

WILHELMSSEN SHIPS SERVICE

TECHNICAL SERVICES
MARINE PRODUCTS
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SHIPS AGENCY

MAGAZINE CONTENTS Replacing R22 refrigerants | Focus on Suez and Port Said | The arctic passage | High-capacity plasma cutter





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Experienced Refrigeration Technicians on Board

Replacing R-22 Refrigerant: The Window is Closing...

Most ship owners and operators are aware that the refrigerant gas R-22 will be phased out due to its negative effect on the ozone layer. However, they may not be aware that time is running out for ships that have not yet made the change-over.

The final date for phasing out virgin R-22 in the EU and on EU flagged ships is 31 December 2009. Those operators who leave it till the last minute are going to find the decision process very rushed. They will be competing against one another and against shore-based industries for skilled technicians and available resources.

WHAT NEEDS TO BE DONE?

You should consider having a qualified refrigeration technician inspect your system, and advise you on which route to follow. Very often management and technicians have a different perspective on the problem, and it is therefore helpful to have objective advice.

A NEW SYSTEM OR A REFRIGERANT CHANGE-OVER?

For new installations, the most effective refrigerant R-410A. This is 1½ times more efficient than R-22, which means that you can use a smaller system, and less gas, to produce the same cooling effect. However, this system operates at much higher pressures using rotary screw compressors, which are more expensive to install. It also takes more time to install and this can be costly in terms of lost operating time, except in the case of new-builds or during a major renovation or dry-docking.

In practice, the most commonly used gas is R-404A, as it uses familiar systems, and is readily available. However, it has a high GWP (Global Warming Potential) so is likely to be the next gas to be phased out in the near future.

For refrigerant replacements, the best options available at present are R-417A or R-407C. These require very few changes to the refrigeration system, and have similar properties to R-22. However, new alternatives are being developed all the time, with better cooling properties, and lower GWP.

Of course, there are other gases. In addition to ammonia and CO₂ (which are natural gases and therefore ideal from an environmental point of view), there are over 500 registered refrigerants on the market. As the biggest supplier to the shipping industry, Wilhelmsen Ships Service had to make the right choice. They did extensive research before deciding on which gases to bring to the market. The main criteria were effectiveness, environmental impact, availability and cost.

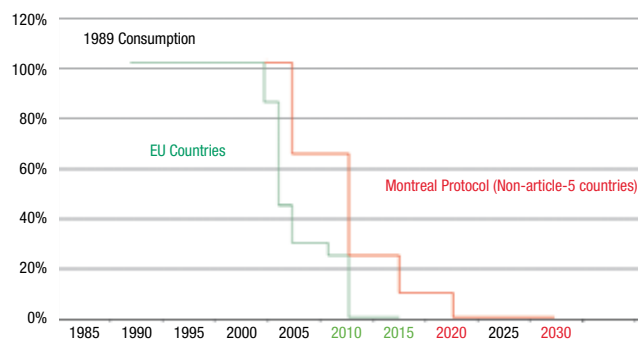
THE ENVIRONMENTAL EFFECT

In the 1950s and 1960s, the most common refrigerant was the chlorofluorocarbon compound R-12. When released into the atmosphere, this has a damaging effect on the ozone layer. In 1987 representatives from concerned nations met in Canada and passed the Montreal Protocol banning R-12, and bringing in restrictions on other gases.

Today, 207 countries have ratified the Montreal Protocol. According to Kofi Anan, "It is perhaps the single most successful international agreement to date..." The signatories recognised at the time that banning R-12 was only the first step. R-22 is much less damaging, but it still has some detrimental effect, although less than 5% of the effect of R-12.

It was decided, therefore, to phase out R-22 over a longer period. The graph below shows the agreed schedule. The green line represents the EU countries, and the red line shows "non-article 5" countries. ("Article 5" countries will have another 30 years to phase out R-22. These are countries where the consumption of ozone-depleting gases is less than 0.3 kg per person and includes 117 countries, mostly in the developing world).

PHASE-OUT SCHEDULES FOR R-22 IN THE EU AND OTHER INDUSTRIALISED COUNTRIES (% of base-level)



The recommended replacements belong to groups of HFCs (hydro fluorocarbons). These have been shown to have no effect on the ozone layer. However, they have a highly damaging effect on global warming – around 1 000 – 3 000 times more than carbon dioxide. The combined effect of these gases contributes around 10% to total global warming. Controls on these gases are being introduced.

AVAILABILITY

At present, R-22 is readily available, and relatively cheap. However, demand has already started to decline, and will continue to drop as more ships retrofit to ozone-friendly gases.

Continued next page...

