

(Example For V-Ray Material Translucency)

Types of Lighting in V-Ray (Simple & Clear Explanation)

1) Ambient Lighting

Purpose: General background light in the space

Effect: Soft, low-contrast lighting

Where used: Living rooms, bedrooms, wide interior spaces

V-Ray Source Example: V-Ray Environment Light

Short description:



Provides overall illumination with no strong direction.

2) Task Lighting

Purpose: Lighting for a specific activity or function

Effect: Focused, practical, direct

Where used: Desk light, kitchen counter light, reading light

V-Ray Source Example: V-Ray Light (Rectangle) near surfaces

Short description:

Light designed to help perform tasks clearly.

3) Accent Lighting

Purpose: Highlight or emphasize an object / feature

Effect: Strong contrast, shadows, dramatic

Where used: Sculpture, plants, wall textures, architectural details

V-Ray Source Example: V-Ray Spot Light / IES Light

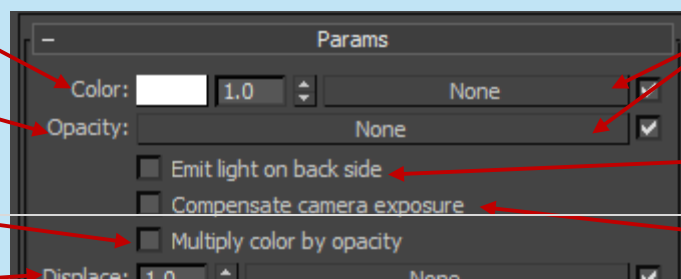
Short description:

Used to draw attention to specific elements.

Type	Purpose	Effect	Example in Scene	V-Ray Light
Ambient	General room lighting	Soft, low contrast	Living room at night	Environment Light / Dome Light
Task	Lighting for work/activity	Focused & Direct	Reading lamp, kitchen counters	Rectangle / Spot Light
Accent	Highlighting objects	High contrast / dramatic	Garden feature, art wall	Spot / IES Light

V-Ray Light Material

للتحكم في لون الاضاءة



لاضافة الشفافية للخامات

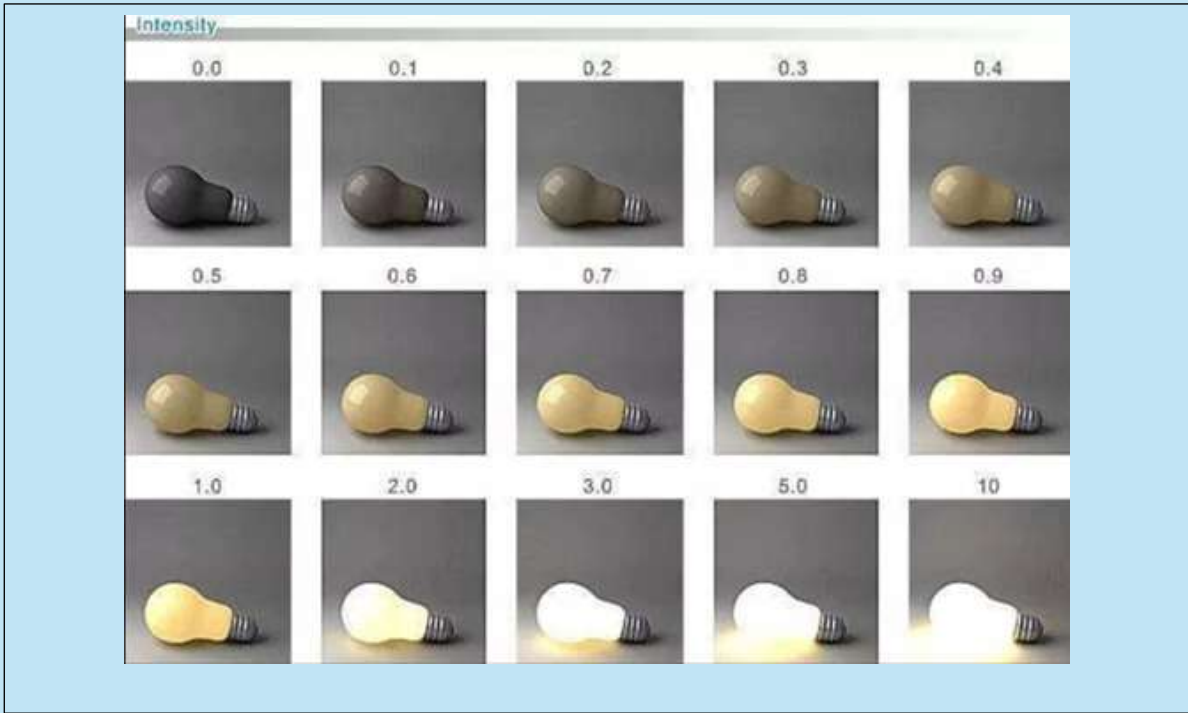
لزيادة قوة الشفافية لاضافة
سمك للخامات

لتشغيل حسابات
الاضاءة المباشرة

يستخدم لوضع

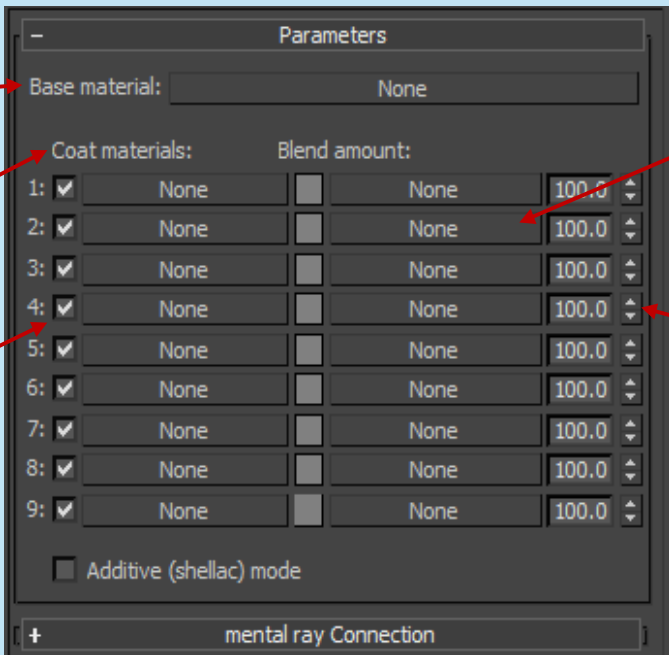
لوضع الخامات على كلا الوجهين
للمجسمات

يستخدم لزيادة قوة انارة الخام



(Example For V-Ray Material Translucency)

