Creating New Materials

- Creating a tileable image based material from a digital photo
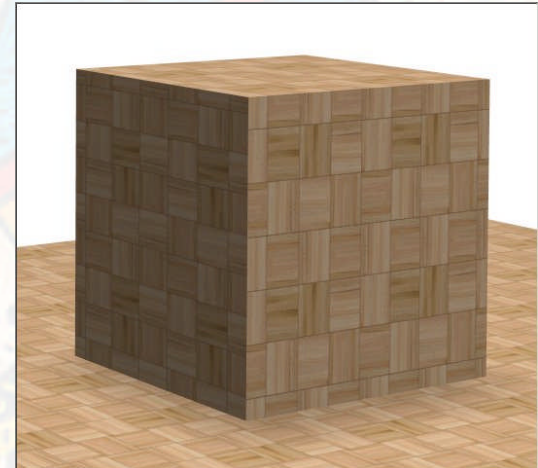- Creating a procedural material by adapting an existing material
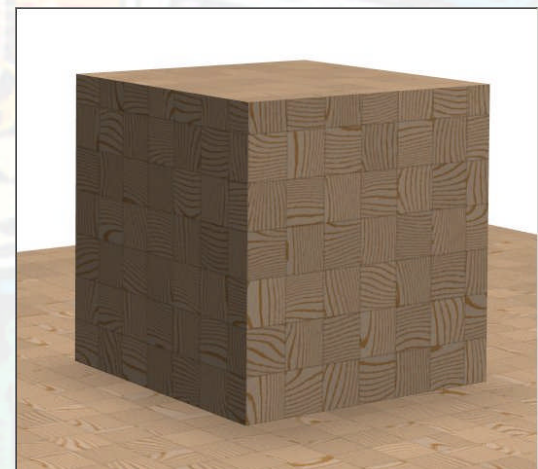
Creating Materials – 2 examples

Image Based Material

- ◆ Accurate representation
- ◆ Tiling can cause problems
- ◆ Bitmap image resolution needs to be large for print quality images

Procedural Material

- Difficult to simulate material exactly
- No tiling issues
- Resolution independent

