



Solid Edge Virtual Studio+



Overview PLM World 2006

DRAFT
EDITION
April 11
2006

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Today's agenda AM

- ▶ Virtual Studio+ demo
- ▶ How rendering works
- ▶ Rendering Workflow
- ▶ Differences between VS & VS+
- ▶ VS+ Environments
- ▶ The VS+ Toolkit



Today's agenda PM

- ▶ What's new in V18 VS+
- ▶ VS+ Advanced Glossary
- ▶ Creating a material from scratch
- ▶ Managing custom archive
- ▶ Decals / Textures
- ▶ Backgrounds and environments
- ▶ Atmospheric effects (foreground)
- ▶ 7 Tips & Tricks
- ▶ Q&A
- ▶ Free lab time





About rendering...

- ▶ Rendering is an artistic process
- ▶ Not all Engineers are artists...
- ▶ Virtual Studio+ fills the gap
 - ▶ Enough pre-defined settings for Engineers
 - ▶ Settings are flexible enough to suit Artists



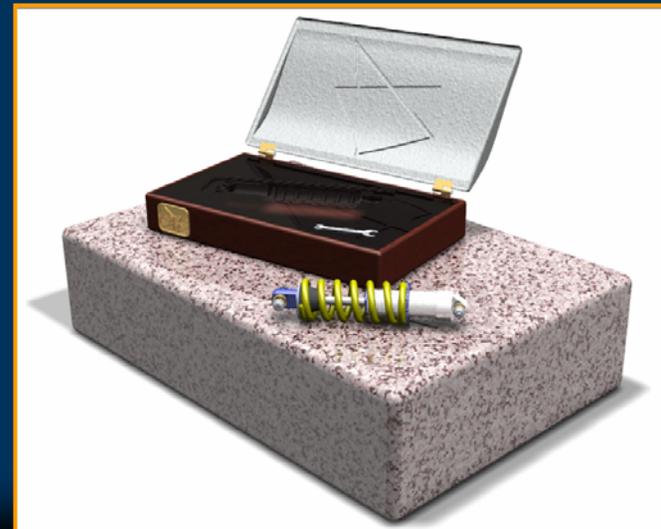
- ▶ **Why render?**
 - ▶ **It's always about selling!**



Virtual Studio+ Demo

- ▶ Know your audience!
 - ▶ Engineers
 - ▶ Ease of use
 - ▶ Predefined settings (filter for advanced)
 - ▶ Reuse
 - ▶ Marketing
 - ▶ Advanced settings
 - ▶ No translation required (3DS, etc.)
 - ▶ Flexible
 - ▶ Directors
 - ▶ Results : show images, not demos!

- ▶ **DEMO**





Virtual Studio+ high quality rendering

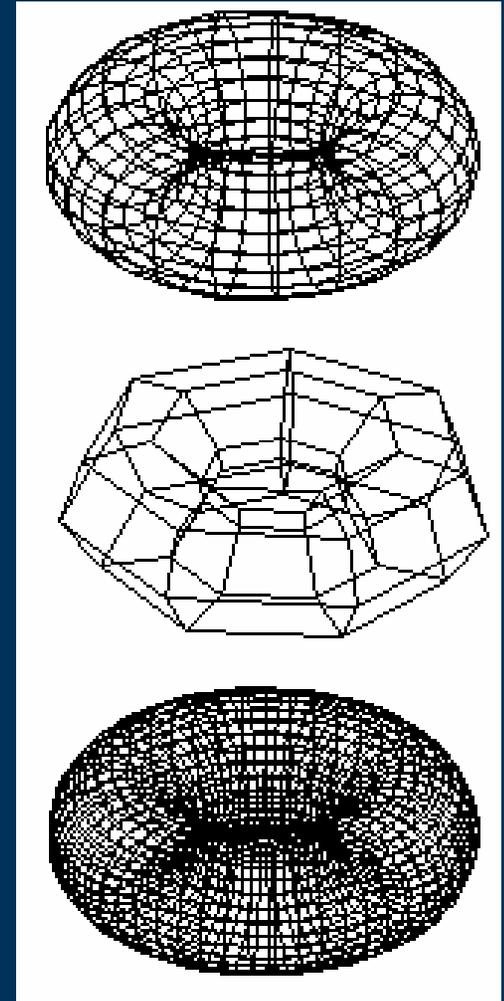
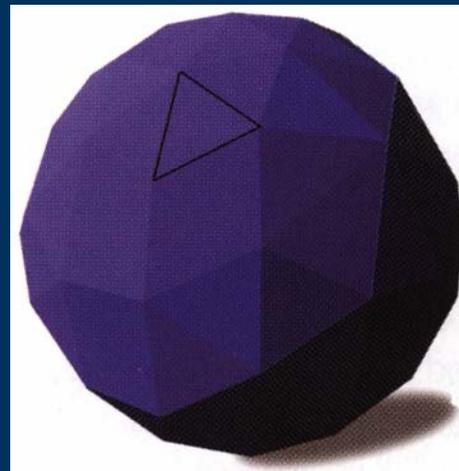
How rendering works