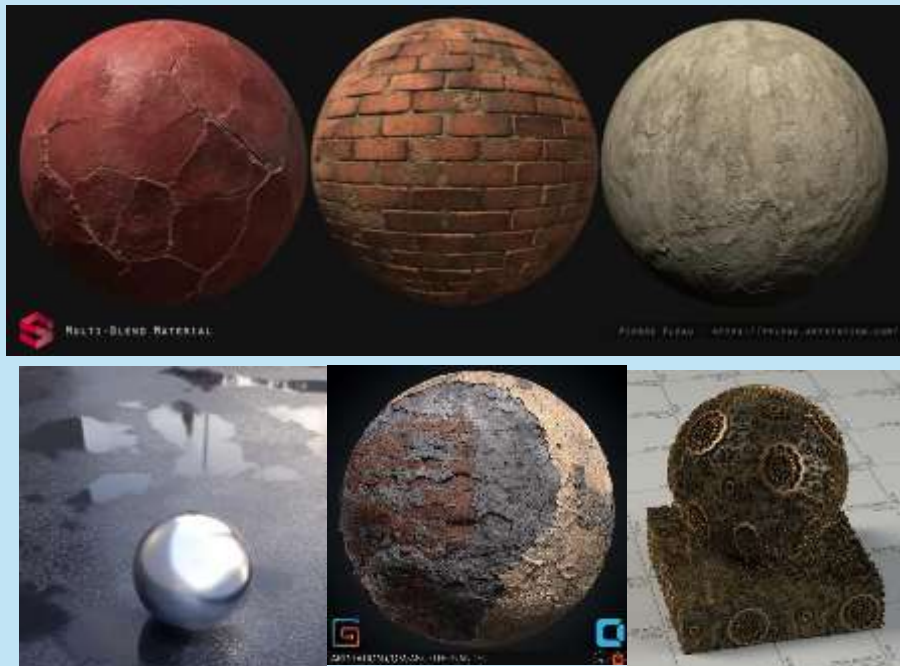
V-Ray Blend Material



The screenshot shows the 'Parameters' panel for a V-Ray Blend Material. It includes a 'Base material' dropdown set to 'None', a 'Coat materials' list with 9 entries, and a 'Blend amount' column with values of 100.0. A 'mental ray Connection' button is at the bottom.

Annotations in Arabic:

- يسخدم لوضع الخامة الاساسية (Used for setting the base material)
- يسخدم لوضع الخامة الثانوية (Used for setting the secondary material)
- لتفعيل او الغاء الخامة (To activate or deactivate the material)
- يسخدم لوضع map من اجل حذف جزء من الخامة الثانوية لتظهر اجزاء من الخامة الاساسية (Used to place a map to delete part of the secondary material, showing parts of the base material)
- يسخدم للتحكم في قيمة الـ map (Used to control the map value)



(Example For V-Ray Blend Material)

OTHER TOOLS USED IN RENDER

VRayProxy

VRayProxy its mean save object as external file (vrmesh) and then you can import into current file by using (VRayProxy).

VRayProxy used to reduce file size .

Using the following methods to creat VRayProxy :

- 1- Select objects ► Right - click ► Convert To ► Convert to Editable Poly .



- 2- Select one object from them and attach other objects to make one object by using Editable poly .

- 3- Assign material to objects .

- 4- Select object ► Right- click ► V-Ray mesh export ► from dialog specify parameters ► Click Ok .

