

Design Resource

Glass Making - Purdilnagar, Uttar Pradesh

Glass - The Exquisite Material

by

Prof. Bibhudutta Baral, Divyadarshan C. S. and

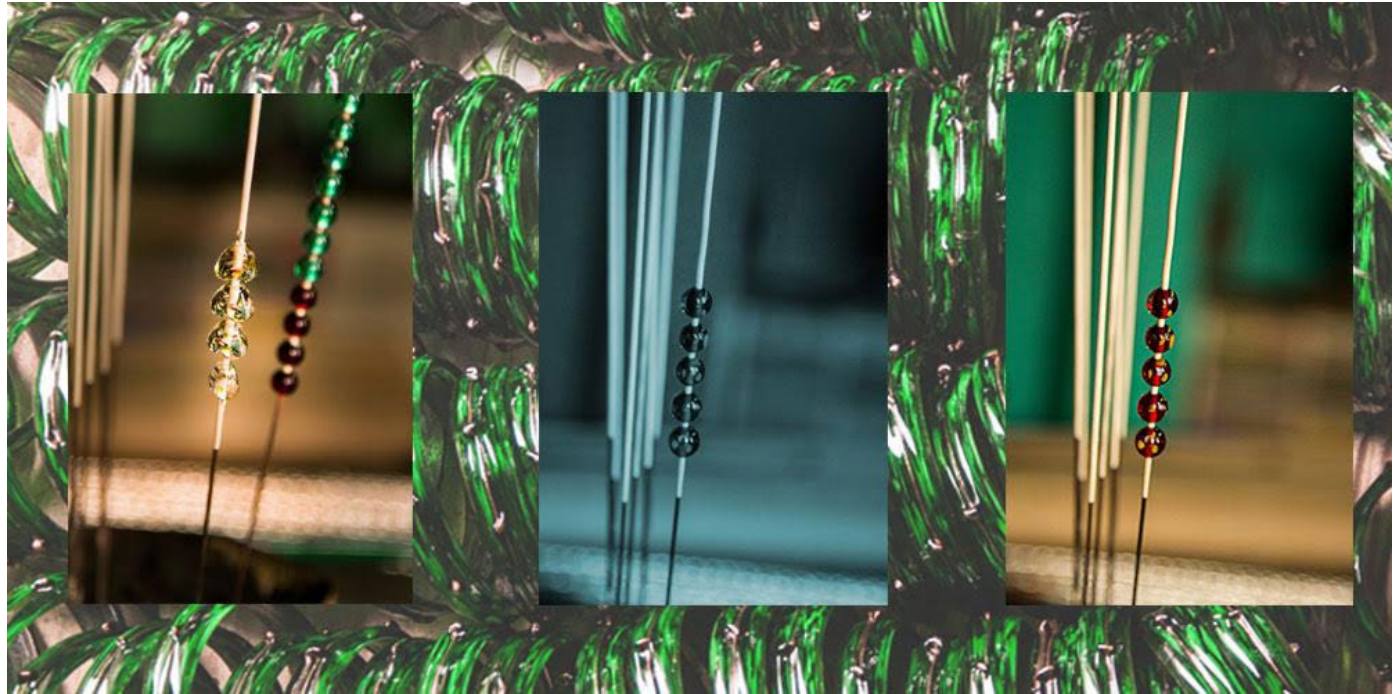
Tejesh J.

NID Campus, Bengaluru

Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh>

1. Introduction
2. Tools and Raw Materials
3. Making Process
4. Products
5. Panorama
6. Contact Details



Design Resource

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Introduction

Glass is one of the most exquisite material contrived by man. The history of glass making can be traced back to 3500 BCE in Mesopotamia, ancient Egypt. The technology of glass making was possibly an accident or a by-product of metal work. Its existence in India has been dated over 2000 years old by the archaeologist who discovered glass objects at an area near Basti in Uttar Pradesh. Glass in its decorative form was introduced in India by the Mughal rulers of northern India to make ornaments and various other decorative objects. They also mastered in making Chandeliers with unique blowing technique, besides making other decorative products like trinkets, bowls, tumblers and glass vials for perfume. Firozabad in Uttar Pradesh is the main center for such glass works in the country. Although this town produces a large variety and range of glassware in India, it has become synonymous to Bangles, where entire community seems involved in making different varieties of bangles with unique design, color and pattern.

Purdilnagar (Hathras) is a small town near the glass city of Firozabad which is famous for the production of glass beads. This 400 years old process of bead manufacturing involves the use of block glass or colorful glass rods. The delicateness of these glass beads makes the process difficult in handling that requires great amount of patience and skill.

