



## NEW FIVB VOLLEYBALL WORLD RANKING FOR SENIOR NATIONAL TEAMS

# HOW IT WORKS

## MATCHES COUNTING TOWARDS THE NEW FIVB WORLD RANKING

All matches played by 222 senior national teams in top official FIVB competitions, Olympic Games, Continental Championships, Qualification Tournaments and all annual official events organized by Continental Confederations with a minimum of 4 participating teams.

## METHODOLOGY

To calculate the FIVB World Ranking, the following is considered:

- The World Ranking score (WR score) reflects the current sporting strength of a team and its position in the ranking.
- Before each match, the World Ranking scores of the 2 teams are compared. The team with the highest score is identified as the strongest team in this match and is therefore expected to perform better than its opponent.
- Based on both teams' score and historical match data, the algorithm will calculate the probabilities of all 6 outcomes of the match: 3-0 / 3-1 / 3-2 / 2-3 / 1-3 and 0-3. The actual result of the match is then compared with the expected results, previously calculated.
- If the team over-performed and exceeded expectations, the team scores World Ranking points (WR points). If the team under-performed, the team loses World Ranking points. The same amount of points won by one team is lost by the other.
- The closer the actual match result is to the most expected outcome, the smaller the number of World Ranking points will be won and lost. The further the actual match result is to the most expected outcome the greater the number of World Ranking points will be won and lost.

## FORMULA

### Definition

Probabilities of 3-0 / 3-1 / 3-2 / 2-3 / 1-3 / 0-3	P1 / P2 / P3 / P4 / P5 / P6
Normal distribution with average 0 and standard deviation 1	$\sim N(0,1)$
Strength difference between the teams	$\Delta$
Standard scaling factor	8
Teams World Ranking scores	WRS1 / WRS2
The cut-points in the normal distribution that represent the average outcome of a match between two equal strength opponents derived from the actual match results of the past decade	C1 / C2 / C3 / C4 / C5
Expected Match Result	EMR
Set Score Variant	SSV
Match Weight Factor	MWF

### Calculation

$$\Delta = 8 * (WRS1 - WRS2) / 1000$$

Probability of	<b>3 - 0</b>	result = $\sim N(0,1)(C1 + \Delta) = P1$
Probability of	<b>3 - 1</b>	result = $\sim N(0,1)(C2 + \Delta) - \sim N(0,1)(C1 + \Delta) = P2$
Probability of	<b>3 - 2</b>	result = $\sim N(0,1)(C3 + \Delta) - \sim N(0,1)(C2 + \Delta) = P3$
Probability of	<b>2 - 3</b>	result = $\sim N(0,1)(C4 + \Delta) - \sim N(0,1)(C3 + \Delta) = P4$
Probability of	<b>1 - 3</b>	result = $\sim N(0,1)(C5 + \Delta) - \sim N(0,1)(C4 + \Delta) = P5$
Probability of	<b>0 - 3</b>	result = $1 - \sim N(0,1)(C5 + \Delta) = P6$

Match Result	Set Score Variant	Probability
3-0	+2	P <sub>1</sub>
3-1	+1.5	P <sub>2</sub>
3-2	+1	P <sub>3</sub>
2-3	-1	P <sub>4</sub>
1-3	-1.5	P <sub>5</sub>
0-3	-2	P <sub>6</sub>

$$EMR = P_1 * (+2) + P_2 * (+1.5) + P_3 * +1 + P_4 * (-1) + P_5 * (-1.5) + P_6 * (-2)$$

Match weight factors are given to different competitions to reflect the prestige of the tournaments.

Organizer	Event	Match Weight Factor
World	Olympic Games	50
FIVB	World Championship	45
FIVB	Volleyball Nations League	40
FIVB	OQTs / World Cup	35
Confederations	Continental Championship	35
FIVB	Volleyball Challenger Cup	20
Confederations	Continental Championship QT	17.5
Confederations	Other annual official events organized by Continental Confederations	10

The difference between the actual result (set score variant) and the expected match result gives the WR value.

$$SSV - EMR = WR \text{ value}$$

The WR value is then multiplied by the match weight factor of the event and divided by the standard scaling factor to get the WR points.

$$WR \text{ value} * MWF / 8 = WR \text{ points}$$

The same amount of WR points won by one team is lost by the other.

FIVB will continuously evaluate the implementation of the new ranking and may make necessary adjustments.