

Rupture testing of Röslau steel wire, as used in clavichords

This brief Comm gives the results of my string rupture testing. I tested such diameters as were critical in a clavichord design setting. I could not find any such figures published anywhere, so I did the physical string breaking. The string supplier was Fletcher and Newman.

0.18mm diameter	publ. max.: 6.10kg	tested max.: <u>5.58</u>	- safe max.: 4.98kg
0.19mm diameter	publ. max.: 6.79kg	tested max.: <u>5.07</u>	- safe max.: 4.52kg
0.21mm diameter	publ. max.: 8.30kg	tested max.: <u>7.35</u>	- safe max.: 6.55kg
0.22mm diameter	publ. max.: 9.11kg	tested max.: <u>8.01</u>	- safe max.: 7.14kg
0.23mm diameter	publ. max.: 9.95kg	tested max.: 10.15	- safe max.: 9.05kg
0.25mm diameter	publ. max.: 11.76kg	tested max.: 11.99	- safe max.: 10.69kg

Figures underlined / in red are where the published figure is higher than the tested maximum tension.

"Tested maximum" indicates the tension at the semitone point at A440hz which the string sustained immediately below the rupture point.

The "safe max", minus 2 semitone figure seems to be a safe working maximum tension.
JG

Phosphor Bronze (CuSn6) wire
(suppliers: Vogel & Heckschers)

V 0.211mm diameter	publ max.: 3.032kg	safe max.: 1.578kg
V 0.235mm diameter	publ. max.: 3.637kg	safe max.: 3.005kg
V 0.248mm diameter	publ. max.: 4.297kg	safe max.: 3.55kg
V 0.277mm diameter	publ. max.: 4.823kg	safe max.: 4.823kg
V 0.309mm diameter	publ. max.: 6.188kg	safe max.: 5.74kg
V 0.326mm diameter	publ. max.: 7.307kg	safe max.: 6.8kg
H 0.35mm diameter	publ. max.: --	safe max.: 8.1kg
V 0.364mm diameter	publ. max.: 9.11kg	safe max.: 6kg
H 0.4mm diameter	publ. max.: --	safe max.: 9.1kg
H 0.445mm diameter	publ. max.: --	safe max.: 11.303kg
H 0.5mm diameter	publ. max.: --	safe max.: 11.342kg
H 0.56mm diameter	publ. max.: --	safe max.: 12.655kg

V = Vogel CuSn6 H = Heckschers Phos Bz

The rupture testing was carried out on a beam of wood mounted with a wrest pin at each end--574mm apart. The string was then tensioned and its pitch noted as it attained each semitone at A440hz.

Two semitones below the point of rupture was noted, and this is the "safe max" figure, to allow for a safe seasonal rise of one semitone.