

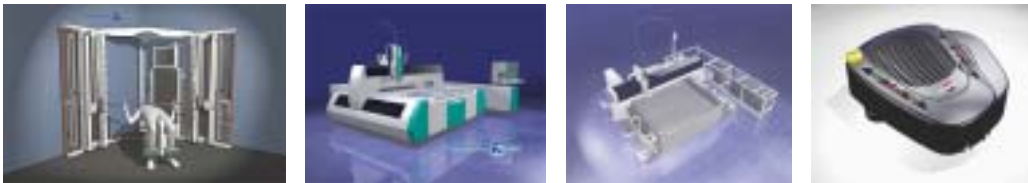
The following contains a number of “case studies” submitted by Okino software customers. They detail how Okino’s PolyTrans & NuGraf software act as vital links in their production pipelines, namely for moving 3D data from one application to another with optional intermediate data optimization and rendering.

The majority of the case studies on this page are from customers who are moving data from the Pro/Engineer solid modeling package (by PTC) into other 3d animation packages via Okino’s PolyTrans software, or into Okino’s NuGraf software for texturing and rendering. Pro/E customers dominate these case studies because they were culled from a list of user submitted data for a Pro/E magazine article written by Robert Lansdale of Okino. In reality, Okino’s customers use many more CAD packages other than just Pro/E, with popular data packages being CATIA, Unigraphics, AutoCAD, Autodesk Inventor, SolidWorks, Solid Edge, SDRC, Microstation, CADKEY, Rhino-3D and many others; all of these are supported by such file formats as IGES, ACIS SAT, Parasolids, native Pro/E, SLP, STEP, VDA-FS, Inventor, DXF/DWG, native Rhino-3D and more in Okino software.

Brooks Stevens Design Assoc. David H. Roland. ProE to Okino’s NuGraf For Rendering

Brooks Stevens Design is a multi-disciplinary product development firm committed to creating great commercial products for our clients and ourselves. Pro/E is the primary engineering modeling and documentation package used at Brooks Stevens.

All along the process, from initial concept development through final engineering, we need to develop images that communicate a designs’ status and configuration to clients, vendors, researchers, and ourselves. It’s not enough to create shaded isometric views. We find it extremely valuable, when possible, to create images that look REAL and convey the detail, accuracy, and excitement that we bring to products in our design process. At times, we also create images for sales and marketing purposes; images of the designs which must look very realistic (even photographic), but have not yet been produced. These are the reasons Okino’s NuGraf has been a valuable asset to us. **Yes, there are other packages that produce some great images, but nothing I’ve seen works as well with Pro/E in terms of simplicity, consistency, and speed to get to those realistic images we are looking for.**



We’ve been using NuGraf for about 3 years now, Pro/E for more than 10. **NuGraf proved to be an excellent choice for generating great images of our designs created in Pro/E. It proved to be so easy to use we lost the manual early on and didn’t even bother to find it.** Go figure. We have other very robust rendering packages in house, but **NuGraf proves to be the fastest and easiest renderer to use in conjunction with Pro/E. I can’t say enough about how much faster it is.** As an example, we did a rendering test about 2 years ago, comparing NuGraf (Pro/E files via .slp files) with a renderer in one of our surface packages (Pro/E files via .igs). The difference was (4 hours for the surface package) vs. (15 minutes for NuGraf) - all variables being kept as close as possible. That’s a big difference when you have 24 hours to crank out a full presentation for a client.

Credits: Middle two images, Flow International Corporation (Kent, WA) and Brooks Stevens Design (Grafton, WI), David Roland (designer) and Scott Klos (engineer). Image of Flow International’s “Waterjet Machining Center (WMC)” which can be viewed on their WEB site. Right most image: Briggs & Stratton ELS500 Engine cover; Design by Brooks Stevens Design.

CraneDigital. John B. Crane. CAD (Unigraphics via IGES) to Lightwave Translations & Optimizations

My name is John B. Crane and I run CraneDigital, a 3D illustration and animation studio in Fort Collins, Colorado. I specialize in 3D scientific/technical illustration and animation.

