The calculation of scaling

Today we know the tensile strength (Rm) because of our test-report. So we can calculate wether the wire will be stabil on a certain scaling.

The vibrating string length between the bridges (length) is dependent to: frequency, diametre, gravity, drawing force, specific weight

l = 1 / (n x d) x (g x p / x s)

length = 1 / (frecuency x diametre) x root of (gravity x load / x specific weight)

If you take out the gravity and as constant with which you calculate the diametre and put in 17841 for it, the formula looks like this:

length = 17841 / (frecuency x diametre) x root of (load / specific weight)

So if three items: frequency, tension and length on two strings one factor is equal and one is unequal, the third factor has to be unequal as well, for example: at equal frequency and unequal lengths of two strings the tension is unequal, too.

If the load of a string is near up to breaking limit, the string will be continous elongatied by the constant overload so it has to be compensated by tuning again. During the time the string gets more and more thinner and weaker until it breaks. This can also happen after one year or later. One shouldn‘t forget that the stress on the string is not spreaded equal because of the friction at the bridge pins. The bigger the bend is on the bridge pin the bigger is the friction, and the bigger must be the reserver on the wire.