



Rob Vissers, above, is a man with a mission and he is not shy about it! He wants everyone to know his job is to rid recirculating systems of sludge.

OK, so he is not saving the world but he could be saving developers, consultants and anyone who is in it for the long haul, a lot of money.

Paul Braithwaite reports

SLUDGE BUSTER!

ROB Vissers, managing director of Engineering Appliances, deals in sludge. Or rather, he hopes, the lack of it! But not just any old sludge.

Rob's concern is the sludge which is found in heating systems, cold radiators, inefficient boilers and under-achieving pump heads.

"Everyone is familiar with these symptoms but few understand why."

Rob knows. "It is caused by air in the water in any recirculating system," he says unequivocally.

Engineering Appliances, which has been part of Andrews Sykes since 1985, has been leading this fight against sludge since 1988 when it launched a range of deaerators and dirt separators.

In fact, says Rob, his company introduced the word deaeration. Engineering Appliances was, in 1988, Rob claims, the first company to take the dissolved air out of the water as well as free air.

In those days, he admits, it was a case of having to explain the physics of the deaeration process before trying to sell any products.

Before that, a vent or air scoop would be introduced which was only able to remove free air when filling the system.

Rob is unequivocal.

The methods used before the deaerator did not work, hence the corrosion and hence the sludge.

"What people did not realise is that the air is in the water. When the water is heated, air comes out of the solution (Henry's Law)."

Rob says there is about 25ml of air dissolved in a litre of water at ambient temperature and pressure.

"When water is heated to 90°C, most of the air will come out of the water just like the bubbles which come to the top when a kettle boils."

It is the oxygen content which causes corrosion and, therefore, the sludge.

When the water cools, the air is re-absorbed. When the water heats up again, the air comes out again.

Rob says there is a second part to Henry's Law which is pressure related.

"The higher the pressure, the more air there is in the system."

Hence, the reason divers can get the bends.

"When a diver goes deep, the pressure forces more air into the blood. When he comes back to the surface, air comes out in bubbles which can get into the brain."

He relates this to a tall building.

As the water goes up the building, the pressure decreases and air dissolves in the water comes out of solution. As the water comes down again, the pressure increases and air is re-absorbed.

"This is why there are inevitably problems with high static heads."

Sixteen years on and deaerators have become mainstream products. But, Rob believes there are still many people who do not understand why deaerators are necessary.

For Engineering Appliances the learning has not stopped.

The technical team has learned more and more about problems in recirculating systems.

For instance, Rob says, it is not just air in solutions which is causing problems.

"Problems are caused by air coming back into the system and in large volume, far more than is dissolved in the water in the first place."

He admits air will always get into the system through seals, glands and gaskets.

But the main cause is "a loss of pressure in the system which is compensated for by adding water."

And adding fresh water to the system means a large amount of air is also added.

So it is necessary to prevent pressure loss.

"Any water which is added to the system must be deaerated before it goes in so that oxygen can't react with the steel."

He adds: "and by designing the expansion system correctly, specifiers can greatly reduce the need to add water".

There is also the size of the expansion vessel to be taken into consideration.

The pressure is on for specifiers to design smaller and smaller expansion vessels for the system, because of the space requirements and cost.

However, the smaller the vessel, the greater the pressure fluctuation.

Rob explains: "In these vessels there is a gas pocket in the top above

the water. It is this pocket which compensates for expansion and keeps up the pressure on the water."

Over time, pressure is lost from the gas pocket and consequently the pressure in the system is lost.

When the system realises it has not got enough pressure and the gas charge can no longer compensate, then it thinks it has lost water, the pump switches on and fresh water goes in.

When the water cools down, the gas pocket has to be sufficient to push the water back into the system but eventually it cannot.

Next time around the system the vessel is full.

As the water heats up, it has nowhere to go and it blows the safety valve. This water is piped away, nobody can see it and then the cycle starts again.

"This principle is not understood." In some buildings this cycle begins "within months" but it depends on the size of the expansion vessel, the quality of the membrane and the pressure.

Given that most maintenance contracts are annual, "it is already too late" when the engineer checks the system.

Ultimately, the membrane ruptures and the tank fills up. But because they are relatively cheap it is a case of throwing that one away and buying a new one.

This link between corrosion and wrongly-sized and poor quality expansion/pressurisation systems is what Rob has been trying to explain to consultant engineers.

Having explained the link, what is Engineering Appliances doing about it?

First, the company wants to ensure these vessels are the correct size, of adequate volume and the price differences between sizes are relatively low.

Perhaps, more important is the necessity of having a vessel of sufficient high quality that there is no loss of pressure.

Here is where the tie up between Engineering Appliances and Pneumatex comes in.

The company has become the sole distributor for Pneumatex products in the UK.

The move, says Rob, fits in well with the need for quality equipment. The Pneumatex vessels are 10 times more air tight and the gas pocket is guaranteed for five years. The bag inside is a thick butyl membrane which is resistant to gas oozing through it.

Rob admits the Pneumatex vessel is dearer because the vessel is, perhaps, up to 50% bigger and the quality is much higher.

For large systems where a fixed air cushion vessel gets too big, Pneumatex offers other solutions.

For instance, the company offers compressor systems which keep constant system pressure to within 0.1bar

Again, Rob agrees other companies make similar compressor systems but it is the quality of the tank and, especially the bag, which he claims sets his equipment apart.

Again, he admits, the Engineering Appliances' equip-

ment is dearer but he adds that it is like comparing a Ford Focus and a BMW.

"Both do the job but the drivers have different expectations."

Rob is not unhappy about having to sell his products against cheaper ones.

"As long as consultants give us a fair hearing, are aware of the differences with our products and then go away and make the decision."

The higher price has not stopped Pneumatex selling its systems. Over the life of the system, Pneumatex is by far the most effective option, he says.

Rob believes that once the differences are explained to them, consultants want to use the better equipment because their reputations are on the line.

"With cheaper equipment the problem is air entering the system."

But regardless of whatever system is used, there will, at some

point, be a need to replace water.

This is where the Pneumatex pressure drop degassers, micro-bubble separators and make-up systems come into their own.

Pneumatex also supplies the best multifunction equipment for combined pressurisation and deaeration.

Rob suggests this is the only multi-function unit on the market and Engineering Appliances believes it can go to consultants with a unit which will save them money and give them the quality they want.

As well as the Pneumatex range, Engineering Appliances still sells its traditional expansion joints and rubber bellows which are, says Rob, still very much part of our product range.

It's all part of an integrated approach for treating corrosion in recirculating systems. In fact, Rob says that in deaeration, Engineering Appliances is the market leader. In five years time he also wants to be



Pneumatex EG pressure vessel with compressor

the market leader in specialist pressurisation systems too.

Back to explaining about sludge (or lack of it) then!



Pneumatex PND expansion vessel with preset gas cushion