

Human Shaders - Materials & Texture Maps

Human Shaders for URP



This guide documents the six Human Shader material families, their packed data maps, profiles, and texture import expectations.

1. Skin

Shader:

STL Dynamics/Human/Skin

The Skin shader is designed around layered skin response rather than a single smoothness/specular control.

Main material sections include:

- Surface Inputs
- Subsurface & Transmission
- Skin Specular
- Micro Detail
- Makeup Layer
- Emission
- Skin Visibility
- Rendering Options

Skin Profile

[HumanSkinProfile](#) can share the following response between materials:

- Subsurface quality: Off / Fast / High
- Scatter color, strength, radius, and falloff
- Transmission response
- Thickness scale
- Dual-lobe specular
- Epidermal and surface roughness
- Index of refraction
- Specular strength and tint

- Ambient occlusion strength
- Receive Shadows

Skin Map

```
R = Ambient Occlusion  
G = Roughness  
B = Specular Mask  
A = Thickness
```

The Texture Packing workspace uses white for missing Skin Map channels.

2. Hair

Shader:

```
STL Dynamics/Human/Hair
```

Main material sections include:

- Surface & Coverage
- Fiber Inputs
- Strand Direction
- Fiber Highlights
- Transmission
- Optional Fiber Pigment
- Rendering Options

Surface modes

```
Cutout  
Transparent
```

Cutout coverage modes

```
Hard Cutout  
Alpha To Coverage  
Dithered
```

Transparent mode is useful when soft alpha blending is required. Cutout modes are generally preferable when stable depth and opaque-style rendering are desired.

Hair Profile

[HumanHairProfile](#) shares:

- Fiber roughness
- Roughness-map strength
- Diffuse wrap
- Ambient occlusion

- Flow strength and strand rotation
- Primary and secondary highlight lobes
- Reflection-probe strength
- Transmission
- Optional melanin/redness pigment response
- Receive Shadows

Common Hair textures

- Base Map
- Strand Opacity / Alpha Map
- Normal Map
- Hair Map
- Comb / Flow Map

Hair Map

```
R = Ambient Occlusion  
G = Roughness  
B = Specular Mask  
A = Transmission
```

If your source texture stores smoothness, enable Invert Green Input while packing.

3. Eyes

Shader:

```
STL Dynamics/Human/Eye
```

Main material sections include:

- Eye Inputs
- Sclera & Redness
- Iris & Pupil
- Cornea & Tear Film
- Rendering Options

Eye Profile

[HumanEyeProfile](#) shares:

Sclera

- Tint
- Roughness
- Scatter color and strength
- Redness amount, spread, and color

Iris and pupil

- Iris tint / brightness
- Pupil color / dilation
- Limbal ring color / strength / width
- Iris roughness
- Iris depth
- Iris concavity

Cornea and tear film

- Cornea enable
- Cornea IOR
- Reflection tint
- Cornea roughness
- Highlight strength
- Virtual cornea bulge
- Reflection-probe strength
- Wetness
- Tear roughness
- Tear highlight boost
- Wet normal smoothing

Eye Mask

```
R = Iris  
G = Pupil  
B = Redness / Veins  
A = Wetness / Tear Pooling
```

Default packing values:

```
R = Black  
G = Black  
B = Black  
A = White
```

4. Tongue

Shader:

```
STL Dynamics/Human/Tongue
```

Main material sections include:

- Surface Inputs
- Vascular Tissue
- Saliva Film
- Rendering Options

Tongue Profile

[HumanTongueProfile](#) shares:

- Tongue tint
- Tissue roughness
- Subsurface quality
- Vascular scatter
- Transmission
- Thickness scale
- Saliva film
- Saliva IOR and roughness
- Reflection-probe response
- Wetness

Tongue Map

```
R = Occlusion  
G = Roughness  
B = Saliva Pooling  
A = Thickness
```

Default packing values:

```
R = White  
G = Mid gray  
B = White  
A = White
```

5. Teeth

Shader:

```
STL Dynamics/Human/Teeth
```

Main material sections include:

- Surface Inputs
- Dentin Body
- Enamel & Moisture
- Incisal Edge
- Detail & Staining
- Rendering Options

Teeth Profile

[HumanTeethProfile](#) shares:

Dentin

- Base and dentin tint

- Roughness
- Scatter color, strength, and radius

Enamel

- Enable
- Tint
- Thickness / density
- Scatter strength
- IOR
- Roughness
- Highlight strength
- Reflection-probe strength

