

Issue: implants 4/2025

Title: Surface **cleanliness** of dental **implants**: Current insights

Authors: *Susanne Reichard, Dr Maurice Hatzky & Prof. Rüdiger Junker, Austria*

References

1. Duddeck DU, Albrektsson T, Wennerberg A, Larsson C, Beuer F. On the cleanliness of different oral implant systems: a pilot study. J Clin Med. 2019 Aug 22;8(9):1280. doi: 10.3390/jcm8091280.
2. CleanImplant Foundation. Trusted Quality seal. Berlin: CleanImplant Foundation; 2025 [cited 2025 Oct 26]. Available from: <https://cleanimplant.com/certified-approved/trusted-quality-seal/>.
3. Baranov MV, Kumar M, Sacanna S, Thutupalli S, van den Bogaart G. Modulation of immune responses by particle size and shape. Front Immunol. 2021 Feb 12;11:607945. doi: 10.3389/fimmu.2020.607945.
4. Duddeck DU. CleanImplant Trusted Quality mark 2017 - 2018: process description quality mark criteria. Berlin: CleanImplant Foundation; 2017 Sep 19 [cited 2025 Oct 26]. Available from: https://cleanimplant.com/wp-content/uploads/2024/10/CleanImplant-Quality-Mark-Criteria-2017-2018_c-6.pdf.
5. Duddeck, D. (2023, June 26) [online]. How clean do sterile implants have to be? Analysis and clinical relevance of factoryrelated contaminations. Dental Tribune. Retrieved from: <https://www.dental-tribune.com/news/how-clean-do-sterile-implants-have-to-be/?time=1687776534>, [accessed April 25, 2025].
6. Feighan J., Goldberg V., Davy D., Parr J., Steven S. (1995, September). The influence of surface-blasting on the incorporation of titanium-alloy implants in a rabbit intramedullary model. Journal of Bone and Joint Surgery (77). pp. 1380-1395. Retrieved from: <https://oce.ovid.com/article/00004623-199509000-00015/HTML>
7. Schupbach P, Glauser R. Preventing aluminium oxide contamination of dental implant surfaces. Stonehouse (England): Research Outreach; 2019 Dec 17 [cited 2025 Oct 26]. Available from: <https://researchoutreach.org/articles/preventing-aluminium-oxide-contamination-dental-implant-surfaces/>.
8. Draenert GF, Mitov G. Lack of corundum, carbon residues and revealing gaps on dental implants. arXiv:2209.05728 [Preprint]. 2022 Sep 13 [cited 2025 Oct 26]: [37 p.]. doi: 10.48550/arXiv.2209.05728.
9. Ganz S, Duddeck DU, Kurtzman GM, Serota KS. Does the implants condition at manufacturing and packaging have an effect on peri-implantitis? Spectr Implants. 2023 Aug–Sep [cited 2025 Oct

26];14(4):30–38. Available from: <https://cleanimplant.com/does-the-implants-condition-at-manufacturing-and-packaging-have/>.

10. Reinedahl D, Galli S, Albrektsson T, Tengvall P, Johansson CB, Hammarström Johansson P, Wennerberg A. Aseptic ligatures induce marginal peri-implant bone loss-an 8-week trial in rabbits. *J Clin Med*. 2019 Aug 18;8(8):1248. doi: 10.3390/jcm8081248.
11. Albrektsson T, Tengvall P, Amengual L, Coli P, Kotsakis GA, Cochran D. Osteoimmune regulation underlies oral implant osseointegration and its perturbation. *Front Immunol*. 2023 Jan 24;13:1056914. doi: 10.3389/fimmu.2022.1056914.
12. Kotsakis GA, Ganesan SM. Microbial dysbiosis, titanium release, and peri-implantitis. *J Dent Res*. 2025 May;104(5):473–80. doi: 10.1177/00220345241307939.
13. French D., Ofec R., Levin L. (2021, March 25). Long term clinical performance of 10 871 dental implants with up to 22 years of follow-up: A cohort study in 4247 patients. *Clinical Implant Dentistry and Related Research* (23). pp. 289–297. Retrieved from: <https://doi.org/10.1111/cid.12994>
14. Östman P.-O., Chrcanovic B., Albrektsson T. (2024, June 21). A Prospective Report of the Clinical Outcome of TiUnite Implants at 20 Years of Follow-up. *International Journal of Oral and Maxillofacial Implants*. pp.389–395. Retrieved from: <https://doi.org/10.11607/jomi.10654>
15. Ehlicke F., Berndt J., Marichikj N., Steinmüller-Nethl D., Walles H., Berndt E.-U., Hansmann J. (2020, August) Biomimetic in vitro test system for evaluation of dental implant materials. *Dental materials* (36). pp. 1059-1070. Retrieved from: <https://pubmed.ncbi.nlm.nih.gov/32546398/>
16. Sladkova- Faure M., Pujari- Palmer M., Öhman- Mägi C., Lopez A., Wang Jr h., Enggvist H., de Peppo G. (2020, December 17). A biomimetic engineered bone platform for advanced testing of prosthetic implants. *Scientific Reports* (10). p. 22154. Retrieved from: <https://www.nature.com/articles/s41598-020-78416-w>