How rendering works

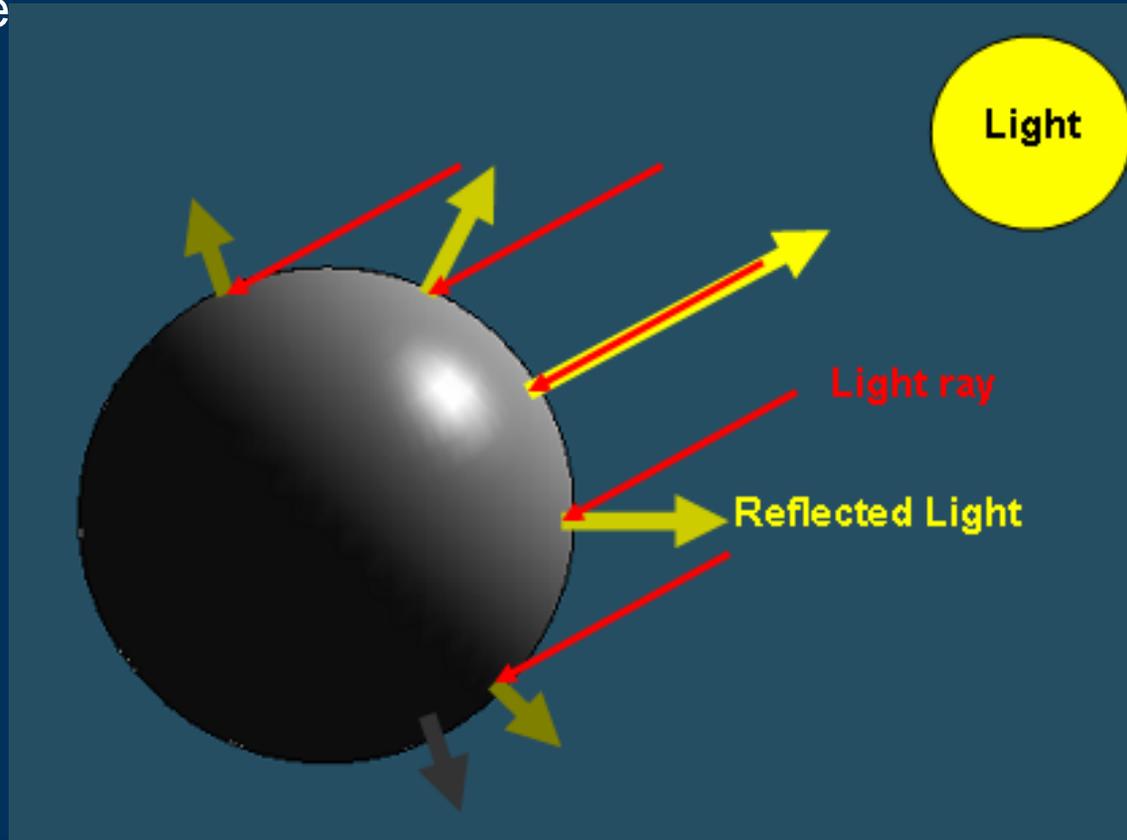
- ▶ 1. Model is created (geometric definition of faces, edges, etc.)
- ▶ 2. Model is broken into small triangles (tessellation)
- ▶ 3. Normal vectors for each face and vertex are computed





How rendering works

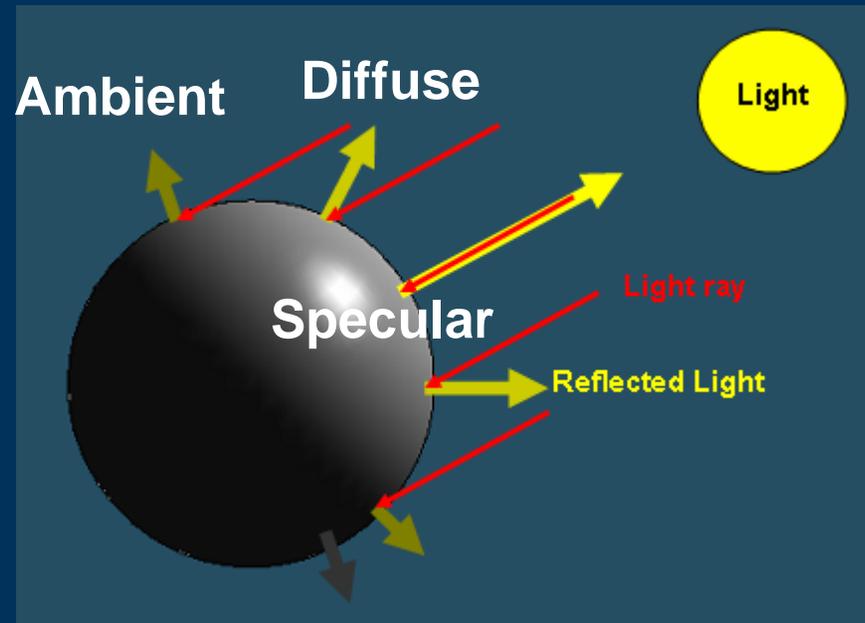
- ▶ 4. Vectors between each light source and each triangle are compared
 - ▶ Imagine 50,000 triangles and 5 light sources...
- ▶ 5. Shading based on the angle between each
- ▶ 6. Interpolation across each triangle is done to compute the shading
- ▶ Quality of image is based on the number of triangles and the color depth