As demand drops, manufacturers will cut production, and after 2010 it will become more difficult to source, and more expensive. European refrigerants suppliers will be unable to sell it from EU-based outlets, and although some quantities will continue to be stocked in "Article 5" countries (such as China), eventually these countries will also be banned from selling R-22.

The gases mentioned above, R-407C, R-410A and R-417A, are likely to become the international standard replacements. The cost of other gases, including R-22, can be expected to rise, although some gases (such as R-134a and R-404A) have dropped in price.

LEGISLATION

Initially the legislation only applies to new systems, and topping up existing systems. It will be possible to use re-processed R-22 that has been captured from other systems for another 5 years, provided you can guarantee your system has no leaks. It will also be possible to buy virgin R-22 from outlets in "article 5" countries, but it will be illegal for ships from industrial countries to install this gas in their systems. If a ship changes flag, the regulations of the new registration will apply to the refrigerants in the ship.

The legislation only applies to gas which is leaked into the atmosphere. If you can guarantee your system does not leak, you can continue to use R22 indefinitely.

PENALTIES

The big question is; how will the IMO police this legislation? They rely on member countries enforcing the regulations. Some countries already have tight controls on emissions, such as the United States. The US Coastguard can stop and impound vessels within the 12 mile territorial limit for contravening the Clean Air Act (Section 608). Singapore, despite being an Article 5 country, will also impose heavy penalties on non-compliant ships.

COSTS

Every ship is different, and it is impossible therefore to give an accurate assessment in this article. Operators will have to weigh up the cost of the retrofit against the time out of operation. They also need to consider the cost of disposing of R-22, which can only be incinerated at a limited number of designated ports around the world. Many countries do not accept returned R-22 from foreign-flagged vessels.

DECISIONS

What replacement gas will you use? The process of making decisions takes time, if you need to gather information and discuss your decision with other interested parties.

THE QUESTIONS TO ASK:

- Will you be renewing the system, or changing over the existing one?
- What gas do you need to cover the temperature range of your systems?
- How do you get rid of the old R-22 gas?
- Is the new refrigerant compatible with the existing oil?
- How long will the change-over operation take?
- What is the legislation in the area in which your ships trade?
- What is the world-wide availability of the new gases?
- What gas will the other ships in your fleet be using?

Wilhelmsen Ships Service refrigeration technicians will be happy to answer these questions, by sharing with you our experience of all the replacement gases. We can also advise on any other problems you may have regarding compliance with the new regulations.

- We have a dedicated research team who constantly conduct tests and research into new refrigerants in marine systems.
- We are the world's biggest supplier of marine refrigerant gases and we stock or have access to spares for all major brands.
- We are the world's biggest employers of specialist marine refrigerant technicians stationed throughout our worldwide network.
- We have recently replaced R-22 gases on over 900 vessels.
- We remove all old R-22 gas using our ERM (Environmental Return Management) system and dispose of it in approved incinerators.

For more information, contact
WSS.literature@wilhelmsen.com,
or look up Safety and Refrigeration at
www.wilhelmsen.com/shipservice



Refrigerants Supplied by Wilhelmsen Ships Service



“However, even after I leave work, I am still “on call” for 24 hours a day, in case any of our clients have an urgent situation to deal with.”

Mohamed El-Shenawy, operations officer in Suez



SUEZ OR CAPE? DISTANCE COMPARISON

FROM	TO	SUEZ	CAPE	SAVING
Ras Tanura	Constantza	4 144	12 094	66%
	Lavera	4 684	10 783	57%
	Rotterdam	6 436	11 169	42%
	New York	8 281	11 794	30%
Jeddah	Pireaus	1 320	11 207	88%
Bombay	Rotterdam	6 337	10 734	41%

Distances in Nautical Miles

FOCUS ON Suez and Port Said

The canal was formally opened during the ruling of El Khedive Ismail 17 November, 1869. Since then, it has had a dramatic impact on world shipping routes. The saving in time and distance, compared with going around the Cape of Good Hope is dramatic, particularly in the case of vessels travelling from the Gulf to Europe.

- Since 1980, the canal's maximum depth has increased from 38 feet to 66 feet
- Canal can handle 100% of the world's container vessels
- Currently 13% of world trade and 30% of world's container-transport passes through the Suez Canal

Future Developments

- The target is to reach 72 feet draft to allow 350,000 ton ships passage by 2015
- New bypass is being built for 2010 targeting a 25% increase in daily volume

Last year Port Said recorded the biggest jump in the world rankings of container ports. Currently it is ranked 35th (up from 67th). The goal is to be part of the top ten container ports.

The man on the spot

Mahomed El-Shenawy is an operations officer working in the Suez Canal zone.

