

Surface Lab - generator specification

A seamless camo/texture generator for layered tileable surfaces, basic shapes, palettes and exports.

Feature	Description
Tileable output	Wrapped drawing across edges, draggable tile phase, PNG/SVG export
Color ratios	Weighted palette, chaos/order modes, random weights also shuffle color order

Purpose

Surface Lab is a web lab tool for quickly creating repeatable textures, camouflage patterns and abstract surfaces. The output is intended as a seamless tile for web backgrounds, graphic assets, textile mockups or further processing.

The application is a client-side editor with an immediate canvas preview, local/server preset storage and PNG, SVG, JSON, WebM and GIF exports.

Main modes

Basic shapes: a multi-layer generator for circles, polygons, star-like and deformed shapes. Each layer has its own palette, color ratios, seed, placement, opacity, outline and transforms.

Camouflage: a legacy mode with starter palettes and families such as woodland, brushstroke, tigerstripe, flecktarn, splinter and digital.

Materials and gallery: helper libraries for local PBR materials and saved presets with previews.

Layer model

A layer contains shape type, object amount, placement, colors, color weights, opacity, outline, seed and visibility. Layer order controls drawing from bottom to top.

Placement can be chaos, regular grid or staggered grid. In grid mode the density control creates tile-friendly regular structures.

Colors and ratios

Each color has a 0-100 weight. The final ratio is normalized by the weight sum, so 100/100 means 50/50 and a zero weight removes the color from distribution.

The random color-ratio button now changes both the weight values and the order of colors in the layer. In Order mode this changes the color sequence in patterns, not only the percentages.

Seamless tile logic

The generator draws shapes with wrapped repetition across tile boundaries. Reduced tile zoom does not crop a finished large image; it generates a smaller seamless tile and repeats it in the preview.

The draggable dashed frame changes the tile phase offset so the selected part can be moved to the center of the export without breaking repeatability.

Exports and formats

PNG export creates a raster output according to the selected aspect ratio and tile zoom. SVG export captures the vector shape output, JSON is a portable preset, and WebM/GIF export is for short ping-pong parameter animations.

The specification PDF is linked directly from the page in Slovak and English.

Limitations and future work

The current lab is primarily a creative exploration tool, not a final asset management system. Very dense layers can make exports slower. Next steps: clearer preset management, more export sizes and documented parameter mapping for production use.

