

Biomechanics – Stance theory

Stance theory using the example of saddle stance (Juchum Sogi)

Stances: One of the most important element of a martial art. Without a correct position it is very difficult, or even impossible to carry out optimal technique. To make matters worse, false positions are often taught out of an attachment to tradition. Even today this biomechanical ignorance leads to serious misalignment in many dojangs around the world. The optimal stance on the other hand is solidified through scientific research of the human biomechanics and should be used in every stance.

Why should the optimal width if a stance be half of the body's height?

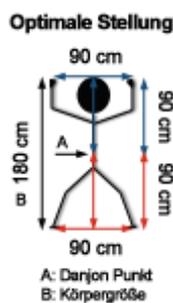


Figure 1: Scheme

Stances are the handling of a body's center of gravity, its middle and the balance. The result of an analysis of these factors determines the depth and width of a stance. In regards to figure 1 and its depiction as the saddle stance as example we can see that the stability is a result of the Danjon Point and the body's center. Therefore:

$$\text{height} : 2 = \text{stance's width}$$

The width must be multiplied by two times the body's height to gain an optimal center of gravity and align the stance in the best way. This basic principal of stances is elementary for every significant and combat-relevant stance. Hereinafter is a chart that lists height and the corresponding widths.

Body height	Stance width	Body height	Stance width
130 cm	ca. 65 cm	170 cm	ca. 85 cm
140 cm	ca. 70 cm	175 cm	ca. 87 cm
145 cm	ca. 72 cm	180 cm	ca. 90 cm
150 cm	ca. 75 cm	185 cm	ca. 92 cm
155 cm	ca. 77 cm	190 cm	ca. 95 cm
160 cm	ca. 80 cm	195 cm	ca. 97 cm
165 cm	ca. 82 cm	200 cm	ca. 100 cm

Reference table: Relation body height/ stance width

This principal applies to all stances apart from the basic stance shown here and is the only way to develop an optimal stance.

How is the weight of an optimal stance distributed?

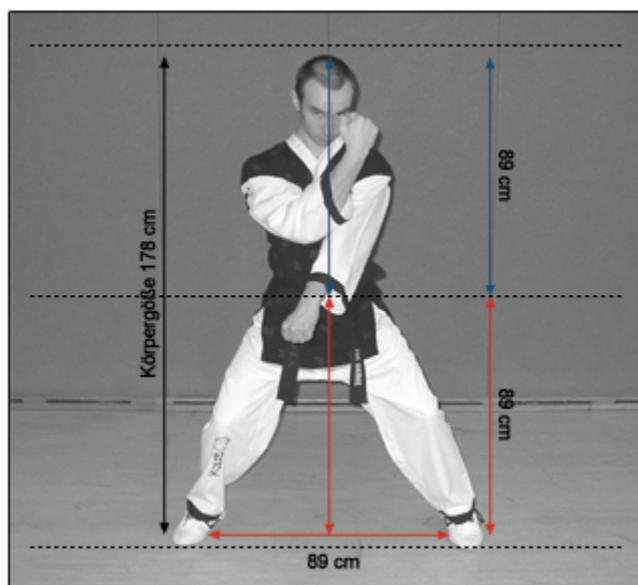


Figure 1: Optimal stance width

Often stances are taught and justified that put about 70% of the weight on rear leg and about 30% on the front (e.g. Dwiit Gubi). However, this difference in weight can be devastating for a stable stance. Every stance should therefore be balanced and center-oriented at the same time to enable quick action and reaction. Furthermore, the heel should have no direct contact to the ground but be slightly elevated to keep reaction time short.

Figure 2 shows how the Danjon Point (the body's center) and the width of the stance are in correlation to the body's height.