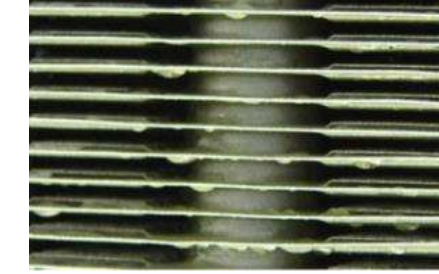
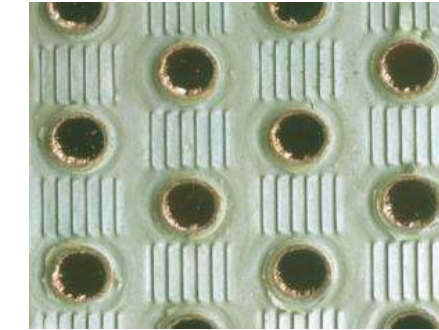
***This product already achieve 11,000 hours salt spray test in Blygold Netherland factory as per ISO92144.**

Test Results*

Our treatment is tested by countless independent laboratories and some of the biggest manufacturers in the world.

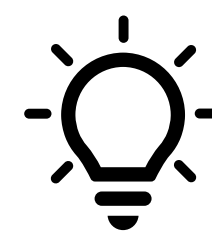


Unprotected coil after 4000 hours salt spray test



Coil with PoluAl XT after 4000 hours salt spray test

SALT SPRAY TEST (neutral)
ISO92144
ASTM B117



To ensure that the heat exchanger remains in good condition, and we recommend a yearly visit by Blygold technician to clean the coils as preventive maintenance with touch up. We are ready to offer preventive maintenance contracts with quarterly / yearly visit to make equipment healthy.

References

Our references



Data Centres
E-Shelter, Germany
Evoswitch, Netherlands
Google, California



Transport & Construction
Royal Dutch Airlines
KTX, Korea
Volvo Heavy Equipment



Airports
London Heathrow
Shanghai Airport
Schiphol Amsterdam



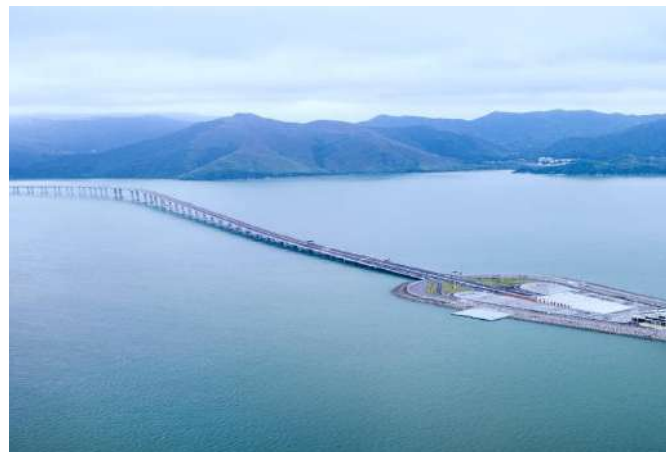
Museums
Louvre, Paris
Rijksmuseum, NL
Queensland Museum



Hotels
Grand Lucayan Bahamas
Diplomats Resort Florida
Mariott Hotels



Transportation
BTS Sky Train Yellow & Pink Line



Construction
Hong Kong Macao Bridge



Airports
Heathrow Airport UK Terminal 5



Construction
Channel Tunnel France to UK



Offshore
Texaco Captain Production Platform

Our references



Powerplants
Cairo, Egypt
Guam, Micronesia
Berlin, Germany



Sport Facilities
Sun Life Stadium, Miami
Old Trafford, Manchester
Stamford Bridge, London



Offshore & Marine
Queen Mary II
Palm Island Dubai
Pearl Harbour, Hawaii



Hospitals
VUmc, Amsterdam
UMC, Utrecht
Antonius, Nieuwegein



Office Buildings
EU Parliament, Brussels
Burj Kalifa, Dubai
Heineken, Netherlands