Creating Image based materials

- Generate an image of the sample using a scanner or digital camera
- Try to get even illumination
- Start with highest resolution possible
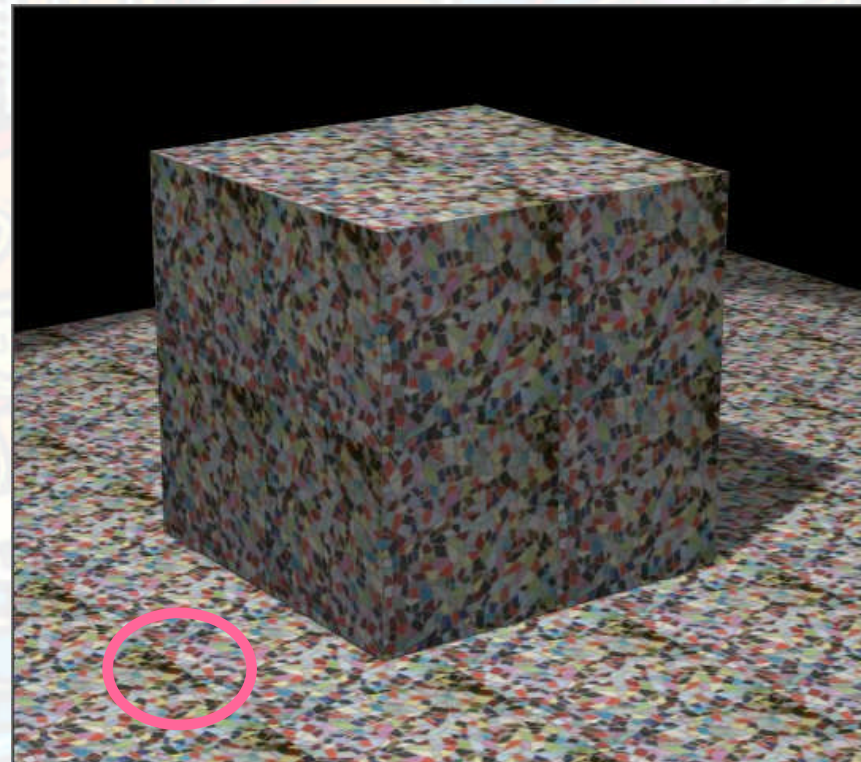- Get as much of the pattern in the image as possible
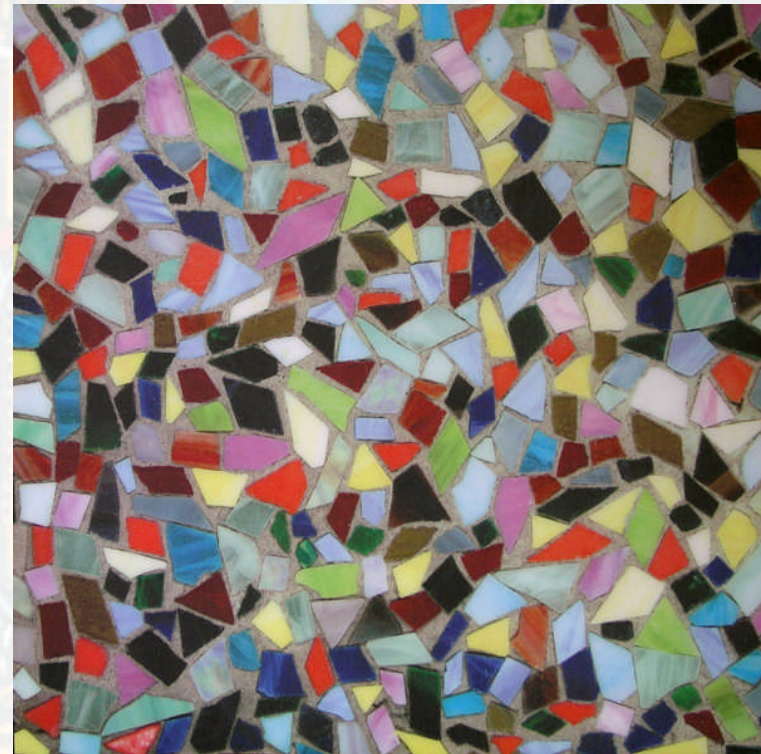
Creating Bitmap textures