How rendering works

- ▶ **Specular**: light reflected from light vectors that are ~ 0 degrees to light source vectors
- ▶ **Diffuse**: light reflected from light vectors ~ 45 degrees to a light source vectors
- ▶ **Ambient**: light reflected from light vectors ~ 90 degrees to a light source vectors
- ▶ **Emission**: an intensity value added to the sum of these three (clamped to white)





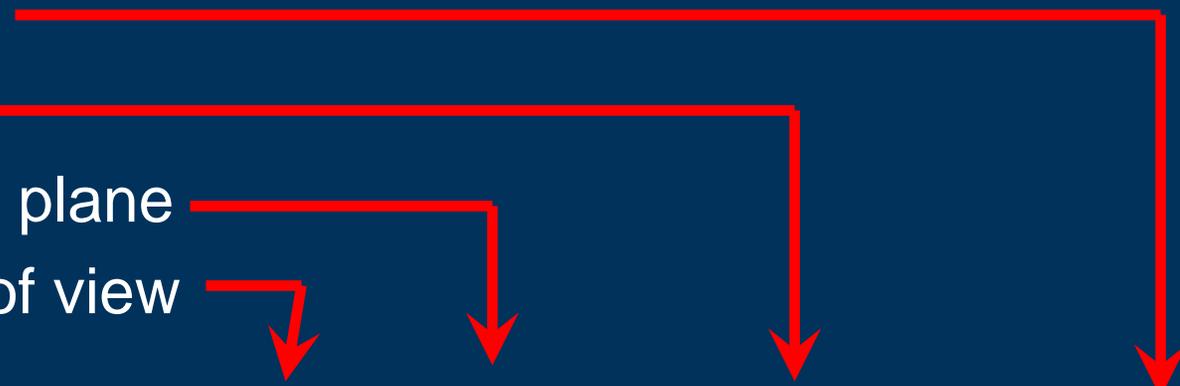
How rendering works

- ▶ Virtual Studio+ is based on Lightwork technology
 - ▶ Based on shaders
 - ▶ Archives are the predefined settings library
- ▶ LW is a **ray tracing** render application
- ▶ In ray tracing, a ray of light is traced in a backwards direction. This means that we start from the eye or camera and trace the ray through a pixel in the image plane into the scene and determine what it hits. The pixel is then set to the color values returned by the ray.



