

## SEALING 3D CAD MODELS

PEO often receives questions about the requirements for sealing 3D CAD models issued to clients and what to do if the models contain proprietary design information. Here's what professional engineers need to know.

By José Vera, P.Eng., MEPP

Consider this scenario: Leylah, a professional engineer, has been asked by her supervisor to send a client a 3D computer-aided design (CAD) model, which the client will use to print engineered machinery components in their industrial 3D printer. Leylah is uncertain if she should seal the 3D CAD model. In the past, Leylah had issued to the same client final sealed 2D PDF drawings. However, in this case she is not sure if a 3D CAD model must also be sealed, and she does not know how a seal, which is 2D, could be applied to a 3D model.

In situations like these, PEO's practice advisory team refers practitioners to PEO's *Use of the Professional Engineer's Seal* practice guideline, which indicates that practitioners must seal engineering documents. There are some exceptions, such as draft or incomplete documents, which should not be sealed. The guideline indicates that engineering documents, including electronic formats, that are not used solely for internal purposes must be sealed.

After reading the PEO guideline, Leylah realizes that 3D CAD models issued outside of her organization and that contain engineering content must be sealed to comply with section 53 of Regulation 941 of the *Professional Engineers Act*. However, sometimes 3D models by themselves do not have engineering content. For example, the G-code of a bracket simply contains instructions for a 3D printer to produce the bracket and may not need to be sealed, since the context is not there to make it an engineering document. However, there is often a specification written by a professional engineer with specific instructions on how the models should be printed, finished and assembled, and this specification must be sealed since it contains engineering instructions, as noted in the PEO guideline.

Leylah concludes that, in her case, the 3D CAD model sent to the client must be sealed, since the model contains engineering content, such as materials specifications, dimensional tolerances and manufacturing instructions. However, she is still not sure how to apply a 2D seal to a 3D model, so she contacts PEO's practice advisory team.

### DIGITAL APPROVALS PROCESS

Every leading professional 3D CAD software today has a document management system that includes

a digital approvals process. Although the models themselves might not be able to be sealed, a PDF specification linked to the models could be approved and sealed electronically by the professional engineer(s) assuming responsibility for the work. This digital process could be used to follow the requirements set out in section 53 of Regulation 941 and described in PEO's guideline. For example, if the practitioner is using the Onshape system, he or she can specify approvers.

Other CAD software, such as AutoDesk, Bentley Systems, Dassault Systèmes and Siemens, have similar digital approvals processes. Building information modeling (BIM) software packages also have a digital approvals process that could be used to comply with the use-of-seal requirements. Additionally, finite element analysis (FEA) models themselves are not typically sealed; however, the engineering analysis reports that refer to the FEA models are. For more information, refer to PEO's *Professional Engineers Using Software-Based Engineering Tools* guideline, specifically:

### 7. Issues Related to Software-Derived Information

Output from computer programs, like all working notes and calculations, are usually the property of the engineer (his, her or their employer) and generally do not need to be provided to the client or submitted as part of regulatory approval processes unless required by law or contract. In those cases where output data must be supplied to people outside the organization employing the practitioner, the data should be distributed either as hard copies or electronic files bearing the seal and signature of the professional engineers who prepared or supervised the preparation of the input data and checked the output data...

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**WHILE ALL DOCUMENTS CONTAINING ENGINEERING CONTENT, INCLUDING ELECTRONIC, GENERALLY MUST BE SEALED, PRACTITIONERS SHOULD ASK THEMSELVES IF THEIR NATIVE 3D CAD MODELS CONTAIN PROPRIETARY DESIGN INFORMATION THAT SHOULDN'T BEING SHARED.**

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### INTELLECTUAL PROPERTY CONSIDERATIONS

When Leylah contacts PEO's practice advisory team, a practice advisor raises the possibility that the 3D CAD model, which Leylah would be sealing and issuing to the client, might contain engineering design information that is proprietary to ABC Engineering, Leylah's employer. The practice advisor suggests that Leylah discuss this issue with her management team and possibly their legal counsel to ensure proprietary design information is not being shared inadvertently with



the client. So, Leylah schedules a meeting with ABC's management and legal counsel. At the meeting, they agree that the best option is to remove any proprietary design information from the 3D CAD model before sharing it with the client. Management recommends to Leylah that she collaborate with the CAD administrator and IT to find a workable solution.

Leylah, the CAD administrator and IT conclude it's best not to share the original native 3D CAD model, since it contains proprietary design information. They decide to share a neutral 3D CAD file, such as Standard for the Exchange of Product (STEP) model data, instead. Together they determine the best option is to export and share a STEP file with the client, accompanied with an electronically sealed PDF of an engineering specification, which allows the client to print the machinery components on their industrial 3D printer but does not contain any proprietary engineering design information.

PEO's practice advisory team often receives questions from practitioners wondering if they must seal 3D CAD models issued to clients. Although all documents containing engineering content, including electronic, generally must be sealed, practitioners should ask themselves if their native 3D CAD models contain proprietary design information that shouldn't be shared. If that is the case, there are alternative neutral 3D

CAD formats that can remove proprietary design information and be used instead. Practitioners can contact their IT department and CAD administrator for more detailed technical information on this subject.

There are also cases when an engineering firm is engaged to provide native 3D CAD models to a client; for example, if the design is the intellectual property of the client. Consequently, practitioners may need to consult with their management team and their firm's legal counsel to address potential intellectual property issues before sharing 3D CAD models outside of their organization.

For further questions on the use of the seal and the obligations of professional engineers, please visit PEO's practice guidelines webpage. For questions on these guidelines, contact PEO's practice advisory team at [practice-standards@peo.on.ca](mailto:practice-standards@peo.on.ca). [e](#)

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