

Powerflushing of Microbore and Single Pipe Systems – Update

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With some boiler manufacturers now giving 10 year Warranties on their heat exchangers all systems need to be flushed out properly and microbore systems and single pipe systems are much more difficult to do than conventional ones. If you don't look after the system then at some stage it is going to come back and bite you.

So let's look at flushing procedures and in particular microbore. The methods shown will also apply to single pipe systems although each system will be different and may need to be thought about before actually connecting and starting to powerflush.

Successful powerflushing can only be done by not cutting corners and certainly, if the heating system looks in a bad way, it is quite likely that some remedial work will have to be done before you even consider powerflushing a system. There is no point keeping leaky valves or rusting radiators because it is going to lead to problems at a later date.

I'm not teaching you good guys how to do your job but you really need to go round with the customer to point out the problems, or potential ones. If you show the customer you know what you are talking about you are more likely to pick up some extra work and at the same time save yourself the effort of having to go back on a non-chargeable recall. Call backs cost you money!

There isn't such a thing as a typical system and what you do on one system may not work on the next. I've found that out many times during my years in the Industry when dealing with corrosion, talking to heating engineers at training seminars across the country or actually being out on site.

Many people within the Industry say that you can't successfully powerflush microbore or single pipe systems and some manufacturers will not guarantee their boilers where a new boiler is fitted to a system with microbore pipework. What do you do? Tell the customer that they will have to change all the pipework? Unlikely you will get the job. Let's look at the problem in more detail.

Admittedly, flushing microbore is not the easiest thing in the world and I always groan when either the dreaded M word is mentioned or I go out on site to do some one- to- one training and find 8mm pipework everywhere and an engineer who hasn't surveyed the job properly. Let's face it, if you get a request to go round and sort out a badly sludged up system with poor circulation, probably a noisy boiler and leaky rad valves and then find out it is on 8mm pipework to the rads don't you just want to turn round and make a sharp exit?.

I think though that I have now found the best way to flush out a microbore system without problems. It does take a while and the engineer will have to allow at least a day, day and a half to do it. Of course this also depends on the number of radiators on the system. I've known of engineers taking 4 days to do a system flush and being out of pocket at the end of it because they hadn't done a proper survey.

Having recently failed dismally (exactly what I had expected with 8mm microbore. twin entry valves and no drain off valves on the downstairs drop feed radiators) an engineer I was training on site had to go back, prior to fitting the new boiler, and flush it the way I suggested.

Remember that heat rises. At the time, we had no trouble heating up the individual radiators with the Norstrom Thermal heater. (The boiler was inoperative) Every radiator got hot eventually. So we had circulation everywhere. Come to flushing out. Didn't want to know! So how come we can get heat and circulation but not a flush. The answer is Heat itself!

Heat rises and starts to enter the radiators from the 22mm circuit once the circuit starts to heat up. It then completes the heating of the radiator and after a while starts to permeate back into the circuit through the return valve. Remember, though, that the flow rate through microbore is considerably reduced from that of conventional 15mm pipe off a 22mm circuit.

The best method of final flushing on conventional systems is to isolate all the radiators on the circuit except the one nearest to you and then to work away from yourself isolating each completed rad and opening the next one until all the rads have been flushed out to plain water, each one having had a separate TDS meter test at the foul drain dispersal point.

So, back to microbore, when you start to flush that first radiator (which is still hot because you have just been circulating hot chemical water through it) the rest of the radiators will have cooled down a bit but will still have hot water in them.

By this time however the fresh cold water in the powerflushing machine being used for the final flush will have cooled the circuit and the cold water therefore takes the line of least resistance and bypasses the radiators in the 22mm circuit instead of diverting into the 8mm radiator pipe work. If that water was hot it would rise and enter the radiator.

If you then open the next radiator and start to flush it the same way as the first radiator it is likely you will just be flushing out clear circuit water and not the contaminated water in the next radiator.

Therefore the only effective way to flush out the individual radiators on a microbore circuit after the first one has been done is to reheat the circuit, (either by using the system boiler or, if that is not available, the Norstrom Thermal Heater Unit), get heat circulating through the one open radiator (and circuit) and then open the drain valves to immediately flush that radiator (and circuit) until you get back to plain fresh water again. (Using a TDS Meter to confirm that you are in fact back to plain water).

