

# Testing Wood Quality?

## The Resistograph F Series - Q

### The Right Tool For The Job

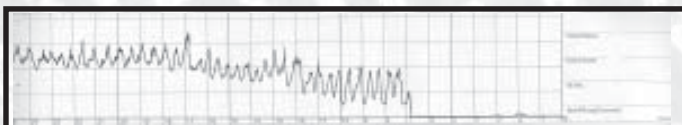
Traditional approaches to assessing wood quality and density require time consuming sampling techniques and laboratory analysis, or rely on relatively crude impact resistance measurements to derive an indicator of wood density.

IML Resistographs are sophisticated tools capable of detecting very detailed wood density variations - they are used worldwide to detect decay in trees, log bridges, power poles, and other wooden structures.

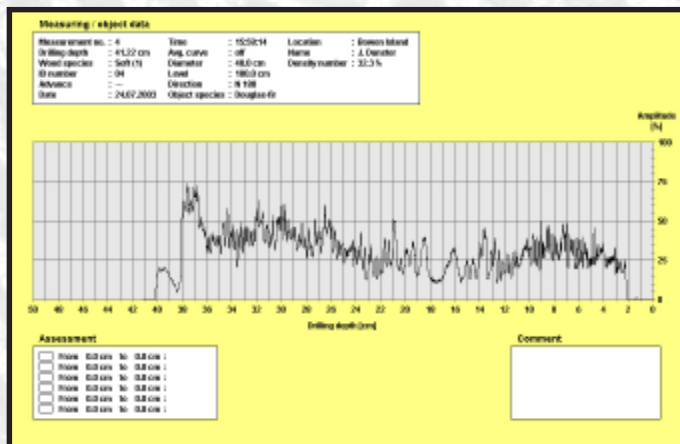
In response to demand, and following on from research work in the United States, IML is pleased to announce the release of its latest application software - F-Tools Q and associated Resistographs, the F Series - Q. Specifically designed to meet the needs of researchers testing wood quality and density properties, these instruments are ideal for use in seed tree nurseries, test plots in the forest, or sample sections in the laboratory.



The principle behind the Resistograph is simple. A fine drill is fed into the wood at a set rate. As the drill traverses through the wood, variations in wood density cause corresponding variations in the torque applied to the drill. By means of sophisticated gearing and instrumentation, this variation in torque is translated into a high quality reading of relative wood density plotted against the drilling depth (reading the chart from right to left). The output is transcribed onto a paper chart, and at the same time, stored in the onboard datalogger as a digital file. These data files are simply downloaded to a computer for further analysis if required



Standard paper output



Digital output

Its ease of use, portability, and rugged design, combine to make it an excellent tool for field work. These instruments perform in a wide range of conditions, including underneath bridges, working from bucket trucks, out in the forest, and high in tree canopies.

# Testing Wood Quality and Density

Working with experts in the field, IML has developed new software and datalogger capabilities to yield a simple surrogate test of wood density. The user takes a reading by drilling right through the tree so that the drill bit appears on the other side. Once the drill bit is fully retracted, the software performs an additional calculation to create a Density Number. This Density Number is derived with a series of factors.

Firstly, the software deducts the thickness of bark on either side of the trunk - this ensures that only wood is being assessed. Secondly, because the annual rings on the outside are larger than those in the centre of the tree, a weighting algorithm is applied to the reading to adjust for this. Next, the software adjusts the overall reading to deduct any additional friction on the drill shaft that might bias the overall result. Finally, the adjusted area under the curve is divided by two to yield a representative wood density for a radial section.

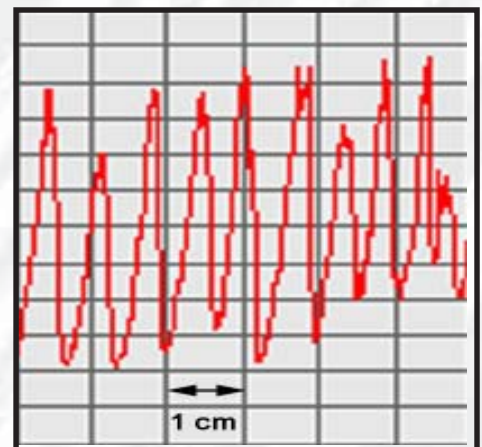
The Density Number is displayed on the datalogger screen at the completion of each reading, thus enabling the user to record the test result right in the field. It is also recorded in the digital file and displayed in the file data along with other data that the user inputs, such as the individual identifier for each reading taken, species, location, height above ground, drilling direction, and a user name.



The Series Q is based on the widely used F model of Resistograph. These instruments record density variations every 0.1 millimetres, thus yielding an extremely sensitive, and very accurate recording of the wood condition. User switchable settings allow testing of conifers and deciduous woods.

