# The Toon Shader 2D

## Documentation

**Version 1.0.0**
**September 2025**

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# Contents

# Introduction

## Overview

**The Toon Shader 2D** is your ultimate toolkit for crafting awesome cartoon-style materials! Whether you're going for a bold, vibrant comic book vibe with cross-hatching, a smooth, soft animation look, or even a retro pop art style with halftones, this shader has got you covered. The best part? It's designed for *total artistic control*, so you can craft any toon style you can dream up with just the "**The Toon Shader**" shader.

**It works with URP 2D lights, Sprites, and Tilemaps!**

Note: To use the specular feature (Styling and regular) you have to add the Toon2DLightManager component to your scene! Example in the demo sample scene!

## Toon Shading

You get two ways to control the shading style:

- **Cell-based Shading**: This gives you a sharp, comic-book-style look with flat blocks of color. It adapts to the light direction, giving you that classic cartoon appearance. Plus, you have complete control over the core shadow color, the terminator width and smoothness, and the form shadow color, allowing you to fine-tune the shading to get exactly the look you want.
- **Gradient-based Shading**: Want more color versatility? The gradient-based approach allows you to use rich, multi-color gradients to create smooth, dynamic transitions between light and shadow. You can design gradients with a wide range of colors, adding depth and complexity while responding to light directions for that true cartoon feel.

If you prefer a simple, flat look with no shading effects, just turn off **Toon Shading**. This will give you a solid color appearance without any shading alterations.

With **Toon Shading**, you can add **specular highlights** and **rim lighting** for extra gloss and dramatic outlines.

**Styling** is all about giving you full control over how your toon materials look. Whether you go for bold **(Cross-)Hatching** or fun **Halftones (Polka Dots)**, you can adjust everything from pattern density to stroke or dot size, edge smoothness, opacity, and more. Both styles also allow for randomization, letting you add natural variation, just like in real life, where lines and patterns aren't always perfectly uniform.

## Hatching

For **Hatching**, you have control over:

- **Density** of the strokes
- **Stroke size** and **falloff**
- **Edge smoothness**
- **Opacity** and **falloff**
- **Color**
- **Draw space**: UV space or screen space
- **Coordinate system**: Cartesian or polar
- **Blending modes**: Lerp, additive, subtractive, multiply

**Hatching-Specific Options**:

- **Stroke direction**: Control the angle of your hatches
- **Number of hatching cells**: Add more layers for a cross-hatched effect

## Halftones

For **Halftones**, you can adjust:

- **Density** of the dots
- **Halftone size** and **falloff**
- **Halftone hardness**
- **Opacity** and **falloff**
- **Color**
- **Draw space**: UV space or screen space
- **Coordinate system**: Cartesian or polar
- **Blending modes**: Lerp, additive, subtractive, multiply

**Halftone-Specific Options**:

- **Dot roundness**: Adjust the shape of your halftones
- **Line offset**: Fine-tune the spacing between halftone lines for precise control

## Randomization for Both Styles

Both **Hatching** and **Halftones** allow you to introduce **randomization** to any of these settings—whether it's stroke/dot size, opacity, or density. This adds a natural, real-world feel, making your lines or dots vary in thickness, smoothness, or placement, just like a hand-drawn effect. It's perfect for adding that organic touch to your toon materials!

## Outlines

Naturally, you can add outlines with ease! Take full control over the **color** and **width**, giving your toon assets that perfect comic book look.

## Optimization

No need to worry about performance! Our one-click optimization solution automatically generates the most efficient version of the shader based on your material settings, keeping everything fast and smooth.

## What is a Shader?

To understand what a shader is, we highly recommend you to read the introduction on https://en.wikipedia.org./wiki/Shader and https://docs.unity3d.com/Manual/shader-introduction.html

We support the BiRP and URP Render Pipelines and every stable version from 2020 on!

**That means we support:**

URP 2020, URP 2021, URP 2022 and URP 6.

Note: Please know that you do NOT need to understand what a shader is to use our asset. Plenty of scripts are included so that you can entirely focus on the result without worrying about the inner workings.