I discovered Okino’s PolyTrans during a project in early 2001. A marketing firm contacted me with an engineering client who had just developed a new tabletop spectrometer. The story was familiar: the engineers had spent 4 years developing and designing this new tool (in Unigraphics) and on the virtual eve of production release, the one-offs and prototypes were of little to no use to the marketing people. Their precious new machine lay trapped in the technically intimidating world of Unigraphics’ Open GL Previews. They needed pre-sales tools and a way of explaining how their device worked across a variety of deliverables.



After a few exploratory calls I learned of PolyTrans and wrote for more information. After the initial purchase of PolyTrans with the IGES I/O module, Robert Lansdale worked closely with me developing a “custom” solution for the specific task that lie ahead. There were a few kinks to work out in the new UG IGES export module and after sending Robert a few samples he began tweaking his IGES module to pick up as much as possible, then sent the update over the web. One of the main challenges with this project was defining polygonal meshes from the UG/IGES trim curves. Control over tessellation settings was important as was smoothing and control over the normals, but more importantly I needed control over specific grouped surfaces. In other cases, an IGES export can generate hopelessly confusing meshes with millions of individual polygons the designer would then need to (impossibly) pick through and stitch back together. The goal was to achieve a high-fidelity model that could still be rendered and animated in LightWave. PolyTrans was indispensable. After trying a direct IGES import through two other leading applications, **PolyTrans produced the highest-quality results with the most control over surfacing, smoothness, and tessellation. Without PolyTrans I would not have been able to meet the tight timeline.**

Since this initial project I’ve used PolyTrans (with the IGES I/O Module) for countless projects, moving seamlessly between 3ds max and LightWave. PolyTrans handles Pro/E files extremely well, as evidenced by the project shown for Waterpik. Why move between applications? Sometimes it’s as simple as a slightly different look a client is after. Sometimes it’s more complicated, like creating a motion, object or affect more easily in one application than another. Sometimes a client will already have 3ds max files and want that to be the starting point. **With PolyTrans, moving between different worlds is a reliable, “promisable” task.** Without it my life would be far more difficult.

Kral GMBH (Austria). Andreja Balon Kral. ProE (CAD) to Maya Translations & Optimizations.

We bought PolyTrans to convert Pro/E data into Alias Maya. We have been making computer animations since 1992. We began with Alias and now we have Maya. We have a customer Bonardier-ROTAX GmbH in Austria, who are making motor engines for Ski-Doo, Sea-Doo, ATV, Light Airplanes, Kart and Motorcycles (Aprilia and BMW). They developed a completely new engine generation named 4-TEC. They have constructed it in Pro/E. For marketing presentation of this new engine they wanted to show their customers the “high-tech” of this engine.



We exported the engine data from Pro/E via large IGES files. However, we had a problem: the IGES data was really really big! **Maya could read small IGES parts but it could not import big parts (100MB with thousand of parts); Maya just hung up. So we performed the conversion with PolyTrans. It worked very well and fast.** In meantime we also use VRML data format, especially for parts, that are not so important. The Bombardier-ROTAX company uses VRML data for their preview discussions. Thanks to the PolyTrans VRML importer we are able to read this data, too and they are much smaller.

Reyer Corp. Don Lynch. SDRC & Lightwave to Okino’s NuGraf For Rendering.

Over the past 13 years Reyer Corporation has provided engineering design services for private industry as well as US government laboratories, such as Naval Research Lab, National Institute of Standards and Technology and NASA Goddard Space Flight Center. We have focused mainly on scientific instruments and use 3D CAD modeling on a daily basis. Just recently we were contracted to do a really exciting project. The US government wanted to explore the possibility of restoring an old hotel while adding a new building to it. Our job was to recreate the hotel and lobby with its fantastic columns and provide a walk-through.



We obtained old black and white photos of the hotel façade and lobby from the local historical society and worked under the direction of an architect for the new building concept. Everything, except for the Mercedes, was modeled in SDRC’s Master Series 3D CAD software and Lightwave3D. The final model was exported to Okino’s NuGraf. NuGraf is a package we have been using for several years and for which Okino has provided personal support and updates to us directly. We imported the data via IGES and Lightwave objects, and ended up with a 950,000 polygon count model of the interior and 1,200,000 polygon count of the exterior

scene. NuGraf rendered the images in a short time. The models use about 100 texture maps, 30 light sources for the interior and 6 lights for the exterior and took from 4 to 8 minutes to render on a 1.3Ghz machine depending on the view. We would like to thank DeEspona Infografica for the fantastic Mercedes model.