The Glass making process in India consist of various skillful technique, some of which has not been altered. Though the decorative glass making was brought to India by the Mughals in the 17th century it is still being carried forward by the artisans of Purdilnagar and Firozabad with the same amount of antiquity and delicateness. Beads and bangles come in thousands of patterns, design and colors and are liked globally. The raw material for bangles and beads are glass, which are manufactured from glass rods and block glass, different sizes and colors are easily available in India produced in Firozabad, some special glass rods in multicolor are also imported.

Contacts:

Mr. Ishyat ji is a master craftsmen from Purdilnagar, involved in bangle making since a decade and his contact number is +91 91522555222

Mr. Sanjeev kumar is another master craftsmen working on varieties of beads and bangle making since 8years. His contact number is +91 8410953998

1. Introduction

2. Tools and Raw Materials

3. Making Process

4. Products

5. Panorama

6. Contact Details

Design Resource

Glass Making - Purdilnagar, Uttar Pradesh

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Different types of glass bangle and beads.



Various patterns of beads made out of glass.



Beautifully decorated Zari Inlaid bangles.

1. Introduction

2. Tools and Raw Materials

3. Making Process

4. Products

5. Panorama

6. Contact Details

Design Resource

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Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/introduction>

1. Introduction

2. Tools and Raw Materials

3. Making Process

4. Products

5. Panorama

6. Contact Details



Torch process where the glass meets the metal to form a bead.



Artisans working in a cluster of 10 to 15 people in a single Bhatti.



Decorative heart shaped and round beads.

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Tools and Raw Materials

Glass rods which act as the basic raw material for all kinds of glass work are transported from Firozabad. They come in different colors and sizes and some unique ones are also imported for producing special kind of beads. Beside glass rods, large chunks of glass are also used for making bangles (kada).

Raw Materials:

- **Open Furnace (Bhatti):** Open Furnace is used to melt the chunks of glass, it is maintained at a temperature around 500 to 600°C.
- **Fire Wood:** It acts a fuel for the furnace.
- **Golden Kirkira:** Also called as golden sparkle is used to give the glittering effect in the bangle.
- **Rajmahal Clay:** A layer of coating which separates the glass bead from the stick, making it easier to remove.
- **Ghee:** It is used for lubrication in the Saanch/mould.
- **Zari:** A glittering strip used to make patterns on the bangle.
- **Blowing Burner Fitted with a Pedal:** Used to melt the glass rods to make the beads.
- **Kerosene:** Used as fuel for the blowing burner.

Tools:

- **Mala:** A tool shaped as an arrow used to separate the beads from each other and also from the Sariya.
- **Tinko:** It is made out of tin which is used to feed large chunks of glass into the furnace.
- **File:** A flat iron file is used to shaper the molten glass bead on the Sariya.
- **Sariya:** Long iron mandrel used for drawing and coiling of molten glass.
- **Saancha:** It is a mold which is used to develop required shape of the glass beads.

1. Introduction

2. **Tools and Raw Materials**

3. Making Process

4. Products

5. Panorama

6. Contact Details

Design Resource

Glass Making - Purdilnagar, Uttar Pradesh

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- **Khalboot:** It is a conical spinning wheel which consists of different grooves, for maintaining uniform thickness on all sides of the bangle.
- **Unaar:** A long pin, used to slide and control the movement of the bangle ring while spun on a Khalboot.
- **Chimta:** A tong used to pull glass.
- **Kann:** It is a trowel which is used to flatten the beads.
- **Stone Slab:** Used to keep decorative glass chips, silver varak or glass powder so that the bead can be rolled in it.
- **Mala:** A tool shaped as an arrow used to separate the beads from each other and also from the Sariya.
- **Tinko:** It is made out of tin which is used to feed large chunks of glass into the furnace.
- **File:** A flat iron file is used to shaper the molten glass bead on the Sariya.



Combination of materials in solid form is used to melt and make the glass bangles and beads.

1. Introduction
2. **Tools and Raw Materials**
3. Making Process
4. Products
5. Panorama
6. Contact Details

Design Resource

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<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/tools-and-raw-materials>

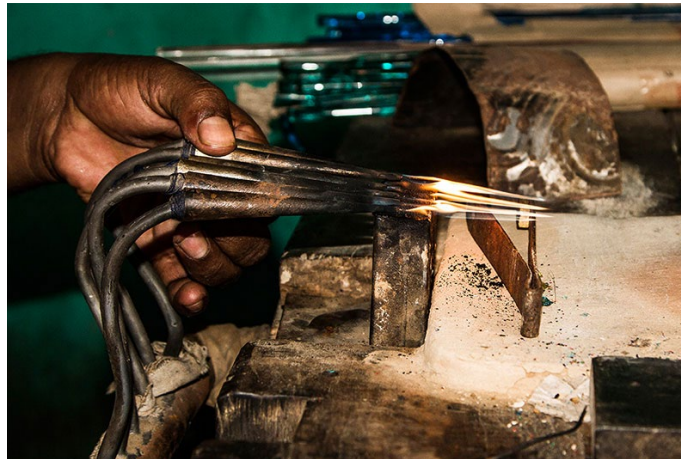
1. Introduction
2. **Tools and Raw Materials**
3. Making Process
4. Products
5. Panorama
6. Contact Details



Various designed molds are used to shape the beads.



