

Submitting Milking Machine Tests for Marking

Is it time for you to submit tests for marking?

Relax, help is at hand – below are some tips from our Marker, Darrell Mclean, of Fox, Eden & Associates.

Full details of requirements when sending in test reports for marking are listed on page 3 of this document. The issues that are often disregarded are that:

- tests need to be less than a year old
- tests must include recording for Vacuum Regulation Characteristics
- tests must not be abbreviated tests
- no two reports are for the same milking machine.

Please save yourselves some embarrassment and us some discomfort as tests received that don't meet these requirements will be referred back to you without any marking.

All tests are marked against strict guidelines and all faults, minor or major, are addressed. The reason for this is that the test report is a legal document that records the condition of the machine as you left it at the end of the test. It is your defence should a problem occur such as mastitis or teat damage, that the farmer, or their advisor, may claim is caused by the machine. If an independent tester finds a fault with the machine while investigating the farmer's problem, your test report is the written evidence of the machine's condition on the date you tested it, and of your recommendations to correct any faults. For full validity, it is important that the test report thus follows all recognised test protocols.

Less than ten percent of applicants submit six acceptable tests first time around. This is disappointing, as you have full control over which tests you submit and can make corrections or attach explanatory notes to those that you send. If you insist on sending in a test that varies from normal testing routines, for whatever reason, a note describing what you did and why is essential. We will happily mark it and evaluate your understanding of the underlying principles – if we can see that you understand what you did and how you related that to the standards we will accept it.

Please make sure that your photocopies are readable. Marking is nearly impossible on some of the tests that are sent in. That makes it hard to be unbiased.

Many of the minor errors are no more than inattention, like using your pet name for the pulsators, or forgetting to record where the working vacuum was measured.

The most serious problems that are made most often are the following:-

- Not measuring the vacuum pump speeds, particularly the minimum speed on Variable Speed Control (VSC) machines. Some of the installers of these systems choose to disregard the manufacturer's specified minimum speed on water ring pumps, which invalidates any warranties. It is essential to note this in your report if it is the case.
- Oiling rates on vane-type vacuum pumps are important, not only for lubrication but also to maintain the integrity of the oil seal at the top of the rotor, between rotor and cylinder.
- After reading 10, the flowmeter has to be opened to drop the vacuum to working vacuum for reading 11. In thermodynamics there are what are called universal gas laws: one states that the ratio PV/T (Pressure x volume divided by temperature) is a constant. At constant temperature this reduces to $P_1V_1 = P_2V_2$ so, for example, if you measure 4000 l/min at 50 kPa (reading 10), you should expect to measure at, say, 46 kPa working vacuum (reading 11), $50/46 \times 4000 = 4348$ l/min – lower

vacuum means higher flowrate. If your reading is widely off this estimate you have a problem that requires investigation.