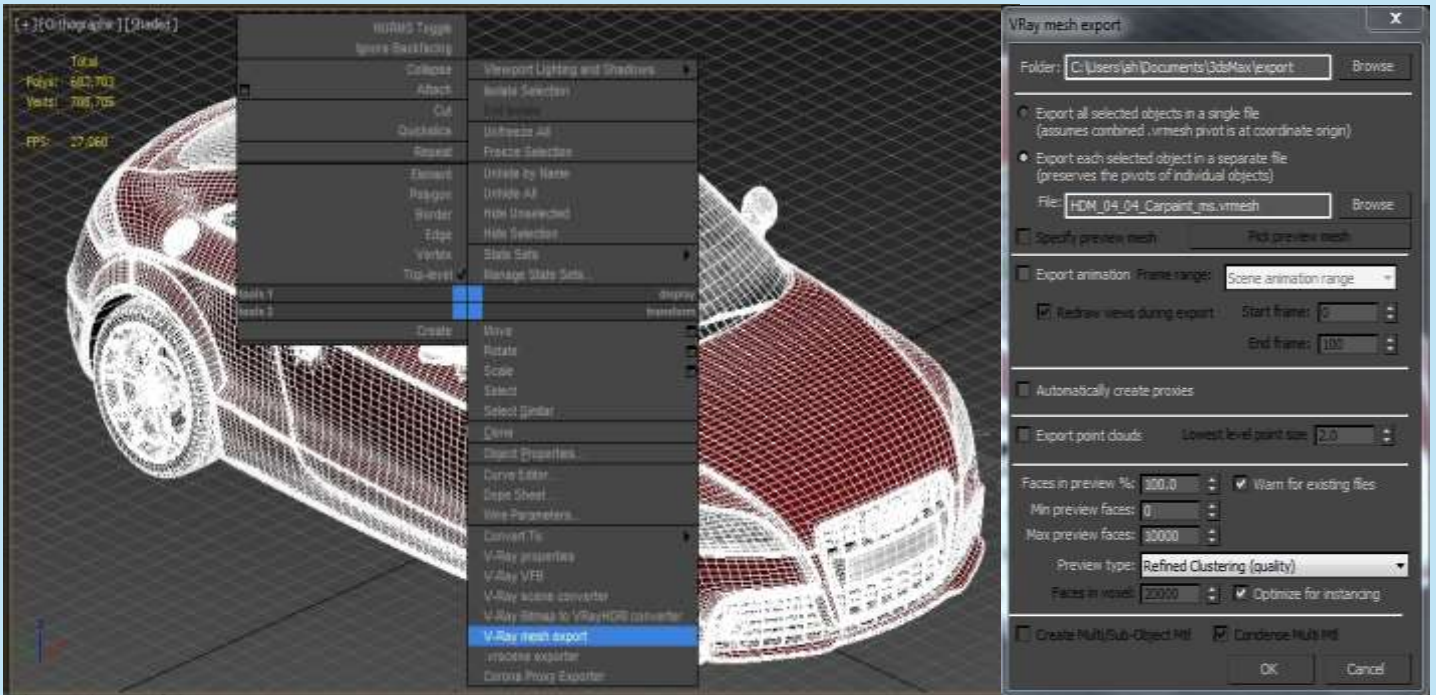


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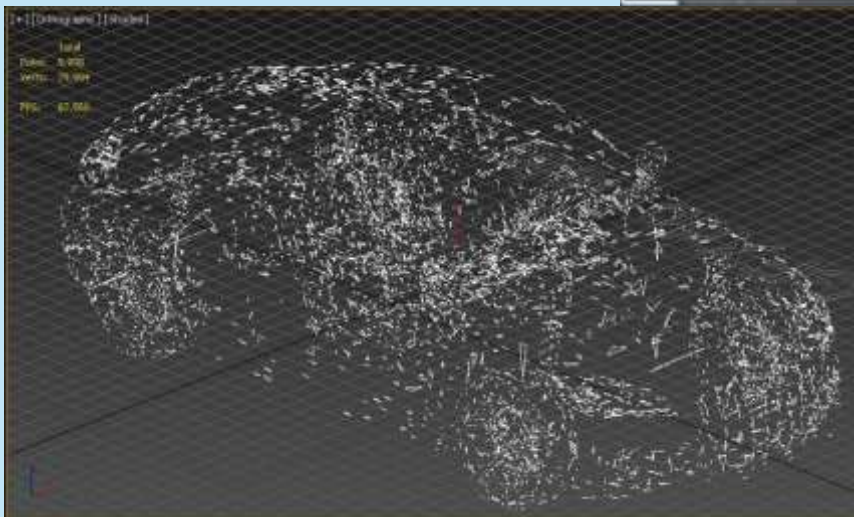
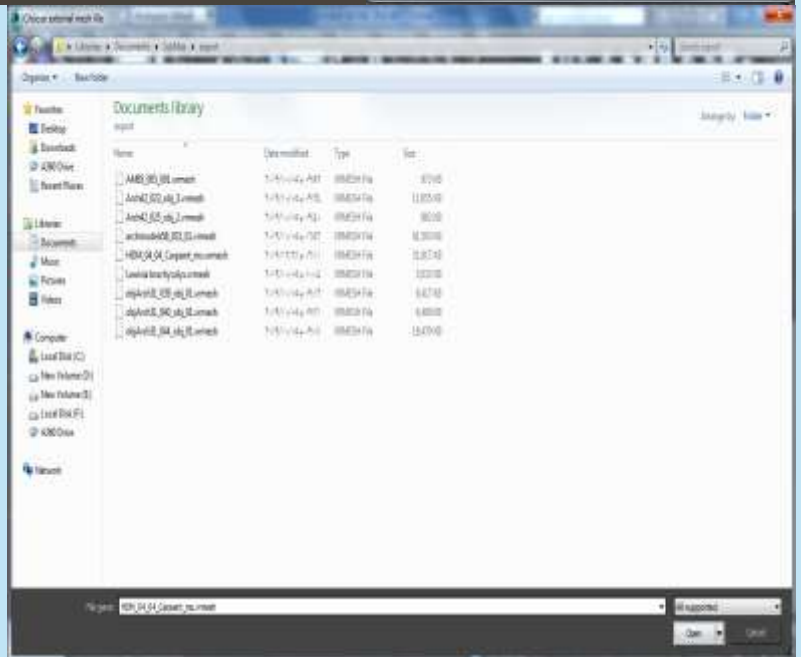
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- 1- Delete object .
- 2- To import object In the Command panel click Create () ► Geometry ()► from the drop-down menu select VRay ► from Object Type select VRayProxy ► click in viewports .
- 3- From dialog select file ► click Open .



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LECTURE 12

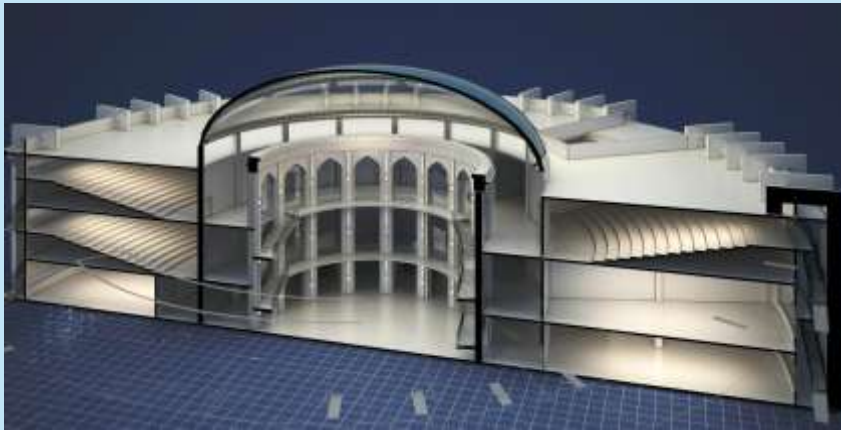
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VrayClipper

In the Command panel click Create () ► Geometry () ► from the drop-down menu select V-Ray ► from Object Type select VrayClipper ► click in viewports .

(Effect VrayClipper)



Enabled – Turns the clipper effect on and off.

Affect lights – When enabled, the clipper affects area lighting as well.

Camera rays only – The clipper affects objects as they are directly seen by the camera, but they appear unchanged to reflection/refraction/GI rays.

Clip lights geometry – Enables or disables the clipping of lights geometry (for example a mesh light).

Use object material – When enabled, the clipper uses the material of each clipped object to fill in the resulting holes. When disabled, the material applied to the clipper object itself is used.

Set material ID – When enabled, you can specify a face material ID for the clipper object. This ID can then be used inside a Multi/Sub-object material to specify a different filler material for different objects. This option is available only when **Use object material is enabled**.

