

Control logs – measurement and volume determination

Guidelines:

- 1) Diameter needs to be measured and registered in mm;
- 2) Length needs to be measured and registered in cm;
- 3) Identify the type of bark;
- 4) Identify first assortment;
- 5) The nominal section length is 1m, except the last section which can range from 15 cm to 114 cm.

Measurement

1. At each processing site make additional measurements to basic measurement method:
 - 1.1. Diameter measurements are made at the end of the log and at one meter, starting from the assortment butt end;
 - 1.2. To be measured in accordance with **Figure 1**:
 - a. The **green coloured** diameters must be measured over and under bark;
 - b. The **red coloured** diameters must be measured **only** under the bark.

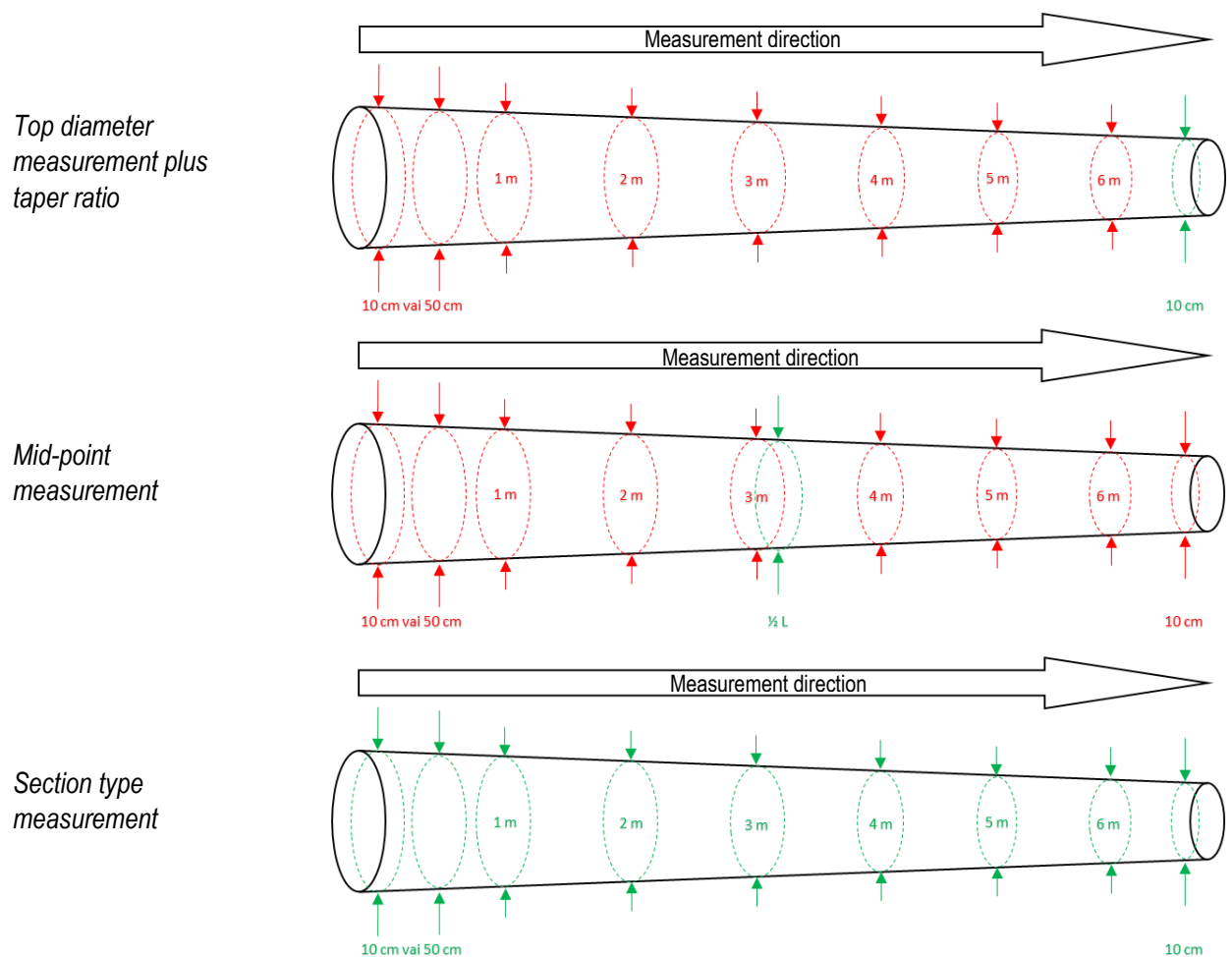


Figure 1. Volume determination scheme according to used measurement method in processing site