- After reading 21, when the milking machine is all back together apart from the regulator, the flowmeter has to be opened to drop the vacuum by 2 kPa to get reading 22. The latter must thus always be higher, and using the above gas law, if working vacuum was 46 kPa and reading 21 was 900 l/min, then reading 22 will be about $46/44 \times 900 = 940$ l/min.
- Reading 24 should be the same as reading 22 if there are no leaks through the regulator. If the regulator is leaking, then reading 24 will be less than reading 22. If you find a reading 24 higher than reading 22 you have an error, possibly caused by introducing a leak when you disconnected the regulator. Your vacuum pump output at 50 kPa, reading 10, or your air flow with main airline/receiver airline connected will then have been affected, depending on where the regulator is fitted. This is a serious error and should be addressed before the test is ended.
- Check also that reading 24 is the same as reading 6 and if not, explain why. Perhaps you found and eliminated a leaking union, for example.
- In the Farm Gauge Error boxes, you must write the difference between the test gauge and the farm gauge, not the actual farm gauge reading.
- Make sure that you have the correct standards for the type of pulsator and the ratio setting. Some pulsators are hard to identify, but you have got to get this right to make sense of the standards that apply. To make failures easier to identify, write in the range of readings that you took in the pulsator tests – the highest and the lowest readings for each variable.
- Remember that all tests submitted for marking now must have the Vacuum Regulation Characteristics correctly recorded and analysed. If you do not know how to do this, you should consider attending the MPTA Refresher Course.
- On the Visual Faults Checklist the most important numbers that need to be filled in are the milkline height (determines the appropriate working vacuum), milkline diameter, the shell type or dimensions and the claw inlet diameter. The latter because they confirm the compatibility of the shell and liner and the claw and liner. If you cannot identify the shell, measure and note the length and FS dimension.
- Tick or cross (as appropriate) every box on the Visual Faults Checklist as you check it, as that confirms that you have given it attention and eliminates the risk of overlooking something that may well have a serious affect on the functioning of the machine. It also shows more clearly to anyone reading the report that attention was given to each appropriate item.
- It stands to reason that the liner must be positively identified, for example “Delaval” or “Milfos” is insufficient – there must be a code number as well. Whether the liner is standard or large tail is also essential information.
- In the Milking Machine Test Summary, it is important that you not only identify the problems, but also indicate to the farmer what he needs to do to correct them. If you are using the AutoRep Computer Programme for reporting - make thorough use of the of the “Notes” facility in this software, at each machine factor investigated, to key in your recommendations.

When you are recording pulsation characteristics, try to be more analytic in your approach to recommendations. If the “d”-phase is too short – anything below 20%, as far as we are concerned – look at the “a”- and “c”-phases. If the “c”-phase is long relative to other pulsators in the dairy, while the “a”-phase is similar to the others, the problem is in the air inlet to the pulsator. Filters or connections to the filtered air line are blocked. If only the “a”- phases are longer than other pulsators the fault is most likely in the valve seals or diaphragms in the pulsator itself, or the connection to the pulsator airline, or leaks through splits in the pulsator air tubes or short pulse tubes. If there are leaks through the connection to the pulsator airline, this may show up as high pulsator airline leaks. When

the graph does not reach working vacuum during the “b”-phase, the same factors can be at play. If both “a”- and “c”-phases are extended, there is probably a blockage in the pulsator itself, pulsator air tubes or pulsation manifold on the claw. It is amazing what a bit of cow dung or a small pebble in the claw manifold can do to the pulsation graph. As you can see, it is often very inaccurate to recommend “service pulsators” when there is a departure from the standard values.

Note that if you measure relatively short “a”- and “c”-phases it may mean that the claw button is out, there is no vacuum in the claw and thus the liners are not moving much during pulsation. This reduces the amount of air flowing through the pulsator, so working vacuum or atmospheric pressure levels are reached much quicker.

Requirements for sending in Milking Machine Test Reports for Marking

The following requirements apply to all Milking Machine Test Reports sent in for marking:

- Six complete and correct reports are required to assess your testing ability. (Note: please only send photocopies of test reports as they are not returned to the tester).
- Include all three reports – NZ Standard Milking Machine Test Report, Visual Faults Checklist and the Milking Machine Test Summary.
- All pulsators must be tested and recorded and digital printouts must include rate and ratio values for each pulsator. Please attach to your test papers 20% of the pulsator recordings for each machine tested.
- Of the six tests sent in for marking, no two can be from the same milking shed.
- All tests must be less than 12 months old.
- At least one farm dairy owner will be contacted to verify that the test has been carried out by the tester.
- It is now mandatory that your Milking Machine Tests include recordings of the Vacuum Regulation Characteristics. Test Report pads can be ordered from the Stationery tab on our website www.nzmpa.co.nz
- Include one updated passport sized photograph to be used on your new Practising Certificate.
- The fee to have your tests marked is \$125.00 + gst and will be invoiced once we receive your Test Reports.
- Please send your six Test Reports, accompanying data and photo to:

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