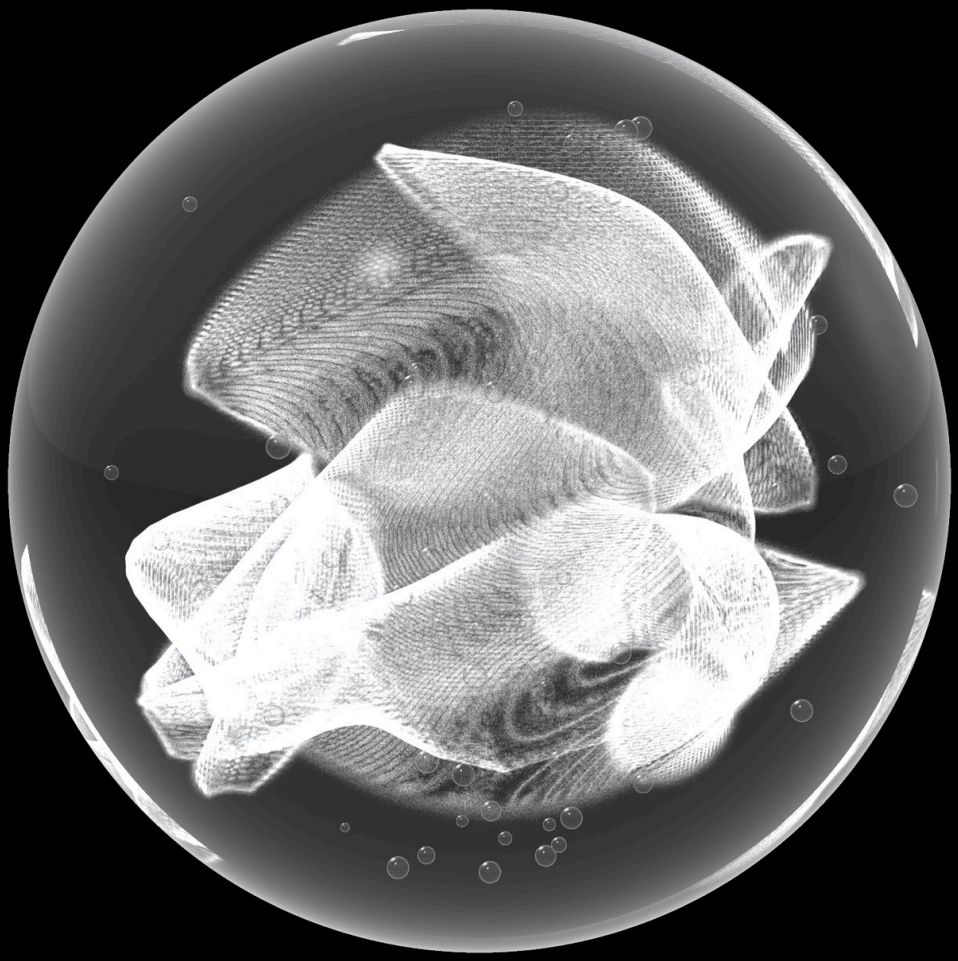


Vanguard Orb FX

Ink, silk and water inside a glass orb — GPU particles and a looping cloth veil for 3ds Max.

3DS MAX 2024–2027 **GPU** NVIDIA, GTX 10 TO RTX 50 **LICENCE** ONE COMPUTER

SUPPORT SUPPORT@VANGUARDFX.PRO

01

Getting started

Install, activate, and find the plugin in 3ds Max.

System requirements

ITEM	REQUIREMENT
Operating system	Windows 10 or 11, 64-bit, as supported by your 3ds Max version
3ds Max	2024, 2025, 2026 or 2027
Graphics card	NVIDIA GeForce GTX 10-series up to RTX 50-series, or a workstation card of the same generations, with a current driver. The Quadro GP100 and data-centre cards such as the A100 and H100 are not covered.
Video memory	Ink keeps its particles on the card when they fit. When **Render particles (0 = all the GPU holds)** asks for more, the particles are kept in system memory and passed through the card in chunks, so system memory sets the limit. Surface Swirl and Ink in Water particles must fit on the card.
Optional	tyFlow, for the Studio panel's **Create particle cloud (tyFlow + vortex force)**. Corona Renderer: when it is installed, **Studio for Orb in Corona (camera + lights + white)** and **Render test frame (Corona)** use Corona materials and lights. Without it they use Physical materials and standard lights.

Without an NVIDIA card. Vanguard Orb FX still works. **Use CUDA (CPU fallback)** is on by default and switches to the CPU when no CUDA card is found or the card runs out of memory. The CPU runs the same cloth solver as the GPU. The two space warps also run on the CPU. Vanguard Orb Ink and its renderer need an NVIDIA card. Without one, Ink renders nothing and its messages report `CUDA unavailable`.

Installing

1. Close every running 3ds Max. A running Max locks the plugin file. If one is still open, the installer offers to close it.
2. Run `VanguardOrbFX_Setup_0.8.2.exe` and allow it administrator rights.
3. Tick each Max version you want the plugin in. The installer only lists versions installed in their default folder, `C:\Program Files\Autodesk\3ds Max 20NN`.
4. Start 3ds Max.

INSTALLED ITEM	LOCATION
Plugin `VanguardOrbFX.dlo`	`3ds Max 20NN\Plugins`
Studio panel	`3ds Max 20NN\scripts\VanguardOrbFX\UI`, `%LOCALAPPDATA%\Autodesk\3dsMax\20NN - 64bit\ENU\scripts\VanguardOrbFX\UI` and `C:\Program Files\VanguardFX\OrbFX\UI`
Startup script that adds the toolbar action	`3ds Max 20NN\scripts\Startup` and `%LOCALAPPDATA%\Autodesk\3dsMax\20NN - 64bit\ENU\scripts\startup`
Toolbar icons	`3ds Max 20NN\UI_ln\Icons` and `%LOCALAPPDATA%\Autodesk\3dsMax\20NN - 64bit\ENU\usericons\VanguardFX`
Sample scenes, HTML guide, read me, `Open_OrbFX.ms`	`C:\Program Files\VanguardFX\OrbFX`

The panel is installed in three places, so it keeps working if one of those folders is cleaned. If the toolbar button reports that the panel files are missing, run the installer again to repair the installation.

Activation

Each licence is signed for one computer and one product. The plugin checks it offline every time it runs, so it works with no internet connection. When a connection is available, it also checks at start-up and every ten minutes whether the licence has been withdrawn. A licence bought on the 1-year plan keeps working with every build released during that year. Only builds released later ask for a renewal.

1. Open the licence window. On an unlicensed computer it opens by itself when you open the Studio panel, and the first time in a session that a Vanguard Orb Ink object's parameters open. You can open it at any time with **Licence / Hardware ID** in the Studio panel.
2. Press **Copy** next to your Hardware ID.
3. Press **Open panel**, or go to `vanguardfx.pro/panel.php`. Sign in, give the Hardware ID when the panel asks for it, then press **Download licence**.
4. Paste the whole licence, both lines, into the box and press **Activate**.

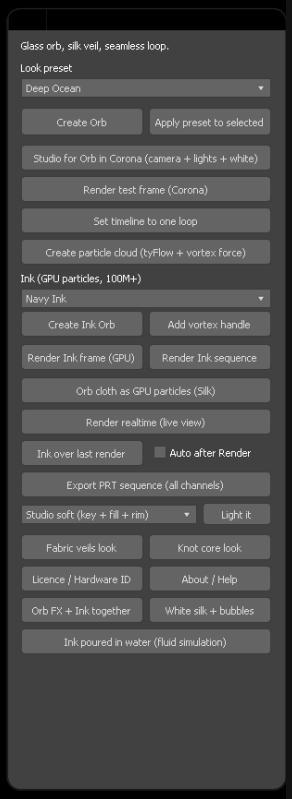
Until the plugin is licensed, Orb FX builds no mesh, Ink renders nothing, the forces have no effect and the Ink Material renders black. The licence is stored in `%LOCALAPPDATA%\VanguardFX\orbfx_signed.lic`.

