



Cool Flash

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Editorial

We've had to be patient, but finally, we've all been enjoying warm summer days and pleasant summer evenings. However, this is also a time where cooling is more essential than ever, both in our professional as in our personal life. Food storage, at the right temperature, will prevent spoiling of food, possibly in the end causing harm to the end-consumer. And in these warm temperatures, we gladly welcome an air-conditioned environment. So you need guaranteed cooling, and want to avoid break-down of your installation in this period. Regular maintenance and checks of the heat transfer fluids, will help you to react proactively if needed, and will allow you to enjoy, without problems, of a nice summer holiday!

Els Quintyn

Zitrec approval for use with Durapipe ABS pipes for secondary refrigeration

By Tom Lansbergen

Very recently our whole range of Zitrec products were studied by Durapipe chemists and found to be compatible with their ABS based products.

We are also thankful to Bill Griffiths of Durapipe who contributed to this newsletter by sending us underneath article.

ABS =
Acrylonitrile
Butadiene
Styrene

ABS – the pipe that came in for the cold

Today there is a diverse range of plastic pipe systems in widespread use within buildings. As manufactures now design their systems for clearly defined roles in fluid distribution and

drainage, perhaps the only feature common to modern plastic pipes is an outstanding resistance to corrosion.

Versatile

Some plastic systems, however, are exceptionally versatile. Add to corrosion resistance the qualities of low-temperature toughness, rigidity, thermal insulation, lightness and rapid jointing and you have a system for economical, reliable pipework suited to a variety of chilled water and secondary refrigeration uses. The leading example is undoubtedly ABS.

In the UK, ABS pressure pipe has been produced since the 1950s, firstly by Durapipe, although it was the industrial market which first caught on to its benefits as a corrosion – and abrasion – resistant alternative to steel. Industry also recognised its ability to cut installation and maintenance cost for pipes.

Established

In the building sector, Durapipe ABS is an established choice for chilled water distribution and growing rapidly with the number of air-conditioning systems using secondary circuits. As it is compatible with many new-generation secondary refrigerants and retains its ductility down to -40°C, ABS is also coming into its own for low temperature refrigeration.

Depending on fluid and room temperatures, distribution pipes may require around half the insulation of metal systems and for chilled-water applications with short pipe runs it can be feasible to dispense with insulation altogether.

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Condensation

The advantage of self insulation ensures that problems traditionally caused by condensation forming and dripping from pipe surfaces are eliminated or greatly reduced.

“ABS is an established choice for chilled water distribution and growing rapidly with the number of air-conditioning systems using secondary circuits”.

Another maintenance issue, that of debris build-up and sludge formation, is addressed by the smooth, shiny bore, characteristic of ABS pipe and fittings. As well as resisting scaling this reduces frictional losses in cooling systems.

Installation is assisted by the light weight of the system and its quick method of jointing, using sol-

vent cement. Pipes are half the weight of copper and a sixth the weight of steel. This simplifies fitting in confined areas with difficult access and allows pipes to be placed where metal pipes could impose too high a load – above a suspended ceiling, for example.

Decisive factor

Though certainly a popular option with ABS users, uninsulated pipework is by no means advocated in every situation, and speed of installation is frequently the decisive factor in selecting ABS. It is recommended that designers seek the manufacturer's technical advice in order to optimise system performance.

From Artec to Zitrec

Health & Risk Assessment. During the development of our heat transfer fluids, health, risk and toxicity assessment are important criteria. Specifically on the corrosion inhibitors, there are lots of different products on the market. Artec strives for performing inhibitors, but with low toxicity.

But on the market you still find heat transfer fluids containing inhibitors such as amines and nitrites, which may cause in combination carcinogenic nitrosamines. The Material Safety Data Sheet of the product might indicate the presence of harmful inhibitors, however, they are only mentioned as of a certain min. concentration. None of our heat transfer fluids however contain these inhibitors.

Level of corrosion inhibitors

By Els Quintyn

Already in previous editions, we have elaborated about the benefits of organic inhibitors versus traditional inhibitors. But not only the type of inhibitors also the *concentration* of the inhibitors determines the level of corrosion-protection. Too high or too low level of inhibitors may lead to the opposite effect and cause increased corrosion :

- ~ Silicates are multipurpose inhibitors, but are hard to stabilize in solution. When destabilizing, they can form gelly substances, blocking filters and pumps. Or they form hard layers of abrasive solids, causing water pump seal failure.
- ~ Nitrates can become aggressive toward solder, or cause iron corrosion.
- ~ Phosphates are known to be highly unstable in combination with hard water.
- ~ Nitrites are a classical ferrous metal inhibitor, but in too high levels, may cause increased solder corrosion. At too low concentrations, nitrites may become aggressive toward cast iron. Nitrites have also been associated with increased aluminum corrosion.
- ~ Amines are known to be aggressive to copper/brass.

Although these inhibitors can be quite efficient on one or two metals, they never achieve optimal performance on all materials used in a modern cooling/refrigeration system. Whereas the Organic Acid technology (Zitrec L, M, S, and A) offers excellent corrosion protection and a long life protection effect on a broad range metals.



