



## PolyJet Matrix™ Technology

- Simultaneous multi-material 3D printing
- Digital Materials™- composite materials fabricated on-the-fly
- Unique application opportunities
- Mixed tray capabilities
- 16-micron ultra-thin-layers
- Fine details
- Smooth surfaces
- High accuracy
- High resolution

## Simultaneous Multi-material 3-Dimensional Printing

Developing products requires multi-material combinations for maximum functionality. This vastly complicates the development process as product prototypes also must combine multiple materials in a single part.

Objet's patent-pending PolyJet Matrix™ Technology, the first technology to allow jetting of multiple materials simultaneously, fully solves this challenge. Available on the Connex family of 3D Printing Systems, this technology offers the unique ability to print parts and assemblies made of multiple materials, with different mechanical properties, all in a single build.

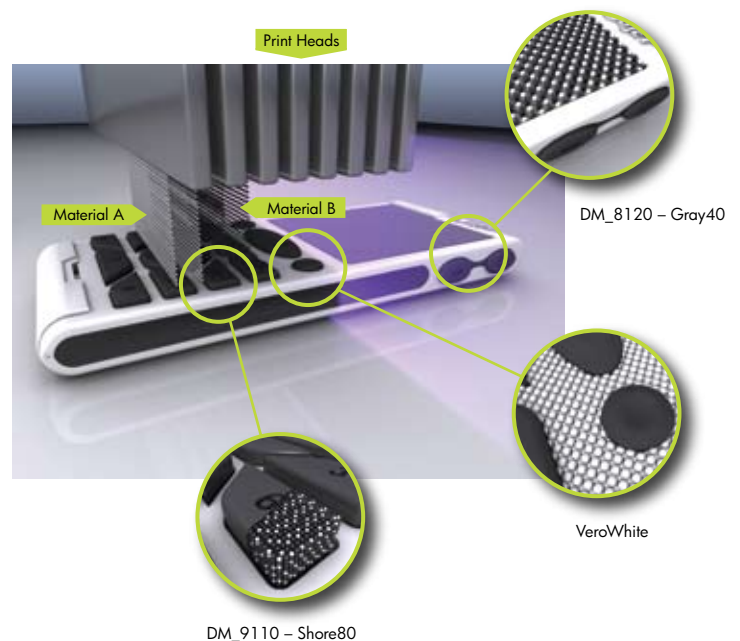
Multi-material and mixed part printing with PolyJet Matrix Technology opens up unlimited opportunities. The ability to create diverse product models enables simultaneous modeling and testing of multiple variations of a design, and cost effective modeling of products at the earliest of stages. This can dramatically reduce the risk of error, particularly when creating complex molds for double injection.

## The PolyJet Matrix Process

PolyJet Matrix Technology works by simultaneously jetting two distinct Objet FullCure® photopolymer model materials in preset combinations. The dual-jet process combines these materials to produce multi-material parts and create new composite materials, called Digital Materials™, that have the desired mechanical and physical structures. The two FullCure model materials are jetted from designated print head nozzles according to location and model type, providing full control of the structure of the jetted material and its mechanical properties.

The materials are jetted in ultra-thin, 16-micron layers onto a build tray, layer by layer, until the part is completed. Each photopolymer layer is cured by UV light immediately after it is jetted, producing fully cured models that can be handled and used immediately, without post-curing. The gel-like support material is easily removed by hand or waterJet.

Dedicated Objet Studio for Connex™ software manages the process and allows you to assign different materials, handle multi-material STL files and create files that combine different materials, assemblies and model characteristics.



## Digital Materials

Digital Materials™ are multi-phase composite materials based on a combination of different FullCure modeling materials, which are created on-the-fly using PolyJet Matrix Technology. This rich set of new materials enhances the mechanical and physical properties of the original materials, providing new values of tensile strength, flexural strength and Shore A values.

The ability to fabricate Digital Materials to provide specific properties opens up vast opportunities for many applications. It brings you much closer to realizing the final product by enabling feasibility testing and over-molding process simulation at an early stage.

## FullCure® Family of Materials

### FullCure®720

- General purpose
- Transparent

### Vero Materials

- Improved mechanical properties
- Opaque colors
- Excellent detail visualization

### Durus Materials

- Polypropylene simulation

### Tango Materials

- Rubber-like flexible
- Multiple elasticity options

### FullCure®705

- Universal Support for all model materials



## Applications



**Durable end-use parts** – Answer most of the design requirements by creating complex structures in a single build process.



**Over molding parts and double-injection process simulation** – Eliminate design restrictions and facilitate part creation with accurate look, feel and functionality.