- Repeating patterns caused by luminance shifts across the image
- Pattern edges do not tile causing visible repeats
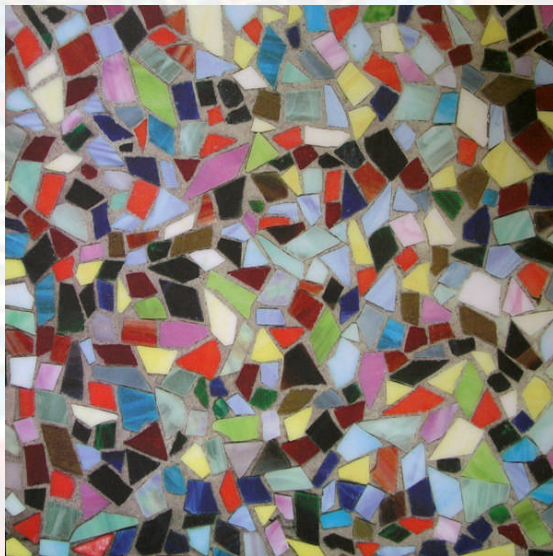
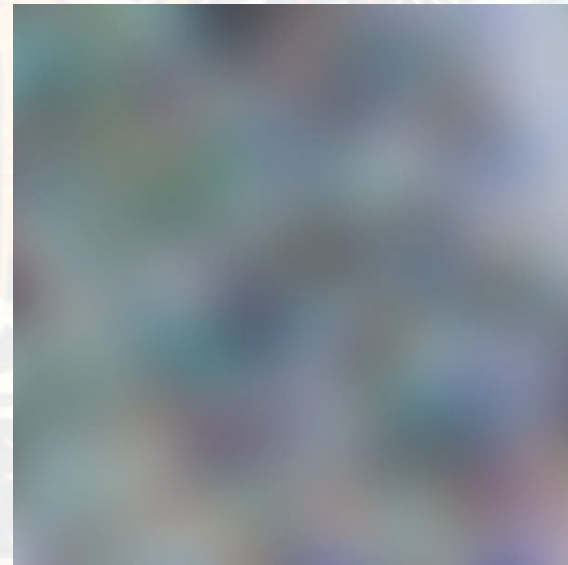Changing Luminance ⟶
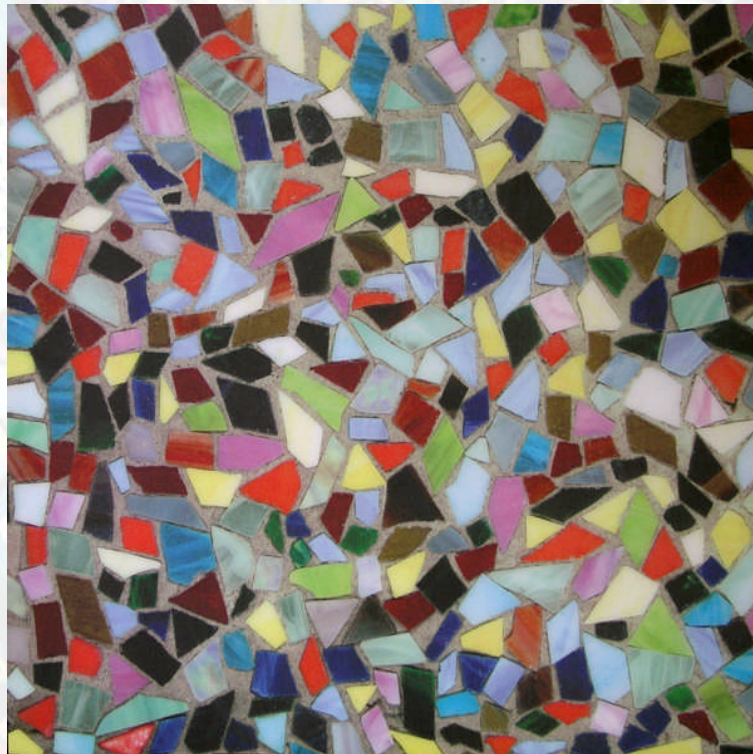
Visible tiling problems

Luminance Equalisation using Photoshop

- Import photographic image to Photoshop
- Copy the layer
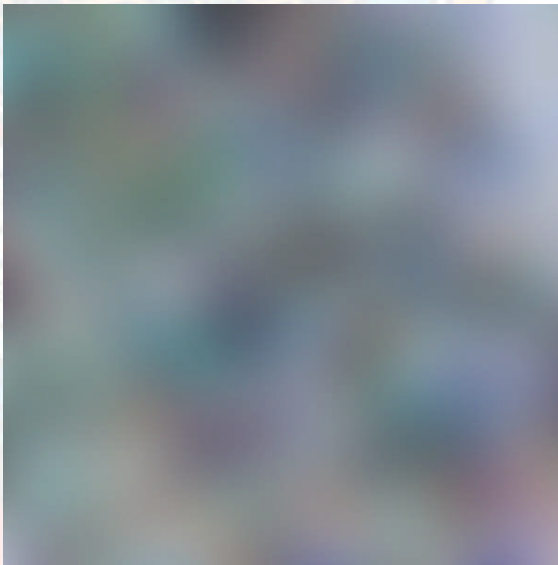- Invert the layer using Image>Adjust>Invert

Luminance Equalisation using Photoshop

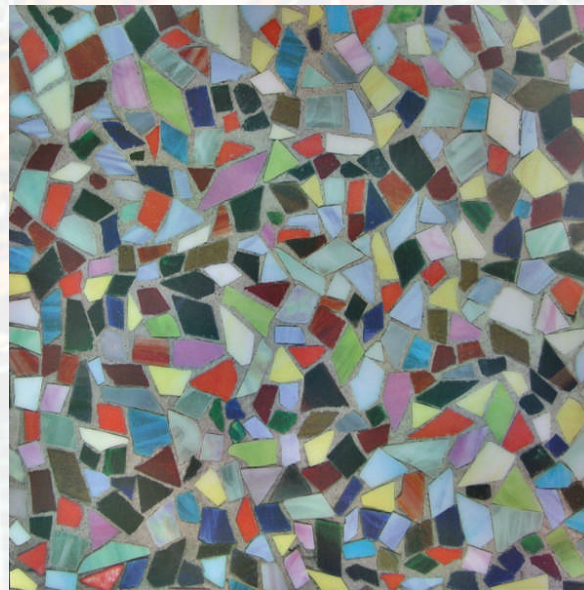Blur the details using Filter>Blur>Gaussian Blur (Set to 20-40)