How rendering works : simplified ray tracing

- ▶ Background
- ▶ Model
- ▶ Virtual image plane
- ▶ Virtual point of view

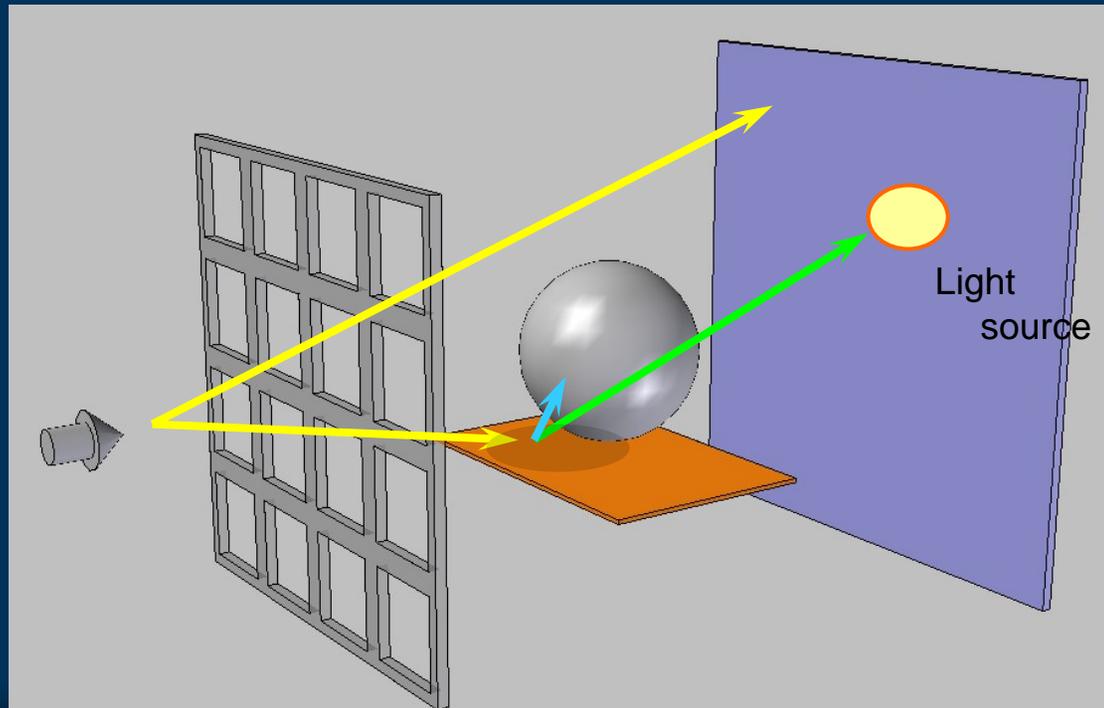


Primary ray

Shadow ray

Reflected ray

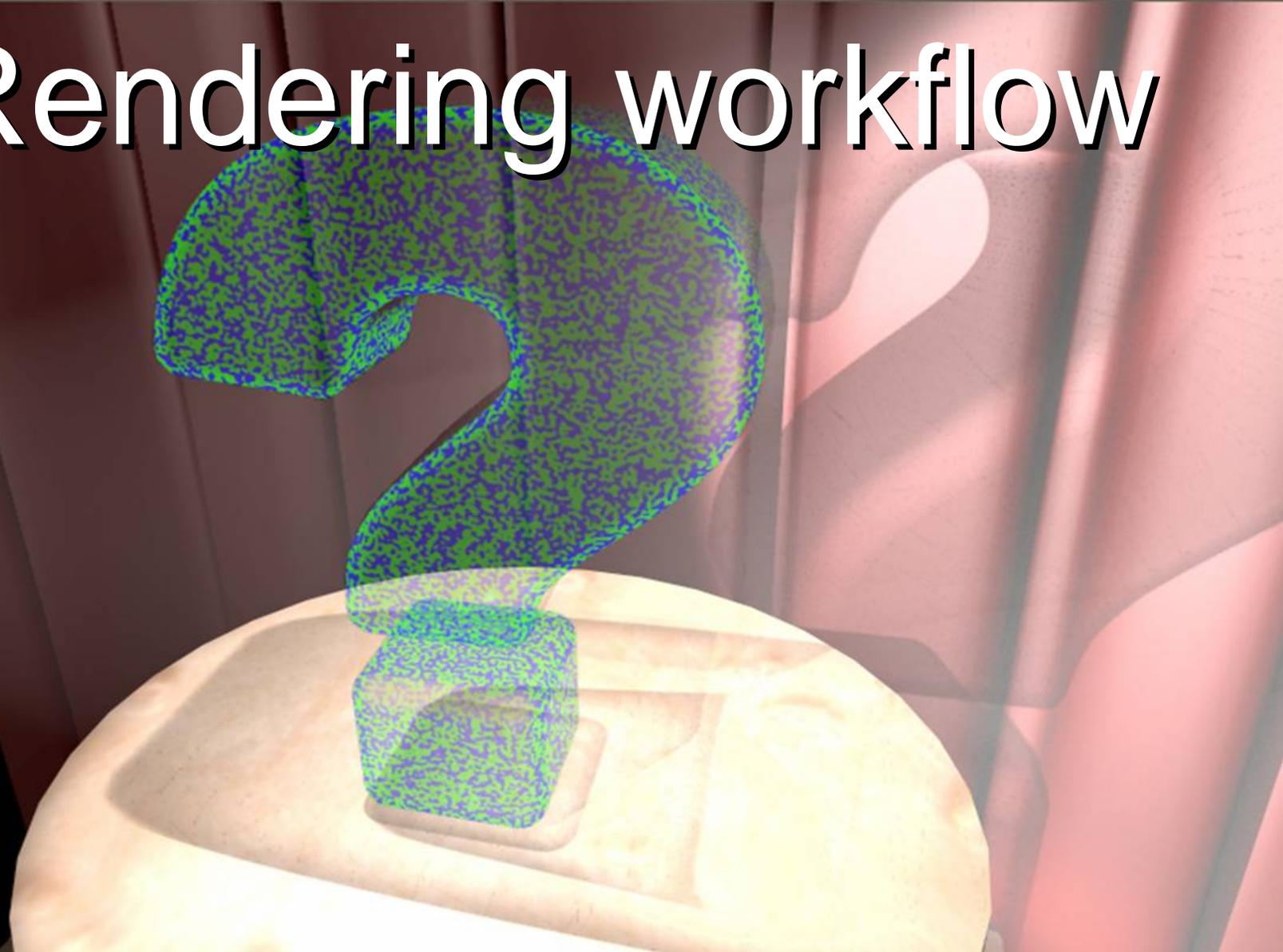
Refracted ray





Virtual Studio+ : high-quality rendering

Rendering workflow





Rendering Workflow



- ▶ Give yourself a goal (and a timeline...)
 - ▶ What is the purpose?
 - ▶ Marketing / Web site / Prints / Internal / Customer approval
 - ▶ Where is my focus?
 - ▶ Specific part / global assembly / environment

- ▶ Create a copy of your assembly
 - ▶ Inactivate all parts to save memory
- ▶ Setup your scene
 - ▶ Show / Hide parts + Position them
 - ▶ Environment
 - ▶ Save pre-defined views + Perspective



Rendering Workflow



- ▶ Create a new folder
 - ▶ Rendered ASM, custom archive*, background and image texture, image results
- ▶ Enter Virtual Studio+
- ▶ Scroll through mapped materials, lights and background
- ▶ Analyse the default rendered image
 - ▶ Any errors in the geometry?