"I normally start my working day at 8 o'clock, and check messages from vessels or principals, and follow these up if necessary. After that, I head off to visit my dedicated vessels, and carry out whatever I have arranged. This can be delivering spare parts, finalising ships' paperwork, dealing with local authorities, or couriering documents, or oil samples. I meet the captain, and coordinate operations plan with him and the pilot.

"I also drop off and pick up ships' crews. A number of vessels choose to change crews at the Suez Canal, as it is just a short journey to Cairo Airport, which is conveniently positioned for transfers to Europe and the Middle East.

"When I return to the office, I report back to our clients using our global online operations systems (VOSS). I maintain responsibility for the vessel, and keep in contact until she has cleared our area. However, even after I leave work, I am still "on call" for 24 hours a day, in case any of our clients have an urgent situation to deal with.

"I find the job interesting, even though it is physically and mentally demanding. I enjoy meeting people from different cultures, and I like developing relationships with clients. As our business grows from word of mouth, I am aware that I carry a big responsibility to give a good impression of myself, my company, and even my country and culture.

"I have learnt a lot on the job. When I first started, I knew that time was important, but I have learnt that for ship owners and operators, time is something sacred!"

Wilhelmsen Ships Service in the region

Wilhelmsen Ships Service has 6 offices in Egypt, providing a full range of services to clients. They have over 100 employees in the region, and have been certified by the Egyptian government as agents with authority to arrange transit of ships through the canal. They have two offices at the Northern and Southern ends of the canal which are at Port Said and Suez, respectively.

Our Capabilities in the Suez Canal

Transit Administration	Crew Change
Spare Parts	Medical Treatment
Ships Supply	Bunkering
Cash to Master	Ships Mail
Product deliveries:	Provisions
Refrigerants, gases, chemicals	

Wilhelmsen Ships Service in Egypt

Dekheila
 Alexandria (HO)
 Damietta
 Cairo (Commercial and Airport office)
 Port Said
 Suez

THE Arctic passage



Last year, for the first time ever, the ice cap north of Canada melted enough to allow normal ships to navigate through the famous “North-West Passage” during the northern summer.

With the increase in global temperatures, environmentalists are expecting even greater expanses of sea to open up this year. If this becomes a viable alternative for ships travelling between Europe and China, there could be a dramatic shift of traffic to this route, particularly in the summer months. A ship travelling at 21 knots between Rotterdam and Yokohama takes 29 days if it goes via the Cape of Good Hope, 22 days via the Suez Canal and just 15 days if it goes across the Arctic Ocean.

For environmentalists, this is a mixed blessing. On the one hand, this could bring pollution to unspoiled oceans. However, ships using this route will make considerable savings in fuel, reducing their CO2 emissions, and the impact on global warming.

The Polar Regions are presently the least affected by human activities. A movement of trade routes to the Arctic would change this, without relieving the pressure on the most heavily affected waters in the North Sea and the Sea of Japan.

A new atlas of the world's oceans shows that human activities have strongly affected 40 per cent of the area and have left only about four per cent relatively untouched. Scientists who produced the first global-scale atlas of human influence on marine ecosystems said the damage was even worse than they had expected.

Photo courtesy NASA/Wikipedia.

OUTSOURCING COMPETENCE

Pressured to cut costs and increase quality, shipping has squeezed its knowledge bases into increasingly narrow segments.

There was a time when ship-owners possessed large technical departments with decades of experience and tremendous knowledge of ship operations. Now more ship-owners rely on global suppliers to ensure their compliance, competitiveness and long-term operational profitability. The knowledge needed to deliver this has shifted to classification companies, insurers, supply companies and consultants.

The F-GAS Example is a perfect example of one of the multitude of changes that demand attention to ensure compliance (see separate paragraph on right). Increasingly, responsibility for monitoring and responding to these changes is picked up by suppliers eager to create added value for their customers on a global basis. For example, the F-GAS regulations came into effect July 2007, but Wilhelmsen Ships Service was aware of the changes as early as spring 2006.

The EU's influence Worldwide

With respect to the F-GAS regulation, its main sphere of influence is within the EU. At the same time, global operators need to be aware that the non-refillable (i.e. disposable) refrigerant cylinders will soon not be available in any EU ports. F-GAS is, like the EU's emissions trading scheme, a European response to the carbon-reducing and global-warming promises made under the Kyoto Protocol. Increasingly, any authority that can win points for a constituency is doing so by making environmental demands on the shipping industry. For example, witness debates in California concerning ship emissions in the Pacific trade routes. "The California attorney general ... has called for federal regulation to curb heat-trapping emissions from the worldwide fleet of about 90,000 ocean-going ships," reported the New York Times on October 4. Instances like this are likely to increase.

Who Knows What?

