

Revised 3/13/10
see note below

Slope of neck = $28.65 \times (22.8 - 12.6) / 176 = 1.66$ degrees
Length of missing cone = $28.65 \times (12.6 - 0) / 1.66 = 217.5$ mm
Volume of missing cone = $3.1416 \times 6.3^2 \times 217.5 / 3 = 9.04$ ml
Measured volume of neck = 50 ml
Volume of neck plus missing cone = $50 + 9.04 = 59.04$ ml



Measured mouthpiece volume 12.4 ml **

Neck taper = $28.65 \times 22.8 - 12.6 / 176 = 1.66 \text{ deg}$

Length of missing cone = $28.65 \times 12.6 - 0 / 1.66 = 217.5 \text{ mm}$

Volume of missing cone = $3.1416 \times 6.3 \text{ sq} \times 217.5 / 3 = 9.04 \text{ ml}$

MP volume displaced by neck = $3.1416 \times 7.9 \text{ sq} \times 28.2 = 5.53 \text{ ml}$

Mouthpiece volume used = 12.4 ml - 5.53 = 6.87 ml

Total effective mouthpiece volume * = 6.87 + 2.26 = 9.13 ml**

Estimated volume of missing cone extrapolated from neck taper = 9.04 ml

Difference = 9.04 - 9.13 = -.09 = 1% discrepancy

Length of neck including tenon = 197 mm

Calculated length of missing cone = 217.5 mm

Length of neck + cone to apex = 414.5 mm

Speed (velocity) of sound $v = 345 \text{ m/s}$

Formula for frequency of missing cone $F = v/2x_o$

$$F = 345/(2)(.4145) = 416.2 \text{ vps (hz)}$$

Ab₄ Concert (written alto sax F2) F = 415.3 hz

Calculated pitch is .9 hz (4 cents) below Ab₄ Concert Pitch

* Measurements taken from a Selmer Super Balanced Alto Neck and body

**** Rousseau 4R Classical Mouthpiece used for study**

*** Total effective volume taken from a previous study