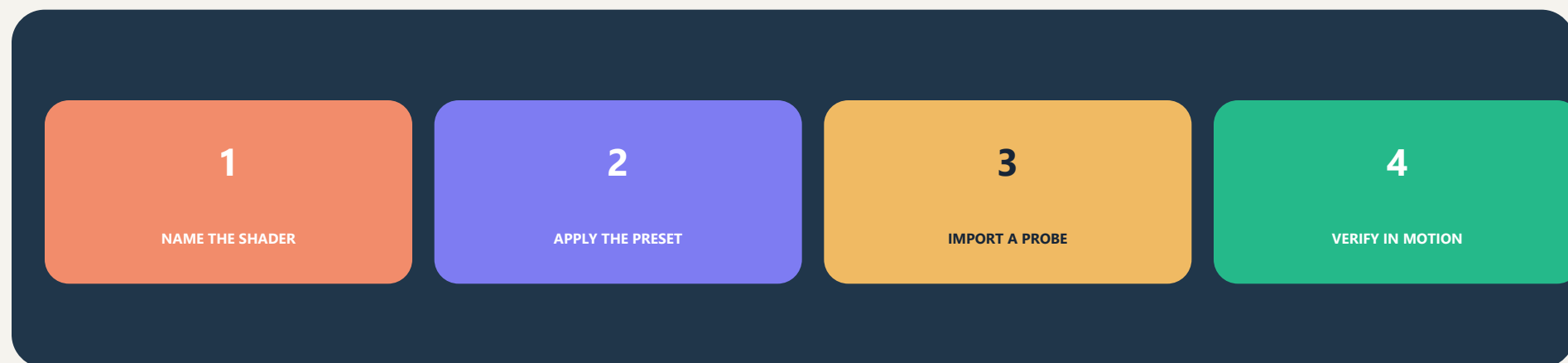


PBR engine import matrix

A target-aware reference for base color, packed data, normal conventions, alpha behavior, and the checks that prevent silent import errors.



Current documentation reviewed August 24, 2026. Revalidate after engine or shader upgrades.

Targets 1-4

TARGET	BASE / COLOR	DATA / PACK	NORMAL	ALPHA	NOTES
glTF 2.0 metallic-roughness	baseColor RGB: sRGB; alpha: linear coverage; straight/unassociated	ORM: R occlusion, G roughness, B metallic; linear	Tangent-space +Y; linear; alpha ignored	OPAQUE, MASK, or BLEND via material.alphaMode	Use MikkTSpace-compatible tangents when generated. Verify extensions before relying on clearcoat, transmission, or emissive strength.
Unity Built-In Standard	Albedo/base color as color texture	Metallic R; smoothness commonly metallic A or albedo A	Import as Normal map; Flip Green Channel when source convention differs	Opaque, Cutout, Fade, or Transparent rendering mode	Built-In is deprecated in current Unity documentation; keep pipeline named in the preset.
Unity URP Lit	Base Map as color texture	Common Lit packing: metallic R, occlusion G, smoothness A; B unused	Import as Normal map; confirm green convention	Surface Type plus Alpha Clipping and blend settings	Name the exact URP shader. Custom Shader Graphs can use different layouts.
Unity HDRP Lit	Base Color Map as color texture	Mask Map: R metallic, G AO, B detail mask, A smoothness; linear	Tangent or object-space options depend on material setup	Surface Type, blend mode, and alpha clipping settings	Do not substitute a glTF ORM image for an HDRP Mask Map without repacking and roughness inversion.

Targets 5-8

TARGET	BASE / COLOR	DATA / PACK	NORMAL	ALPHA	NOTES
Unreal Engine material	Base Color sampled as color; remove captured lighting	Roughness, Metallic, AO, and packed masks: sRGB off; channel order is project-defined	Use Normal compression/sampler; flip green if the source convention differs	Blend Mode and Opacity or Opacity Mask input	Many teams use ORM, but the material graph is the contract. Record it explicitly.
Godot ORMMaterial3D	Albedo as color texture	ORM: R occlusion, G roughness, B metallic	OpenGL-style +Y; Godot can invert green at import	Transparency mode on BaseMaterial3D	Godot uses normal R and G for compression; inspect import hints and final VRAM format.
Blender Principled BSDF	Image Texture to Base Color using color interpretation	Roughness, Metallic, AO masks, and packed channels set to Non-Color	Image Texture Non-Color -> Normal Map node -> Principled Normal	Image alpha to Principled Alpha plus material blend settings	For glTF export, follow the exporter-supported node patterns and +Y tangent normal convention.
Three.js MeshStandardMaterial	map uses SRGBColorSpace	aoMap R, roughnessMap G, metalnessMap B; NoColorSpace	Tangent-space normalMap; NoColorSpace; normalScale.y can compensate handedness	transparent, alphaTest, alphaMap, and blending settings	aoMap requires the expected UV channel. Use an environment map for meaningful PBR review.

Known-value import probe

Before a large delivery, import a tiny probe whose values cannot be confused. It reveals channel swaps, hidden transfer-function conversion, and normal Y errors in minutes.



1

Display each channel alone after import and compare the numeric sample.

2

Use a normal patch with a known raised mark; flip only green if the vertical relief is reversed.

3

Record engine, pipeline, shader, importer flags, preset version, and the observed result.

4

Repeat the probe after upgrading the engine or changing compression settings.