Different types of tools and molds are used in making glass beads.



Flame torch is used to melt the glass rods while making the beads.



Waste glass pieces are recycled to make bangles or beads.

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Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/tools-and-raw-materials>

1. Introduction

2. **Tools and Raw Materials**

3. Making Process

4. Products

5. Panorama

6. Contact Details



Thin metal wire is used to loop the beads.



Rajmahal clay is applied on the metal wire which makes it easier to remove the beads.



Holders known as chimta are used to pull the molten glass.



Open furnace is used to melt the molten glass.

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Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/tools-and-raw-materials>

1. Introduction

2. **Tools and Raw Materials**

3. Making Process

4. Products

5. Panorama

6. Contact Details



Sariya and khalboot are the main tools used in glass work.



Mala, tinko and unaar are different tools used in the making process.



Small strips of silver foils are used to embellish the beads.

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Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/tools-and-raw-materials>



Strips of Zari used in the bangles.



Khalboot is tool used to shape the different sizes of bangle.



Silver leaf looped inside the beads.

1. Introduction
2. **Tools and Raw Materials**
3. Making Process
4. Products
5. Panorama
6. Contact Details

Design Resource

Glass Making - Purdilnagar, Uttar Pradesh

Glass - The Exquisite Material

by

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Source:

<http://www.dsource.in/resource/glass-making-purdil-nagar-uttar-pradesh/making-process>

Making Process



Glass Bangle Making



Bead Making Bhatti Process



Millefiori Beads



Torch Bead Process

1. Introduction
2. Tools and Raw Materials
3. **Making Process**
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. Millefiori Beads
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details

Design Resource

Glass Making - Purdilnagar, Uttar Pradesh

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<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/glass-bangle-making>

Glass Bangle Making

Bangles, often called “Choodi” in Hindi are traditionally worn by women to symbolize matrimony. Purdilnagar is one of the main centers for making of bangles using an open furnace method.

Initially the artisan places large chunks of shattered glass into an open furnace to melt it. He then uses an iron rod to make a loop of molten glass. This molten glass is then transferred to a conical wheel called Khalboot using a long iron pin locally known as “Unaar”. It is also used for maintaining a uniform thickness on all sides of the bangle. A “Khalboot” consists of grooves which are marked with different sizes for the bangles. Simultaneously during this process of shaping the bangle on a Khalboot, the bangle is rolled over a powder of golden sparkle also known as “Kirkira” to get the sparkling effect on its surface. This process of coating the surface of bangle is also done by using a glittering strip called “Zari” to form a symmetric pattern on its surface. Finally another layer of molten glass is coiled over the coated surface, and then it is again transferred to the khalboot for subsequent resizing and cooling.

Different designs are also created by the skilled artisan who work in a cluster of 15 to 16 people engaged at a single bhatti or furnace which is maintained at a temperature of around 500 to 600°C.

Purdilnagar itself comprises of 30 to 35 open furnaces producing around 500 to 600 bangles per day, these bangles are liked and worn almost every day as a tradition and it also comes as a style statement in modern times.



The furnace is being fueled by wooden logs.



Artisan's working in a Bhatti with ambience of high temperatures.

1. Introduction

2. Tools and Raw Materials

3. Making Process

3.1. Glass Bangle Making

3.2. Bead Making Bhatti Process

3.3. Millefiori Beads

3.4. Torch Bead Process

4. Products

5. Panorama

6. Contact Details

Design Resource

Glass Making - Purdilnagar, Uttar Pradesh

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Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/glass-bangle-making>

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. Millefiori Beads
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



Artisan is manually breaking the glass rods.



A Tin sheet (tinko) used to collect broken glass rods.



Different color of chunk glass is used for various colored bangles.



Chunk glass is fed into the furnace.

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Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/glass-bangle-making>

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. **Glass Bangle Making**
 - 3.2. Bead Making Bhatti Process
 - 3.3. Millefiori Beads
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



Waste glass pieces are also recycled to melt in the furnace.