Material ID – Specifies the face material ID for the clipped surfaces when **Set material ID** is enabled.

Icon text – Shows/hides the V-Ray clipper icon text from the viewports.

Mesh mode - Enables the clipper to clip against an arbitrary mesh object rather than an infinite plane.

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Operation - Determines how to use the mesh when **Mesh mode** is enabled:

Intersection - Clips away anything that is outside the specified mesh; only renders objects and parts of objects inside the specified mesh;

Subtraction - Clips away anything inside the specified mesh; only renders objects and parts of objects outside of the specified mesh.

Replace mesh with clipper – Specifies what to do with the mesh that is picked through the **Pick mesh** button. When enabled, the mesh is moved as a sub-object under the V-RayClipper object and the clipper takes the place of the mesh. If disabled, the clipper just references the picked mesh.

Icon Size – Specifies the size of the viewport gizmo in world units. This allows the gizmo to be static, regardless of its distance from the camera, or to be removed altogether.

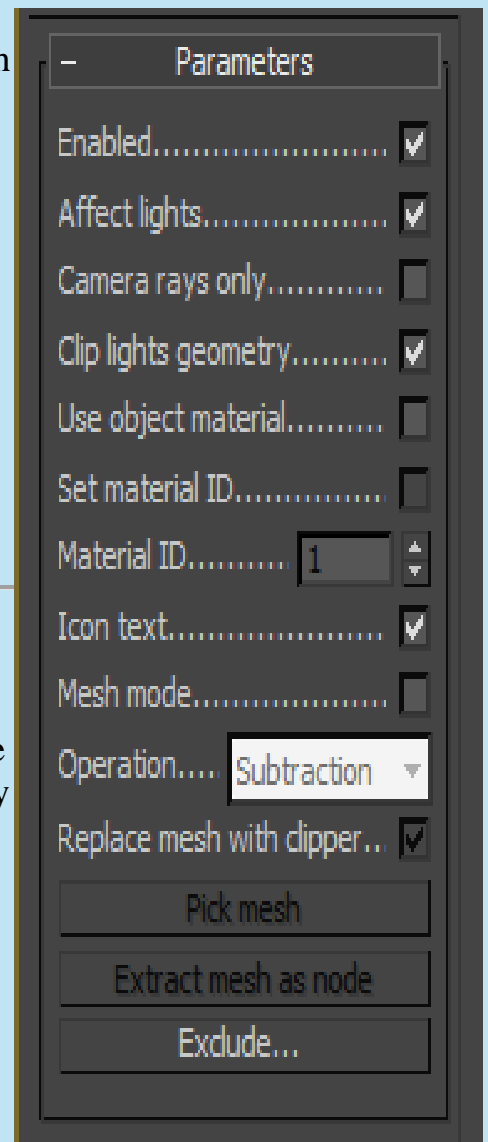
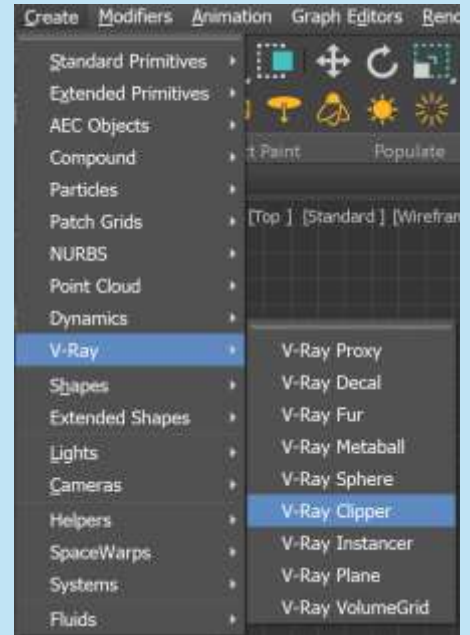
Pick mesh – Allows you to pick a mesh object against which to clip when **Mesh mode** is enabled. This button is only active in the Modify tab of the 3ds Max Command Panel, and not in its Create tab.

Extract mesh as node – Extracts an instance geometry of the clipper mesh when **Mesh mode** is active.

Exclude – Opens an include/exclude list that allows you to select which scene objects to be clipped.

Notes

- V-RayClipper works best with "closed" objects that have a corresponding back face. The results on open objects (without a corresponding back face) are not well defined.
- Currently the V-RayClipper may produce artifacts if there are overlapping triangles in the scene, regardless of whether they are part of the same object or not.
- Note that **Set material ID** must be used for Multi/Sub-object, it does not act like Mtl ID in MultiMatteElement



General user interface

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<i>Open file</i>	CTRL+O (LETTER "O")
<i>Save file</i>	CTRL+S
<i>Redo scene operation</i>	CTRL+Y
<i>Undo scene operation</i>	CTRL+Z
<i>Delete objects</i>	DELETE
<i>Top view</i>	T
<i>Bottom view</i>	B
<i>Left view</i>	L
<i>Front view</i>	F
<i>Camera view</i>	C
<i>Isometric user view</i>	U
<i>List view</i>	V
Snaps	S
Angle snap	A
<i>Maximize viewport toggle</i>	ALT+W
<i>Shade selected faces</i>	F2
<i>Wireframe / smooth toggle</i>	F3
<i>Activate edged faces view mod</i>	F4
<i>Material editor</i>	M
<i>Expert mode</i>	CTRL+X
<i>Show tab panel toggle</i>	Y
<i>Hide cameras toggle</i>	SHIFT+C
<i>Hide lights toggle</i>	SHIFT+L
<i>Hide grids toggle</i>	G
<i>Go to end frame</i>	END
<i>Go to start frame</i>	HOME
<i>Forward time one unit</i>	. (PERIOD)
<i>Back time one unit</i>	, (COMMA)
<i>Play animation</i>	/ (FORWARD SLASH)
<i>Auto key toggle</i>	N
<i>Render last</i>	F9
<i>Show cordient</i>	X
<i>Render scene</i>	F10
<i>Select all</i>	CTRL+A
<i>Select invert</i>	CTRL+I (LETTER "I")
<i>Select none</i>	CTRL+D