Engineering Tips & Tricks

By Tom Lansbergen

When you are engineering the ideal cooling system, you require a fluid that helps you. We have a whole range of products and you can select the cheapest product that is suitable for your application. However, in general important savings can be achieved in the design phase of a cooling or heating system when you pay attention to the following characteristics of the fluid that will be used in your system:

Low viscosity

less pumping energy, less compressor power needed

High thermal conductivity

smaller heat exchanger required = cheaper installation

Compatibility

some products are more compatible with elastomers and sealings than others. By choosing the right combination, you can save money. Also metal choices are important. Freezium is less compatible with Aluminum than Zitrec M or L for example.

Small primary circuits

service costs of secondary systems are known to be cheaper up to one-third than those for primary refrigerants.

Secondary systems are cheaper

because the secondary circuit works at low pressure, the secondary system can be build with cheaper, even pre-assembled component groups and adapted easily to the changing needs of your equipment.

In the engineering phase you can prevent with small and cheap changes those small annoyances that become a big thing in the long run. For example:

Pumps

are best placed on stainless steel drip trays with a discharge to a floor drain

Water pump seals

most water pumps use face seals which need minimum leakage for lubrication purposes. Those leaks do not indicate any pump failure but are necessary for its normal functioning. To make sure you have the right type of water pump seal, it is recommend to speak with your pump supplier and inform him which heat transfer fluid you will be using.

Customer that put their trust in us!

Via our Coolflash, we want to inform our readers of projects in which the benefits of our heat transfer fluids have been proven. Just a few examples....

- × Production of a wind tunnel at VOLVO-facilities (Sweden), using Freezium
- × A skating rink in Kolomna (Moscow), cooled with Freezium
- × Use of Zitrec S at Westvlees (Belgium) to cool meat-production facilities
- × Arnegg, Zitrec S
- × Gresco Zitrec M
- × Use of Zitrec L and Zitrec A, in the production of MPG at Lyondell

Contact us if you would like more information on one of these applications, and see how our heat transfer fluids can also benefit in your installation.

(Engineering Tips & Tricks cont'd)

Air purge

must be installed at the highest point of the system. Important to remember here is that filling the system should be done from at lowest point to avoid air pockets!

Separators

all products will perform optimal as long as the right dilution is present. One should avoid contamination or dilution by building into the system dirt and air separators.

Filter

the installation of a filter with porosity 0.6 – 0.8 mm will capture those corrosion products that might be formed at some critical parts of the installation. By removing those corrosion products, further depletion of the inhibitors is prevented.

Expansion tanks

like all other fluids, Zitrec-solutions will expand as temperature rises. Expansion tanks are therefore commonly used in systems containing Zitrec-fluids. To determine the expansion volume required, one can use the following formula:

$$V = [(\rho_{\text{low}} - \rho_{\text{high}}) \times V] / [\rho_{\text{high}}]$$

where: ρ_{low} = the density at the lowest anticipated temperature
 ρ_{high} = the density at the highest anticipated temperature

Remarks: Zitrec fluid/water mixtures can dissolve Zinc when hot and should therefore not be used in galvanised pipes.

Readers corner

Do you have comments or feedback? Want to share experiences with other readers ... this is where you can do this. This is your corner! A selection of comments will be published here.

Contact

Els Quintyn

Elsq@chevron.com

Fax +32(0)9.240.73.42

Technologiepark Zwijnaarde 2
B-9052 Gent

Zitrec AC at work at Analog Devices in Ireland

By Total Fluid Solutions

At Analog Devices, a leading world wide electronic components manufacturer, with production sites based in Limerick and Cork, Ireland, problems were occurring in the cooling systems. Having heard of these problems, Paul Leyden, our Zitrec distributor in Ireland went out to meet Mr McCoy of Analog Devices.

Problem

Mr McCoy, Technical Engineer at Analog Devices in Cork, had been asked by his management to make a study on the problems that were occurring in their systems and their possible solutions.

“The following are the problems he had seen on the production tools:

1. Blockages in the coolant line which result in unnecessary maintenance to unclear these lines.
2. Erosion in the aluminium which has resulted in cooling blocks and chamber walls becoming pitted and developing leaks.
3. Excessive wear on the chillers which means these chillers require regular maintenance such as replacement of motors and pumps. The same chillers should require little maintenance.”



Agenda

- 18 Oct - 20 Oct '06.

IKK

Nürnberg - Germany

Come and visit the Arteco stand 5-316

- 9 Nov - 11 Nov '06.

Thermoclima

Rome - Italy

- 28 Feb - 03 Marc '07.

Climatización

Madrid - Spain

The solution

On the 25th May, we made up a 25 litre drum consisting of 2.5 litres of Zitrec AC and the balance de-ionised water. We flushed the cooling lines of one of the systems with about 12

litres of this, we then filled the lines with this solution and allowed recirculation for about 30 minutes. We then drained this from the system and filled the cooling loop again. We monitored this line for the next 4 days, there were no blockages and liquid through the floatmeter was visibly cleaner.