Moisture

- Moisture level
- Wet roughness
- Wet highlight boost
- Wet normal smoothing

Incisal response

- Transmission
- Opalescence

Teeth Map

```
R = Occlusion  
G = Roughness  
B = Enamel Thickness  
A = Incisal Translucency
```

Default packing values:

```
R = White  
G = Mid gray  
B = White  
A = White
```

6. Clothing

Shader:

```
STL Dynamics/Human/Clothing
```

Main material sections include:

- Fabric Inputs
- Fibers & Sheen
- Transmission

- Surface Coating
- Wetness
- Rendering Options

Clothing presets

Human Clothing includes these optical presets:

```
Woven  
Knit  
Denim  
Satin / Silk  
Velvet  
Leather  
Synthetic
```

Presets adjust optical behavior while preserving assigned textures and tint.

Clothing Profile

`HumanClothingProfile` shares:

- Material type
- Roughness
- Diffuse wrap
- Fiber IOR and specular strength
- Reflection-probe strength
- Anisotropy and fiber rotation
- Sheen
- Transmission
- Clear coating
- Wetness
- Ambient occlusion
- Receive Shadows

Clothing Map

```
R = Occlusion  
G = Roughness  
B = Fiber Sheen Mask  
A = Thickness
```

Default packing values:

```
R = White  
G = Mid gray  
B = White  
A = Black
```

Other optional clothing inputs include:

- Detail / weave normal

- Fiber direction map
- Variation mask
- Wetness mask

Texture Packing

Open:

Tools > STL Dynamics > Human Shaders Studio > Texture Packing

Available output sizes:

```
512
1024
2048
4096
8192
```

The packer:

- Packs four grayscale sources into RGBA.
- Provides shader-specific fallback channel values.
- Imports output as linear data.
- Disables sRGB.
- Preserves alpha.
- Uses high-quality compression.
- Applies the selected maximum texture size.
- Does not require source textures to have Read/Write enabled.

Texture Import Rules

Color textures

Base/albedo textures are color data and normally use sRGB enabled.

Packed data maps

Packed maps store numeric shader data and should use:

```
sRGB = Disabled
```

This includes:

- Skin Map
- Hair Map
- Eye Mask
- Eye Occlusion
- Tongue Map
- Tongue Subsurface Mask

- Teeth Map
- Teeth Stain Mask
- Clothing Map
- Clothing Fiber Map
- Clothing Variation Mask
- Clothing Wetness Mask
- Hair opacity / flow data

Normal maps

Normal textures should use:

```
Texture Type = Normal Map
```

The Diagnostics workspace checks Human Shader materials for common import mistakes.

Project Create Menu

Human Shaders editor assets are centralized under one Project-window root:

```
Create > STL Dynamics > Human Shaders
|-- Materials
| |-- Human Skin Material
| |-- Human Hair Material
| |-- Human Eye Material
| |-- Human Tongue Material
| |-- Human Teeth Material
| `-- Human Clothing Material
`-- Profiles
    |-- Skin Profile
    |-- Hair Profile
    |-- Eye Profile
    |-- Tongue Profile
    |-- Teeth Profile
    |-- Clothing Profile
    |-- Skin Paint Profile
    `-- Skin Visibility Set
```

Profiles vs Materials

Profiles are texture-independent.

Use a profile when several materials should share optical response, while keeping character-specific textures separate.

Example:

```
Character A Skin Material ----\
Character B Skin Material -----+--> Human Skin Profile
Character C Skin Material ----/
```

Textures remain on each material. The profile applies response settings such as roughness, scattering, transmission, and specular behavior.

In the editor, material setup and profile application are handled through Human Shaders Studio > Materials. A Skin, Hair, Eye, Tongue, Teeth, or Clothing profile Inspector provides Open Human Shaders Studio instead of direct Load Material / Apply To Material buttons. Opening the Studio from a profile automatically selects the matching material family and assigns that profile to the Optional Profile field.

At runtime, profiles can still be applied through their [ApplyTo\(Material\)](#) APIs as documented in the Runtime API guide.

Material Synchronization

If you modify shader feature values through code, synchronize the material afterward so keywords and render state match the new settings.

Examples:

```
HumanSkinMaterialUtility.Synchronize(material);  
HumanHairMaterialUtility.Synchronize(material);  
HumanEyeMaterialUtility.Synchronize(material);  
HumanTongueMaterialUtility.Synchronize(material);  
HumanTeethMaterialUtility.Synchronize(material);  
HumanClothingMaterialUtility.Synchronize(material);
```

The Studio can also synchronize selected materials from the Diagnostics workspace.