Accuracy of full-arch implant frameworks obtained through digital impression.

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Aim
The purpose of this in vitro study is to assess the passive fit of prosthetic metal frameworks obtained through a novel digital impression system, for full-arch rehabilitations on multiple implants.

Materials and methods
5 master casts, reproducing edentulous jaws with 4 tilted implants, were poured (Figure 1).

An intraoral scanner system [True Definition Scanner, 3M ESPE, St. Paul, MN, USA] was used to perform 5 digital impressions (DI) of each master cast (n=25). The implant position was detected with 4 special scan bodies [Toothless, Simbiosi srl, Empoli Firenze, Italy].

A single DI, presenting mean values compared to the others, was selected from each group in order to fabricate a metal framework with CAD-CAM technology (n=5) (Figure 2).

Passive fit was assessed with the Sheffield Test, screwing each framework on the corresponding master cast (Figure 3).

A stereomicroscope [Wild M3Z, Wild Heerbrugg, Heerbrugg, Switzerland] with a 40x magnification was used to record maximum gap values at the framework-implant analog interface (Figure 4).

Results
The findings of the Sheffield Test are in Table 1.

All the frameworks showed a mean gap value of < 50μm.

No significant differences were found among the groups (p>0.05).

Conclusions
Within the limits of this study, digital impression represents a reliable method to fabricate full-arch implant frameworks provided with passive fit.

References