Luminance Equalisation using Photoshop

Set Layer Opacity to 50% and flatten the image
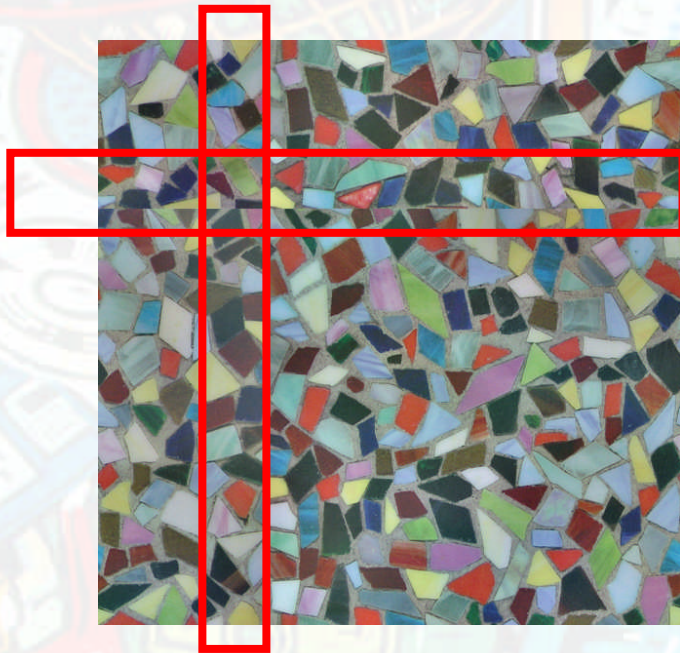
Luminance Equalisation using Photoshop

Choose Image>Adjust>Levels and do one channel at a time (R,G and B). Set the levels to the existing dark and light points. Reset the channels to display R, G and B.
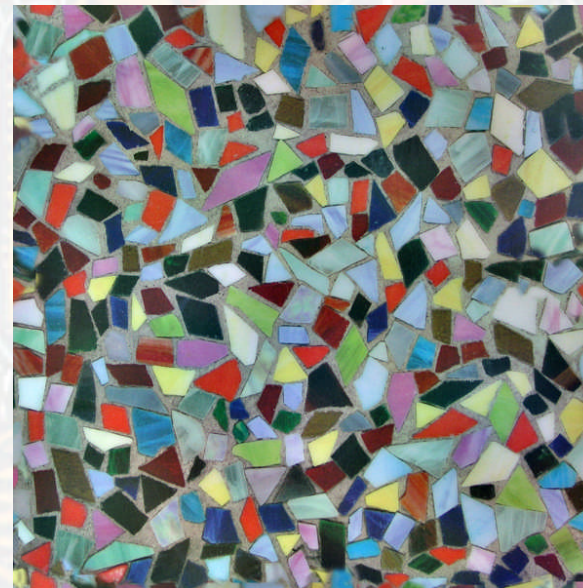
Blend Seams using Photoshop