Industrial 3D. Beau Brown. SolidWorks (CAD) to 3DS MAX Translations & Optimizations.

Beau Brown of “Industrial 3D” (industrial design visualization) was one of the first Okino users to obtain and put to full use our new XGL import converter. Beau provided a large 3D dataset of an oil drilling rig created in SolidWorks (as a solids model) and wanted to render it in 3ds max (as an optimized mesh model). Beau used Okino’s totally unique SolidWorks to 3ds max conversion pipeline to perform this job quickly and with little user involvement. He is quoted as saying **“The XGL model was well over 200 megs and it only took PolyTrans about 5 minutes to open and convert. It turned out great and worked beautifully.”**



The oil ring consisted of 5700 different parts and 1,908,464 polygons. The final rendering consisted of 75% data from SolidWorks and 25% created in 3ds max. The 7500x7500 pixel image took 9 hours to render in 3ds max. The final poster was used in “Oil and Gas Journal”, a Pennwell magazine. The models and technical instructions were provided by Rowan Companies, Inc.

Credits: Copyright Oil & Gas Journal, PennWell Publishing and by Beau Brown, Industrial 3D. Used by permission. Models and technical instruction provided by Rowan Companies, Inc.

Thomas-Bradley Illustration & Design. Will Coats. ProE (CAD) to 3DS MAX Translations & Optimizations.

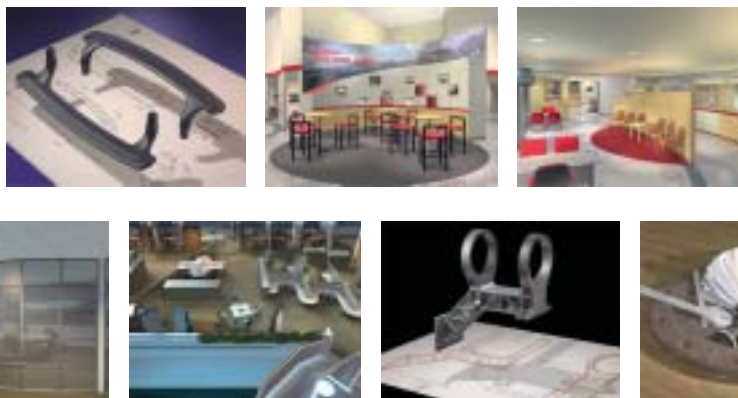
Thomas-Bradley Illustration & Design is a full service illustration and design studio specializing in photoreal illustration and animation, usually of the technical nature. The central Illinois based firm began in the mid ‘80’s creating hand painted airbrush illustrations. It was decided in 1988 to explore the potential of computers as a new creative tool, the rest, as they say, is history.

About a year ago, staff artist, Will Coats, began using PolyTrans in their production pipeline to import and optimize Pro/E geometry data over to 3ds max for final rendering and animation. The resulting images speak for themselves.



Genexis Design, Inc. ProE to Okino’s NuGraf For Rendering.

We started using Okino’s NuGraf software in 1996. At that time we researched available rendering software packages and found out that only NuGraf can handle conversion and consecutive rendering with all the flexibility we needed. Even after PTC introduced Pro/Photorenderer we continued using PolyTrans and NuGraf for complex scenes that would put too much pressure on resources if a CAD package would be used for rendering. **Also we have found a tremendous support from Okino on NuGraf’s side with any problems we have faced as, novice users of a rendering software.**



IDE, Inc. ProE to Okino’s NuGraf For Rendering.

IDE is a multi-disciplined product design and development firm serving technology based companies worldwide since 1985. IDE provides a unique blend of industrial design, mechanical design and engineering, and unmatched prototyping skills to create

products that look great, are easy to use, and cost effective to manufacture. Though many of our designs have won international awards, our focus is to provide our customers with a solution that meets or exceeds their project goals. IDE provides its clients an experienced team of industrial designers, mechanical design engineers, and a fully equipped rapid prototyping facility all under one roof.