Where it appears in 3ds Max

LOCATION	ENTRY	PURPOSE
Create > Geometry > VanguardFX	Vanguard Orb FX	Glass orb with a looping silk veil, built as mesh for your renderer
Create > Geometry > VanguardFX	Vanguard Orb Ink	GPU ink and silk particles with their own renderer
Create > Space Warps > VanguardFX	Vanguard Orb Vortex Force	Whirlpools on a sphere for tyFlow or Particle Flow. It also drives Ink's Surface Swirl
Create > Space Warps > VanguardFX	Vanguard Orb Particle Force	The original particle force, kept so older scenes still load
Material Editor: Material/Map Browser > Materials > VanguardFX Tools	Vanguard Ink Material	Ink particle shading. Use it in the Ink object's **Particle material (diffuse colour or map, self-illum, opacity)** slot
Customize > Customize User Interface > Toolbars, Category VanguardFX	Vanguard Orb FX Studio	Drag it onto a toolbar. The button (text **Orb FX**) opens the Studio panel

You can also open the Studio panel without the toolbar button: go to Scripting > Run Script and run `C:\Program Files\VanguardFX\OrbFX\Open_OrbFX.ms`.

Support: `support@vanguardfx.pro`



The Orb FX Studio panel (toolbar button **Orb FX**).

02

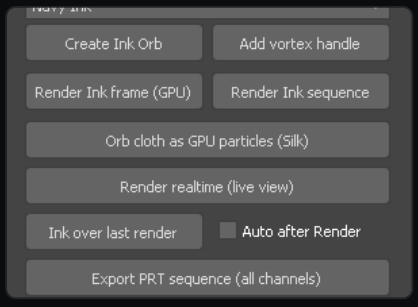
Your first result in 5 steps

From an empty scene to a finished frame in a few minutes.

STEP 1

Open the Studio panel

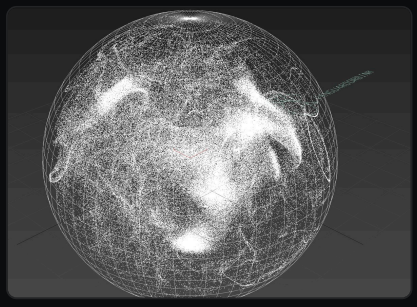
Drag **Vanguard Orb FX Studio** onto a toolbar (Customize > Customize User Interface > Toolbars, category VanguardFX) and click it. Every step below is one button here.



STEP 2

Create Ink Orb

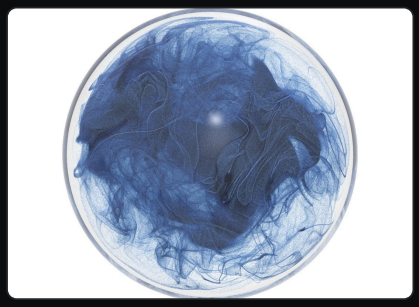
Leave **Ink (GPU particles, 100M+)** on **Navy Ink** and press **Create Ink Orb**. The orb appears at the origin; the viewport shows a preview of its particles.



STEP 3

Render Ink frame (GPU)

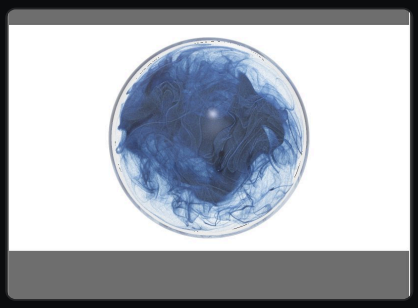
Press **Render Ink frame (GPU)**. It renders through the active view (no camera needed) at the Render Setup size and saves to `renderoutput\VanguardOrbInk`. The first frame of a scene simulates the loop once and takes longer.



STEP 4

Tune it live

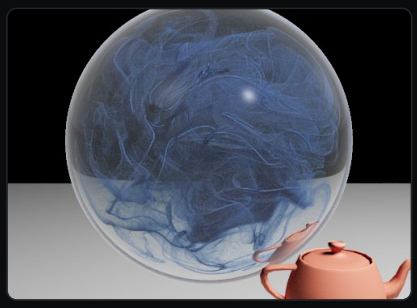
Press **Render realtime (live view)**. The window re-renders as you scrub the timeline or change a value; choose **Half** or **Quarter** for speed.



STEP 5

Put it over your render

Render your scene in Corona, V-Ray, Arnold or Scanline, then press **Ink over last render** (or tick **Auto after Render**). The glass refracts your image and the ink sits inside it.



NEXT

Try a ready look

The panel also builds **White silk + bubbles**, **Ink poured in water**, **Fabric veils look** and **Knot core look** in one click — see Recipes.



03

Every control

Panel by panel, rollout by rollout, in the order they appear. Range and default sit next to each control.

ORB FX STUDIO PANEL

Glass orb, silk veil, seamless loop.
A caption at the top of the panel; it does nothing.

Look preset `Deep Ocean, Sapphire, Ice Glass, Liquid Silk, Dark Crystal · default Deep Ocean`
Sets the veil shape and colours used by Create Orb; pick it before you create the orb.

Create Orb
Creates an orb at the world origin with the chosen look and a four-slot material.

Apply preset to selected
Applies the chosen look to one selected orb; it replaces the material and loses your edits.

Studio for Orb in Corona (camera + lights + white)
Builds a white camera-and-lights studio around the orb; keep the orb at the world origin.

Render test frame (Corona)
Renders a 512 x 512 test of frame 0 to a PNG; reset your output size before a final render.

Set timeline to one loop
Sets the time segment to exactly one loop of the orb; use it before rendering a seamless loop.

Create particle cloud (tyFlow + vortex force)
Creates a tyFlow particle cloud driven by a vortex force; requires tyFlow and sets 30 fps.

Ink (GPU particles, 100M+) `Navy Ink, Silk Veils, Swirl Globe · default Navy Ink`
Chooses the starting look for Create Ink Orb; every value can be changed afterwards.

Create Ink Orb
Creates an Ink orb at the world origin; Max's Render does not show it, use the Ink buttons.

Add vortex handle
Adds a helper the ink swirls around; move, rotate or animate it to steer the swirl.

Render Ink frame (GPU)
Renders the current frame of every Ink to PNG through the active camera to check quality.

Render Ink sequence
Renders every Ink over the Render Setup frame range to a folder of PNG files.

Orb cloth as GPU particles (Silk)
Creates an Ink that draws the orb's veil as silk particles; tick Ink tracers on to add ink.

Render realtime (live view)
Opens a live preview of the Ink while you tune; use Half or Quarter if it lags.

Ink over last render / Auto after Render `Auto after Render: on/off · default off`
Composites every visible Ink over Max's last render; render with the viewport's camera.

Export PRT sequence (all channels)
Exports Ink particles as one PRT file per frame for Krakatoa, Frost or tyFlow.

(lighting list, no label) / Light it `Studio soft (key + fill + rim), Backlit glow, Top light, dark mood, Warm / cool split, Underwater blue, Clear (remove preset lights) · default Studio soft (key + fill + rim)`
Creates a set of omni lights around the Ink and tunes its shading; each press replaces the set.

Fabric veils look
Creates a petal mesh with veil and droplet Inks; render both, then lay droplets over veils.

Knot core look
Creates a morphing knot mesh with veil, smoke and droplet Inks to composite together.

Licence / Hardware ID
Opens the licence window with your Hardware ID; use it once on each machine.

About / Help
Shows a short workflow summary and offers to open this guide.

Orb FX + Ink together
Draws Orb FX veils inside the Ink's glass in one image; render with the Ink render buttons.

White silk + bubbles
Creates a ready-made dark poster look of white silk; raise Silk density for more opacity.

Ink poured in water (fluid simulation)
Creates ink poured into simulated water; the first update can take a while to compute.

Status line (below the buttons)
Reports the last button's result; read it when a button seems to do nothing.

ORB INK - INK PARTICLES

Radius `0.01-100,000 · default 50`
Sets the glass sphere size; start shapes, vortices and the wall layer all scale with it.

Render particles (0 = all the GPU holds) / Viewport particles `0-2,000,000,000; 1,000-5,000,000 · default 20,000,000; 300,000`
Tracer particles for renders and export; more render smoother, 0 uses ~80% of free GPU memory.

