

PCV (Packed Cell Volume) Tube

Catalog number: TC-1041

PCV tubes are a cost effective and rapid alternative to visual counting for the determination of cell number. No dilutions or manipulations are necessary and an accurate cell count is obtained by a 3-minute procedure. The PCV method works for virtually all cell types and accurately accounts for cell aggregates.

PCV Tube Use Instructions

1. Mix cell suspension and add between 500 µl to 1000 µl to PCV tube.

IMPORTANT: To completely replace manual counting with PCV counting you must establish a conversion factor for cells/ml between a given cell line and the measurement on the PCV tube. There are two options for this; please refer to page 2 of this document.

2. Centrifuge for 1 minute at 5,000 rpm / 2,400 g. (PCV tubes can be centrifuged up to 10,000 rpm / 9,500 g if necessary).

TIP: A swing-out rotor is preferred. If a microcentrifuge rotor for 1.5/2ml tubes is not available then the PCV tube can be placed inside a 15ml conical centrifuge tube and then placed into a rotor for 15ml tubes. This is an effective and inexpensive method used by many labs.

TIP: A fixed-angle rotor works as well: PCV tubes are compatible with rotors from common manufacturers such as Hermle™, Lab-net™ and Eppendorf™.

3. Read the value directly from the calibrated capillary

TIP: The obtained value in µl corresponds to the total biomass or total number of cells.

4. Calculate % PCV and convert to cells/ml

1. Obtain the % PCV by dividing the µl of cells by the sample volume; e.g. 0.5% PCV corresponds to 5µl of pelleted cells per ml of cell culture.

2. Convert % PCV to cells/ml: For a given cell line a certain value of % PCV corresponds always to the same number of cells/ml. CONVERSION FORMULAS for calibrating cell counts or cell diameters to % PCV are on page 2 of this document.

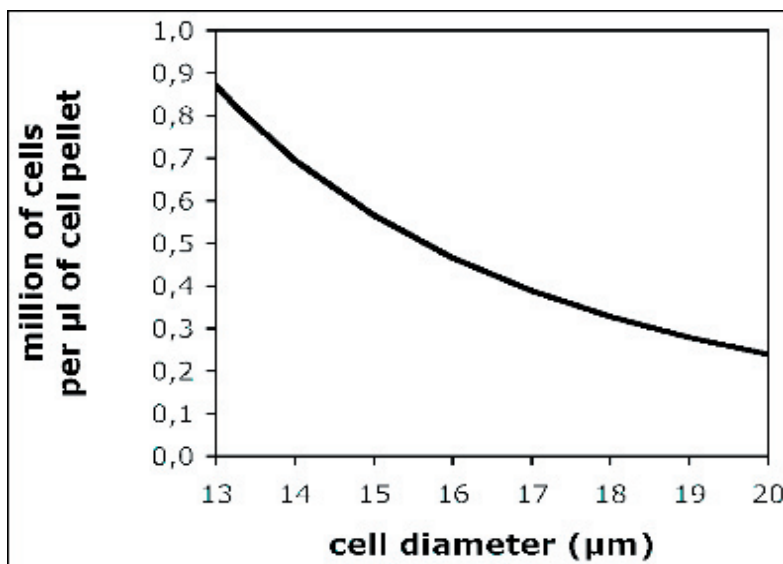
Quantification of Cells Using PCV Biomass Tubes

The PCV biomass tube gives a Packed Cell Volume percentage that can be used as a stand-alone parameter, but in some cases cell density (cells/ml) is preferred. In these cases the user has two options by which to convert packed cell volume into cells/ml.

Option 1: Use Cell Diameter

An easy solution to cell quantification is to convert the PCV into cells/µl using the known cell diameter for a cell line. Simply read the volume of the cell pellet in µl then apply the cell diameter to the graph below.

For example: an average cell diameter of 17µm would have an average of 390,000 cells/µl PCV.



Option 2: Use Cell Counts

To calibrate % PCV to a specific cell number: For a given cell culture run one PCV tube with 1ml of culture and physically count 1ml of the same culture. Obtain the % PCV value, and calibrate by converting the % PCV value to cell density as described below.

$$\% \text{ PCV} = \text{volume of cell pellet (ul)} / \text{volume added to PCV tube (ul)}$$

$$\text{Calibration: manual count (cells/ml)} / \% \text{ PCV} = \text{cell density} / \% \text{ PCV}$$

For example: if your physical count calculates a cell density of 2,000,000 cells/ml and the corresponding % PCV value is 2.5%, simply divide the physical count by the 2.5%. Now it is known, for that specific cell line, that for every 1% PCV there are 800,000 cells/ml.