<i>Show safe frames</i>	SHIFT+F
<i>Create camera from view</i>	CTRL+C
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<i>Select-by-name dialog</i>	H
<i>Select</i>	Q
<i>Move</i>	W
<i>Rotate</i>	E
<i>Scale</i>	R
<i>Transform gizmo toggle</i>	X
<i>Transform type-in dialog</i>	F12
<i>Align</i>	ALT+A
<i>Zoom extents selected all</i>	Z
<i>Zoom region mode</i>	CTRL+W
<i>Maximise viewport</i>	Alt+W

Editable Poly

1	Vertex level
2	Edge level
3	Border level
4	Poly level
5	Element level
Shift+E	Extrude mode
Ctrl+Shift+B	Bevel mode
Ctrl+Shift+C	Chamfer mode

Ctrl+Shift+E	Connect
Shift+X	Edge constant
Ctrl+Shift+W	Target weld
Alt+C	Cut
Ctrl+Shift+Q	Quickslice
Alt+H	Hide
Alt+I	Hide unselected
Alt+U	Unhide all

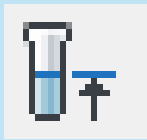
Material Editor



(Go to Parent)



(Material Editor Options)



(Show End Result.)



(Put Material to Scene)



Show Shaded Material
in Viewport



(Reset Map/Mtl to Default
Settings)



(Assign Material to
Selection)



(Make Material Copy)



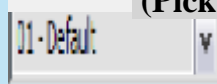
(Get Material)



(Pick Material From Object)



(Select By Material)



Material Name field

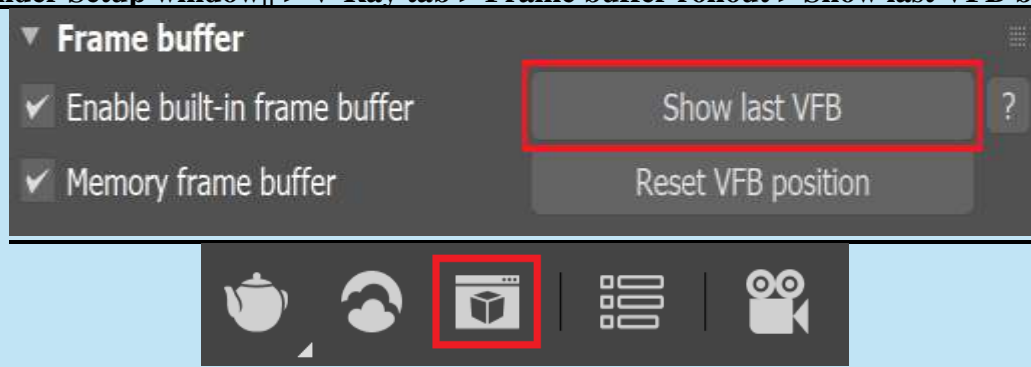
V-Ray Frame Buffer

||V-Ray Toolbar|| > Last
VFB button



Max2024 VRay6.2 VFB UI toolbar

||Render Setup window|| > V-Ray tab > Frame buffer rollout > Show last VFB button



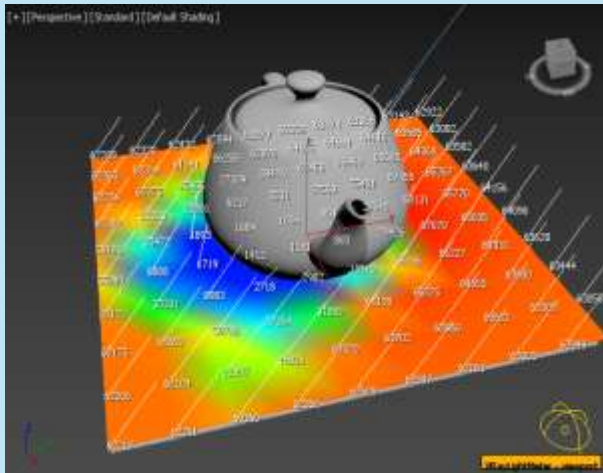
Overview

The lighting analysis workflows with V-Ray are based around two components: the VRayLightMeter helper object, and the VRayLightingAnalysis Render Element. While the VRayLightMeter object has been included in V-Ray since version 2.0, it is updated and improved for V-Ray Next and later to ensure better precision of the results. The VRayLightingAnalysis Render Element is newer than the VRayLightMeter workflow in V-Ray.