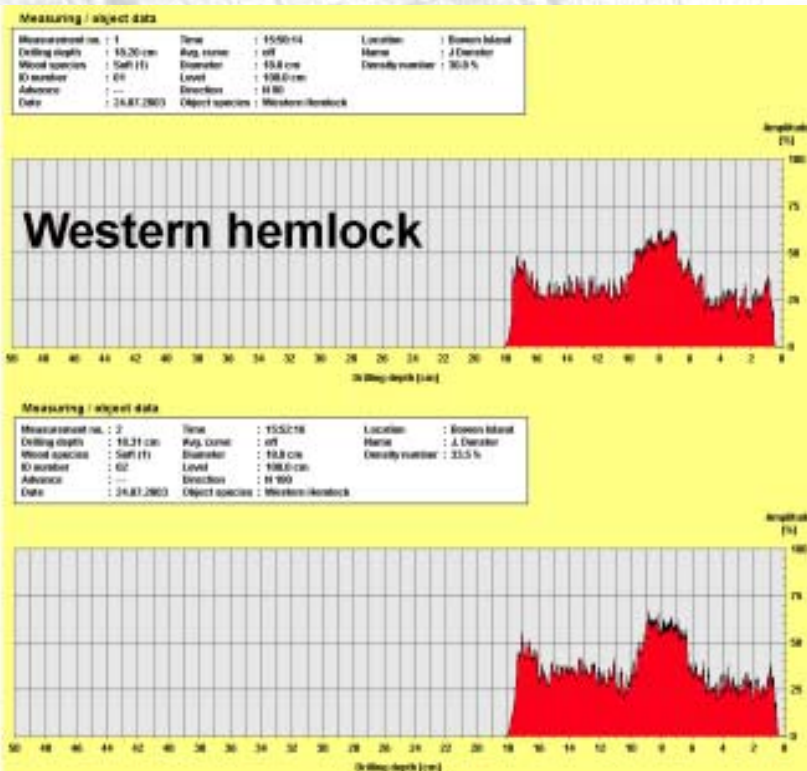
For many applications, simply recording the Density Number at the end of each reading is sufficient. For more specialised analysis, the F-Tools Q software permits the user to view the data in greater detail on the computer, and in many cases, especially in conifers, annual ring widths can be readily measured and assessed.

By making multiple readings across any one plane of the tree, or by taking sequential readings up and down the tree, growth patterns, and Density Number readings can be aggregated to yield excellent results. These aggregated readings can then be used to compare wood quality and relative wood density patterns between trees - ideal for progeny testing in nurseries, or sample plots in the forest.

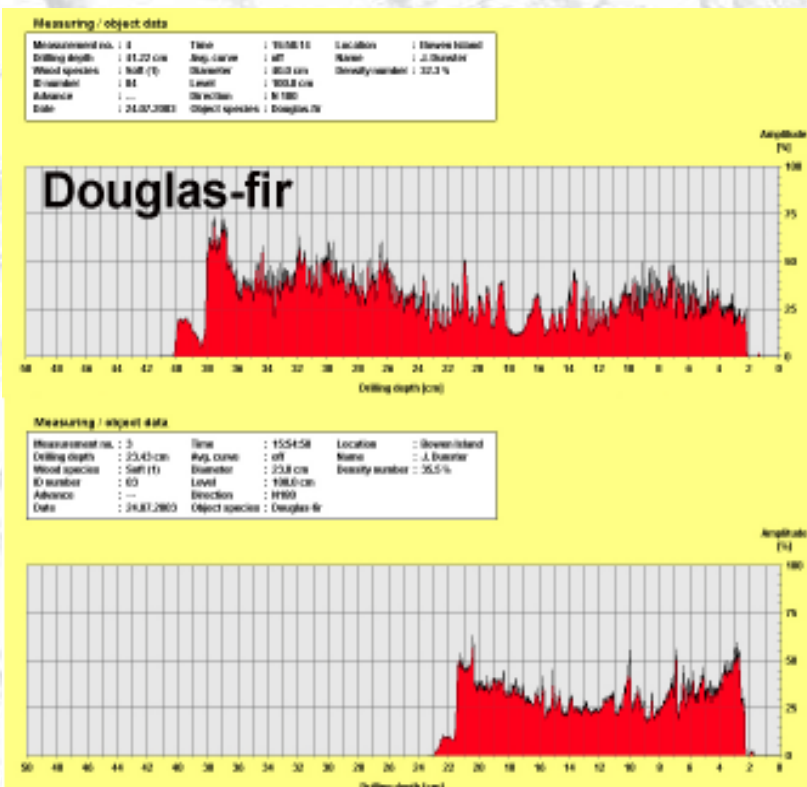


Available models are the F300-Q, F400-Q, and F500-Q, representing the drilling depths of 30, 40, and 50 centimetres. All three models are fully equipped with the datalogger and associated wood quality testing software, and come as a package complete with carrying case, tool kit, download cable, five spare needles, 400 paper strips, one battery and charger, adapter cable to hook up to a portable lead acid battery (user supplied) and a complete set of instruction manuals. A one year warranty is standard.

# Sample Outputs



Sample tests on Western hemlock (*Tsuga heterophylla*) drilling in the same plane but different quadrants. The area under the curve is coloured for ease of viewing. The Density Numbers are 30.8% and 33.5% reflecting the variation in ring widths outside the core of the trunk.



Sample tests on Douglas-fir (*Pseudotsuga menziesii*) showing readings on a small and a large tree growing a few metres apart. The Density Number on the larger tree is 32.3% while the smaller tree is 35.5%.

Note that the Density Number is an assessment of relative density, not absolute density.

# In Summary...

The new F Series - Q models have been specifically designed to meet the needs of researchers investigating wood quality and wood density in a wide range of settings.

These instruments offer:

- ☞ ease of use in the field, with the Density Number immediately available after every reading
- ☞ software that allows for more detailed analysis of the test output if required
- ☞ a rugged and well established record of dependability
- ☞ unsurpassed accuracy and sophistication

For more information about IML Resistographs and the new F Series - Q please contact us.

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