BLYGOLD INTERNATIONAL

Blygold is an innovative and forward-thinking company offering unique and sustainable high-quality protection against corrosion. With over 40 years experience, we have the know-how and state-of-the-art products and techniques to solve any corrosion problem. Our multitude of success stories says it all.

Application protocols

Because of the specific geometry of heat exchangers, the quality of the application process is just as important as the applied product. Blygold has developed specific application protocols for heat exchangers of all different dimensions, geometries and materials.

Global network

To ensure our products are applied according to these protocols, Blygold works with trained and certified applicators only. Our global network of qualified Blygold applicators can offer local support in over 60 countries around the world.

Quality

- ✓ Over 40 years of experience
- ✓ Unique application techniques
- ✓ Unrivalled test results
- ✓ All trained & qualified applicators
- ✓ ISO 9001 Certified

Innovation

- ✓ Revolutionary R&D
- ✓ Inhouse laboratory
- ✓ Deep understanding of the market
- ✓ Global awareness of customer needs
- ✓ Problem solving mentality

Sustainability

- ✓ Lifetime extension
- ✓ Energy saving & Eco Friendly
- ✓ Life Cycle Cost reduction
- ✓ Maintenance friendly
- ✓ Corporate Social Responsibility

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Blygold Energy Saving References

- ✓ *Energy saving*
- ✓ *Extends the lifetime*
- ✓ *Prevents breakdowns*

Earn back time of one year

Air-conditioning systems are big energy consumers. Especially the compressor of a cooling installation uses more energy than you might think. Therefore, it is very important that this compressor operates at optimal conditions at the highest efficiency possible. One of the most important parameters will be the condensing temperature of the cooling system. A low condensing temperature will result in a higher efficiency of the compressor.

Air-cooled condensers are very sensitive to corrosion, which has a great impact on their performance. A corroded air-cooled condenser causes a higher condensing temperature resulting in higher energy consumption of the system.

The Blygold corrosion protection system will ensure the performance of the condenser over time, and stop increase of energy consumption. This way a Blygold treatment can be regained within one year.

Contents

Impact of corrosion on aircooled

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.

Galvanic corrosion in a coil

Corrosion on aluminum fins causes a rough surface. Due to this rough surface dirt will easily adhere to the fin resulting in an isolation layer around the fin. This dirt layer will reduce heat transfer but also reduce airflow through the coil. Again the performance of the coil is affected.

How to calculate?

A raise of 1 °C in condensing temperature will result into a raise of energy input of ± 1.3% and a decrease of cooling capacity of ± 1.1% (depending on refrigerant, compressor etc.)

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

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

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

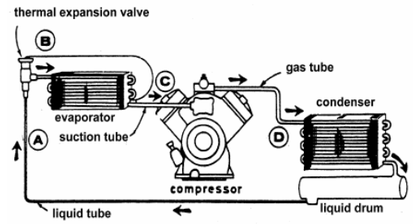
Chiller with Blygold treatment (100 R.T. chiller)

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

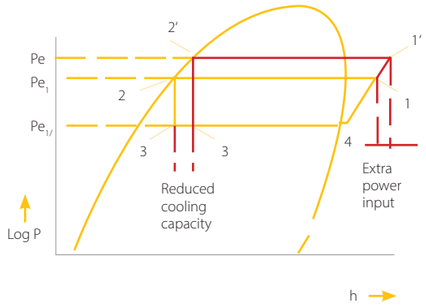
BLYGOLD **ENERGY SAVING**

Impact at the cooling process

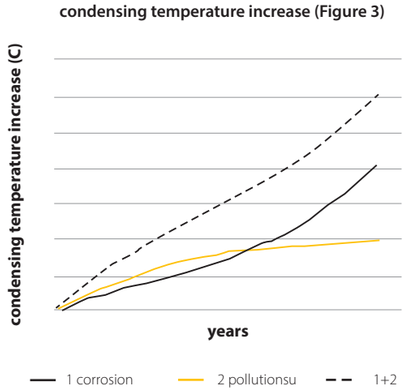
basic cooling system (Figure 1)



Basic cooling process (Figure 2)



condensing temperature increase (Figure 3)



Corrosion will have a huge impact on the energy consumption of your cooling machine. A standard simple cooling process contains 4 steps (see figure 3)

- **4-1 :** Compression, the compressor increases the refrigerant gas pressure from low Pe1/2 to high Pe1
- **1-2 :** Condensing, in the condenser the refrigerant gas condenses from gas to liquid by transferring heat.
- **2-3 :** Expansion, in the expansion valve the liquid refrigerant is throttled from high pressure (Pe1) to low pressure (Pe1/2) without change in enthalpy.
- **3-4 :** Evaporation, the liquid refrigerant at low pressure starts to evaporate in the evaporator by extracting heat from the environment.

The logP-h diagram shows the cooling process. In this graph the cooling capacity is given by the ?h of 3 and 4, the compressor power input is given by ?h of 4 and 1. If the condensing temperature rises, due to the environment or corrosion, the cooling process will follow the red line in the log P-h diagram with step 1'-2', 2'-3', 3'-4, 4-1'

Result:

A raise in condensing temperature results in higher energy input and a lower cooling capacity.

Energy saving per year:

238000-207975 = 30024 kWh
=
30024*0.125$ = 3753 US $ per year