<u>Unity Package Manager</u>

The Demo Samples are shipped with the asset but have to be imported via the **Package Manager**.
After Importing the Asset follow these steps to import the samples:
Click Window > Package Manager and select "The Toon Shader 2D".
Now select the Samples Tab and press Import as shown here:
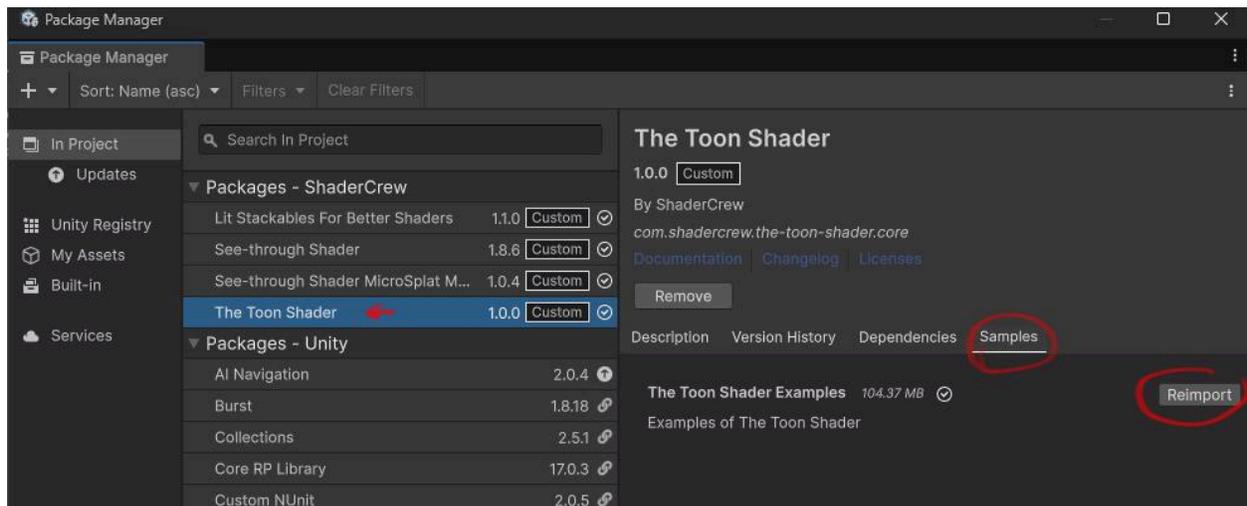


(2D version, image shows The Toon Shader 3D)

# How does it work

**The Toon Shader** is a shader that you can apply to your materials.

## How to apply the Shader

The first thing you have to do to use this asset is to apply the shader to your materials.

To add the shader to your material, you first need to add a material to your GameObject by clicking **Assets->Create->Material** in the project view context menu or from the main menu.
After that, assign the shader to your material using the Shader drop-down menu in the inspector window under TheToonShader.
You could also drag and drop the `.shader` onto the shader drop-down menu.

For more information regarding seeing the official Unity documentation on this topic:
https://docs.unity3d.com/Manual/materials-introduction.html

# How to control the effect of the shader

The **The Toon Shader** uses a custom GUI, which is divided into five sections.
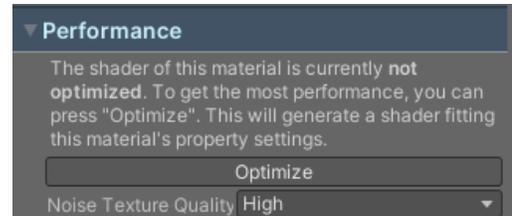
Those are:

1. Performance

2. Surface Options And Inputs

3. Toon Shading

4. Styling

5. Outline

## Section 1  - Performance

The Performance Area lets you optimize your shader with one click. The optimized shader is automatically used in the current material, and you can always switch back to the original one. The save location of the optimized shaders is:



"Packages/com.shadercrew.the-toon-shader.2d/Scripts/Resources/OptimizedShaders"