Seed `0-1,000,000 · default 42`
Reshuffles start shapes and turbulence; try a few seeds to find a composition first.

Veil sheets / Ink drops / Volume dust / Glass skin / Emitter meshes `0-10 each · default 0.5; 0.48; 0.02; 0; 1`
Splits particles among sheets, drops, haze, skin and meshes; only the ratios matter.

Sheet count / Sheet size / Sheet thickness / Sheet bend `0-64; 0.05-2; 0-0.1; 0-4 · default 8; 1; 0.0015; 1`
Count, spread, thickness and bend of the starting veils; set sheets to 0 to remove them.

Drop count / Drop size `1-64; 0.005-0.6 · default 4; 0.07`
Dense ink drops near the centre; a few small ones read as ink just dropped into water.

Emitter meshes (particles start on their surface)
Emits the mesh share from these surfaces; keep meshes inside the orb, animation is ignored.

Ink tracers on `on/off · default on`
Toggles the ink tracers; turn off when using only silk, a PRT sequence or ink in water.

Show the sphere outline in the viewport `on/off · default on`
Shows a non-rendering wire sphere; turn it off once your own glass or Container is in place.

Container (any closed mesh instead of the sphere) / Container detail (distance grid) `16-256 (detail) · default none; 96`
Uses a closed mesh as the vessel; centre it and set Radius to about half its largest size.

ORB INK - FLOW

Loop seconds / Seamless loop (two generations) / Start frame (no loop) `0.5-120; on/off; -100,000 to 100,000 · default 9; on; 0`
Sets the flow cycle length and seamless looping; turn the loop off for one-off unravelling.

Time scale `0-20 · default 1`
Speeds up or slows the whole flow without changing loop timing; 0 holds the start shapes.

Substeps per frame `1-16 · default 2`
Simulation steps per frame; raise to 4-8 if particles spiral out of vortex cores.

Turbulence strength `0-500 · default 3.6`
Turbulence speed that stretches ink into filaments; scale it yourself when resizing the orb.

Turbulence scale / Turbulence detail `0.05-20; 1-6 · default 0.75; 3`
Eddy size and noise layers; detail 1-2 keeps veils smooth, 4-6 gives ragged, smoky edges.

Turbulence evolve `0-10 · default 0.7`
How far turbulence drifts per loop; raise it for restless water, lower for steady stretching.

Glass wall softness `0.01-0.5 · default 0.12`
Wall layer where flow slides along the glass; raise for calmer flow, lower for swirls at wall.

Global spin (rad/s) `-10 to 10 · default 0.08`
Rotates the whole fluid around local Z in radians per second; negative turns the other way.

ORB INK - VORTEX FORCES

Surface whirlpools / Whirlpool strength `0-48; -500 to 500 · default 8; 16`
Whirlpools spread over the glass and their speed; a negative value reverses them all.

Whirlpool size (deg) / Whirlpool depth / Whirlpool wander `1-89; 0.02-1; 0-3 · default 26; 0.6; 0.6`
Whirlpool width, depth and wander; low depth keeps swirling at the surface, wander 0 pins them.

Inner vortices / Inner strength `0-48; -500 to 500 · default 5; 15`
Vortex tubes that fold ink deep inside the orb; set 0 to leave the inside to other motion.

Inner core size / Inner length / Inner orbit `0.01-2; 0.02-4; 0-6.3 · default 0.3; 0.6; 0.5`
Inner vortex thickness, length and swing; a thin, strong core twists a tight thread.

Vortex seed `0-1,000,000 · default 42`
Repositions whirlpools and inner vortices without changing start shapes; use if motion is unbalanced.

Object vortex strength / Object vortex core / Object vortex length / Vortex objects (local Z = axis; User Props strength= core= length=) `-500 to 500; 0.01-2; 0.02-10 · default 15; 0.2; 0.6; none`
Turns listed scene objects into animated vortices spinning fluid around their local Z axis.

ORB INK - VANGUARD INK RENDER

Ink density `0-1,000 · default 10`
Raise for darker, denser ink; more particles at the same value make it smoother, not darker.

Absorb red / Absorb green / Absorb blue `0-10 · default 1 / 0.68 / 0.4`
Sets how much colour the ink absorbs; the ink shows the colour it absorbs least.

Scatter red / Scatter green / Scatter blue / Scatter amount `0-10 · default 0.35 / 0.55 / 0.95; amount 0.12`
Brightens the lit side; keep it around 0.1-0.15 to avoid salt-and-pepper noise.

Light intensity `0-100 · default 1.4`
Sets the brightness of the light on the ink; raise it when the ink looks dull.

Light direction object (optional)
Pick a Point helper to aim the built-in key light; without one, light comes from above.

Self shadow `0-20 · default 1.2`
Sets self-shading; lower for flatter ink, raise for deeper shading in folds.

Ambient `0-10 · default 0.12`
Adds flat light to every particle so shaded parts never go fully dark.

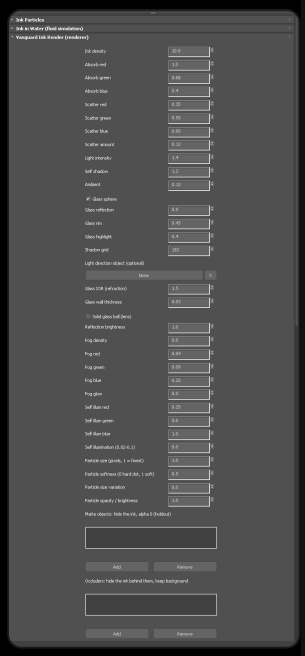
Shadow grid `32-512 · default 192`
Grid resolution for shadows; raise to 256-384 if shadows look blocky in close-ups.

Self illum red / Self illum green / Self illum blue / Self illumination (0.02-0.1) `colour 0-10; amount 0-100 · default 0.25 / 0.6 / 1; amount 0`
Makes the ink glow without light; 0.02-0.1 is the useful range and 0 is off.

Particle size (pixels, 1 = finest) `0-64 · default 1`
Sets each particle's footprint; raise to 2-4 if a low particle count looks grainy.

Particle softness (0 hard dot, 1 soft) / Particle size variation `0-1 · default 0.5 / 0`
Softens particle footprints and randomises their size; variation breaks up a uniform grain.

Particle opacity / brightness `0-100 · default 1`
Thins or thickens the ink on screen for every group while keeping the self-shadow.



The Ink object in the Modify panel.

Glass sphere `on/off · default on`
Draws a glass shell around the ink; turn it off to render the ink or silk on its own.

Glass reflection `0-4 · default 0.9`
Sets the Fresnel glass reflection; 0 removes it, above 1 carries it further across.

Glass rim `0-1 · default 0.45`
Darkens the view through the glass toward the silhouette; raise for a heavier edge.

Glass highlight `0-20 · default 0.4`
Sets the brightness of each light's sharp highlight on the glass; 0 removes them.

Glass IOR (refraction) / Glass wall thickness / Solid glass ball (lens) `IOR 1-3; thickness 0.001-0.5; on/off · default 1.5; 0.03; off`
Controls how the glass bends the view; a thicker wall bends the ink more near the edge.

Glass reflects: 0 studio, 1 HDRI, 2 colour, 3 nothing / Reflection colour R / Reflection colour G / Reflection colour B `mode 0-3; colour 0-10 · default 0 (studio); 1 / 1 / 1`
Chooses what glass and bubbles reflect; HDRI mode falls back to the studio without one.

Reflection brightness `0-20 · default 1`
Scales everything the glass and bubbles reflect; lower it when reflections wash out the ink.

Fog density / Fog red / Fog green / Fog blue / Fog glow `density 0-100; colour 0-10; glow 0-100 · default 0; 0.04 / 0.09 / 0.22; 0`
Fills the glass with tinted fog; start at 0.1-0.3 for a sense of depth.

Background: 0 colour, 1 transparent, 2 HDRI / Background colour R / Background colour G / Background colour B `mode 0-2; colour 0-10 · default 0 (colour); 1 / 1 / 1 (white)`
Sets what is behind the orb; use 1 for compositing.