**Labeling, texture and imprints** – Apply unique visual effects and transparency to differentiate areas of interest and create aesthetic appeal, without post-processing.



**Plugs and seals** – Create a watertight barrier or airtight seal directly on the part in one build process.



**Living hinges, gaskets and hoses** – Create parts that withstand repeated bending and flexing, with excellent elongation at break combined with very good tear resistance.



**Shock absorption and impact resistance** – For protective covering, vibration damping and improved performance.



**Coating parts** – Coat rigid material with flexible material to create a final part with specific touch-and-feel properties, flexibility and more.



**Biomedical and translucent parts** – Combination of transparent FullCure720 and opaque FullCure Vero materials enables creation of translucent medical models that show nerves, tumors and other details.

## Unique Feature Set

PolyJet Matrix Technology provides the innovative and unique opportunity to create models and prototypes with varied multiple materials in a single build. The Connex family of 3D Printing Systems uses this technology as the foundation for creating almost any complex multi-material 3D shape with unprecedented detail, accuracy, speed, and ease-of-use.

### Multi-material Parts

Multi-material parts that closely emulate the final product are printed in a single build, eliminating gluing and complex post-processing.

### Digital Materials

A wide variety of composite materials are used to create models that mimic the mechanical properties and color tones of end-products.

### Mixed Trays

To maximize system yield, varied material parts can be simultaneously created on a single tray, saving materials replacement time and enabling multiple users to build models at the same time.

### 16-micron Super-thin Layers for Smooth Surfaces

Microscopic drops are jetted in super-thin layers of just 16 microns (0.0006 inch), producing ultra-smooth surfaces regardless of geometric complexity.

### 100 to 300-micron Accuracy

High-precision printing enables builds that fit very tight tolerances of 100 microns ( 0.039 inch ) for most models and up to 300 microns ( 0.118 inch ) for all geometries.

### Durable Models for a Variety of Applications

Objet FullCure® proprietary photopolymer resins offer excellent flexibility, impact strength and transparency, producing durable models suitable for fit, form and functional parts.

### Easy Support Removal on any Geometry

Quick and simple removal of support material using a high-pressure water jet takes just a few minutes, creating finished models, ready for use, in record time.

## The PolyJet Matrix™ Advantage

### Multi-material Printing

- Simultaneous jetting of different model material types
- Composite Digital Materials™ with improved mechanical properties
- Combination of rubber-like and rigid materials, creating wide range of mechanical properties and grayscale range
- Close emulation of final products
- Saves printing and post-production time
- Reduces risk of error when creating complex molds for double injection

### Mixed Trays

- Print multiple models on single tray
- Maximizes system yield
- Save on material replacement
- Enables multiple users to use system simultaneously

### High-quality Models & Parts

- Selection of 16 or 30 micron, ultra-thin layers
- High resolution ensures smooth surfaces and fine details
- Automatic "click & build" for any geometry – simple or complex
- Thin walls – down to 0.02 inch (0.6 mm)
- High accuracy: 0.004 – 0.012 inch (0.1 – 0.3 mm)
- Slice on-the-fly

### Wide Variety of Materials

- FullCure®720, Vero, Durus, Tango
- Composite Digital Materials on-the-fly
- Wide range of applications

### Clean Technology

- Instant curing
- Fully cured, ready-to-use models
- Material packaged in sealed cartridges
- Easy machine operation
- Easy support removal
- No model-finishing required
- Office environment

## About Objet Geometries

Objet Geometries Ltd., the innovation leader in 3D printing, develops, manufactures and globally markets ultra-thin-layer, high-resolution 3-dimensional printing systems and materials that utilize PolyJet™ polymer jetting technology, to print ultra-thin 16-micron layers.

The market-proven Eden™ line of 3D Printing Systems and the Alaris™30 3D desktop printer are based on Objet's patented office-friendly PolyJet™ Technology. The Connex™ family is based on Objet's PolyJet Matrix™ Technology, which jets multiple model materials simultaneously and creates composite Digital Materials™ on the fly. All Objet systems use Objet's FullCure® materials to create accurate, clean, smooth, and highly detailed 3D parts.

Objet's solutions enable manufacturers and industrial designers to reduce cost of product development and dramatically shorten time-to-market of new products. Objet systems are in use by world leaders in many industries, such as automotive, electronics, toy, consumer goods, and footwear, in North America, Europe, Asia, Australia, and Japan.

Founded in 1998, Objet serves its growing worldwide customer base through offices in USA, Europe and Hong Kong, and a global network of distribution partners. Objet owns more than 50 patents and patent pending inventions.

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