## Section 2  - Surface Options And Inputs

This section lets you choose to enable the MainTex, choose a Tint/Color, enable the Normalmap with Strength Settings, and set your Emission.
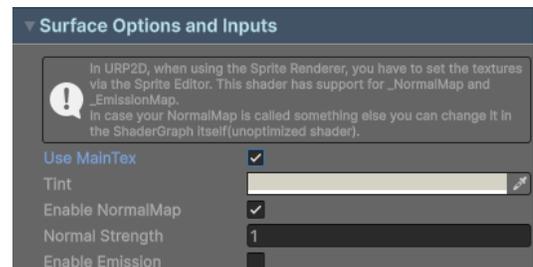
To enable **posterization** or **cell-based** shading,
simply turn on **Toon Shading**. For more details, see the next section, **Toon Shading**.

## Section 3  - Toon Shading

You can still add shading through one of two functions: **Cells** or **Gradient**.

- **Cells**: Set shadow colors (core and form), define terminator width and smoothness, and choose how many cells and how smooth the transitions are, much like in the light-based mode.
- **Gradient**: Create a custom gradient to control how the shading is applied.

Finally, you can include **Specular** and **Rim** lighting in this section as well.
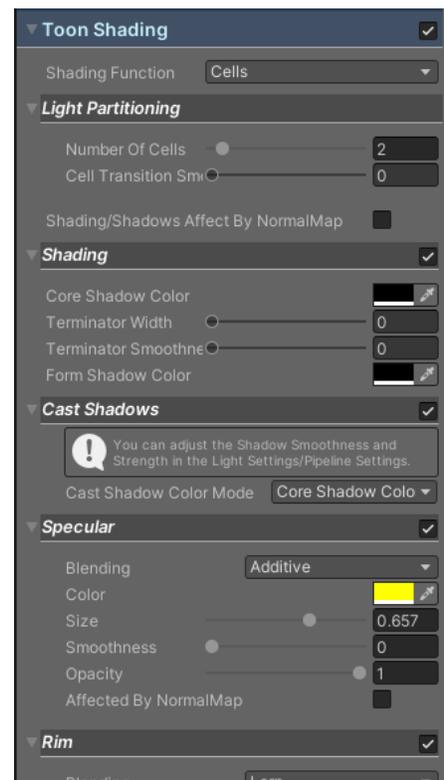
You can choose between various **styling** options, including procedural **hatching** and **halftones**. Each component—**Shading**, **Cast Shadows**, **Specular**, and **Rim**—can be styled independently. For convenience, you can also sync certain styles (for example, matching Specular to Rim). Syncing is enabled by default, so if you want to style Rim separately, set **Sync with** to **None**.

Both **hatching** and **halftones** give you control over blending, draw space, density, and more. Here's a quick overview:

### Partitioning (Hatching only)

For **Hatching**, you can set the **Number of Cells**, which is similar to the posterization cells in "Toon Shading," but they can overlap, letting you replicate cross-hatching when using more than one cell.

### Blending

Determine how to blend the style with the rest of the shader and whether it's inverted.

### Draw Space

Choose **Object UV Space** or **Screen Space** and select either a **Cartesian** or **Polar** coordinate system.

### Density & Direction / Density, Rotation and Offset

**Density** controls how dense the pattern is. It's best to start from 0 and gradually increase it to avoid odd optical effects.

Adjust the **Initial Direction** and rotation between cells (for hatching) or the overall rotation (for halftones).

In halftones, you can also set an **Offset** between halftone rows.

## Style Settings

Adjust **Opacity** and **Falloff**, **Thickness/Size** and **Falloff**, and **Hardness** for both Hatching and Halftones.

In Halftones mode, you can additionally fine-tune the **Roundness** and **Falloff** of the patterns.



## Randomization

Add a natural feel by randomizing **Opacity**, **Hardness**, **Spacing**, **Length**, **Thickness**, and general **Shape**.

In Hatching mode, randomization can apply per line, to all lines at once, or a mix of both.

In Halftones mode, it can apply per halftone, to all halftones simultaneously, or a combination of both.

*Section 5* - Outline

You can set the outline width and color.