Glass pieces are kept inside the furnace to obtain molten state.



Craftsmen making sure that all the raw materials in the furnace (bhatti) are melted.



A long iron rod (sariya) is used to loop the molten glass.

Design Resource

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Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/glass-bangle-making>

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. **Glass Bangle Making**
 - 3.2. Bead Making Bhatti Process
 - 3.3. Millefiori Beads
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



Molten glass collected on iron rod.



A conical spinning wheel (khalboot) which consists of different grooves.



Molten glass is transferred to the khalboot.



Molten glass taking the shape of a bangle.

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Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/glass-bangle-making>

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. **Glass Bangle Making**
 - 3.2. Bead Making Bhatti Process
 - 3.3. Millefiori Beads
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



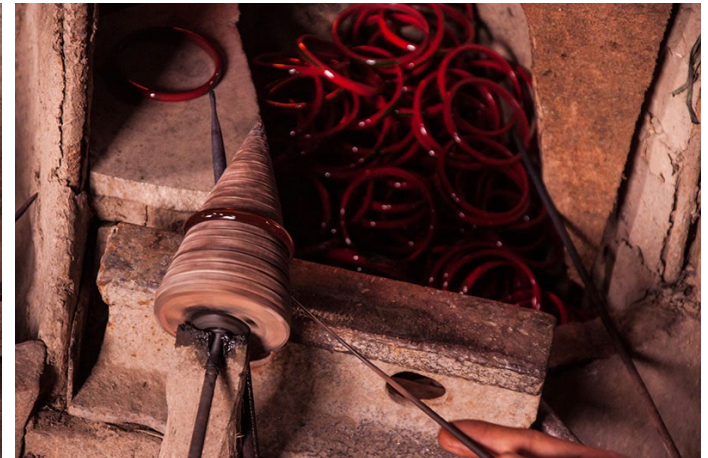
A glass bangle is being manipulated.



Bangles are pushed on khalboot, depending on the required size.



A long pin is used to slide and control the movement.



Completed bangle being taken out from the wheel.

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Glass Making - Purdilnagar, Uttar Pradesh

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Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/glass-bangle-making>

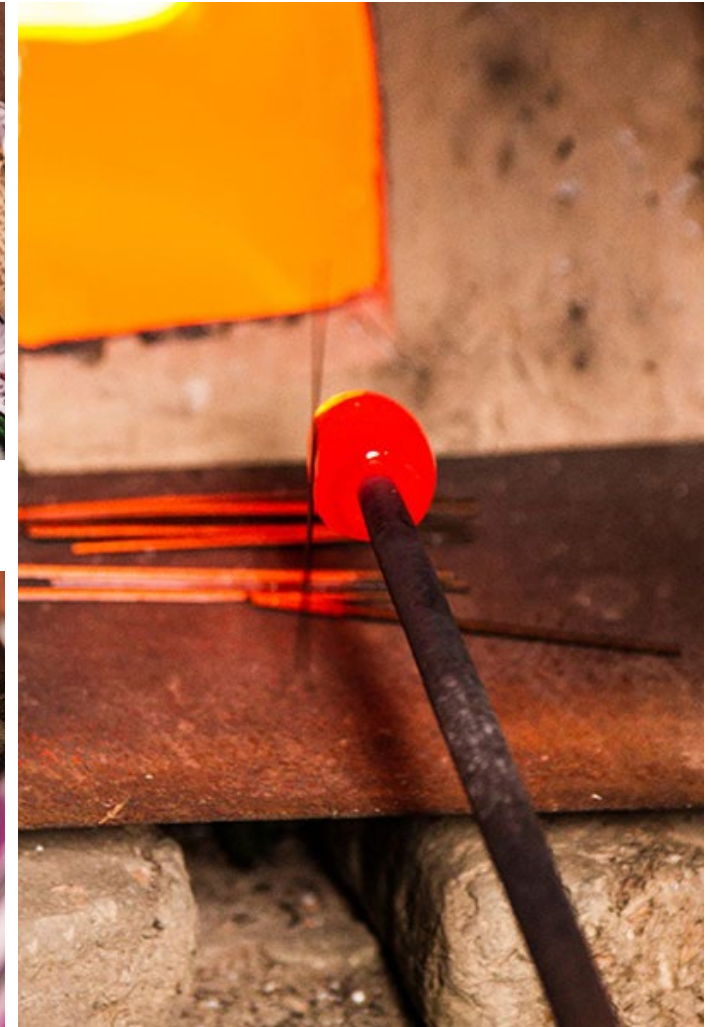
1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. **Glass Bangle Making**
 - 3.2. Bead Making Bhatti Process
 - 3.3. Millefiori Beads
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



A glittering strip used to make different patterns on the bangle.