Buildings
Marina Bay Sands
Singapore



Buildings
Opera House Sydney Australia



Buildings
Swiss Re

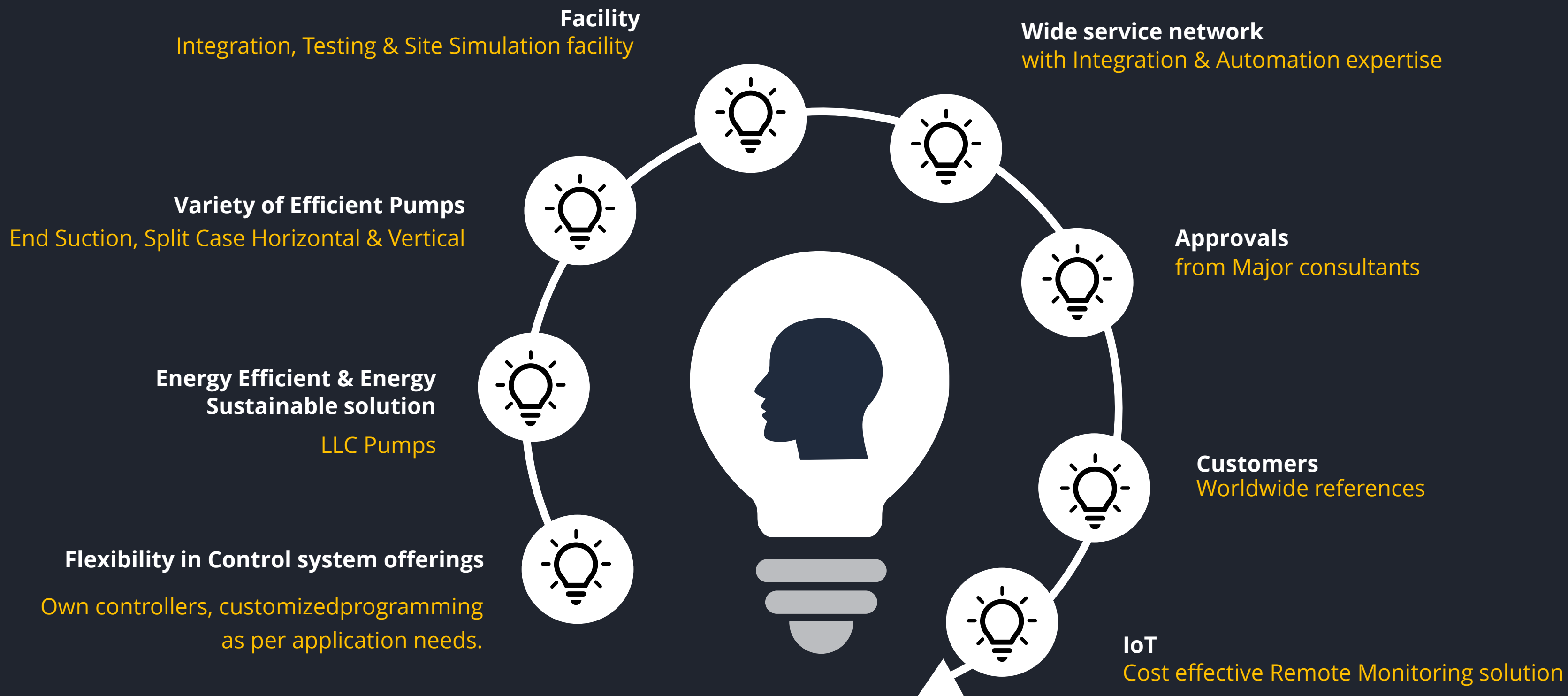


Shopping mall
Siam Paragon



Shopping mall
Icon Siam

Why us?



LET'S SCHEDULE A DATE TO AUDIT AND OPTIMIZE YOUR HVAC SYSTEM TODAY



KIRLOSKAR BROTHERS (THAILAND) LIMITED
A Kirloskar Group Company

Office: 50 Sukhumvit 21 Road, GMM Grammy Place Office Building, 18th floor, Unit 1805, Khlongtoey-nua, Wattana, Bangkok 10110

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