The IDE production pipeline: IDE use a combination of solid modeling software from PTC (Pro Engineer) and Robert McNeel's Associates NURBS surfacing software, Rhinoceros. Okino's NuGraf is used for final presentation imagery. If the final surfaces are very complex then it is exported as an IGES file for refinement in Rhino. In Rhino the surfaces are interactively tessellated to insure design intent and high image quality in the final rendered images. Product graphics are applied in NuGraf or using Adobe Photoshop. NuGraf is used for visualization purposes in presentations and often supports 2D image manipulation tools in the creative process.



Image descriptions, from left to right, and top to bottom:

Silicon Film

A digital film cartridge that allows some existing, non-digital, SLR cameras to take pure digital images. It is a modular system comprised of 3 components. Created concurrently in both Rhinoceros and Pro-e, then rendered in NuGraf for presentation to the client before display models, color studies and prototypes were developed.

Colorado Micro Display

IDE developed a prototype for technology presentation. A Pro-E solid model was exported as an IGES file which was interactively tessellated in Rhino. A mesh was imported from Poser. The head was scaled to fit the Pro-E Solid model. The image was rendered in NuGraf.

Anritsu Synthesized CW Generator MG3690A

An RF & Microwave signal synthesizer. The exterior surfaces were all modeled in Rhino. These surfaces were rendered in NuGraf. IDE used a combination of Adobe Illustrator & Rhino to develop the interface and bezel graphics/markings. When the final concept was selected the surfaces were exported from Rhino and then imported into Pro-E for mechanical design.

Okino Camera

The camera model was created by Deam Amir Depay (of IDE Inc.) using AutoCAD's solid modeling capabilities. It is the first model that was rendered via use of Okino's ACIS SAT geometry import converter. The turn-around time from import to final rendering was about 40mins, most of which was consumed in deciding what materials and what colors to assign to the object. The actual ray traced rendering took 2mins to complete.

PDA Concept Rendering

The PDA model was created by Deam Amir Depay (of IDE Inc.) using AutoCAD's solid modeling capabilities. It was then exported to NuGraf as an ACIS SAT model and triangulated. An interesting variety of textures, bump maps and lighting give an overall soft look to this image.

Creative Labs Nomad Jukebox

A digital music jukebox holding up to 150 CDs of music. Created concurrently in both Rhinoceros and Pro-e, then rendered in NuGraf for presentation to the client before display models, color studies and prototypes were developed.

Ziatech Computer Server

The Ziatech server bezels were created using two programs. The Industrial designed exterior surfaces were created using the NURBS surface modeler Rhino and the mechanical design was created with Pro/E. The rendering was created with Okino's NuGraf. The image uses 8 different texture maps and 3 light sources.

Motorola PCS. Tim Sutherland (Product Developer). ProE to Okino's NuGraf For Rendering.

I work in the Industrial Design department at Motorola. My role here is to obtain a preliminary set of internal components from the engineering development group and provide all of the external surfaces of the design. I return a set of external surfaces and thin-walled parts to the engineering group and they add all of the internal geometry (snaps, bosses, etc.). What's shown here is the final design after a year and a half of development.

The model was created in ProE then imported into Okino's NuGraf software, via IGES, for final rendering. The clean conversion of trimmed NURBS (in IGES) to polygon data via Okino's IGES importer makes it easy to render large production files, complete with all of the internal detail, for otherwise raw NURBS would be far too heavy. The graphics are mapped on with a technique I use that combines Adobe Illustrator and Photoshop.



Guidant Corporation. Robbie Halvorson (Senior Designer/Animator). ProE (CAD) to Maya & Studio.

I am a designer that has used Okino's NuGraf to translate models from ProE to Maya and Alias Studio for rendering. I have done this for about 4 years with great results. By using the Pro/E SLP render file format and the batch translator in NuGraf, I can quickly bring multiple parts into Maya (now my main animation and rendering tool). In fact one of these translations led to us being nominated for a Pro/E award in medical products. My reasons for exporting out of Pro/E were that this device had parts that showed refraction and I also needed better control of surface detail. Alias has ray tracing and finer control of things like specular highlights and texture mapping. I'd say the key points for moving out of Pro/E are: better control of shaders, lights, cameras, etc. Raytracing for transparent parts. Simpler user interfaces.

