



## Too many unreliable energy statistics

Nine energy tests performed in 2008 prove Star Cool's reefer machine to be more energy efficient than competing products. Having said this we are not the only ones stating to have the most efficient product – a fact that calls for a more reliable industry.



By Per Holm Knudsen,  
Vice President, Star Cool

Facts are facts. Nine comparative energy tests carried out by our customers in 2008 all prove Star Cool's reefer machine to be the most energy efficient product in the market.

These results are obviously very satisfying, especially because Star Cool has believed from the very beginning that leading the market on important factors like energy consumption and total cost of ownership (TCO) are of key importance, as this will improve our customer's ability to compete in their market while at the same time minimize the environmental impact and assist in preventing global warming.

What alarms us though, is the fact that these tests simultaneously prove that the reefer business is disturbingly unreliable. Despite the fact that the result of these tests is widely known in the market – we can observe that everybody still continues to put forward undocumented statements regarding energy consumption and that all still claim to be the most energy efficient.

This raises a lot of questions and doubts towards our industry. For instance, when one of our US based customers tested our reefer machine against its existing fleet for energy consumption, it found that Star Cool used up to 50 percent less energy than its existing fleet. However this fact has not prevented other suppliers claiming to have the most energy efficient product – statements that must make any customer consider how reliable their suppliers are about other issues.

We can only encourage our customers to keep putting our words to the test. Nine have done this so far in 2008, and four more test are planned this year taking the total to 13 tests carried out by clients giving us a solid platform to prove our products superior energy efficiency.

In 2008 we have seen a shift towards a market where new and important factors like energy consumption and total cost of ownership (TCO) play a significant part when deciding what kind of reefer machine to

invest in.

At Star Cool we welcome this change with open arms, because it is based on facts and reliable test data. We greatly support competition based on documentation and independent test results, which will hopefully lead to decisions based on facts rather than unsubstantiated statements.

We strongly recommend that our customers carry out these kind of tests. We believe that testing should be done in the environment closest to real-life situations of our clients and we are always willing to assist with these tests.





# Looking for the Power Factor

The world's third largest container shipping company, French-based CMA CGM, is constantly rethinking how to maintain market leadership on quality, efficiency, and energy consumption. This includes looking at how many reefer machines can be supplied from each generator on board.

If you want to be a market leader on quality, efficiency, and energy consumption you have to take into account the smallest details to find the right solutions.

This is what the world's third largest container ship-

ping company, French-based CMA CGM, is doing at the moment to secure reefer cold chain quality and efficiency. And one such detail is the so-called power factor of a reefer machine, a factor that determines how much space a reefer takes up on a generator or transformer.

Not all machines have the same power factor – in fact new reefer machines will run with a power factor from

0.55 to 0.95 with 1.00 being the maximum theoretical value. This variation creates a big difference in how many reefer machines can be supplied from each generator or transformer on board the vessel.

Therefore CMA CGM is looking for reefer machines with a high power factor. Not only to optimize the numbers of generators necessary on board, but also to cut the risk of overburdening the electrical circuits on the ship.

“Power factor has always been one of major issues – as well as energy consumption – in all our discussions with reefer machines providers” says *Frank Baulme, Vice President, Reefer, CMA CGM.*

CMA CGM's mission is to become one of the leading container shipping groups worldwide, offering its customers top quality door-to-door solutions and increasingly comprehensive global coverage. CMA CGM serves maritime shipping routes around the world and has 400 ships on more than 150 shipping routes – with a fleet of 80 new vessels on order for delivery between 2008 and 2011.

“With a reefer container fleet of 90,000 teus CMA CGM has become the second largest reefer operator. With the large increase of vessels capacity we will keep growing, offering the most environmental friendly technology at the most convenient price to our customers” explains *Frank Baulme, Vice President, Reefer, CMA CGM.*



Visit CMA CGM at [www.cma-cgm.com](http://www.cma-cgm.com).



## Understanding the Power Factor:

### Active Energy [W]:

Active energy is measured in Watt or kilo Watt (1000W). The active energy is the energy for which the power provider is paid – by households and companies alike. Active energy also determines the fuel consumption of generators.

### COSφ (PHI):

COSφ is a factor, without unit, that tells how well the system/machine uses the power. In machines with

pure resistive loads, COSφ will be 1.00 which is the maximum theoretical value (an ideal situation). In machines with capacitive or inductive loads, such as motors or traditional fluorescent light tubes, COSφ will decrease.

Newer reefer machines will run with COSφ from 0.55 to 0.95 depending on model and actual load.

### Apparent Energy [VA]:

Apparent energy is measured in Volt Ampere or kilo

Volt Ampere (1000 VA). The apparent energy describes how much energy (capacity) is used or booked on the supplying transformer or generator. Active energy can be measured directly or calculated with the following formula:

### Example 1:

A reefer machine is consuming 6 kW, with a COSφ of 0.55. The apparent energy can be calculated as  $6/0.55 = 10.9$  kVA.