Data registration

2. The following data is recorded for assortment of each measurement method:

2.1. "Top diameter measurement plus taper ratio" the following data must be registered to determine the volume of assortment:

- Length of assortment, cm;
- Butt diameter under bark, mm;
- Diameters under bark after 1m, 2m ... n m from log butt end, mm;
- Top diameter over bark, mm;
- Top diameter under bark, mm;
- First assortment reference;
- Type of bark.

2.2. "Mid-point measurement" the following data must be registered to determine the volume of assortment:

- Length of assortment, cm;
- Butt diameter under bark, mm;
- Diameters under bark after 1m, 2m ... n m from log butt end, mm;
- Mid-point diameter over bark, mm;
- Mid-point diameter under bark, mm;
- First assortment reference;
- Type of bark.

2.3. "Section type measurement" the following data must be registered to determine the volume of assortment:

- Length of assortment, cm;
- Butt diameter under bark, mm;
- Butt diameter under bark, mm
- Diameters under bark after 1m, 2m ... n m from log butt end, mm;
- Top diameter over bark, mm;
- Top diameter under bark, mm;
- First assortment reference;
- Type of bark.

Calculation of volume

Calculation formula for 1 section:

$$V_{tr} = \frac{\pi \times (d_t^2 + d_r^2) \times l}{4 \times 2 \times 10000}, \text{ where:}$$

V_{tr} – volume, three decimal places, m^3 ;

d_t – top diameter, cm;

d_r – butt diameter, cm;

l – length, m;

π – constant, four decimal places (3,1416).

$$V_{KS} = V_{tr1} + V_{tr2} + V_{tr3} + \dots + V_{trn}, m^3, \text{ where:}$$

V_{KS} – the volume of control log calculated on the basis of the principle of 1 m (length 1m);

$V_{tr\ 1}$ – volume of the 1st section (length 1m);

$V_{tr\ 2}$ – volume of the 2nd section (length 1m);

$V_{tr\ 3}$ – volume of the 3rd section (length 1m);

$V_{tr\ n}$ – volume of the n section (length from 15 cm to 114 cm).

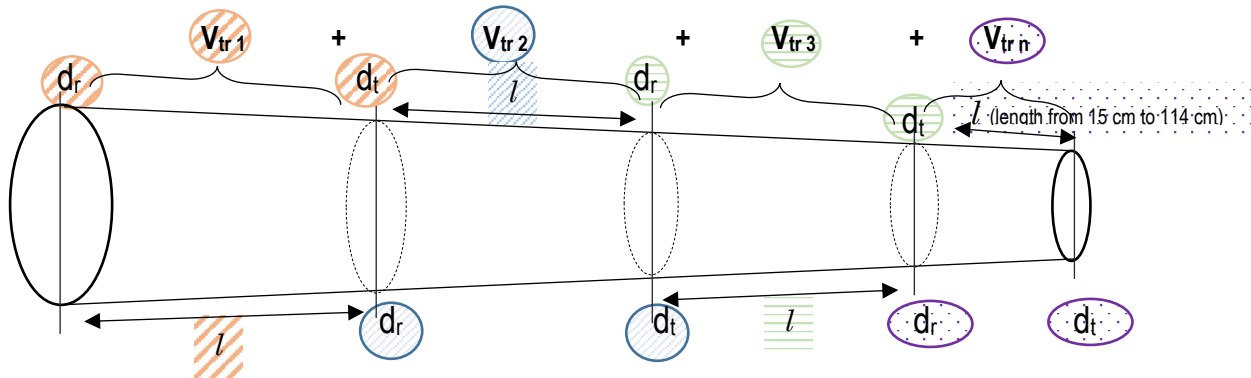


Figure 2. Principle of the calculation of volume for control logs measured with “Section type measurements” measurement method with step of 1 m (interval)