This you would have to do for each subsequent radiator until all the radiators have been done. A supply of hot water from a hot water cylinder would reduce the time between each radiator flush otherwise you would have to wait for each heated circuit or Norstrom tank to become available. This means that the average time for flushing each radiator could be around 35/40 minutes.

If you have the facility of a boiler then the system can be kept reasonably hot and the boiler made use of to get the individual radiators back up to temperature ready for a flush out. This will save a lot of time. Hot water circulation of each radiator through the machine prior to a final flush is therefore imperative.

Where the downstairs radiators are drop-feed, however, the above method may still not work. In this case you will have to flush those individual radiators out by using a separate drain hose on each rad straight out to foul drain, opening each rad in turn and draining the rad until clear water is obtained.

In this instance you may have to use the Norstrom Powerflushing machine in circulation mode instead of the conventional dump position and, whilst opening the drain valve on the drop feed rad, bring in fresh water by opening the mains tap on the machine so that you are draining that rad whilst filling the system at the same time.

You will only be dumping from the radiator and not by the dump hose on the machine. By operating the reverse flow lever to change the direction of water flow you will be able to remove any contaminated water in the return drop back into the circuit.

A faster flush can be attained by switching on the powerflush machine to refill the system whilst you are draining. If a number of downstairs radiators are fed from one drop feed a separate drain off from each rad will have to be fitted as, unless you do this, you will not be able to individually flush the downstairs rads. (In this case a TDS Meter reading for each radiator would be imperative).

The only other way is for the whole system to be drained, refilled, heated, drained, filled, reheated for as many times as it takes to get back to some semblance of clear water and hope for the best, (You would not be able to adopt this method if drop feed rads were in the circuit but using the method of individual radiator flushing separately would be an advantage).

Alternatively a manual flush of each radiator in the garden which will again take time if done with the power flush unit because of the fact that you would need to alter the entry valves on each radiator and make up a connection, one top and one bottom diagonally and flush out each radiator for 10-15 minutes with the aid of the diverter valve.

If you are powerflushing with a smaller pump which does not have the velocity of the Norstrom Professional range then you are really on a hiding to nothing and it is extremely doubtful that you will be able to achieve a satisfactory flush on a complete microbore or single pipe system. If you do not have a facility for heating the system then you will not be able to achieve a satisfactory flush anyway.

In the case of single pipe systems if the rads have severe deposit build-ups, or cold panels, then the powerflush is not likely to be successful. If you do take on such a system, improve the chances of success by pre-treating with two litres of Prochem® Descaler, and operate the flow reverser more often than usual whilst flushing individual rads.

As circulation through the rads on a single pipe system is by gravity from the main circuit you will only be able to achieve full circulation by connecting each rad diagonally top one end to bottom at the other. If the rad you are working with is a round top type model without top tapping connections you will not be able to achieve any circulation through that rad.

If you have trouble with circulation on a section of a single pipe system where some parts get hot and others don't it is possible that the circuit has been piped wrongly. There have been instances where parts of a system are found to be single pipe with other parts conventional two pipe. You may, therefore, have to check that the circuit pipework has been correctly fitted (especially if extra work has been done to a system since new and new rads have been fitted).

If, when powerflushing a system, you are unable to hear the water being flushed through individual rads then you have to suspect some form of blockage either in the rad tails or in that part of the circuit or, alternatively, a wrongly piped circuit. You are more likely to hear a fast flushing movement of water through a rad when using a powerful powerflush machine such as the Norstrom Proflush® Professional unit which is capable of flow rates up to 90 litres a minute.

Please bear in mind that where you find microbore or single pipe systems you must always connect the Norstrom powerflushing machine directly into the circuit and not through a radiator.

Any powerflushing however will be unable to remove 100% of the debris and astute engineers should also be recommending that a magnetic system filter like the Magmaster System Filter should be fitted on the system return to grab hold of any residues. That filter can be cleaned out on an annual service.

**Happy powerflushing!
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