Molten glass is looped on the iron rod.



Zari is being picked on to the molten glass.

Design Resource

Glass Making - Purdilnagar, Uttar Pradesh

Glass - The Exquisite Material

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Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/glass-bangle-making>

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. **Glass Bangle Making**
 - 3.2. Bead Making Bhatti Process
 - 3.3. Millefiori Beads
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



Zari is coiled and shaped through the help of an iron rod.



Different types of zari patterns are being done.

Design Resource

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Glass - The Exquisite Material

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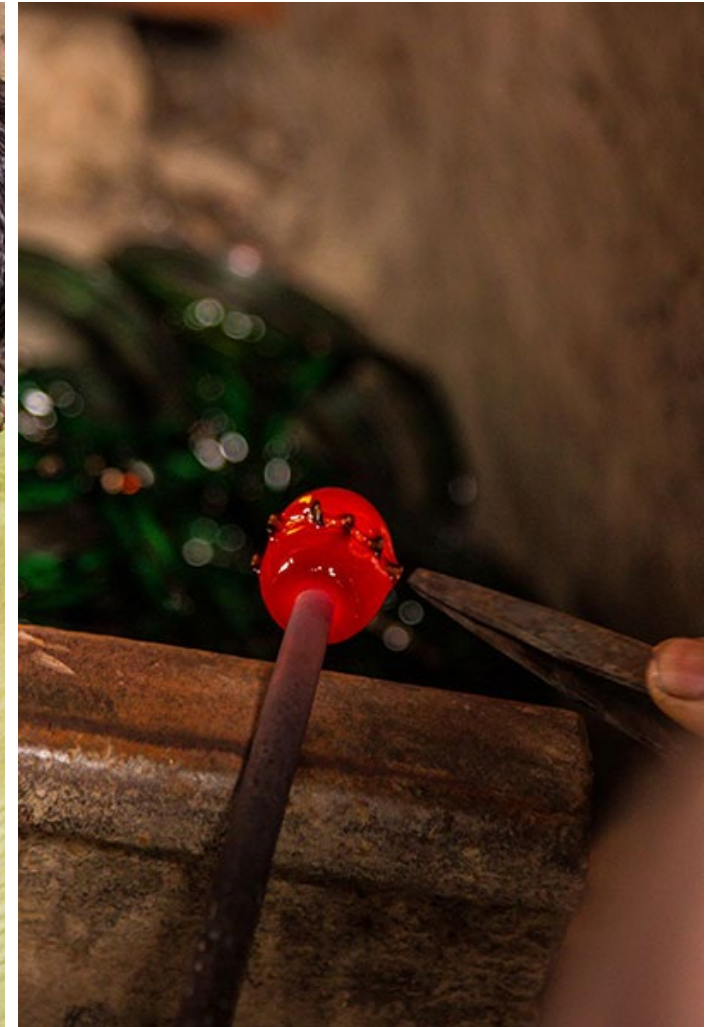
Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/glass-bangle-making>

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. **Glass Bangle Making**
 - 3.2. Bead Making Bhatti Process
 - 3.3. Millefiori Beads
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



Bangle is pressed giving uniform elasticity.



Unique pattern is being created by the artisan using a plier.

Design Resource

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Glass - The Exquisite Material

by

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NID Campus, Bengaluru

Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/glass-bangle-making>

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. **Glass Bangle Making**
 - 3.2. Bead Making Bhatti Process
 - 3.3. Millefiori Beads
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



Finally transferred on to the khalboot.

Design Resource

Glass Making - Purdilnagar, Uttar Pradesh

Glass - The Exquisite Material

by

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NID Campus, Bengaluru

Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/bead-making-bhatti-process>

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. **Bead Making Bhatti Process**
 - 3.3. Millefiori Beads
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details

Bead Making Bhatti Process

Open Furnace Method

Glass beads are also produced on a major scale using the Open furnace method. The basic process of melting and molding is same for the both the bead making technique. During this method large blocks of glass are placed in the furnace which are melted, to be looped around an iron rod or Sariya, with the help of different tools like Trowel, file are used to mold the molten glass into different shapes like cylindrical, circular and flat shaped beads.

Various designs are decided by the artisans according to the demands, he is also capable of producing a multicolor glass bead with different colors of glass rods, some of which are even grinded and polished to give an antique look to the beads. These are then finally tied in a bunch and packed for sale.



Molten glass is looped on iron stick.



The beads are shaped in cylindrical form.



The beads are covered with silver leaf.