Use Filter>Other>Offset to see the seams
Blend the seams together to create a tiling texture.
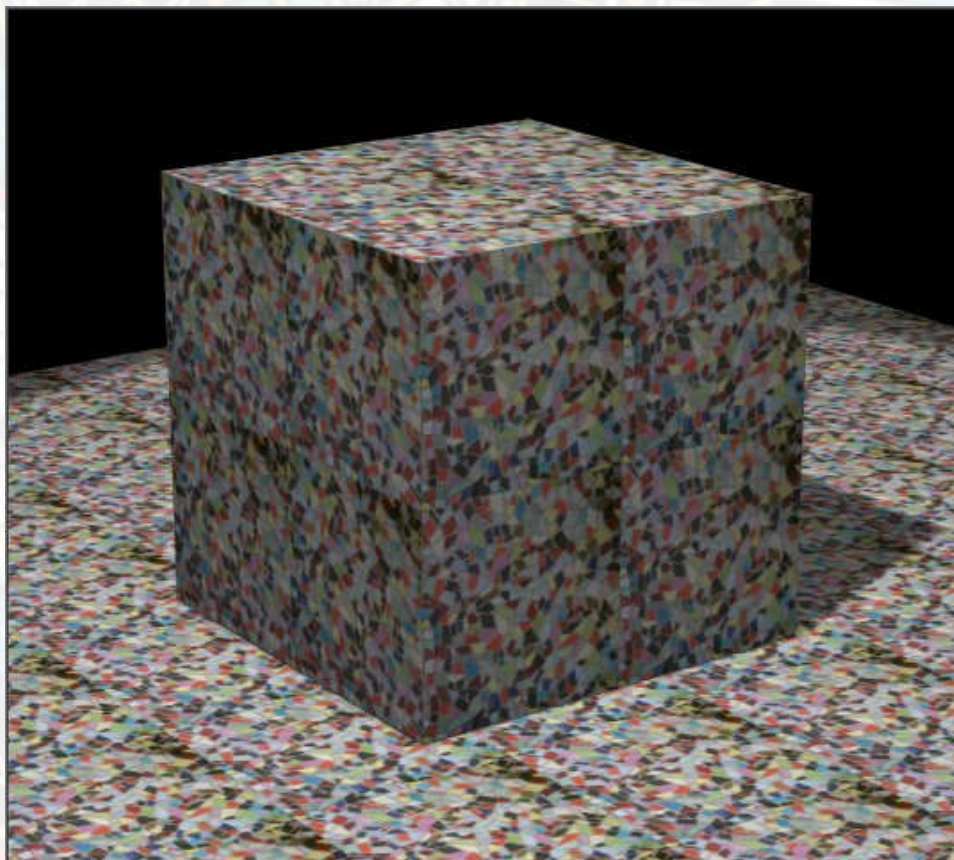Clone tool used for blending in this example
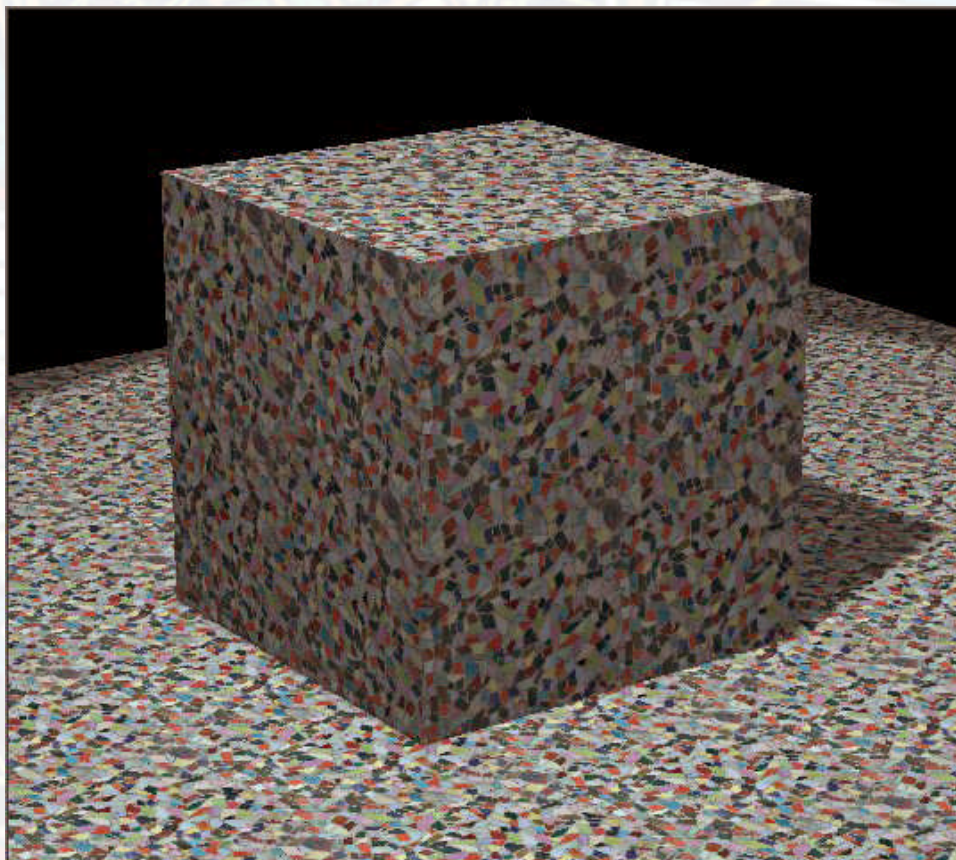
Visible Seams