Rendering Workflow

- ▶ Lower quality settings
 - ▶ Sharpness, aliasing
- ▶ Setup Background
- ▶ Setup Materials (basic)
- ▶ To scene or not to scene?
- ▶ Setup lights





Rendering Workflow

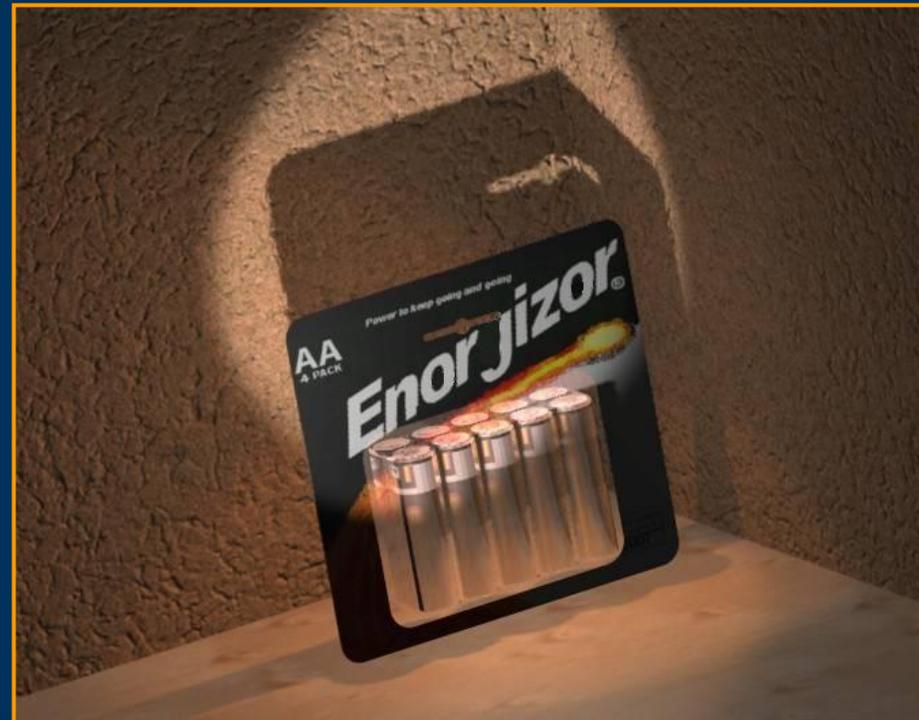
- ▶ Tweak materials
- ▶ **SAVE!!!**
- ▶ Add perspective and fine tune the view
 - ▶ Multiple views?
- ▶ Foreground?
- ▶ Crank up rendering quality
 - ▶ Photorealistic or artistic image?
 - ▶ Sharpness





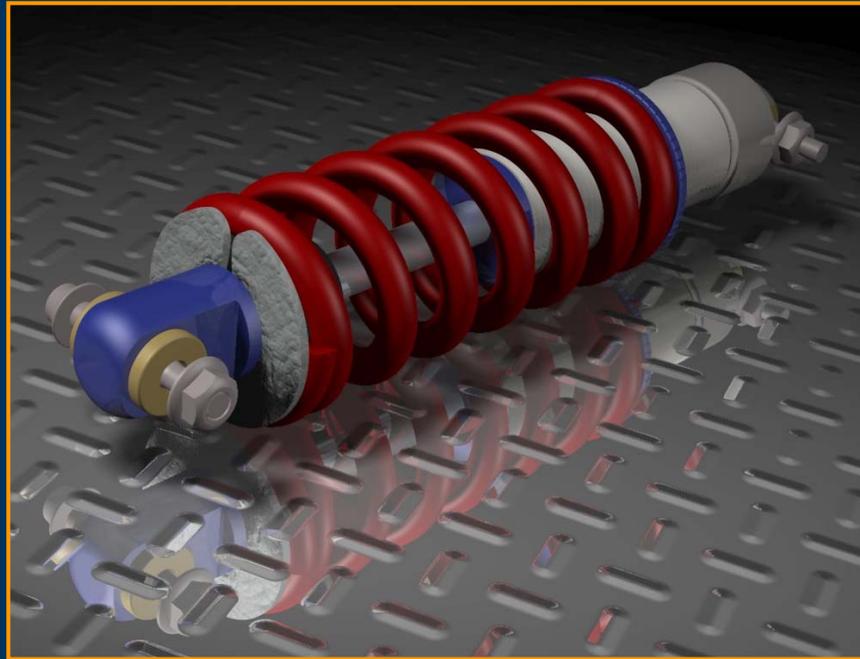
Rendering Workflow

- ▶ Save your results
 - ▶ Print screen or « save as image » ?
- ▶ Save your custom archives
- ▶ Save your assembly