Design Resource

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Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/bead-making-bhatti-process>

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. **Bead Making Bhatti Process**
 - 3.3. Millefiori Beads
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



Another coat of molten glass is looped on the silver leaf covered beads.



The beads are shaped in the required form.



Shaped beads are removed carefully, avoiding breakages.

Design Resource

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Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/bead-making-bhatti-process>

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. **Bead Making Bhatti Process**
 - 3.3. Millefiori Beads
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



Different color and shape beads are made with the same process.

Design Resource

Glass Making - Purdilnagar, Uttar Pradesh

Glass - The Exquisite Material

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<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/millefiori-beads>

Millefiori Beads

Making of Millefiori bead is a multi-step process which involves the production of glass canes or rods with multicolor pattern called murrine. These multi layered rods contain layers of semi liquid glass paste which is applied one on top of another, which is looped on to a cylindrical rod. These layers are molded in the shape of star or flower having different colors at each level. Once these rods are molded, they are then transferred to the furnace for further heating. The artisan then heats up this glass mixture or mold, while it is still in a molten state to bond the murine surface inside the furnace. After heating, these murine rods are subjected to constant pressure using a special kind of trowel to create a continuous Millefiori surface with no gas. In the final stage these pre heated murine rods are pulled to make a thin rod, without tampering the cross sectional design. Then these thin rods are cooled and further cut or broken down to form cylindrical beads.



Various chunks of glass.

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. **Millefiori Beads**
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details

Design Resource

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Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/millefiori-beads>

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. **Millefiori Beads**
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



A metal sheet is used to add chunks of glass into the furnace.



Glass melts at a temperatures around 1200 °C.



Molten state of glass.



A glob of molten glass is collected on a metal rod.

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Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/millefiori-beads>

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. **Millefiori Beads**
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



Artisan skillfully collecting the molten glass on the rod.



A semi-liquid glass paste is applied on top.



Molten glob is constantly rotated and pressed.



Another layer of paste of different color is applied.

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1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. **Millefiori Beads**
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



A trowel is used to create a continuous millefiori surface with constant pressure.



Homogeneous glob is cooled using normal water.



Glob is reheated again in the furnace.

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Glass - The Exquisite Material

by

Prof. Bibhudutta Baral, Divyadarshan C. S. and

Tejesh J.

NID Campus, Bengaluru

Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/millefiori-beads>

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. **Millefiori Beads**
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



Reheated glass is again pressed with a trowel.



Again reintroduced into the furnace.



Metal rod is blown to increase the stiffness of the molten glass on the other end.

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1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. **Millefiori Beads**
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



Artisan shapes the molten glob into a cylindrical form.



Then the furnace process is repeated.



Molten glass is being dipped in water.

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1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. **Millefiori Beads**
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



Craftsmen holds two ends of the molten glass.



One end is placed on a metal hook.

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1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. **Millefiori Beads**
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



The other end is stretched uniformly by two/three craftsmen in Synchronization.



Glass is stretched making sure there are no loose ends in between.

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1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. **Millefiori Beads**
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



Glass is stretched to its maximum limit.



Plier is used to hold the stretched glass.



After the glass is cooled down, it is then broken into smaller pieces.



Glass is been cut to similar sizes.

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1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. **Millefiori Beads**
 - 3.4. Torch Bead Process
4. Products
5. Panorama
6. Contact Details



Millefiori beads are also cut in a machine for uniform shape and size.

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1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. Millefiori Beads
 - 3.4. **Torch Bead Process**
4. Products
5. Panorama
6. Contact Details

Torch Bead Process

Glass rods manufactured at Firozabad are transported to Purdilnagar for the production of glass beads and bangles. Then they are manually broken into smaller rods which are easier to handle. These smaller rods are then placed on a table which is fitted with a blowing burner and a pedal below. Artisan holds the piece of wire in one hand and the glass rod in the other, then he rotates the glass slowly against the flame of the burner to loop the molten glass around the wire. At his state the molten glass is placed on the mold, which is attached to the presses operated by a pedal, to get the required shape of the glass beads. Once the bead is molded it is then cooled off to be removed from the wire, which are coated with a fine paste of clay, making the glass beads easier to be separated from the wire.



A mixture of clay is mixed in a proportion.

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1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. Millefiori Beads
 - 3.4. **Torch Bead Process**
4. Products
5. Panorama
6. Contact Details



Clay is applied on the metal wire.



Furnace is prepared for the process of glass beads.



Flame which is directed are also controlled by a pedal below.



Glass rod is melted to form a coil along the metal wire.