Alpha: 0 ink only, 1 ink + glass reflection, 2 opaque sphere `0-2 · default 1`
Sets what is solid in alpha when transparent; use 2 if the plate must not show through.

Background behind the orb (radii, for refraction) `0-1,000 · default 4`
Places the Ink over last render backdrop behind the orb so the glass refracts it correctly.

Matte objects: hide the ink, alpha 0 (holdout) / Occluders: hide the ink behind them, keep background / Mattes also cut the glass `on/off (checkbox) · default empty; empty; on`
Objects that hide the ink behind them so it composites with another render.

Antialiasing (1 off, 2-4 = samples per pixel side) `1-4 · default 2`
Supersamples to smooth edges; use 1 while adjusting and 3-4 for final frames of fine silk.

EXR render passes (ink, glass, emission, depth, motion, normal, masks) / EXR full 32-bit float (off = half) `on/off · default on; off`
Adds compositing layers to an EXR; render EXR from MAXScript, as the panel saves PNG.

Falloff (fabric look: veils denser edge-on) / Falloff: density facing the camera / Falloff: density edge-on / Falloff: curve (higher = only the very edges) `on/off; facing 0-10; edge-on 0-20; curve 0.05-10 · default off; 0.35; 2; 2`
Makes veils denser edge-on and thinner face-on so sheets read like folds of fabric.

Falloff: edge colour R / Falloff: edge colour G / Falloff: edge colour B / Falloff: edge colour amount `0-1 · default 0.55 / 0.85 / 1; amount 0`
Tints the edge-on parts of the veils toward this colour; needs Falloff on.

Air bubbles in the glass (count, 0 = off) / Bubble size (ratio of radius) / Bubble size variation `count 0-2,000; size 0.002-0.2; variation 0-1 · default 0; 0.025; 0.7`
Adds procedural air bubbles inside the glass; they need Glass sphere on.

Bubble rise speed (radii per second) / Bubble wobble (radii) / Bubble shine (rim + highlight) `rise 0-5; wobble 0-0.5; shine 0-5 · default 0.15; 0.04; 1`
Animates bubbles rising and swaying; set rise and wobble to 0 for still bubbles.

ORB INK - COLOUR, LIGHTS AND HDRI

Colour: 0 off 1 Z 2 radial 3 sphere 4 top 5 front 6 X 7 Y `0-7 · default 0 (off)`
Picks how the colour map is projected onto the ink; it needs a map to do anything.

Colour map (any texmap: Gradient Ramp, Bitmap...) `texture map`
Map that colours the ink as seen over white; used only while Colour is set to 1-7.

Colour strength / Colour map scale `0-1; 0.01-100 · default 1; 1`
Blends toward the map colour and scales it; lower strength to tint, raise scale to repeat.

Colour sticks to the particles (off = planar, fixed in space) `on/off · default on`
On, colour travels with the flow; turn off to keep a region's colour fixed in place.

Particle material (diffuse colour or map, self-illum, opacity) `material`
A material here replaces the ink's shading; a Vanguard Ink Material overrides these colours.

Light with the scene's lights / Scene light strength `on/off; 0-100 · default on; 1`
On, up to eight bright scene lights light the ink; off, one default key light is used.

Only these lights (empty = every light in the scene) `list of lights · default empty`
Limits ink lighting to listed lights, even switched-off ones that skip the final render.

HDRI file (.hdr .exr .png ...) / HDRI rotation (deg) `file path; -360 to 360 · default none; 0`
Loads an HDRI for background, ambient and reflection; 2K is enough, rotate to place highlights.

HDRI as background `on/off · default off`
Shows the HDRI behind the orb and through the glass instead of the background colour.

HDRI light on the ink `0-100 · default 1`
Adds the HDRI's average colour as ambient; set 0 when the HDRI is for reflections only.

ORB INK - PARTICLE SHADING (COLOUR BY CHANNEL)

Colour by: 0 off 1 speed 2 age 3 density 4 depth 5 height 6 radius 7 group/source `0-7 · default 0 (off)`
Picks the value that drives colour, overriding projection; use speed to pick out fast streaks.

Channel value at the start of the ramp / Channel value at the end of the ramp `-100,000 to 100,000 · default 0; 50`
Channel values mapped to the ramp ends; for height with Radius 50, use -50 and 50.

Ramp start R (used when no colour map) / Ramp start G / Ramp start B / Ramp end R / Ramp end G / Ramp end B `0-1 · default start 0.05, 0.15, 0.45; end 0.55, 0.9, 1`
The two ramp colours over white; for more colours, use a Gradient Ramp in the map slot.

ORB INK - SCENE OBJECTS AND SHADOWS

Scene objects to render (lit, with the ink's shadow) / Scene objects: ambient light `list of objects; 0-10 · default empty; 0.25`
Draws listed meshes as solid surfaces lit and shadowed by the ink; add a floor to see shadow.

Shadow catchers (invisible, only the ink's shadow) / Shadow strength on catchers `list of objects; 0-10 · default empty; 1`
Hidden meshes that occlude ink and catch its shadow; use a floor for alpha compositing.

Caustics: the orb focuses light onto scene objects / catchers / Caustic IOR (orb filled with: 1.33 water, 1.5 glass) `on/off; 1-3 · default on; 1.33`
Traces lights through the orb for a focused spot and shadow; needs a surface and light.

Caustic strength / Ink dims the caustic (0 none, 1 full ink shadow) `0-20; 0-1 · default 1; 0.3`
Scales the caustic and how much ink dims it; keep strength at 1 for a physical result.

Caustic softness (cells) / Light size for caustics (degrees; bigger = softer, wider) `0-10; 0-45 · default 1; 6`
Blurs and widens the caustic; raise softness if grainy, lower light size for a hard focus.

ORB INK - INK IN WATER (FLUID SIMULATION)

Ink in water on (simulated water carries the ink) `on/off · default off`
Simulates the orb's water over the frame range and releases ink at the source for it to carry.

Render particles / Viewport particles `render 0-2,000,000,000; viewport 0-5,000,000 · default 20,000,000; 300,000`
Ink particles riding the water; use 20-40 million for finals for a smoother cloud.

Start frame / End frame (water simulated up to here) / Pour time (seconds) `frames -100,000 to 100,000; pour time 0-1,000 · default Start 0; End 150; Pour time 2.5`
Sets simulated frames and pour length; a short pour gives one puff, a long one a stream.

Source X (radii) / Source Y (radii) / Source Z (radii) / Source size (radii) `X/Y/Z -1 to 1; size 0.01-0.5 · default 0, 0, 0.6; size 0.08`
Where the ink pours and how wide; Z 0.6 pours near the top, 0.3 from mid-height.

Ink weight (sinks; negative rises) / Pour push `weight -10 to 10; push 0-20 · default weight 4; push 3`
Ink weight sinks the inked water; Pour push drives it down, raise it for a deep jet.

Billows (vorticity) / Water stir `billows 0-100; stir 0-5 · default billows 15; stir 0.3`
Billows adds rolling curls, Water stir adds slow swirls; about 7 with stir 2 gives soft rolls.

Water resolution `16-160 · default 96`
Water cells per direction for finer billows; use about 64 to set up and 96-128 for finals.

Ink density / Own colour for the ink in water / Ink colour R / Ink colour G / Ink colour B `density 0-1,000; colour 0-1 · default density 3; Own colour on; colour 0.06, 0.28, 0.85`
How dark the ink renders and its own colour; turn Own colour off to shade it like the object.

The cloth is a wall in the water (Particle Silk source) / Water moves the cloth (seconds of drift) `drift 0-5 · default wall on; drift 0.15`
Makes water flow around the picked cloth while ink settles on it; set drift to 0 for still cloth.

ORB INK - PARTICLE SILK (CLOTH MADE OF PARTICLES)

Cloth source (Orb FX object or any UV mesh)
Picking an object fills its surface with silk particles that follow its animation; use 0-1 UVs.

Silk render particles / Silk viewport particles `render 0-2,000,000,000; viewport 0-5,000,000 · default 100,000,000; 300,000`
Particles on the cloth; more give a smoother sheet at the same darkness, 0 hides the silk.