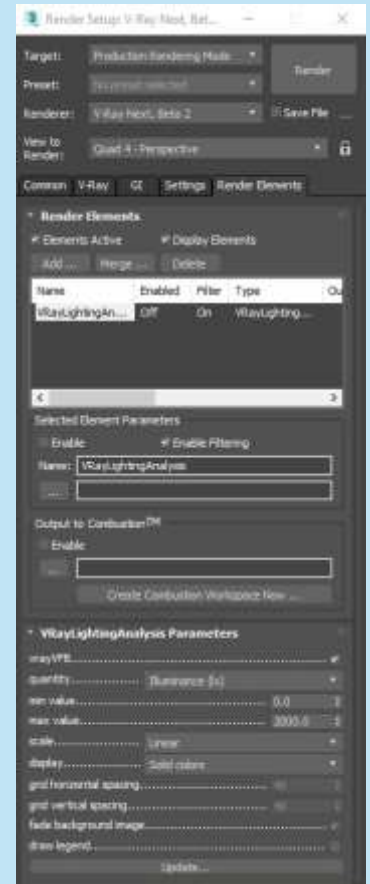
VRayLightMeter Helper

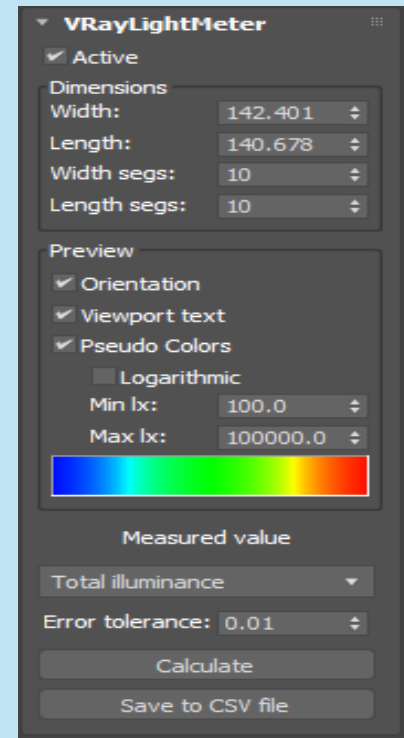
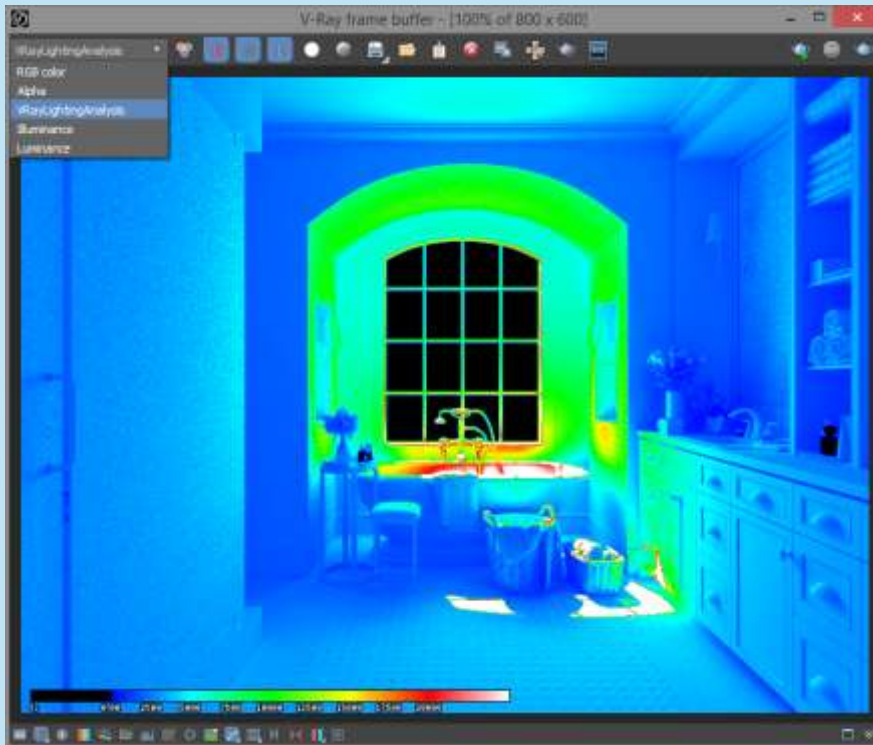
The VRayLightMeter helper is a rectangular grid that can be added to the scene to show illuminance values at the vertices of the grid. It enables showing total illuminance, direct illuminance, indirect illuminance and daylight factor. The predominant direction from which the respective lighting component comes can also be shown.

The VRayLightMeter in the 3ds Max viewport, with pseudo colors, orientation and textual illuminance values displayed.



The interface of the VRayLightMeter in the 3ds Max command panel.





V-RayLightingAnalysis Render

Element

The V-RayLightingAnalysis Render Element is a special element that can be added from the Render Settings.

Adding this render element internally adds two other render elements to the V-Ray frame buffer called Illuminance and Luminance which are filled with the absolute unscaled lux and candela values for the respective quantity.

The V-Ray frame buffer showing the V-RayLightingAnalysis render element in “false colors” mode after a render is complete. The additional Illuminance and Luminance render elements can be seen in the VFB as well.

The interface of the V-RayLightingAnalysis Render Element.

V-RayPhysicalCamera



Overview

The V-RayPhysicalCamera uses real-world camera settings such as f-stop, focal length, and shutter speed to set up the virtual CG camera. It also makes it easier to use light sources with real-world illumination, such as [V-RayLight](#) with physical units or [V-RaySun](#) and [V-RaySky](#).

UI Path: ||Create Menu|| > Cameras > V-Ray > V-RayPhysicalCamera

||Create menu|| > Cameras > V-Ray > V-RayPhysicalCamera

||V-Ray menu|| > Create > Cameras > V-Ray Physical Camera Script Access



||V-Ray Toolbar|| > Physical Camera button



Basic & Display

Type – Specifies whether the camera has a target in the 3ds Max scene or not. This helps to determinate the type of the camera. This mostly has an effect on the motion blur effect produced by the camera.

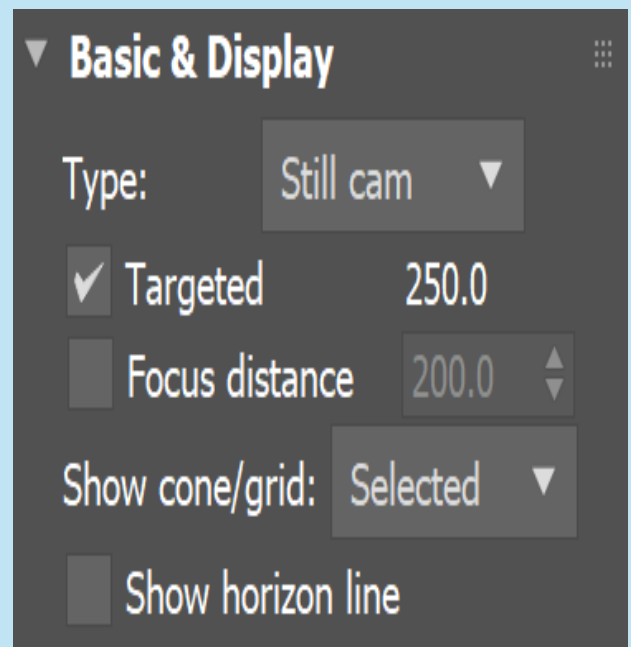
Still cam – Simulates a still photo camera with a regular shutter.

Movie cam – Simulates a motion-picture camera with a circular shutter.

Video cam – Simulates a shutterless video camera with a CCD matrix.

Targeted – Shows the distance from the camera to the camera target, when Targeted is enabled.

Focus distance – If enabled, specifies the distance at which objects are in focus.



Show cone/grid – Controls whether and when to show a preview of the camera field of view and focus plane.

Selected – Only shows the preview when the camera is selected.

Always – Constantly enables the preview.

Never – Constantly disables the preview.