After blending

Creating bitmap textures
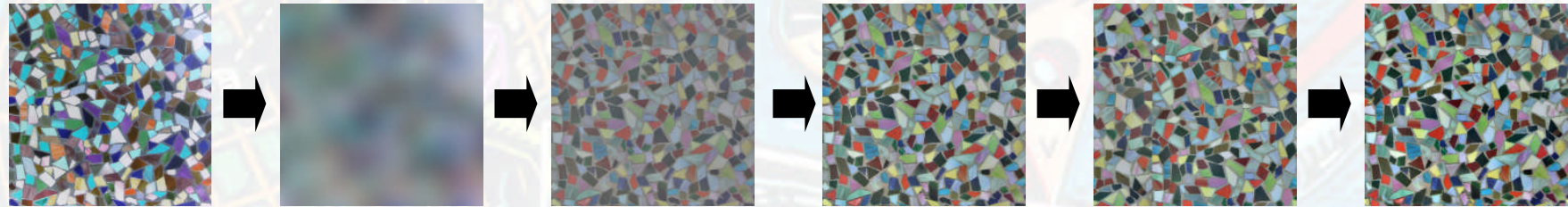
Material before image processing

# Creating bitmap textures

Material after image processing

Summary of Image processing for textures

- Copy the image onto a new layer
- Invert the top layer (Image>Adjust>Invert)
- Blur the details (Filter>Blur>Gaussian Blur - Set to 20-40)
- Set Opacity to 50% and flatten the image
- Image>Adjust>Levels and do one channel at a time (R, G and B). Set the levels to the existing dark and light points. Reset the channels to display R, G and B.
- Filter>Other>Offset. Use Clone tool to blend the seams together to create a tiling texture.
- Save as a square tiff at power of 2 size (512x512, 1024x1024, 2048x2048)
- Full tutorial at http://www.3drender.com/light/EqTutorial/tiling.htm
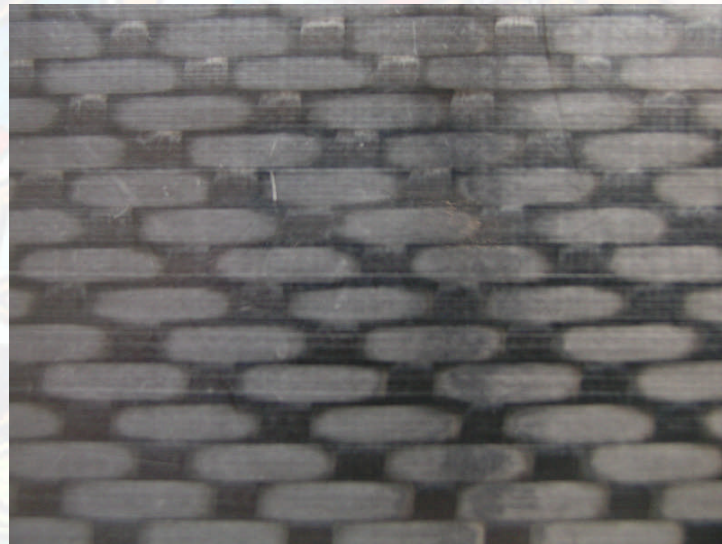
Creating a procedural material

