eXaSkin Physics FAQ

Clinical evidence and practical answers for medical physicists

eXaSkin combines patient-specific conformity with CT-based planning for selected superficial 6 MV photon treatments. Mold it to the patient before simulation, plan with it in place, and use that same bolus throughout the treatment course. [1,3]

1. Why is eXaSkin high density rather than water equivalent?

eXaSkin's high density is intentional: it helps achieve photon build-up with less physical thickness, while its moldable form provides close adaptation to complex contours. Its actual density, shape and thickness are captured during the planning CT, and published measurements support its use in CT-based dose calculation. [1,2]

2. What evidence supports dose accuracy near the skin?

Two peer-reviewed studies provide complementary evidence. Al-Sudani's 2020 phantom study found skin-dose agreement with TPS calculations within 1.22% for a static field and 5.68% for VMAT with eXaSkin, compared with 3.36% and 11.66% with Superflab. The authors linked eXaSkin's closer agreement to its conforming fit and reproducible placement. [1]

In Dadoun's 2026 study, a 1 cm bolus with 6 MV FFF produced a mean measured-versus-calculated depth-dose difference of -0.1% and a maximum deviation of 1.5% with Acuros XB. Measurements extended from 1 mm water-equivalent depth into the phantom. [2]

3. How is eXaSkin incorporated into treatment planning?

Mold the bolus before the planning CT and scan it in treatment position. The CT captures its actual density, shape and thickness, allowing the TPS to account for the bolus used during delivery. Retain that CT representation rather than assigning water density. [3]

4. Which calculation algorithm has the strongest published support?

Acuros XB showed the closest agreement with measurements in Dadoun's study; AAA was also evaluated. [2] These published comparisons give your physics team a useful starting point for reviewing eXaSkin with the department's TPS, beam model and clinical technique.

5. Can eXaSkin be used with VMAT, and which energies are supported?

Yes. Al-Sudani evaluated a 6 MV VMAT plan delivered to an anthropomorphic phantom. [1] eXaSkin is positioned for 6 MV photon applications, rather than electron bolus use. [5] The US labeling notes that 10 MV photons, protons and orthovoltage X-rays have not been assessed; mixed-energy use is outside the evidence summarized here. [4]

6. Does the bolus need a perfectly uniform thickness?

No. eXaSkin is molded to fit the patient's anatomy, so its thickness can vary across the treatment area. With the bolus in place during the planning CT, its actual shape, thickness and density are incorporated into dose calculation. [3]

A 6 MV VMAT phantom evaluation presented at ASRT illustrated this approach using a stepped bolus with thicknesses of 2, 7 and 12 mm, showing how planning can accommodate substantial thickness variation. [6] This allows the team to prioritize close skin contact and plan for the prescribed target coverage using the same patient-specific bolus throughout treatment.

Practical workflow questions

7. How does eXaSkin help with air gaps?

Its moldable form helps achieve close contact on irregular surfaces, a benefit demonstrated against Superflab in the 2020 phantom study. [1] Close contact remains the goal: gap effects depend on field size and geometry, with smaller fields more sensitive in Dadoun's measurements. [2]

8. How is preparation standardized?

eXaSkin Plus pairs a preformulated bolus paste with a matching, preportioned catalyst that initiates setting. Preparation follows a defined process: combine the supplied components, knead to a uniform, streak-free color, and mold the bolus to the patient before the planning CT. The same patient-specific bolus is then used throughout treatment. [3]

9. How is the planned placement reproduced during treatment?

The same custom-molded bolus returns to the same patient, preserving its individual shape. [3] Its conforming fit supported reproducible setup in Al-Sudani's phantom study. [1] Depending on the treatment site, a thermoplastic mask, tubular bandage or medical tape can help secure the planned placement. [5] Setup documentation supports consistent positioning; changes in anatomy or fit can be reviewed through the department's usual clinical process.

10. Do we need a 3D printer or a separate bolus design workflow?

No 3D printer is required. eXaSkin is molded directly to the patient and incorporated into CT-based planning. [3,4] This offers a practical route to a custom bolus when standard flat sheets are difficult to fit, without a separate digital-design and printing step.

11. Is there clinical experience beyond phantom testing?

Yes. Dadoun reported a retrospective, single-institution series of 55 patients: 2 developed grade 3 dermatitis (3.6%) and none developed grade 4 dermatitis. Median follow-up was 5.7 months. These early clinical findings complement the published dosimetric measurements. [2]

12. Is eXaSkin suitable for direct skin contact?

Yes. eXaSkin Plus is designed for contact with intact skin. Its FDA submission reports ISO 10993 biocompatibility testing for cytotoxicity, skin sensitization and irritation, supporting its intended skin-contact use. [4]

13. How can our department get started?

Begin with suitable superficial 6 MV photon cases, review the supporting publications, and assess sample material through your department's normal process for introducing a new bolus. A demonstration can show preparation, molding and fixation, helping physics and therapists establish a shared workflow before the first clinical case.

Ask IOS for a demonstration and the supporting physics publications.

References

[1] Al-Sudani TA et al. eXaSkin: A novel high-density bolus for 6MV X-rays radiotherapy. Phys Med. 2020;80:42-46. doi:10.1016/j.ejmp.2020.09.002

[2] Dadoun J et al. Dosimetric and clinical validation of a high-density bolus for superficial skin tumors treated with radiotherapy. J Appl Clin Med Phys. 2026;27:e70718. doi:10.1002/acm2.70718

[3] Anatomical Geometry. eXaSkin Plus Instructions for Use. Rev 2, February 2023. IFU

[4] FDA. eXaSkin Plus 510(k) K252784, May 22, 2026. Indications and summary

[5] Anatomical Geometry. eXaSkin Frequently Asked Questions. Rev 3, August 2018. FAQ

[6] Brussain A. ASRT 2026 presentation on eXaSkin and eaSyFix. Slide 5: Dosimetric Impact of Thickness Variations in Moldable High-Density Boluses for 6MV VMAT Treatments. Conference presentation.

For qualified healthcare professionals. Published results reflect the reported study conditions. Use the current supplied instructions and departmental physics procedures.