This means that the reefer machine is booking 10.9 kVA on the supplying transformer or generator.

### Example 2:

A reefer machine is consuming 6 kW, with a COSφ of 0.95. The apparent energy can be calculated as  $6/0.95 = 6.3$  kVA.

This means that the reefer machine is booking 6.3 kVA on the supplying transformer or generator.

### Summary:

If the supplying transformer or generator has a capacity of 600 kVA, the following number of reefer machines can be supplied from the transformer or generator:

Example 1:  $(600/10.9) = 55$  machines.

Example 2:  $(600/6.3) = 95$  machines.



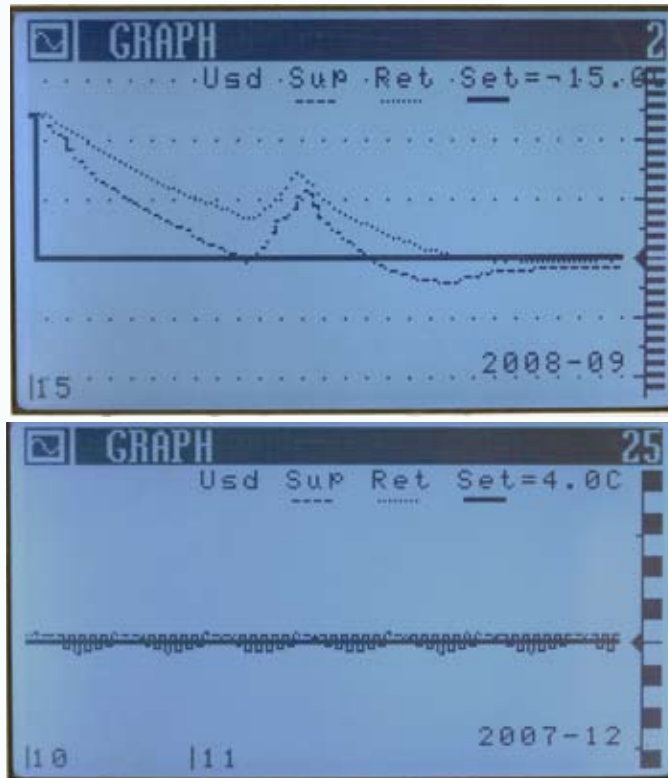
# The retirement of the mechanical recorder

With a reefer solution from Star Cool there is no need to use a mechanical recorder to monitor temperature. The monitor is simply built into the machine itself.

From the moment the Star Cool reefer machine is plugged into the system, it begins monitoring and logging the temperature, saving vital data for comparison over time.

This built-in feature eliminates the use of a mechanical recorder that has traditionally been used to mechanically record and monitor changes in temperature. In the past the mechanical Recorder was the only option if the technician wanted a tool to understand potential problems and rectify them in time.

A Star Cool reefer, however, does the job automatically and, apart from not having to change the mechanical Recorder paper



discs again and again, the built-in feature adds new possibilities of monitoring the temperature.

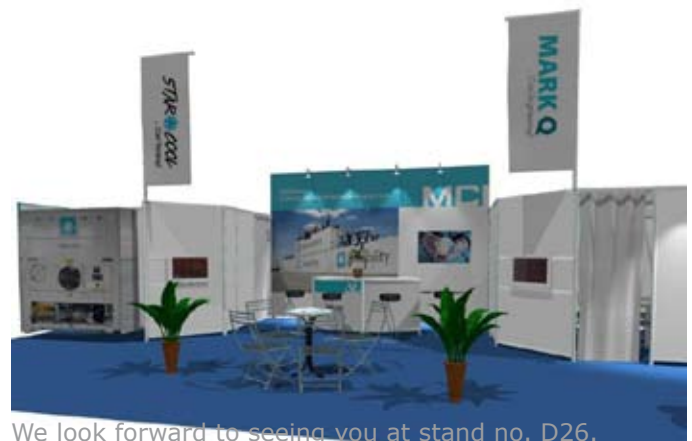
Directly from the reefer machine's display you can see graphs of temperature over time, zoom in on specific periods and document the efficiency without attaching any extra equipment to the machine.

"The built-in system fully replaces the mechanical recorder. You can not only see what the temperature is, but also what it has been over time. This enables you to retrieve better and easier documentation than with a mechanical recorder," says Morten Nylykke from Star Cool.

## Star Cool at Intermodal 2008

This years Intermodal Fair takes place in Hamburg, Germany from December 2nd to 4th. Naturally Star Cool will be present – you can find us at Hamburg Messe Hall A1 – stand D26.

Our next issue of Star Cool News will be a special Intermodal version, with extensive coverage of both current and future features. As always Star Cool develops with focus on the challenges and demands that our customers meet in their market. The issue will be available at the Fair.



We look forward to seeing you at stand no. D26.

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