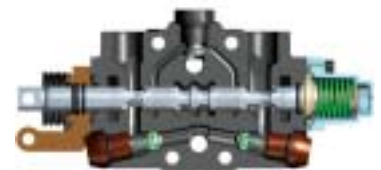
Pro/E does a fine job of handling surface shading and creating basic animation for use in an engineering environment but for higher quality, hyper-realistic presentations, the parts need to be exported to a true rendering and/or animation software. It's like the difference between carpenter's tools and watch maker's tools.



Parker Hannifin AB. Anders Karlsson (Project Leader). ProE (CAD) to trueSpace Translations & Optimizations.

We developed a new product under the project name "Niagara" that was released about a year ago. This was our first project when we used 3D-images instead of photos for promotion material. The product was modeled in Pro/E, exported thru PolyTrans and finally rendered in TrueSpace.

Pro/E modeling was made by myself and a colleague, Peter Fredh. The final rendering was made by Lars Magnusson at Rand Worldwide. The reason for not using Photorender in Pro/E was mainly the interface, very difficult to get the quality and layout of the images as we wanted and a very limited texture library (not easy to create textures as well) for example. The result of the project was a very competitive product and the rendered material has been published in several articles and papers (mainly hydraulic literature) as well as our own promotion material.



Cirring Interactive Inc. David Lennox. ProE (CAD) to Lightwave Translations & Optimizations.

These images are from a multimedia presentation created for an elevator company. We were asked to create an animation of one of their elevator products in operation. We were given STL and IGES object files generated in ProE, and created an animation from these files in Lightwave. Conversion from STL and IGES to Lightwave, including scene & hierarchy optimization, was done with NuGraf.



Neptune Media. Steven Gutierrez. ProE (CAD) to 3DS MAX Translations & Optimizations.

When we looked for availability on Pro/E model-translators, we found PolyTrans to be the best buy. But what really convinced us was the trial demo, and how PolyTrans translated a Pro/E model into a 3DS model within seconds. (I actually did not even read the tutorial.) I was amazed at how exact the models matched. Even when I bring in an AutoCAD DXF model into 3ds max there is always a little tweaking, and AutoCAD and 3ds max are specifically meant to work with each other.



The steps are really as easy as open the Pro/E file, and export as a 3DS file, or you can just use the plug-in that comes with the program and import the Pro/E file directly in 3ds max

We could not use Pro/E alone to render the product due to the final desired product. We needed to have the truck's payload (a Pro/E model) being carried by a hi-tech looking truck. In addition, we needed HUM-Vs, landscapes, special effects, and other props. This was a DVD design project and it needed to look artistic. **We modeled the truck in a 3D modeling and animation program geared towards creating professional looking video, and imported the Pro-E model using PolyTrans. This saved many man-hours and money by saving the time necessary to fix or remodel the payload in the animation program.** When there was a truck payload redesign, the animator did not have to edit the model or animation at all. We just used PolyTrans again, and swapped in the updated model and that was it. The final product had the details and hi-tech look of the actual Pro/E model blended with the artistic production of visual special effects, which is exactly what the client was aiming for.

Pegasus Design, Inc. Steve Calderon. ProE (CAD) to 3DS Translations & Optimizations.

Pegasus Design specializes in opto-mechanical tooling design and technical animation for the semiconductor, medical and optical industries. We designed this optical inspection machine for Tinsley Labs in Richmond, CA using ProEngineer CAD software. Tinsley is famous for making the corrector optics for the Hubble Space Telescope. The beryllium, aspheric, 35" diameter satellite mirror shown here is the primary mirror for the NASA Space Infrared Telescope Facility, (SIRTF). The mirror is valued at about two million dollars. We used PolyTrans to convert the files to 3DS format. We added the floor, walls and ceiling. We stuck a panel outside the 'window' and mapped it with a digital photo of our parking lot.



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