VS vs VS+

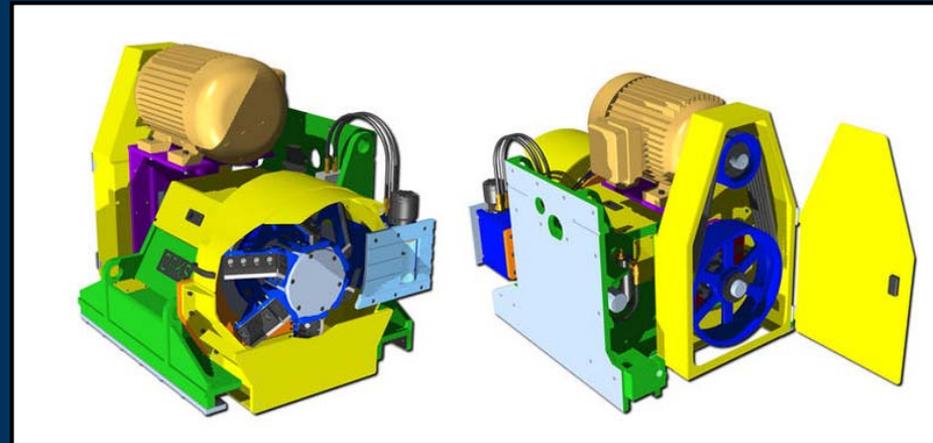


**Differences between
Virtual Studio and Virtual Studio+**



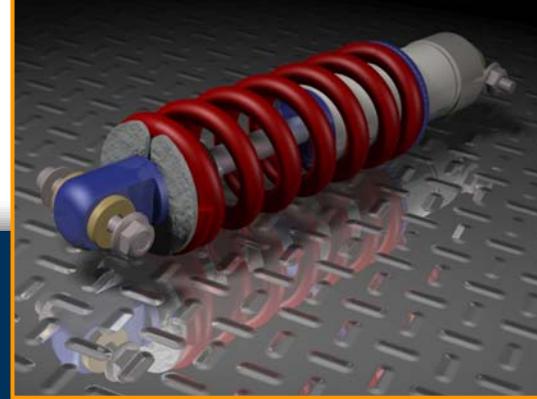
Differences between VS and VS+

- ▶ Virtual Studio+ is a high-quality rendering application
- ▶ Differences between Virtual Studio (built-in) & VS+ (add-on)
 - ▶ Faster rendering engine
 - ▶ More control
 - ▶ More light types, light studio systems
 - ▶ Globally easier to use and to re-use settings (Archive)
 - ▶ Atmospheric effects
 - ▶ Artistic rendering
 - ▶ Virtual Scenes
 - ▶ more...





Virtual Studio+



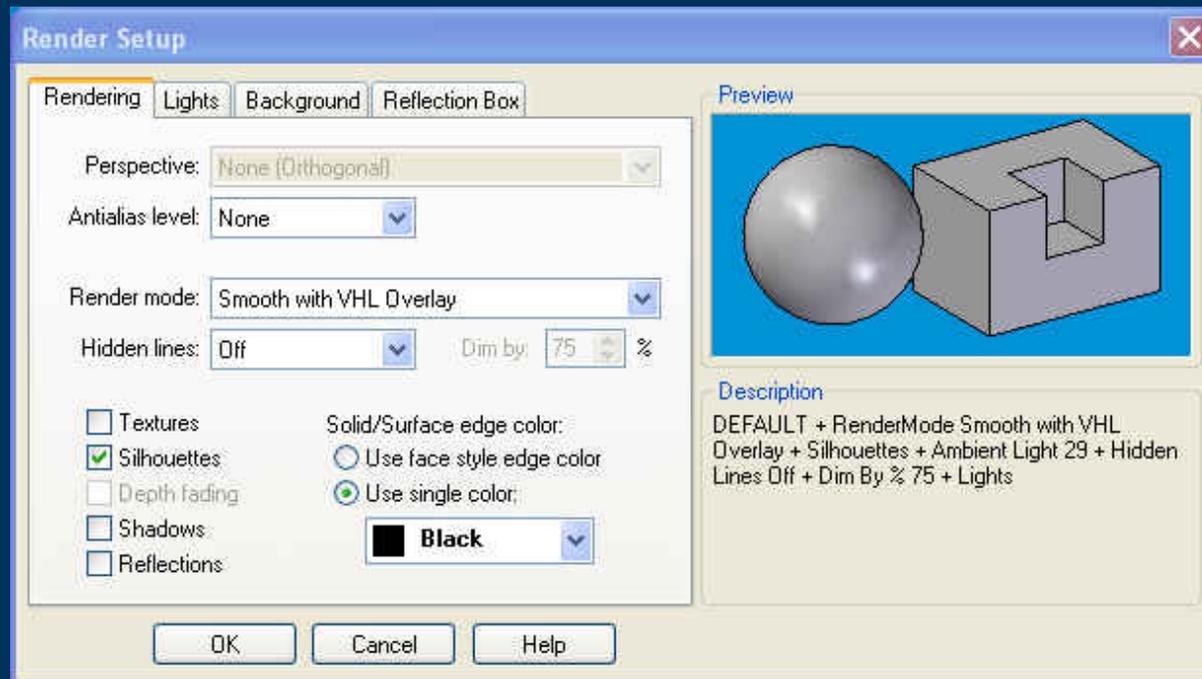
- ▶ VS+ is based on Lightwork technology
- ▶ Uses Archives as the texture, light and scene library
- ▶ Archives (*.LWA files)
 - ▶ Can be customized, saved and shared
 - ▶ Can be downloaded from the web
- ▶ Go to « www.lightworks-user.com » for tips and free downloadable archives
- ▶ VS+ is « LWA enabled »