Silk thickness `0-100 · default 0.12`
How far particles spread either side of the cloth; keep about 0.05 for a crisp sheet.

Fine folds height / Fine folds per sheet / Fine folds detail `height 0-100; per sheet 0.1-1,000; detail 1-6 · default height 0.6; per sheet 40; detail 3`
Small folds pushed off the surface that drift and return; set height to 0 for a smooth sheet.

Frayed edges `0-0.5 · default 0.03`
Width of the torn, wispy UV edge band; 0 gives clean hems, about 0.06 a soft veil edge.

Silk density `0-1,000 · default 0.45`
How dark and opaque the silk renders; about 0.2 gives a sheer veil, 1 or more a solid sheet.

ORB INK - SURFACE SWIRL (VORTEX FORCE, NO TYFLOW)

Vortex Force object (its settings and seed objects)
Picking a Vanguard Orb Vortex Force turns the swirl on; tune the whirlpools on the force itself.

Swirl render particles / Swirl viewport particles `render 0-2,000,000,000; viewport 0-5,000,000 · default 20,000,000; 200,000`
Swirl particles shown; more give a smoother result at the same darkness, 0 hides the swirl.

Force time unit (frames; 1 = tyFlow) / Swirl substeps `time unit 0.0001-10,000; substeps 1-64 · default time unit 1; substeps 4`
Frames per force-time unit and steps per frame; raise substeps to 8-16 if particles overshoot.

Swirl start frame `-100,000 to 100,000 · default 0`
Frame when particles leave the sphere; keep the viewport count low while animating.

Swirl density `0-1,000 · default 2`
How dark and opaque the swirl renders; lower for faint smoky trails, raise for dense bands.

ORB INK - ASSEMBLE (GATHER FROM OBJECTS)

Assemble on / Source 1 (sphere, box, any object) / Source 2 (optional: half the particles) `on/off; any object; any object · default off; none; none`
Starts particles inside a source object and flies them into the orb; pick a source first.

Progress (key it: 0 sources, 1 orb) `0-1 · default 1`
How far gathering has gone; key it from 0 to 1 over the shot, as at 1 nothing shows.

Departure spread `0-0.98 · default 0.6`
Staggers departures; near 0 gives one sudden pull, higher values a slow trickle.

Spiral turns on the way / Path bulge (orb radii) / Wander mid-flight (orb radii) `-10 to 10; -2 to 4; 0-2 · default 1.5; 0.3; 0.15`
Shapes flight with spiral turns, outward bulge and random wander; 0 turns means no spiral.

Smoke curls on the way (orb radii) / Smoke curl size (swirls per radius) `0-5; 0.1-20 · default 0.6; 2`
Moves particles through drifting smoke-like curls mid-flight; set curls to 0 for clean spirals.

ORB INK - PRT EXPORT CHANNELS (KRAKATOA, FROST, TYFLOW)

Velocity (units per second, for motion blur) / Velocity scale `on/off; 0-100 · default on; 1`
Writes particle velocity for motion blur; export with a scale below 1 for shorter streaks.

Color (colour map / material / ink colour) / Emission (self-illumination) / Color / Emission multiplier `on/off; on/off; 0-100 · default on; on; 1`
Writes ink colour and emission; turn Emission off when the ink does not glow to save space.

Normal (from the density: veil surface direction) / Normal grid resolution `on/off; 32-512 · default on; 128`
Writes normals from a density grid; raise resolution if close-ups look blocky, at a memory cost.

ID (stable per particle) / Age (seconds since the particle was born) / Source + Group (assemble source 0/1/2, group ink/silk/swirl) / Rest (birth position / cloth UV, for re-texturing) `on/off · default on`
Writes ID, Age, Source, Group and Rest channels; switch off unused ones for smaller files.

World space (off = object space, load with the object's transform) `on/off · default off`
Writes data in world space; turn on when the PRT goes to a scene that lacks the Ink object.

ORB INK - PRT INPUT (RENDER ANY PRT SEQUENCE)

Render the PRT sequence below / PRT file (any frame of the sequence) / Frame offset `on/off; a .prt file; -100,000 to 100,000 · default on; none; 0`
Loads a PRT sequence to render with the orb; use Frame offset to line up files with the shot.

Density `0-1,000 · default 1`
Overall darkness of the loaded cloud; raise it when a sparse file renders too faint.

Use the file's Color / Emission `on/off · default on`
Uses the file's Color and Emission channels; turn off to apply Orb Ink's own colour controls.

File is in world space (Krakatoa, tyFlow) `on/off · default on`
Reads positions in world space; turn off for PRTs exported from Orb Ink with World space off.

Viewport particles / Render particles (0 = all in the file) `0-50,000,000; 0-2,000,000,000 · default 300,000; 0`
Caps loaded particles by keeping every Nth; use a few million for quick test renders.

ORB INK - ABOUT / HELP

Show the VanguardFX mark in the viewport `on/off · default on`
Shows the logo beside the Ink object in viewports only; turn it off to unclutter the view.

ORB FX OBJECT - SHAPE

Radius `0.01-100,000 · default 50`
Sets the orb's size; resize freely, as motion stays the same and nothing re-simulates.

Glass wall thickness (ratio of radius, 0 = thin) `0-0.3 · default 0`
Adds an inner glass surface for a solid wall; keep Haze volume fill below 1 minus this.

Haze volume fill `0.2-0.995 · default 0.96`
Sets the inner haze sphere's size; lower it to leave clear glass between haze and shell.

Shell clearance `0.02-0.4 · default 0.05`
Keeps the veil off the glass; raise it if the veil looks pressed against the glass.

Veil count / Veil source meshes (row n = veil n, UV 0..1 sheets) `1-4 · default 1 / empty`
Sets how many silk sheets there are; a UV-mapped mesh in the list can replace a veil's band.

Veil rest radius / Veil arc span (deg) / Veil width `0.3-0.95 / 30-340 / 0.05-1 · default 0.9 / 250 / 0.62`
Sets the band's starting size; short and narrow gives a ribbon, wide and long a curtain.

Veil latitude / Veil tilt X / Veil tilt Y / Veil tilt Z `-1 to 1 / -180 to 180 each · default 0.42 / -20, 10, -90`
Places and tilts the band; angle the veil here, since gravity follows the object's Z axis.

Pleat depth / Pleat count `0-0.3 / 0.5-10 · default 0.2 / 3`
Adds large soft folds to the starting shape; set depth to 0 to start from a smooth band.

ORB FX OBJECT - FABRIC SURFACE

Sheet thickness / Thickness in folds / Edge softness `0.0005-0.08 / 0-6 / 0.02-1 · default 0.01 / 1.5 / 0.45`
Sets veil thickness and edge fade; raise Edge softness for a feathered, gauzy border.

Wrinkle amount / Wrinkle scale `0-3 / 0.5-40 · default 0.6 / 10`
Adds fine moving wrinkles; set amount to 0 for smooth satin, and use enough render segments.

Seed `0-100,000 · default 42`
Changes the random pattern and re-simulates; try a few seeds for a different drape.

ORB FX OBJECT - LOOP / MOTION

Loop seconds `0.5-60 · default 9`
Sets one seamless cycle's length; use the shot length or a whole fraction of it.

Motion amount `0-2 · default 0.8`
Scales the wind and wave forces; at 0 the veil simply hangs, above 1 it billows.

Speed / Reverse / Phase (cycles) / Freeze at phase `0.01-10 / on/off / -100 to 100 / on/off · default 1 / off / 0 / off`
Controls cached loop playback; give copied orbs different phases so they move out of step.

ORB FX OBJECT - FABRIC PHYSICS

Stiffness / Bend stiffness / Damping / Solver substeps `1-40 / 0.1-8 / 0.1-12 / 1-8 · default 16 / 0.3 / 3.5 / 4`
Sets cloth stiffness and damping; raise Solver substeps to 6-8 if the cloth jitters.

Cloth slack (folds) / Rest shape hold `0.8-2 / 0-2 · default 1.2 / 0.05`
Slack above 1 makes the cloth fold; raise Rest shape hold to keep the band under wind.