Example material – Carbon fibre
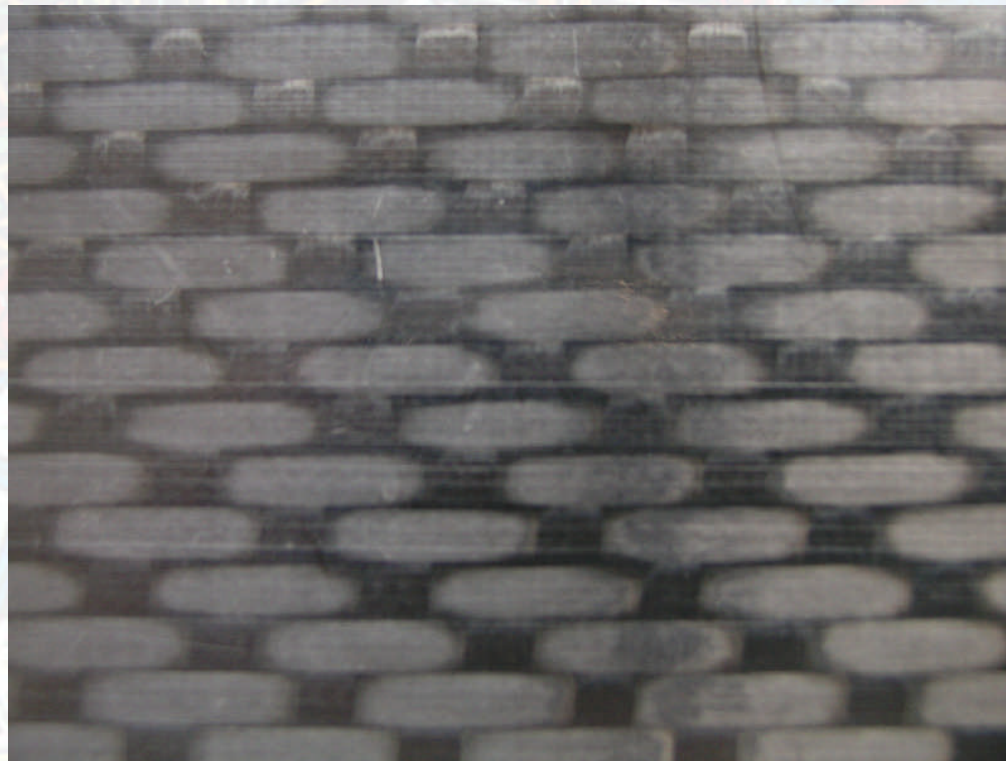
Creating a procedural material

Main characteristics of the sample

- Fairly regular pattern – Similar to a brick bond Pattern
- Reflectance is highly anisotropic (specular highlight changes depending on viewpoint)

Creating a procedural material

Initial Wrapped Brick Bonds Parameters

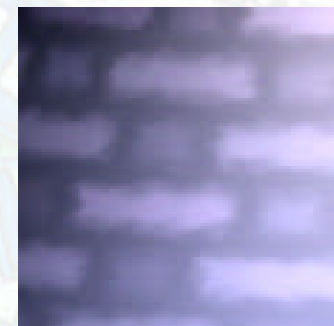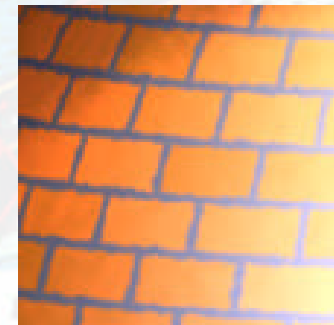| Parameter	Value
Scale	10.0
Brick Width	1.0
Brick Height	0.5
Brick Depth	0.7
Mortar Size	0.1
Rough Scale	1.0
Rough Amplitude	1.0
Fuzz	0.5
Bond	Common

Creating a procedural material

Parameters changed

Colour –Wrapped brick bonds

- ◆ Change the bond to english
- ◆ Set the mortar size larger
- ◆ Set the colours corresponding to the sample
- ◆ Increase Fuzz to get the blurring effect
- ◆ Increase Rough amplitude
- ◆ Leave Rough scale as is

Complete brickbond shader

Completed Wrapped Brick Bond shader

Parameter	Value
Scale	8.0
Brick Width	2.0
Brick Height	0.5
Brick Depth	0.7
Mortar Size	0.4
Rough Scale	1.0
Rough Amplitude	2.0
Fuzz	1.0
Bond	English

Add anisotropic reflectance

Add anisotropic reflectance

Parameter	Value
Ambient	0.0
Diffuse	0.2065
Specular	1.0
Roughness	0.05
Cylinder Distance	1.0
Floor Height	0.0

Completed carbon fibre material