Differences between VS and VS+

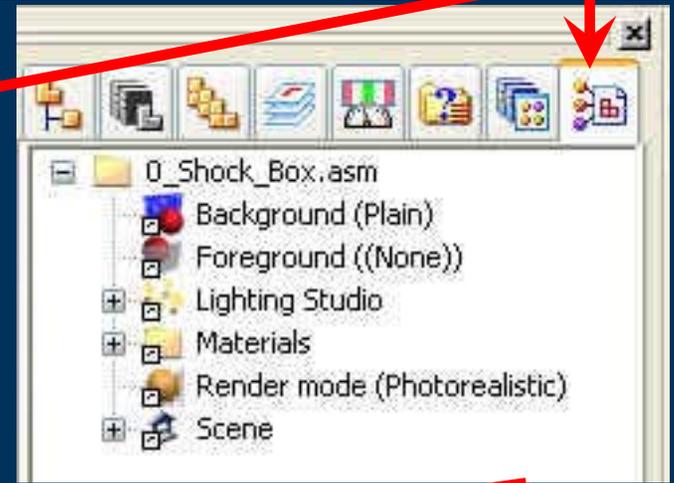
- ▶ « Regular » Virtual Studio interface
- ▶ Notice the available parameters in « Render Setup »
- ▶ 99% same as regular view manipulation



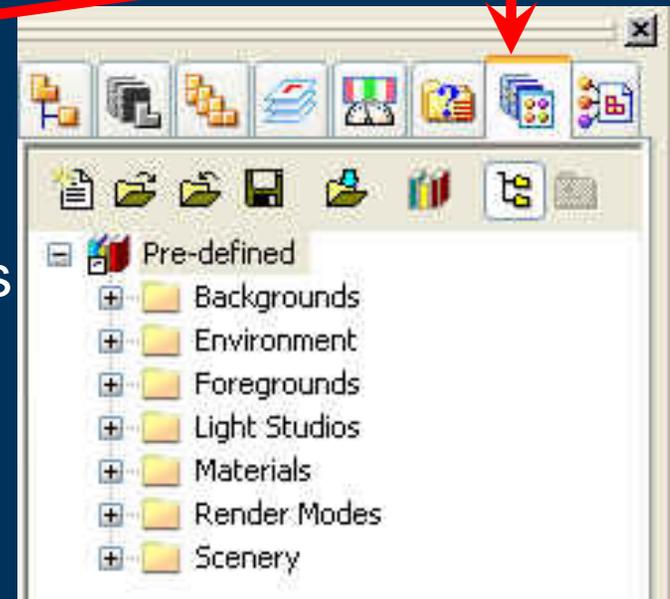


VS+ Environments

- ▶ 1st tab : Session Entities
 - ▶ Settings for the current session
 - ▶ Where you can edit settings



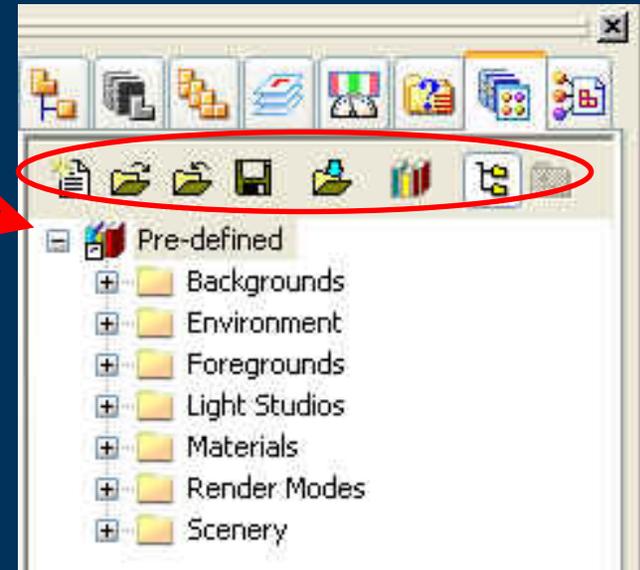
- ▶ 2nd tab : Pre-defined archives
 - ▶ Access to pre-defined settings
 - ▶ Settings are stored in *.LWA files
 - ▶ Open, save and organize settings





VS+ Environments : Pre-defined Archives

- ▶ Access to settings library
- ▶ « Pre-Defined » is the default
 - ▶ HUGE!
 - ▶ Can not be modified or saved
- ▶ Tools to organize custom archives
 - ▶ Create, Open, Close, Save





VS+ Environments : Session entities

- ▶ Some settings are mapped from the assembly env.