Anchor (0 ends,1 top,2 both) `0-2 · default 1`
Chooses which edges are pinned; use 0 for a ribbon held at its ends.

Gravity / Wind `-40 to 80 / 0-40 · default 8 / 16`
Sets gravity along the object's -Z and a looping wind; gravity near 0 feels underwater.

Wave amplitude / Wave cycles / Wave speed / Wave spread `0-30 / 0.25-12 / -8 to 8 / 0.05-2 · default 14 / 2 / 1 / 0.7`
Adds a wave travelling along the veil; keep Wave speed a whole number so it loops cleanly.

Self collision / Self collision distance `on/off / 0.1-8 · default on / 2.5`
Stops the sheet folding onto itself nearby; raise it if tight folds collapse into creases.

ORB FX OBJECT - QUALITY / COMPONENTS

Cloth cells along / Cloth cells across `16-256 / 8-128 · default 96 / 32`
Sets each veil's simulation grid; settle it before tuning Fabric Physics.

Viewport segments / Render segments `12-256 / 12-256 · default 48 / 128`
Sets mesh detail; keep viewport low for scrubbing, raise render for close-ups.

Use CUDA (CPU fallback) `on/off · default on`
Runs the cloth solver on the NVIDIA GPU, falling back to CPU; applies at next re-simulation.

Glass shell / Haze volume / Silk veil `on/off · default on (all three)`
Builds or skips each mesh part; turn off glass and haze to render the veil alone.

VANGUARD INK MATERIAL - INK SHADING

Absorb (what the ink removes) / Scatter (colour of lit ink) / Scatter amount `Scatter amount 0-10 · default Absorb (1.0, 0.68, 0.4); Scatter (0.35, 0.55, 0.95); Scatter amount 0.12`
Absorb tints light passing through; Scatter is lit colour. Keep Scatter low for dye on glass.

Density multiplier / Opacity `Density multiplier 0-100; Opacity 0-1 · default Density multiplier 1.0; Opacity 1.0`
Scale each particle's colour and absorption. Lower Density, not particle count, if ink clogs.

Emission colour / Emission amount / Emission map (optional) `Emission amount 0-100 · default Emission colour (0.2, 0.5, 1.0); Emission amount 0; map none`
Makes ink glow without light, brightest where dense. Use it for ink on a black background.

VANGUARD INK MATERIAL - COLOUR (MAP, GRADIENT, CHANNEL)

Colour map (gradient, bitmap, any map) / Map strength `Map strength 0-1 · default map none; Map strength 1.0`
Colours particles from any map, read as ink on white. Lower Map strength to keep base colour.

Projection: 1 Z 2 radial 3 sphere 4 top 5 front 6 X 7 Y / Map scale / Colour sticks to the particles `Projection 0-7; Map scale 0.01-100; Colour sticks on/off · default Projection 3 (sphere); Map scale 1.0; Colour sticks on`
Lays the colour map onto particles. Turn Colour sticks off to flow through fixed colour.

Colour by: 0 map 1 speed 2 age 3 density 4 depth 5 height 6 radius 7 group / Channel value at ramp start / Channel value at ramp end / Ramp start (no map) / Ramp end (no map) `Colour by 0-7; channel values -100,000 to 100,000 · default Colour by 0 (map); start 0; end 50; Ramp start (0.05, 0.15, 0.45); Ramp end (0.55, 0.9, 1.0)`
Colours particles by a measured channel. Set end value near the shot's highest value.

VANGUARD INK MATERIAL - FALLOFF (FABRIC LOOK)

Falloff on / Density facing the camera / Density edge-on / Curve (higher = only the edges) `Falloff on on/off; facing 0-10; edge-on 0-20; Curve 0.05-10 · default Falloff off; facing 0.15; edge-on 3.0; Curve 3.0`
Thin veils read light face-on, dense edge-on. Turn it on for silk and folded veils.

Edge colour / Edge colour amount `Edge colour amount 0-1 · default Edge colour (0.55, 0.85, 1.0); amount 0`
Tints edge-on veil parts with a second colour; needs Falloff on. Pick a lighter colour.

VANGUARD INK MATERIAL - PARTICLES AND LIGHT

Particle size (pixels) / Particle softness / Size variation `size 0-64; softness 0-1; variation 0-1 · default size 1.0; softness 0.5; variation 0`
Sets each particle's pixel footprint and edge. Use 2-3 to smooth grain, 1 for finest detail.

Self-shadow strength / Ambient light `Self-shadow strength 0-10; Ambient light 0-10 · default Self-shadow strength 1.2; Ambient light 0.12`
Sets ink self-shading and flat fill light. If the far side goes black, raise Ambient light.

VANGUARD ORB VORTEX FORCE

Sphere radius / Surface hold `Sphere radius 0.01-100,000; Surface hold 0-1,000 · default Sphere radius 50; Surface hold 4`
Sphere particles are held on and the spring pulling them back. Match radius to the cloud.

Vortex count / Seed `Vortex count 1-64; Seed 0-1,000,000 · default Vortex count 10; Seed 42`
Procedural vortices spread over the sphere. Change Seed to try another arrangement.

Seed objects (each = one vortex; User Properties: swirl= attract= spread= eye= on=) / Add object / Remove `default empty`
Each listed object adds a vortex in its direction. Animate Point helpers to steer vortices.

Swirl strength / Attraction to vortex `-1,000 to 1,000 (both) · default Swirl strength 24; Attraction to vortex 0.5`
Spin around and pull toward each vortex. A small negative attraction opens a clear eye.

Vortex spread (deg) / Vortex eye (rigid core) / Partition sharpness `spread 1-180; eye 0.01-1; sharpness 0-16 · default spread 30; eye 0.25; sharpness 2`
Vortex size, solid eye and border strictness. Raise sharpness for clean whirlpool borders.

Seed wander / Loop seconds / Turbulence `Seed wander 0-2; Loop seconds 0.1-3,600; Turbulence 0-1,000 · default Seed wander 0.5; Loop seconds 9; Turbulence 8`
Vortex drift, loop time and turbulence. Set Loop seconds to the animation length.

Drag / Response scale `Drag 0-10; Response scale 0.0001-100 · default Drag 0.15; Response scale 0.01`
Drag slows particles; Response scales all forces. In tyFlow keep Response near 0.01.

Icon size `0.01-100,000 · default 50`
Size of the viewport icon and vortex markers. Set it equal to Sphere radius.

VANGUARD ORB PARTICLE FORCE

Mode (0 shell, 1 vortex, 2 attract, 3 curl) / Strength `Mode 0-3; Strength -10,000 to 10,000 · default Mode 0 (shell); Strength 12`
Picks shell, vortex, attract or curl flow. In attract, negative Strength pushes outward.

Radius / range / Falloff exponent / Shell band `Radius 0.01-100,000; Falloff exponent 0.1-10; Shell band 0.01-100,000 · default Radius 50; Falloff exponent 2; Shell band 8`
Force fades from centre to nothing at Radius. Raise the exponent to keep it near the centre.

Swirl / Axial flow `-10,000 to 10,000 (both) · default Swirl 18; Axial flow 0`
Spins particles around and pushes along the icon's Z. Rotate the object to tilt the axis.

Turbulence / Turbulence scale / Time scale / Seed `Turbulence 0-10,000; Turbulence scale 0.0001-100; Time scale -100 to 100; Seed 0-1,000,000 · default Turbulence 4; Turbulence scale 0.08; Time scale 1; Seed 42`
Adds wavy noise with size, speed and seed. Set Time scale to 0 to freeze the noise.

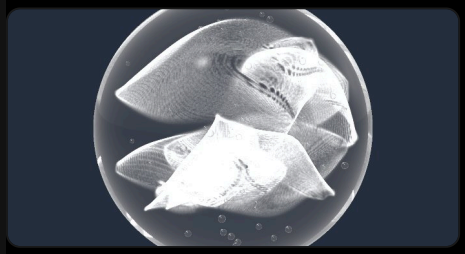
Particle drag / Force response scale `Particle drag 0-100; Force response scale 0.0001-10 · default Particle drag 0.05; Force response scale 0.01`
Drag slows particles everywhere; response scales forces. Keep response near 0.01.