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<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/torch-bead-process>

1. Introduction

2. Tools and Raw Materials

3. Making Process

3.1. Glass Bangle Making

3.2. Bead Making Bhatti Process

3.3. Millefiori Beads

3.4. **Torch Bead Process**

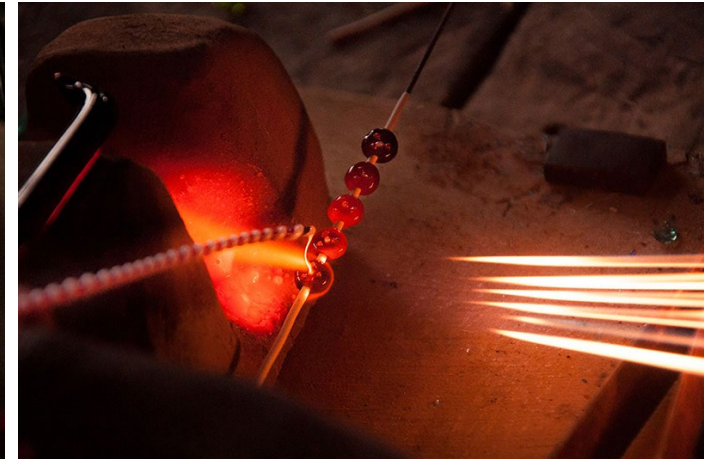
4. Products

5. Panorama

6. Contact Details



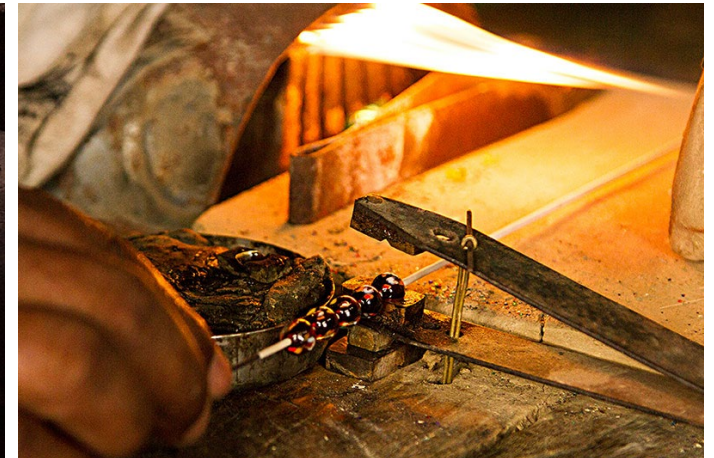
Molten glass being looped.



Beads being decorated with embellishment.



Bead is first dipped in ghee for lubrication.



Glass bead is kept on the mold and pressed.

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1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. Millefiori Beads
 - 3.4. **Torch Bead Process**
4. Products
5. Panorama
6. Contact Details



Small strips of silver foil is rolled on clay applied metal wire.



Glass is being melted to be looped on the wire.



Molten glass is looped and taking a shape of a bead.

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<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/torch-bead-process>

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. Millefiori Beads
 - 3.4. **Torch Bead Process**
4. Products
5. Panorama
6. Contact Details



Torch process involves a lot a patience and experience.

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<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/torch-bead-process>

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. Millefiori Beads
 - 3.4. **Torch Bead Process**
4. Products
5. Panorama
6. Contact Details



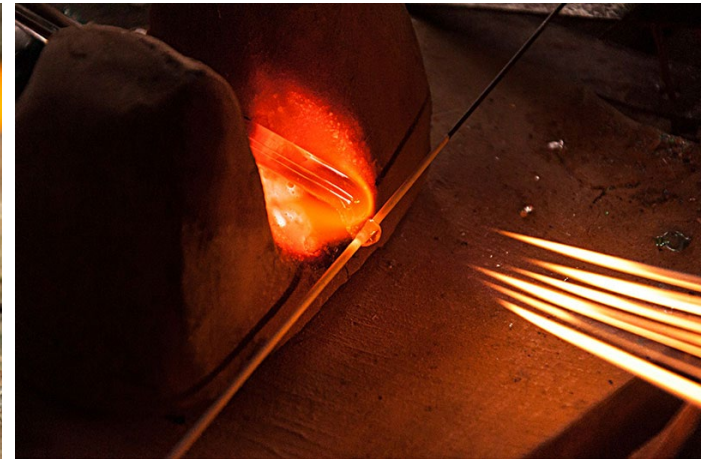
Every bead is dipped in Mold to get the required shape.



Finished glass beads kept for cooling.



Transparent glass rod is melted in high temperatures.



Glass bead being coiled on to the metal wire.