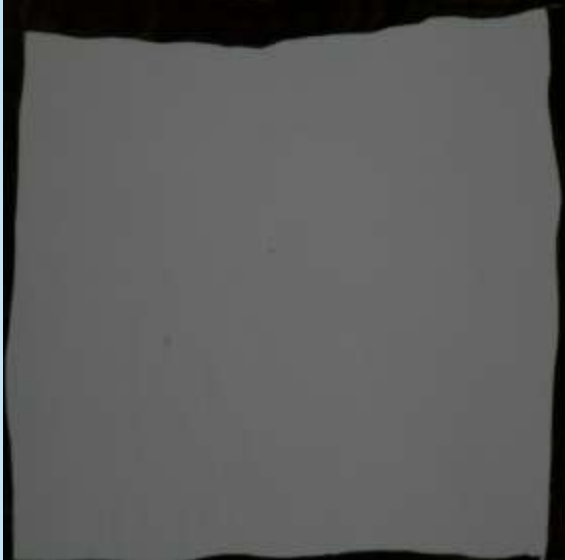
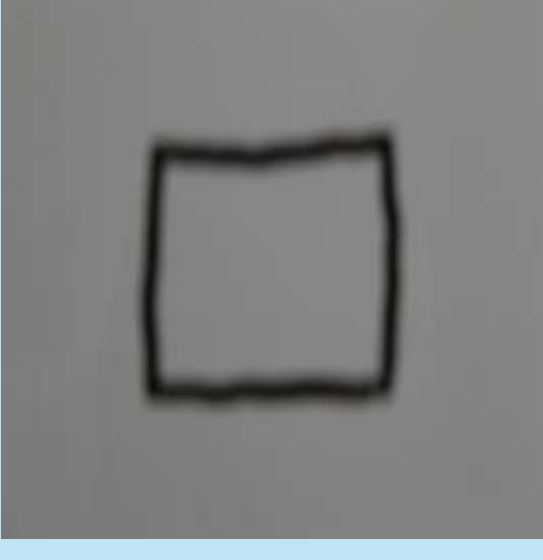
Cone only – Displays the cone in the viewport but removes the grid for the camera view.

Show horizon line – When enabled, displays the camera horizon line in the viewport.

Example: Exposure, Field of View and Focus Distance

The focus distance of the physical camera (as specified by either the Target distance or the Focus distance parameter) affects the exposure of the image and the field of view for the camera, especially if the focus distance is close to the camera. This is an effect that can be observed with real-world cameras as demonstrated in the images below.

The set up is a white board with a small black rectangle and a camera in front of it. Notice how changing the focus distance produces images with different brightness even though the illumination and all other camera parameters are the same in both cases. Also notice the change in the field of view.

		
<p>The camera is focused on the white board; the grey color is approximately RGB 104, 104, 104.</p>		<p>The camera is focused at infinity; the grey color is approximately RGB 135, 135, 135.</p>



Side view of the camera focused at infinity.



Side view of the camera focused on the white board

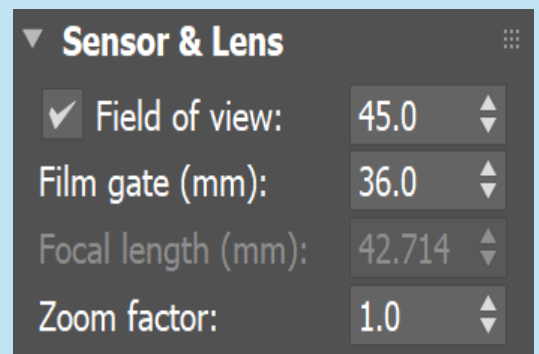
Sensor & Lens

Field of view – When enabled, sets the field of view directly without having to set up the Film gate and Focal length.

Film gate (mm) – Specifies the horizontal size of the film gate in millimeters. Note that this setting takes into account the system units configuration to produce the correct result. Vertical film gate size is calculated by accounting image aspect ratio (vertical film size = horizontal film size / aspect ratio).

Focal length (mm) – Specifies the equivalent focal length of the camera lens. This setting takes into account the system units configuration to produce the correct result.

Zoom factor – Specifies a zoom factor. Values greater than 1.0 zoom into the image; values smaller than 1.0 zoom out. This is similar to a blow-up rendering of the image.



Example: Zoom Factor

This parameter determines the zooming (in and out) of the final image. It doesn't move the camera forward nor backwards.

The following constant settings were used for some parameters: Exposure is set to Physical Exposure mode, F-Number is 4.0, Shutter speed is 8.0, Film speed (ISO) is 100, Vignetting is

on, White balance is white.



Aperture

Film speed (ISO) – Determines the film power (i.e. sensitivity). Smaller values make the image darker, while larger values make it brighter. *For more information, see the [Film Speed \(ISO\) example](#) below.*

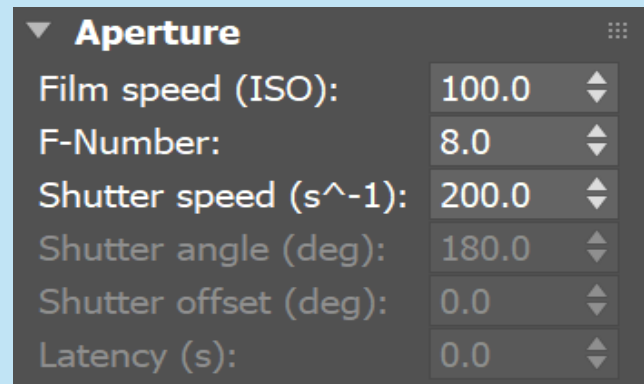
F-Number – Determines the width of the camera aperture and, indirectly, exposure. If the Exposure option is checked, changing the F-number will affect the image brightness. For more information, see the [F-number \(s-top\) example](#) below.

Shutter speed (s^{-1}) – Specifies the shutter speed, in inverse seconds, for the still photographic camera. For example, shutter speed of $1/30$ s corresponds to a value of 30 for this parameter. For more information, see the [Shutter Speed example](#) below.

Shutter angle (deg) – Specifies the shutter angle (in degrees) for the movie camera.

Shutter offset (deg) – Specifies the shutter offset (in degrees) for the movie camera.

Latency (s) – Specifies the CCD matrix latency (in seconds) when the camera mode is set to Video cam.