- ▶ Background

- ▶ Lights

- ▶ Some materials...

- ▶ Other settings are default

- ▶ Foreground

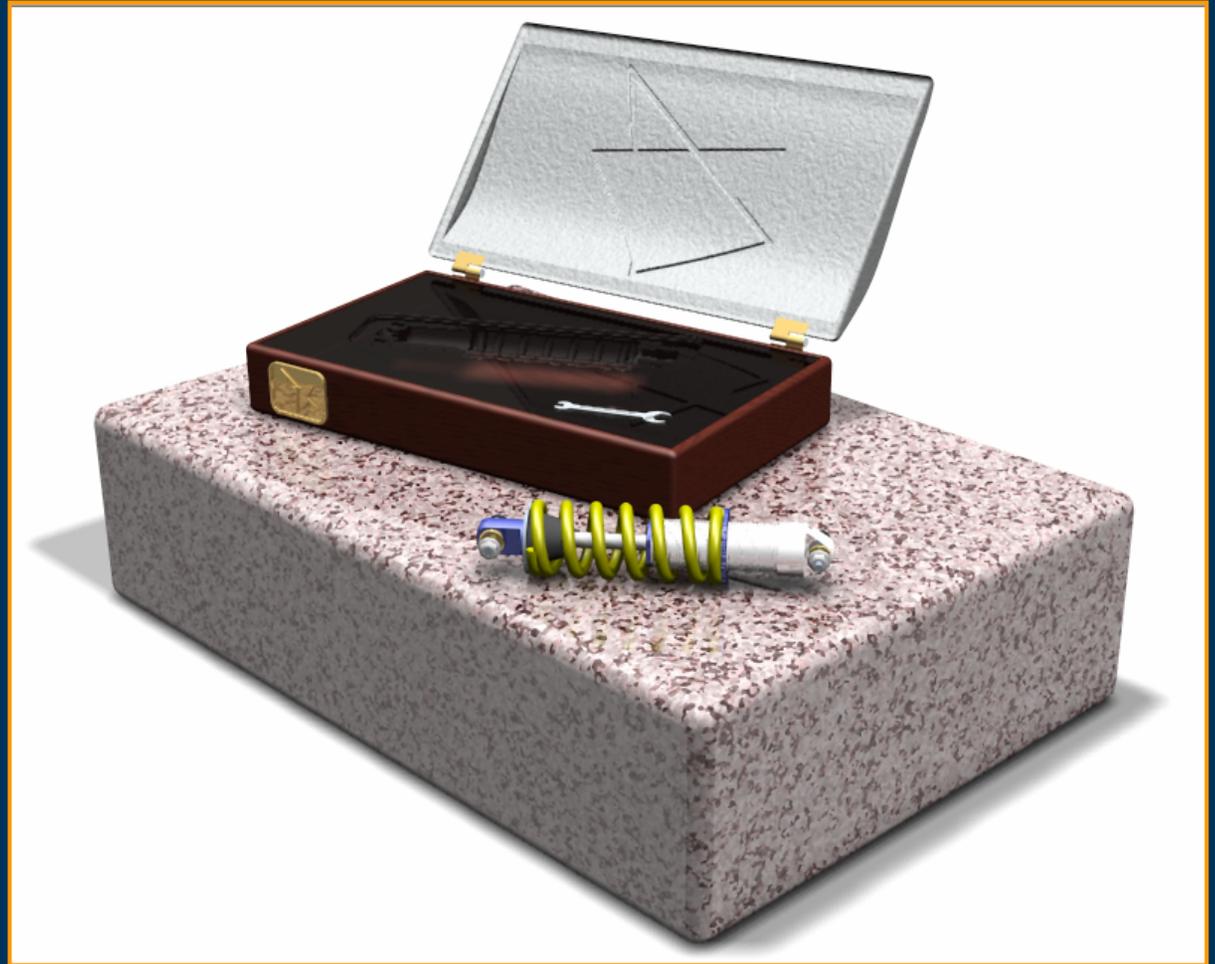
- ▶ Render Mode

- ▶ Scene





DEMO





VS+ Environments : LAB #1 (5 min.)

- ▶ Please take a look at the « Introduction to Virtual Studio+ » hand-out
- ▶ Step-by-step procedures are there
- ▶ Try to stick to the plan, but you can explore on your own

SOLID EDGE

Introduction to Virtual Studio+
Hands-on training session
Morning session

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March 23rd, 2006 rev 0



Virtual Studio+ : high quality rendering



Environments overview

- ▶ Materials
- ▶ Lights
- ▶ Backgrounds, Foregrounds and Scenes
- ▶ Render modes
- ▶ Saving your work



Solid Edge Virtual Studio+



- ▶ **TO BE COMPLETED!!!**
- ▶ **April 11, 2006**



Thank You !

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Thanks to Lightwork Design Limited.
Some portion of this presentation contains quote from the
API Guide of Lightwork rendering engine