

BIOMECHANICAL ASSESSMENT REPORT

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Deep squat

DATE

6 October 2026

AGE

35 years

SPORT

Running and football

PROFESSIONAL

Sarah Lee

We assessed how deep you can squat and what limits the movement: ankles, knees, hips or trunk.

Your summary

For each exercise, the traffic light sums up what we saw. Below we explain, in plain words, what is going well, what we can improve and where to focus your training.

● Good ● Keep an eye on ● To work on ● No reference

Deep squat

● Keep an eye on

Your movement is generally good, with a few points to improve that can be addressed with training.

● WHAT IS GOING WELL

- Trunk posture: within the expected range.
- Knee bend: within the expected range.
- Hip bend: within the expected range.

● WHAT WE CAN IMPROVE

- Limited ankle mobility (dorsiflexion) is limiting your squat, and the trunk compensates by leaning forward.
- Ankle dorsiflexion is limited and is restricting squat depth.
- The trunk is much more inclined than the shin, which loads the hips and lower back.

● SUGGESTED TRAINING FOCUS

- Ankle mobility (calf and soleus stretching, knee-to-wall drills) and squat practice with the heels down.

Notes from your professional

Sample report with fictitious data.

This video assessment is a movement screen, not a diagnosis. Results should be interpreted by your health professional together with the clinical assessment.

TASK 1 OF 1

Deep squat

Keep an eye on

Bilateral squat as deep as possible, filmed from one side only (the side facing the camera), 3 repetitions. On that side it measures ankle dorsiflexion, knee and hip flexion, trunk inclination, depth and how much each segment contributes to the descent.

CAPTURE QUALITY

Valid repetitions: 3 · Tracking 100 % · 60 fps · Side assessed: right

Results

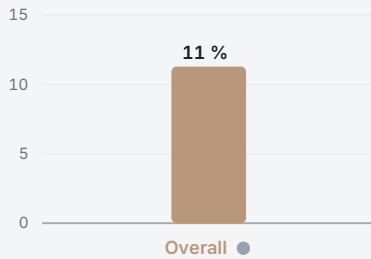
Metric	Right	Left	Asymmetry LSI · R – L	Reference
Deep squat depth ≈	72 %		—	Track over time
Hip below knee *	100 %		—	100 % Cook 2006 (FMS: fémur abaixo da horizontal)
Ankle dorsiflexion at the bottom *	33°		—	≥ 35° Flanagan 2025; Hemmerich 2006
Knee flexion at the bottom *	138°		—	≥ 127° Flanagan 2025; Straub & Powers 2024; Hemmerich 2006
Hip flexion at the bottom (thigh–trunk) *	149°		—	≥ 114° Flanagan 2025; Hemmerich 2006
Trunk inclination at the bottom *	44°		—	≤ 45° Flanagan 2025 (tronco a > 45° da horizontal)
Trunk–shin alignment *	11°		—	≤ 10° Straub & Powers 2024 (relação tronco–tíbia)
Heel rise *	0°		—	≤ 5° Cook 2006 (FMS: calcanhares no chão)
Ankle contribution to depth ≈	11 %		—	Track over time KINESTA (decomposição geométrica exacta)
Thigh contribution (knee and hip) ≈	89 %		—	Track over time KINESTA (decomposição geométrica exacta)

● within reference ● borderline ● outside reference ● no norm (compare sides)
* threshold proposed from published mean ± SD (to be validated)
≈ no reliable 2D norm: compare sides and track over time