Icon size `0.01-100,000 · default 50`
Size of the octahedron viewport icon; it does not change the force.

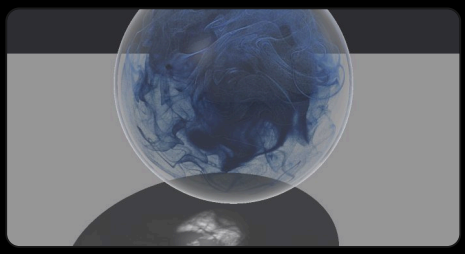
04

Presets and recipes

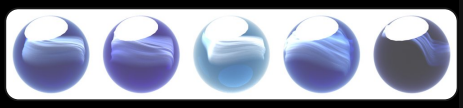
Five setups you can rebuild exactly.



White silk + bubbles.



Caustics on a floor.



Orb FX look presets.

Each recipe starts in the Orb FX Studio panel. The tables show the values the buttons set, plus any defaults the recipe depends on. Render Ink objects with **Render Ink frame (GPU)** or **Render Ink sequence**. Max's Render button does not draw them.

1. Navy ink swirl

Goal: dark blue ink curling through a glass sphere on a 9-second seamless loop.

1. Set **Ink (GPU particles, 100M+)** to **Navy Ink** and press **Create Ink Orb**.
2. Tune the look in **Render realtime (live view)**. Set the timeline to 0-269 (one loop at 30 fps), then press **Render Ink sequence**.

CONTROL	VALUE
Veil sheets / Ink drops / Volume dust	0.5 / 0.48 / 0.02
Turbulence strength / Whirlpool strength	3.6 / 16.0
Ink density / Scatter amount	10.0 / 0.12
Absorb red / green / blue	1.0 / 0.68 / 0.40
Loop seconds / Seamless loop (two generations)	9.0 / on (defaults)

Variants in the same list: **Silk Veils** (Veil sheets 0.95, Ink density 6.0) and **Swirl Globe** (Glass skin 0.55, Ink density 4.0).

2. Deep Ocean silk veil in Corona

Goal: the mesh veil inside a glass orb on paper white, rendered in Corona.

1. Set **Look preset** to **Deep Ocean** and press **Create Orb**. The new orb stays selected.
2. Press **Studio for Orb in Corona (camera + lights + white)**. With the orb still selected, press **Set timeline to one loop**.
3. Press **Render test frame (Corona)**. It renders 512 x 512 at 40 passes and saves `OrbFX_test.png` to the VanguardOrbFX folder inside Max's render output folder.

CONTROL	VALUE
Veil rest radius / Veil arc span (deg) / Veil width	0.90 / 230.0 / 0.55
Veil latitude / Pleat depth / Seed	0.30 / 0.10 / 42
Material Orb FX | Haze volume: absorption colour	16, 40, 130
Timeline at 30 fps	0-269 (frame 270 = frame 0)

3. White silk with bubbles

Goal: sheer white veils in glass on near black, with rising air bubbles.

1. Press **White silk + bubbles**. This builds two objects. **Ink petals** is a non-renderable mesh of 8 twisted sheets that turns slowly over the active time range. **White silk** is an Ink object that draws the petals as particles.
2. Press **Render Ink frame (GPU)**.

CONTROL	VALUE
Silk render particles / Silk density	40,000,000 / 0.22
Absorb red / green / blue; Scatter amount	0.35 / 0.33 / 0.3; 0.45
Falloff (fabric look: veils denser edge-on) / Falloff: density facing the camera / Falloff: density edge-on	on / 0.02 / 10.0
Air bubbles in the glass (count, 0 = off)	60
Background colour R / G / B	0.02 / 0.03 / 0.05

4. Ink poured into water around a cloth

Goal: ink poured in above the centre sinks, billows and wraps around a drifting veil.

1. Press **Create Orb**, then **Ink poured in water (fluid simulation)**.
2. Select the new **Ink in water** object. In its **Particle Silk (cloth made of particles)** rollout, pick the Orb as **Cloth source (Orb FX object or any UV mesh)**. While **The cloth is a wall in the water (Particle Silk source)** is on, the water flows around the veil. **Water moves the cloth (seconds of drift)** lets the water push it.
3. Scrub the timeline or render. The water is simulated once.

CONTROL (INK IN WATER)	VALUE
End frame (water simulated up to here)	150, or the timeline end if later
Render particles / Ink density	40,000,000 / 6.0
Source Z (radii) / Pour time (seconds)	0.3 / 4.0
Ink weight (sinks; negative rises) / Billows (vorticity) / Water stir	0.8 / 7.0 / 2.0
Ink colour R / G / B	0.1 / 0.45 / 1.0

The cloth renders on top of the water ink with **Silk render particles** at its default of 100,000,000. Lower that value for quicker tests.

5. Glass orb with caustics on a floor

Goal: focused light on the floor under the orb.

1. Press **Create Ink Orb**. Make a Plane at least one radius below the orb's centre and add it to **Scene objects to render (lit, with the ink's shadow)**.

2. In the light list, choose **Top light, dark mood** and press **Light it**. Then press **Render Ink frame (GPU)**.

CONTROL	VALUE
Caustics: the orb focuses light onto scene objects / catchers; Glass sphere	on; on (defaults)
Caustic IOR (orb filled with: 1.33 water, 1.5 glass)	1.33 (default)
Light size for caustics (degrees; bigger = softer, wider)	6.0 (default)
Self shadow / Ambient (set by Light it)	2.6 / 0.02

Only lights shining down make caustics. The floor is found from the plane's triangles within about three radii of the orb. A very large plane needs enough segments to have triangles there.

05

Rendering and export

Its own GPU renderer, compositing over your renderer, EXR passes, PRT and VDB.

The Ink renderer

Corona, V-Ray, Arnold and Scanline do not see Ink particles. The Ink has its own GPU renderer, which you run from the Studio panel:

- **Render Ink frame (GPU)** renders each Ink in the scene separately, at the current frame and the Render Setup size. Each one is saved as `renderoutput\VanguardOrbInk\<object>_<frame>.png`.
- **Render Ink sequence** writes `<object>_####.png` for each Ink into a folder you pick. It follows the Time Output range and Every Nth Frame set in Render Setup. Press ESC to stop it.
- **Render realtime (live view)** opens a window that keeps re-rendering the selected Ink (or the first Ink in the scene) as you scrub or edit. It uses the full render count and antialiasing. **Half (fast)** and **Quarter (fastest)** render it at half or quarter resolution.

All three render through the camera of the active viewport. A Perspective view with no camera renders exactly what it shows. PNG files are 16-bit sRGB with alpha. EXR files are linear and premultiplied, in half float unless **EXR full 32-bit float (off = half)** is on. BMP is 8-bit with no alpha; the live view uses it. The panel buttons always write PNG. To get EXR, select the Ink and run a command such as `$.renderSequence $Camera001 0 100 "D:/out/ink_####.exr" 1920 1080`.

TYPICAL SETTINGS	DEFAULT (RANGE)	PREVIEW	FINAL
Render particles (0 = all the GPU holds)	20,000,000 (0-2,000,000,000)	2,000,000-5,000,000	20,000,000-100,000,000
Antialiasing (1 off, 2-4 = samples per pixel side)	2 (1-4)	1	2-4
Shadow grid	192 (32-512)	192	256-384
Render Setup output size		live view at Half	delivery size

Each particle carries the density divided by the particle count, so the overall darkness does not change with the count. A low count shows the final look, only grainier. With antialiasing set to n, the renderer draws n x n times as many pixels. Silk, Swirl and Ink in Water have their own counts: **Silk render particles**, **Swirl render particles**, and **Render particles** in the Ink in Water rollout.

