

# Report: Creating Hot Coffee Smoke Loop Animation in Blender

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## 1 Introduction

This report summarizes the contents and key techniques focused on creating a realistic “Hot Coffee” smoke loop animation in Blender. The objective is to achieve a smooth, looping animation of rising steam above a coffee cup, emphasizing both realism and efficient workflow.

## 2 Modeling the Cup

### 2.1 Cup Body

- Add a cylinder ( $\text{Shift} + \text{A} \rightarrow \text{Mesh} \rightarrow \text{Cylinder}$ ).
- Scale it to the desired cup height and width.
- In Edit Mode, select the top face, and use Inset ( $I$ ) to create the rim thickness.
- Extrude the inset face downward ( $E \rightarrow Z$ ) to form the inner cavity.
- Apply smoothing ( $\text{Object} \rightarrow \text{Shade Smooth}$ ) for a rounded look.

### 2.2 Cup Handle

- Add a torus or curved cylinder to form the handle.
- Rotate and position it so it attaches naturally to the cup’s side.
- Use proportional editing or a Bend modifier to adjust the curve.
- Join the handle to the cup ( $\text{Ctrl} + J$ ) and smooth the transition using the Boolean Union modifier or gentle sculpting.

### 2.3 Optional Details

- Add a liquid surface: insert another small circle, extrude slightly downward inside the cup, and assign it a different material (coffee surface).
- Add a saucer using a flattened cylinder if desired.

### 2.4 Camera and Lighting Setup

- Position the camera at a slightly tilted front view, focusing on the top of the cup.
- Add a key light and a fill light for soft shadows.

### **3 Modeling the Steam/Smoke**

- Add a smoke domain cube surrounding the cup area.
- Place a small emitter object (plane or circle) above the coffee surface where the steam will originate.
- In the Physics Properties, set Flow Type: Smoke, Flow Behavior: Inflow, and add a slight initial upward velocity.
- Bake the smoke simulation to preview rising steam and ensure a smooth, looping motion.

### **4 Materials Shading**

- Cup Material: Use a Principled BSDF shader with a smooth, slightly glossy ceramic appearance. Adjust roughness between 0.3–0.5 and color as desired (e.g., white, cream, or matte finish).
- Handle Saucer: Apply similar materials for consistency.
- Steam Shader: Use a Principled Volume node, adjusting density (0.1–0.3) and color (light gray/white) for delicate, realistic vapor.

### **5 Lighting Rendering Setup**

- Add a soft area light or an HDRI environment texture for realistic illumination.
- Ensure lighting highlights both the steam and the reflective ceramic surface.
- Choose Cycles or Eevee as the rendering engine and enable denoising.

### **6 Animation Looping**

- Adjust the smoke timeline to around 250 frames and bake a continuous rising steam loop.
- Fine-tune the start and end points so the smoke transitions smoothly.
- Optionally add slight camera motion or a gentle cup wobble for realism.

### **7 Additional Environmental Details**

A table surface or wooden plane is added beneath the cup, and small props (spoon, napkin, or coffee beans) enhance the composition. Depth of Field is activated on the camera to keep the cup sharp while subtly blurring the background.

### **8 Material Texture Enhancements**

- Add subtle imperfections to the mug using bump maps or slight displacement.
- Introduce reflection and condensation inside the cup for realism.
- Adjust lighting by adding a rim light or back light to emphasize the steam's silhouette.

### **9 Final Render Export**

- Use resolution  $1920 \times 1080$  px, frame rate 24–30 fps, and Cycles samples between 200–500.
- Enable motion blur for smoother steam flow.
- Export as video and review density, timing, and realism.

## 10 Conclusion

the process results in a highly realistic, looping “Hot Coffee” animation built entirely in Blender. From modeling the coffee cup and handle to simulating natural steam motion, applying materials, and refining lighting, each step contributes to a polished, professional-quality render. By following these methods, artists can not only recreate this scene but also apply similar techniques to other product or atmospheric visualizations, combining 3D modeling and volumetric effects into a seamless, elegant animation.