"I think we have seen a general trend whereby ship-owners and operators rely more and more on knowledge providers like class, insurers, charterers and other partners to guide them in technical matters related to their fleet. This trend will continue. For many, the primary question could then come down to choice of partner. Who do you trust?" said Wilhelm Magelssen, Senior Vice President of DNV. Class societies like DNV are helping ship-owners and operators meet the demands of, among other groups, increasingly sophisticated and knowledgeable charter

groups. An example of the latter are oil majors and the OCIMF [Oil Companies International Marine Forum], whose vetting systems demand extensive documentation from tanker owners that class societies are busily verifying.

Regulation Update

Wilhelmsen Ships Service have representatives on the boards of a number of regulatory bodies, and are able to give advance notice of likely changes in regulations. We will use this section in future to keep you informed of upcoming regulations that are likely to impact on your operations.

Watch this space!

EU F-GAS Regulation (EC 842/2006)

This regulation entered into force in the EU in June 2006, banning use of HFC-refrigerants in disposable cylinders after 4 July 2007 for the entire territory of the European Union and EU-flagged vessels. A relatively large market for disposable cylinders in Europe disappeared practically overnight. As a result, even non-EU flagged vessels calling at European ports are affected by the regulation as they are not able to get disposables in Europe.



Refillable cylinders have replaced disposable cylinders.

A COMPLETE METAL-CUTTING AND GOUGING SOLUTION

High capacity portable plasma cutter for maritime use

In the maritime environment, you cannot predict what problems will need fixing when you are out at sea, away from sophisticated workshops. Versatility is the most important attribute when considering what tools to use.

The Unitor plasma cutter from Wilhelmsen Ships Service provides that versatility. It is light, portable, robust, and effective. It can slice a clean knife-like cut through a variety of metals. It can draw current from a vessel's regular power supply without interfering with onboard power and security systems. And it is fast.

- Ideal for cutting and gouging all types of metals. Superior to gas cutting as it also cuts stainless steel, cast iron, copper alloys and aluminium.
- The UPC-1040 is compact and lightweight to move around on board. Its weight is only 15 kg and its size is: 550x180x320 mm.
- Cutting capacity of up to 40 mm thick steel. Penetrates completely, including thick bulbs in beams.
- Impressive cutting speed of more than half a meter per minute (13 mm steel plate).

- High duty cycle and tolerance to ambient temperature will normally provide completely uninterrupted operation for manual cutting.
- The slim nozzle design gives exceptionally good overview of the actual cutting arc and provides minimal slag clogging.
- Highly efficient for gouging out old welds and opening up cracks with the optional gouging nozzle.
- CE marked

Unitor Plasma Cutter UPC-1040 is supplied complete with:

- Primary cable*
- Air hose with hose clips*
- Ground clamp with cable & connector
- Torch with 6m cable package and front panel connection **
- Accessory kit with initial supply of torch spares & consumables for cutting
- Air regulator with filter and water separator
- Owner's manual

* Primary cable plug and airhose connection are not supplied, as this will depend on the connections available on board.

** Can also be equipped with a 15 m torch, product number 192 – 404015

Technical Specifications

Power supply	380(400)V or 440V*, 3~50/60Hz	Dimensions	L x W x H 550x180x320 mm
Mains fuse	32A slow blow	Weight	15 kg
Maximum power	14,7 kVA	Maximum cutting capacity	40 mm
Process power	120 V, 20-100A	Quality cut	25 mm
Duty cycle @40°C	35% @100A 60% @80A 100% @60A	Air supply pressure	Min 5,0 bar
		Air flow	190 l/min
		Torch cable package	6 m

Power factor	0,95
Protection class	IP 23
Cooling	Forced
Temperature class	F

*Set for 440 V, may be reconnected to 380 (400)V

Product number for the complete UPC-1040 Plasma Cutter with accessories: **192 40400**





TECHNICAL SERVICES



MARINE PRODUCTS



LOGISTICS



SHIPS AGENCY

Wilhelmsen Ships Service is all about people. We have more than 4000 marine professionals at your service, all around the world. Our people make sure that your vessels operate smoothly at sea, and cut down your turnaround time in port.

We mind your business when it matters most to you.

PORT 1



PORT 2



PORT 3



Where in the world...?

These are photographs of well-known landmarks from various ports around the world.

If you think you know where they are, send your answers and contact details to wss.literature@wilhelmsen.com, and you can win a laptop travel-pack (including hub, minimouse and connectors) in addition to several runner-up prizes.

If you have any questions, comments or suggestions regarding the contents or presentation of this publication, please send them to The Editor, wss.literature@wilhelmsen.com. This is a customer magazine, and we want to include the sort of information that you most want to read, in the way you want to read it.