Omnihue

Omnihue is a true-to-color reproduction technology invented by Kage Yaichiro in YE 41 that is found in paints, inks, dyes, and optional skin pigmentation. It uses photoelectric nanomachine-filled beads to represent any color in the typically visible spectrum, plus infrared and occasionally near-ultraviolet, with a refresh rate of 500 frames per second. This is often used to draw an image on virtually any surface, including animation. It can also detect light and is thus used for camera, fingerprint sensor, and touchscreen applications. Its photovoltaic properties also allow it to be used for solar panels.

History

This color system was the better of two invented by Yaichiro for use in a hypothetical Dataweave-compatible Star Army Uniform. The idea was that the uniform could use this system to display patches and rank while also altering its panel color to whatever was necessary for the soldier wearing it. This would make future modernizations simple, would eliminate the need for sewn-on patches if desired, and would simplify overall production by consolidating it into a single panel type. Early concerns over Omnihue's viability made a lower-tech variant, Varihue, see parallel development as an alternate option. Once Omnihue's technological hurdles were cleared though, Varihue was relegated to niche applications and Omnihue was green-lit for its intended role as the superior option. Additional uses were also found for Omnihue's capabilities, which further segmented it from its lesser sibling in the market.

Function and Design

Each bead holds Multi-Purpose Nanomachines, Type 39, which are configured to selectively absorb or reflect energy from the electromagnetic spectrum depending on their intended function. This energy is specifically the range including everything from radio waves to ultraviolet light. Typically, any absorbed energy is converted into electrical power to fuel the system and any light which is supposed to be seen is reflected rather than absorbed. This becomes what is seen by the viewer. The result is true-to-color reproduction rather than an approximation. The ability to selectively absorb and reflect light allows for a myriad of uses, especially when data can be gleaned from what is absorbed or reflected and handed off to an attached computer system. However, some functions are disabled at the hardware level in the nanites making up Omnihue for security and safety purposes in certain applications, and the Omnihue can also be paired to the specific devices they are meant to be used with to avoid improper use.

The sole technological 'disadvantage' compared to Varihue is that while the nanomachines typically do not need supplemental external power due to their photoelectric properties, they tend to deactivate when sealed away without any ambient energy or light. They thus appear jet black until a source is made available. After being exposed to light or radio waves, the saved image is rapidly displayed once more. This takes 2 milliseconds from exposure to restored image and is hardly ever noticeable in practice.

Due to the nature of the technology being superior to other forms of printing, which typically use subtractive color spaces, it was found to be suitable for all manner of uses in the civilian market. As such,

[Yugumo Corporation](#) will use it for other items as well. For government and military purposes, it was licensed to [Ketsurui Zaibatsu](#) for in-house production and application to existing and new technologies as needed. As such, it is possible to see equipment being upgraded to employ Omnihue's characteristics.

Applications

The roles Omnihue can fill are vast and not limited to image processing. Unfortunately, some of the roles require that the nanomachines are explicitly paired with their intended device in the case of civilian computer systems or are restricted to military purposes. This is particularly the case for sensor functionality or achieving blacks that are so dark that highlight and shadow cannot be distinguished.

Image Display

Omnihue can store data for the display of multiple images, including animations, even without an attached computer system or storage. When an external system is connected, Omnihue panels can be used as computer displays capable of up refreshing at up to 500 frames per second. It is possible to use a backlight with this technology to illuminate an image, though not required. The light wavelengths emitted, since they are true colors rather than ones based upon RGB or CYMK color spaces that rely on deceiving the humanoid eye's biology, can be seen clearly by many different races with vastly different eye structures. Infrared light also allows races like the [Separa'Shan](#) to finally employ their full-color spectrum for photography, art, and displaying other visual data.

It should be noted that most non-military uses are not capable of reflecting outside of the visible light/infrared range. This is because reflecting radio transmissions and ultraviolet light carry with them their own dangers, specifically radio interference and sunburn or eye damage respectively. Races that can see ultraviolet light, such as forms of avian life, may be able to secure Omnihue products which allow for the lower end of the UV spectrum (UVA) to be employed. This, however, is tightly regulated.

Regarding military use, camouflage employing Omnihue is inferior to volumetrics because the former can only account for a single vantage point. When two or more targets are viewing an Omnihue-based camouflage, the illusion breaks. RADAR invisibility is possible by absorbing all incoming radio waves, but it is typically not very relevant on the modern battlefield. Omnihue sees better use in absorbing as much light as possible to eliminate light and shadow from a vehicle or power armor in combat, leaving just a flat two-dimensional silhouette without cues of direction or three-dimensional shape. This can disorient an enemy relying even partially on visual cues in combat. Due to this, the range known as 'Black Hole Black' is restricted to military offerings.

Partial List of Uses in Niche:

- Text
- Photography Prints
- Artistic Paints
- Traffic Signs and Road Marking Paint
- Business Signage
- High-resolution 500 Hz Displays

- Clothing and Uniforms
- Paints for Buildings, Cars, Military Equipment, and Ships
- Programmable/Animated tattoos that can be made invisible as needed
- Variable skin color if requested as a skin pigment

Photovoltaics

Because the system can absorb ambient light for energy, this grants the ability to literally 'paint on' high-efficiency solar cells. As such, it is not uncommon for blankets, survival or camping equipment, or even painted rooftops to employ Omnihue as an emergency energy source. Many devices that have an Omnihue screen or painted case can also trickle-charge their own batteries simply by being in ambient light. Some light is typically still reflected rather than absorbed if only to prevent 'Black Hole Black' from escaping military control.

Partial List of Uses in Niche:

- Camping and Survival Gear
- Street Lights
- Roof Paint and Shingles
- Road Asphalt Additives
- Cases for Consumer Electronics

Image Detection

The ability to absorb light also leads to the ability to analyze and process visual data for a connected computer system. Not only can this serve as a general camera or optical sensor, but the ability to detect where a finger is allows for touch screen support and fingerprint reading. Things like eye-tracking are also possible depending on the computer system the Omnihue sensor is connected to. It is also possible to use the ability to absorb radio frequencies to serve as an antenna for radio reception in various devices, though transmission is typically done through alternate means. These functions are typically not accessible to the Omnihue sold in the civilian market unless the nanomachines are paired to a specific piece of hardware, and thus cannot be extracted to function outside of their intended role.

It is also possible to coat a uniform or Power Armor in Omnihue to grant a modern Nekovalkyrja or Minkan panoramic visual data through their SPINE, a capability historically known as 'skin vision' in previous incarnations of the Nekovalkyrja. This is solely restricted to military use.

Partial List of Uses in Niche:

- Cameras and other Optical Sensors
- Touch Screens
- Fingerprint Sensors
- Radio Receivers
- 'Skin Vision' Sensors on Uniforms and Power Armor (Military Only)

Secure Hard Copies

It should be noted that this system can be configured to display false information or appear blank on paper until an authentication pulse is sent to display the true contents. This is often done by the person with the pulse holding the paper to her [SPINE](#) or some future replacement for the [Star Army Communicator](#) or a uniform holding such functionality. This also works with tattoos. This is restricted to government or military use.

Production Details

- Producers: [Yugumo Corporation](#), licensed to [Ketsurui Zaibatsu](#) for government/military purposes
- Cost: Inexpensive

Properties Breakdown

- Adds the ability to program images and colors with nanoscopic precision
- Can absorb or reflect various EM wavelengths
- Non-toxic and tattoo-safe
- Retains image until reprogrammed
- Can detect EM energy and provide this data to a computer to process
- Photovoltaic
- Inexpensive to produce
- Provides no protective armor benefit on its own

OOC Notes

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