On the 29th May we carried out the same procedure on a couple of other installations and again we monitored these tools for about 2 weeks and again no blockages and coolant is noticeably cleaner.

On the 19th June the rest of the systems were completed. We have batches of the Zitrec solution made up in 25 litre drums so that if any cooling loops need to be topped up, we are now using only this solution.

(cont'd next page)

It seemed that most of the problems were caused by ongoing corrosion.

Several solutions to solve corrosion and the resulting problems were investigated, such as to reduce the amount of mixed metals. This was done to reduce galvanic corrosion at certain contact points. Aluminium fittings will replace the existing stainless steel. This would be costly and time consuming but necessary.

Also an inhibitor pack was used as well to reduce the corrosion.

Nigel says:

"Before Zitrec AC came in, we were using chemical packages to inhibit corrosion. Although we have had a reduction in the number of blockages on tools there were still a number of disadvantages: the mixing ratios of water and the inhibitors had to be exact and this is time consuming and not very practical. The inhibitor used was also not an environmentally friendly substance."

He continues: "In the treated installation, an additional problem started to occur: the formation of a liquer or sludge type substance in the chiller was progressing. This indicated to me that the inhibitor is not staying in solution and in turn has lead to reduced flow. That's why finally we have chosen to check out Zitrec AC. With its organic based inhibitor which is more environmentally friendly, it is said to stay in solution and is claimed to be a more effective inhibitor."

READ IN THE PRESS

Is IKK Germany going for a new future?

After the debacle of IKK 05-Hannover, where hardly 60% of the expected visitors showed up, VDKF, the organizer of IKK has not been sitting still. IKK Nurnberg has still a very good and solid reputation, and VDKF has been working on the saving of the yearly IKK, and is even looking to alternatives. Beginning May, VDKF invited 5 companies to make offers where to organize IKK. 2006 remains however still in Nurnberg. Where or what next is still open... Essen, Frankfurt, Koln, Stuttgart and Nurnberg have made proposals.

Source Koude & Luchtbehandeling, June 2006

Looking back to Klimaatvak 2006 — Gorinchem

Klimaatvak 2006 had this year above 5000 visitors, which is about equal as last years exhibition. And although the organization had anticipated a bit more, they remain positive and enthusiastic for next editions. Many exhibitors also confirmed to have obtained many positive leads.

Source Koude & Luchtbehandeling, May 2006

Climate World in the lift.

Last March, the 2nd edition of Climate World at Moscow, the only exhibition in Russia dedicated to HVAC took place, and can be considered a success. This exhibition had 30% more visitors than previous edition, which means 11.000 visitors, and 200 national and international exhibitors. Next edition Climatedworld is from 13-16 march '07

Source Cool & Comfort, June 2006



A satisfied customer

Nigel concludes: "The Zitrec solution has now been in use in all systems between 6 and 10 weeks. In that time we have had no coolant blockages, our chillers are performing better and the lines are cleaner. As this is working so well we will not be changing all our fittings to aluminium as suggested above. In the past we had removed cooling water from chamber walls due this corrosion, But since the problem is no longer happening we are considering putting this cooling back onto the walls in some chambers!"

Our distributors in Europe :

For Denmark :

*Hecodan ApS
Tel +45-4.826.24.07
hecodan@hecodan.dk
www.hecodan.dk*

For Belgium :

*Gasco België
Tel +32-9.341.97.77
info@gasco.be
www.gasco-group.com*

For Sweden :

*Stainless Engineering AB
Tel +46-8.541.335.41
freezium-zitrec@stainlessengineering.se*

For the Netherlands :

*Gasco Nederland
Tel +31-15.251.72.72
gndelft@gasco.be
www.gasco-group.com*

For United Kingdom :

*A-Gas (UK)Ltd
Tel +44-1275.37.66.00
ken.logan@agas.com
www.agas.com*

For Switzerland :

*Strub +Co AG
Tel +41-62.758.22.22
info@strub-lube.ch
www.strub-lube.ch*

For Italy:

*Pietro Carini S.p.A
Tel +39-2.72.56.01
info@carini.it
www.carini.it*

For France:

*Dehon Service France SA
Tel +33-1.43.98.75.00
dehonservice@dehon.com
www.dehon.com*

For Denmark, Sweden, Norway :

*Brenntag Nordic - HTF-group
Tel +46-33.23.18.80 (Sweden)
Tel +47-69.10.25.00 (Norway)
Tel +45-43.29.28.00 (Denmark)
main@brenntag-nordic.com*

For Germany:

*Gasco Deutschland
Tel +49-2841 95306
gdmowers@gasco.be
www.gasco-group.com*

For Germany:

*Fragol
Tel +49-208 300 02 63
waermetraeger@fragol.de
www.fragol.com*

*Arteco NV Technologiepark Zwijnaarde 2
B-9052 Gent*

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*Tel +32-9-240.73.20 arteco@chevron.com
Fax +32-9-240.73.24 www.zitrec.com*

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