Over Corona, V-Ray, Arnold or Scanline

Render your scene, keep the viewport on the same camera, and press **Ink over last render**. With **Auto after Render** on, this happens after every render. The last rendered image becomes the Ink's background. If Max holds no rendered image, Corona's frame buffer is used, and after that the saved output file. The ink absorbs this background and the glass refracts it. **Background behind the orb (radii, for refraction)** sets how far behind the orb centre the image sits for that refraction. Every visible Ink renders on top, the farthest first, to `renderoutput\VanguardOrbInk\<object>_over_####.png`. The nearest Ink's file holds them all. Put objects that stand in front of the orb in **Matte objects: hide the ink, alpha 0 (holdout)** or **Occluders: hide the ink behind them, keep background**. Over a render, your render shows through both kinds.

EXR passes

When **EXR render passes (ink, glass, emission, depth, motion, normal, masks)** is on (the default), an .exr also holds these layers:

- `ink`: RGBA, the ink alone
- `glass`: the glass's reflection, highlights and fog
- `emission`
- `depth`: Z
- `motion`: u and v, in pixels
- `N`: camera-space normal
- `group`: ink, silk and swirl coverage
- `source`: Assemble sources
- `matte`: A, holdout coverage
- `density`: Y
- `glassMask`: Y

Depth, motion and density are always written as 32-bit float.

PRT

Export PRT sequence (all channels) writes `<object>_####.prt` for Krakatoa, Frost or tyFlow. It exports the selected Inks, or every Ink if none is selected, into a folder you pick. Particle counts are the render counts, and the frames follow the Render Setup range. Each file holds Position, Density and every channel ticked in **PRT export channels**. Files are uncompressed: with every channel on, 20,000,000 particles take about 1.3 GB per frame. **World space (off = object space, load with the object's transform)** is off by default. The **PRT input** rollout renders any PRT sequence. Pick any one file in **PRT file (any frame of the sequence)**; the frame number at the end of the file name follows the timeline.

VDB

VDB export has no panel button; it runs from MAXScript. `$.exportVDB 0 100 "D:/vdb/ink_####.vdb" 768` writes one `density` grid per frame, in object space, at a resolution from 32 to 1536. V-Ray's VRayVolumeGrid renders it exactly. Corona's Volume Grid renders it only faintly, which is a known limitation. Particles outside the sphere's bounding cube are not exported.

The Orb FX object

Vanguard Orb FX is a mesh that your renderer draws directly. Its material IDs are 1 glass shell, 2 haze, 3 veil front and 4 veil back. **Create Orb** assigns a matching four-slot Multi/Sub-Object material. It uses Corona Physical materials when Corona is installed and Physical Materials otherwise.

Veil density is stored as a grey vertex colour, from 0 at a soft edge to 1 in a dense fold. The Corona veil material multiplies it with a Falloff map to get its opacity. The Physical Materials do not use it; to use it in your own material, wire a Vertex Color map into the veil.

Studio for Orb in Corona (camera + lights + white) adds a camera, three Corona lights and a white environment. It also makes Corona the active renderer and switches the viewport to the new camera. Without Corona it

adds a Skylight and a spotlight on a white background. **Render test frame (Corona)** renders a 512 x 512 test image to `renderoutput\VanguardOrbFX\OrbFX_test.png`.

06

Troubleshooting and FAQ

Real problems from real installs, and their fixes.

Messages appear in the status line at the bottom of the Orb FX panel, and in the MAXScript Listener (F11) on lines starting `Vanguard Orb Ink:`. With an Ink selected, `$.inkStatus()` prints the most recent message.

Install and licence

Why does the Orb FX button say the panel files are missing? All three copies of the panel are gone. Those copies are in your user 3ds Max scripts folder, in the 3ds Max program folder and in `Program Files\VanguardFX\OrbFX`. Run the installer again, which repairs the installation.

Why does my toolbar button have no icon? A button added by an older version can show no icon. Right-click it, choose Delete Button, and drag **Vanguard Orb FX Studio** back onto the toolbar from Customize > Customize User Interface > Toolbars, category VanguardFX.

Why can setup not replace the plugin? A running 3ds Max locks the plugin file. Close every 3ds Max, or let setup close them when it asks. If setup stopped, run it again.

Why does nothing render, with "Not licensed" in the Listener? This computer has no active licence. On an unlicensed computer the licence window opens by itself when you open the panel. You can also open it with **Licence / Hardware ID** in the panel. Copy the Hardware ID (the customer panel asks for it), sign in at vanguardfx.pro/panel.php and press Download licence. Paste the whole licence into the window, both lines (the first starts with `hwid=`), and press Activate.

Does Orb FX need an internet connection? Only to get the licence. After that the licence is checked on this computer. The first time Orb FX is used in a session, and every ten minutes after that, it asks the server whether the licence was withdrawn. Without a connection nothing changes.

Speed and quality

Why is the first frame slow? When you open a scene, or change a value that affects the motion (in Ink Particles, Flow or Vortex Forces), every particle is integrated from its birth. Later frames continue from that point, and going back to a frame you have already passed is usually quick. With Ink in Water on, the first frame also simulates the water once, from **Start frame** to **End frame (water simulated up to here)**.

What does "GPU out of memory" mean, and how many particles fit? Each Ink particle needs 16 bytes on the graphics card (100 million = 1.6 GB), and Orb FX leaves 900 MB free for 3ds Max. With the Ink selected, `$.gpuCapacityMillions()` reports how many million fit now. If **Render particles (0 = all the GPU holds)** is set higher than that, the particles stream from system memory. This is slower, but they still render. Surface Swirl and Ink in Water must fit on the card. If they do not, lower **Swirl render particles**, or lower the Ink in Water **Render particles**, **Water resolution** or frame range.

Why are playback and the live view slow? Viewport playback simulates **Viewport particles**. Setting it to 20,000-50,000 makes playback lighter. The live view renders the full Render particles count. Choose Half (fast) or Quarter (fastest) in its window, or lower Render particles while you set up the look.

Why do sparse ink edges look grainy? Too few particles reach each pixel there. Raise **Render particles (0 = all the GPU holds)**: the ink stays just as dark, because **Ink density** is divided among all particles. Lowering Ink density also reduces grain, but makes the ink lighter. You can also raise **Particle size (pixels, 1 = finest)** slightly with **Particle softness (0 hard dot, 1 soft)** near 1, so each particle spreads the same ink over more pixels. Keep **Scatter amount** near its default of 0.12. In testing, values above about 0.15 gave salt-and-pepper noise at 20 million particles. When a Vanguard Ink Material is in the Particle material slot, set size, softness and scatter on the material instead.

Output

Why is the ink missing from my Corona or V-Ray render? Other renderers do not see the Ink's particles. Only its own GPU renderer draws them. Render as usual, then press **Ink over last render**, or tick **Auto after Render** to do this after every render. The result is saved in the `renderoutput\VanguardOrbInk` folder of the current project.

Why does an Ink VDB look faint in Corona? This is not solved in 0.8.2. V-Ray reads the same file correctly. In Corona, use Ink over last render instead. A VDB also holds only the sphere set by **Radius**, so particles outside it are left out.

Render Ink sequence saves PNG. How do I get EXR passes? Select the Ink and run `$.renderSequence $Camera001 0 100 "D:/out/ink_####.exr" 1920 1080` in the Listener, with your own camera, frames and size. If **EXR render passes (ink, glass, emission, depth, motion, normal, masks)** is on (the default), each frame becomes one multi-layer EXR with every pass. Only .png, .exr and .bmp file names are accepted.

Why does the tyFlow vortex script do nothing? tyFlow runs a Script operator only after you open it in tyFlow's editor and press Compile. Creating the script version (`VOrbVortexCloud mode:#script`) also needs an active licence. **Create particle cloud (tyFlow + vortex force)** in the panel uses a Force operator instead and needs no Compile.

Why does the live view show `No "close" function for undefined`, or why is nothing saved when a folder or object name is not in English? Both are bugs in older versions, fixed in 0.8.2. Install 0.8.2 over the older version.

Requirements and licence

3ds Max 2024–2027 on Windows 10/11 64-bit. Vanguard Orb Ink needs an NVIDIA GPU (GTX 10-series to RTX 50-series); the Orb FX cloth object and the forces also run on the CPU. One licence is signed for one computer and checked offline. Free 7-day trial, then bought once from vanguardfx.pro. Support: support@vanguardfx.pro.