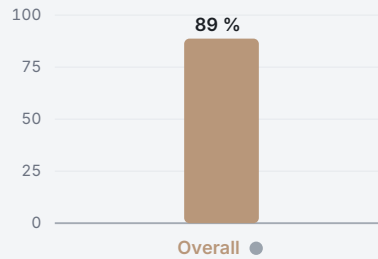
Right vs left

Overall Reference range

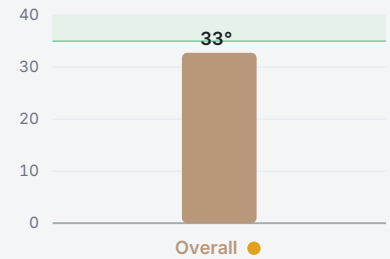
Ankle contribution to depth ≈



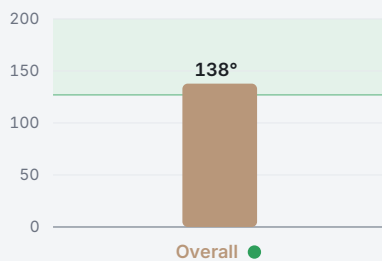
Thigh contribution (knee and hip) ≈



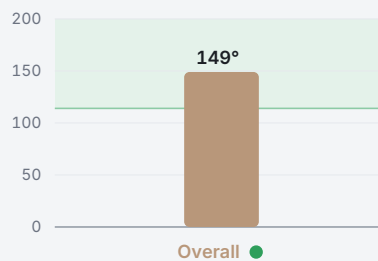
Ankle dorsiflexion at the bottom *



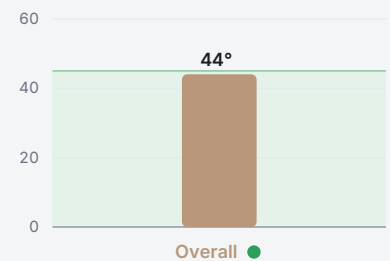
Knee flexion at the bottom *



Hip flexion at the bottom (thigh-trunk) *



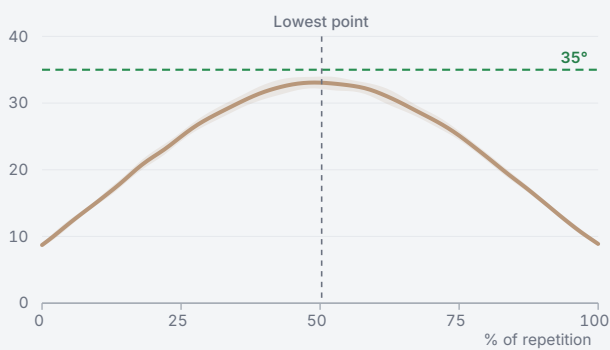
Trunk inclination at the bottom *



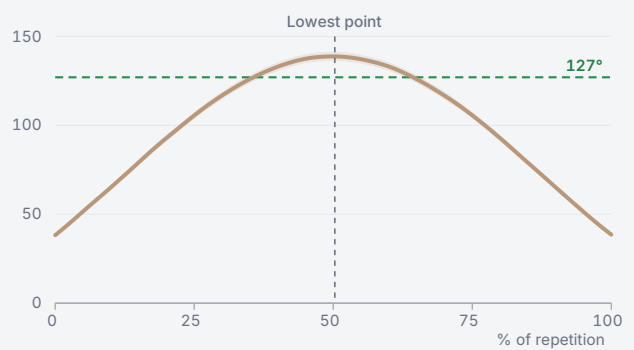
Throughout the movement

Overall mean ± SD reference limit

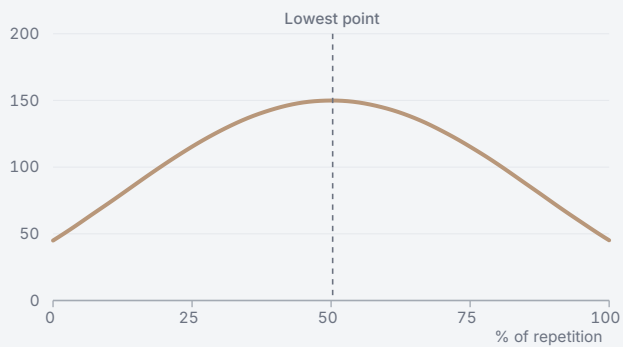
Ankle: shin inclination (°)



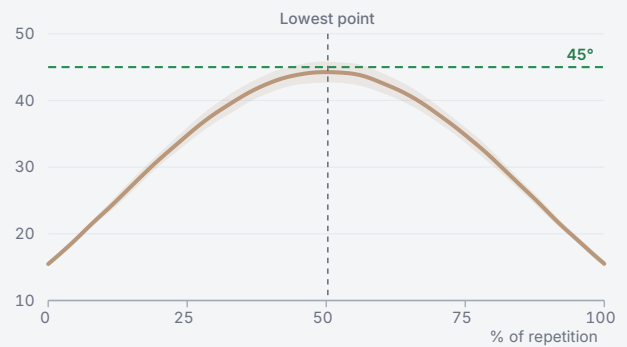
Knee flexion (°)



Hip flexion (°)



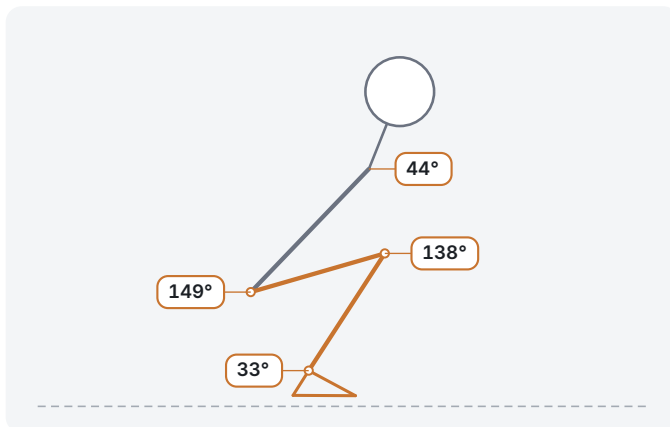
Trunk inclination (°)



Key positions

Side view, rebuilt from the detected joints (no photo).

Deep squat: lowest point **Right leg**



- Ankle dorsiflexion at the bottom · R: 33°
- Hip flexion at the bottom (thigh-trunk) · R: 149°
- Knee flexion at the bottom · R: 138°
- Trunk inclination at the bottom · R: 44°

Methods and references

How the assessment was done

The assessment used 2D video recorded on an iPhone. A pose-estimation model automatically detects the joints in every frame; angles, distances and times are the mean of the valid repetitions or cycles on each side. Curves show the mean $\pm$ standard deviation normalised to 0–100 % of the repetition or cycle (or in milliseconds after contact).

Limitations

Angles measured in 2D are projections onto the camera plane and depend on camera alignment and distance, clothing and lighting. Compared with reference 3D analysis, the typical error of 2D pose estimation is 4–7° (Stenum 2021). Differences between assessments smaller than the measurement error should be interpreted with caution.

How to read the results

Traffic light: green = within reference; amber = borderline, keep an eye on it; red = outside reference, to work on; grey = no reliable 2D norm — compare both sides and track over time. Asymmetry is given by the limb symmetry index (LSI = smaller side $\div$ larger side $\times$ 100 %) or by the right – left difference.

References: unmarked values are published norms; * = threshold proposed from published means $\pm$ standard deviation or measurement error (to be clinically validated); $\approx$ = no reliable 2D norm. References depend on sex and profile (athlete or general population).

This assessment is a movement screening, not a diagnosis. Results should be interpreted by the health professional together with the clinical history and physical examination.

References cited

1. Cook 2006
2. Flanagan 2025
3. Hemmerich 2006
4. Stenum 2021. PLoS Comput Biol. doi:10.1371/journal.pcbi.1008935
5. Straub & Powers 2024