

RBC AND WBC MANUAL COUNT

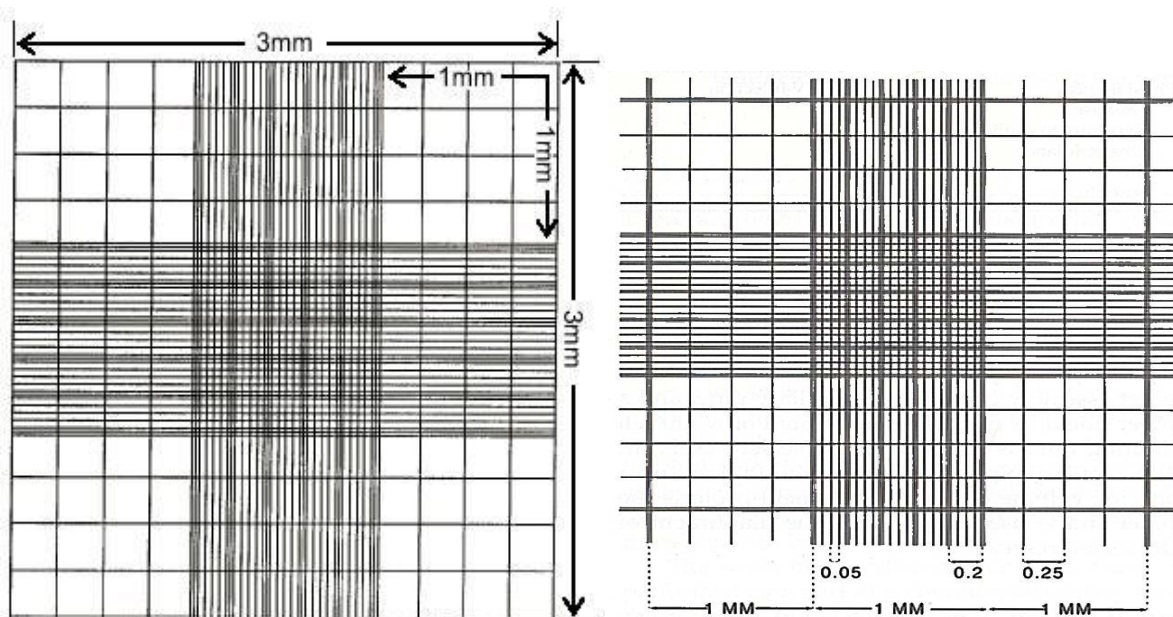
HEMOCYTOMETER

Hemo: blood; **Cyto:** cell, **Meter:** measurement / count. Thus, it is an instrument used to count the blood cells.

It includes:

- a) Neubauer's slide
- b) Cover slip
- c) RBC pipette
- d) WBC pipette

NEUBAUER'S SLIDE



It is the name given to a thick glass slide. In the centre of the slide, there is an H- shaped groove. On the two sides of the central horizontal bar, there are scales for counting the blood cells.

The depth of the scales is 1/10mm or 0.1mm.

NEUBAUER'S CHAMBER

Neubauer's slide with a cover slip over it, is called a Neubauer's chamber.

- Each scale is 3mm wide and 3mm long.
- The whole scale is divided into 9 big squares.
- Each square is 1mm long and 1mm wide.

The four corner squares are further divided into sixteen smaller squares and are used for WBC counting.

The central square is subdivided into twenty five smaller squares and each of these smaller squares is further subdivided into sixteen smallest squares.

These are meant for platelet and RBC counting.

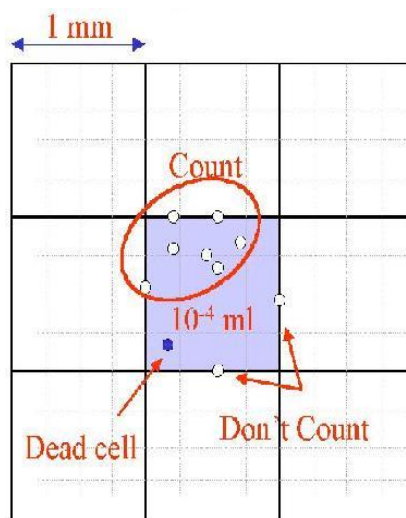
The platelets are counted in all the small squares of the central square, while the RBCs are counted in five small squares, four of corners and one of center.

(Total of 80 smallest squares)

Cell Counts by Hemocytometer

Counting Rule

- Do not count cells touching
 - Bottom line
 - Right line
 - This is to avoid double counting.



DILUTION FACTORS

For RBC counting

Blood is filled till mark 0.5 and Hayem's fluid is then filled till mark 101. Both are thoroughly mixed and then few drops are discarded which contain just the diluting fluid in the stem.

Thus, 1 portion out of 101 is discarded. So,

0.5 part of blood is in 100 parts of fluid or,

1 part of blood is mixed in 200 parts of fluid

Thus, dilution factor for RBC counting is **200**.

For WBC counting

0.5 part of blood is mixed in 10 parts of fluid

So, 1 part of blood is in 20 parts of fluid

Thus, dilution factor for WBC counting is 20.

RBC COUNTING

Total no. of RBCs in 80 smallest squares = X

No. of RBCs in one smallest square = $X/80$

Volume of one smallest square = $1/4000\text{mm}^3$

No. of RBCs in $1/4000\text{mm}^3$ = $X/80$

No. of RBCs in 1mm^3 = $X/80 \times 4000$

No. of RBCs in 200 times diluted blood

$$= X/80 \times 4000$$

No. of RBCs in undiluted blood

$$= X/80 \times 4000 \times 200/\text{mm}^3$$

$$= X \times 10,000/\text{mm}^3$$

WBC COUNTING

Total no. of WBCs in 64 smallest squares = X

No. of WBCs in one smallest square = $X/64$

Volume of one smallest square = $1/160\text{mm}^3$

No. of WBCs in $1/160\text{mm}^3$ = $X/64$

No. of WBCs in 1mm^3 = $X/64 \times 160$

No. of WBCs in 20 times diluted blood

$$= X/64 \times 160$$

No. of WBCs in undiluted blood

$$= X/64 \times 160 \times 20/\text{mm}^3$$