Aperture F-number vs Shutter Speed vs ISO Cheat Sheet

The main options that control the brightness of a V-Ray Physical camera are Aperture F-number, Shutter Speed and ISO. They affect each other and you need to balance their values according to your scene. Keep in mind that these settings do not correspond to those of a real-life camera. They apply only to the V-Ray Physical camera.

- F-number determines the size of the opening in the camera lens. The number refers to the

ratio between the aperture's focal length and the actual diameter of the aperture. A smaller F-number means a larger aperture. The larger the Aperture, the brighter the scene becomes but that also introduces more Depth of field.

- Shutter Speed determines how long the lens stays open when taking the photo. The numbers refer to fractions of a second. The slower the Shutter Speed, the brighter the scene becomes but that also introduces Motion Blur.
- ISO determines the camera's sensitivity to light. Lowering the ISO means that more light is needed to achieve good lighting. Increasing the ISO means that less light is needed to achieve good lighting. A day scene, lit with a V-Ray Sun, for instance, looks best when captured with around 100 ISO.





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LECTURE 11

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Aperture

Small aperture → deep depth of field / darker

→ shallow depth of field / brighter

Large aperture

Shutter Speed

Fast shutter → freeze action / darker

→ blur action / brighter

Slow shutter

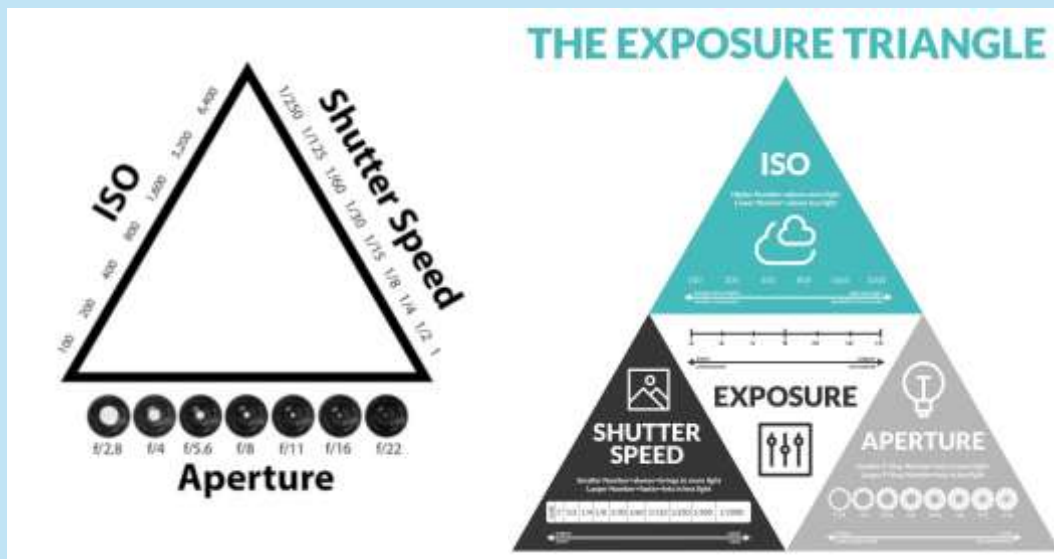
ISO

Low sensitivity to light → darker

→ brighter

High sensitivity to light

©Chaos





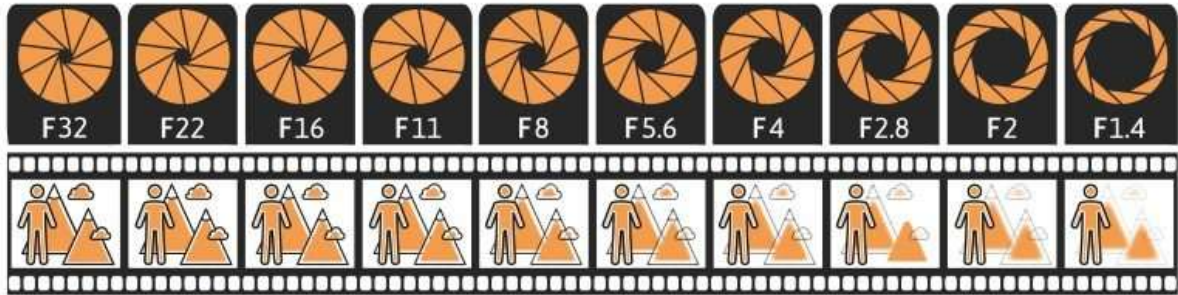
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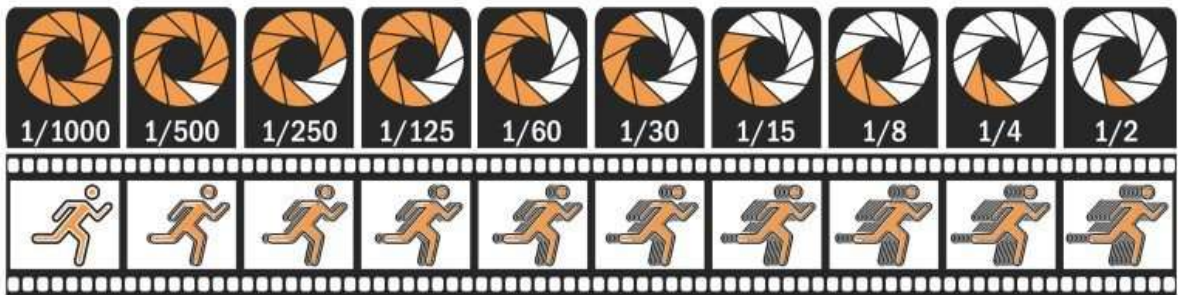
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APERTURE



SHUTTER SPEED




ISO



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LECTURE 11

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Weather condition	Clear & sunny	Slightly overcast	Overcast	Heavy overcast	Sunset
Shadow details	Distinct	Soft around edges	Barely	No shadows	No shadows
Aperture	f/16	f/11	f/8	f/5.6	f/4
Shutter speed At ISO 100	1/100	1/200	1/400	1/800	1/1600
Shutter speed At ISO 200	1/200	1/400	1/800	1/1600	1/3200
Shutter speed At ISO 400	1/400	1/800	1/1600	1/3200	1/6400

ISO 400

1/250



f 11



f 8



f 5.6



f 4

1/30



f 4



f 2.8



f 2



f 1.4