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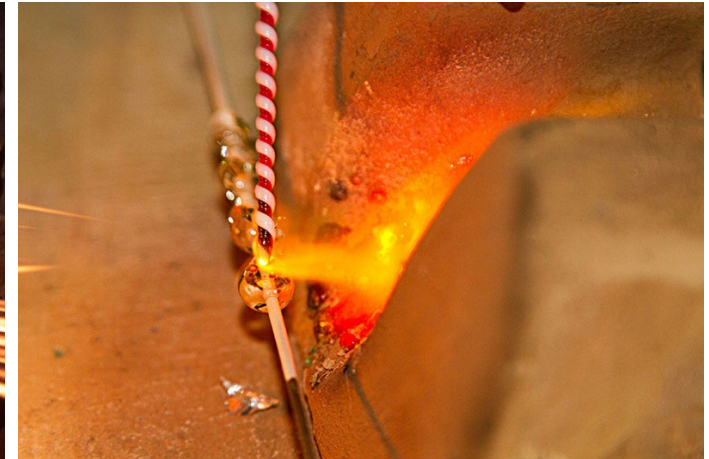
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<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/torch-bead-process>

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. Millefiori Beads
 - 3.4. **Torch Bead Process**
4. Products
5. Panorama
6. Contact Details



Different types, patterns of glass beads can be made depending on the craftsmen.



Two layers of molten glass are usually applied on the designed bead.



Glass bead taking the form a heart shape through the mold.



Heart shaped mold pressed on the bead.

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Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/making-process/torch-bead-process>

1. Introduction
2. Tools and Raw Materials
3. Making Process
 - 3.1. Glass Bangle Making
 - 3.2. Bead Making Bhatti Process
 - 3.3. Millefiori Beads
 - 3.4. **Torch Bead Process**
4. Products
5. Panorama
6. Contact Details



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Products

Glass offers great flexibility for shaping into a wide range of products, each carrying different design, color and appearance, it could be painted and engraved in the form of a bead. It can even be beautified with glitter to make the glass beads more attractive and appealing to the masses. Glass beads produced at Purdilnagar are exported to all over the world to be used in all kinds of items including clothing, accessories, jewelry, shoes, curtains, necklace and other decorative items.

Depending upon their manufacturing process, the different types of glass beads are:

- Blown Glass Beads.
- Millefiori Glass Beads.
- Furnace Glass Beads.
- Heart Glass Beads.
- Oval Glass Beads.
- Round Glass Beads.
- Transparent Glass Beads.

Bangles (Kada) are mostly associated with women because it is customary for ladies to wear bangles from their childhood for ornamental decoration, bangles are very fragile in nature, and comes in different designs and patterns, due to the increase in demand for bangles various new designs and techniques have evolved to make the market of glass bangles more vivid and attractive for its customers all over the world.

Depending on the designs and patterns, different types of bangles are:

- Plain Bangle.
- Zari inlaid Bangle.
- Golden Kirkira Inlaid Bangle.

1. Introduction

2. Tools and Raw Materials

3. Making Process

4. Products

4.1. Glass Bangle

4.2. Bhatti Beads

4.3. Millefiori Beads

4.4. Torch Beads

5. Panorama

6. Contact Details

Design Resource

Glass Making - Purdilnagar, Uttar Pradesh

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Glass Bangle



Bhatti Beads



Millefiori Beads



Torch Beads

1. Introduction

2. Tools and Raw Materials

3. Making Process

4. Products

4.1. Glass Bangle

4.2. Bhatti Beads

4.3. Millefiori Beads

4.4. Torch Beads

5. Panorama

6. Contact Details

Design Resource

Glass Making - Purdilnagar, Uttar Pradesh

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by

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Glass Bangle



Traditional glass bangles worn specially by married women.



Golden color hand painted glass bangles.



Varying sizes of glass rings.



Artistic glass work of the craftsmen.

1. Introduction

2. Tools and Raw Materials

3. Making Process

4. Products

4.1. Glass Bangle

4.2. Bhatti Beads

4.3. Millefiori Beads

4.4. Torch Beads

5. Panorama

6. Contact Details

Design Resource

Glass Making - Purdilnagar, Uttar Pradesh

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Source:

<http://www.dsource.in/resource/glass-making-purdil-nagar-uttar-pradesh/products/glass-bangle>

1. Introduction
2. Tools and Raw Materials
3. Making Process
4. Products
 - 4.1. **Glass Bangle**
 - 4.2. Bhatti Beads
 - 4.3. Millefiori Beads
 - 4.4. Torch Beads
5. Panorama
6. Contact Details



A unique decorative item created by the artisan.



Glass bangles of different sizes.



A different pattern of zari inlaid in the bangle.

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1. Introduction

2. Tools and Raw Materials

3. Making Process

4. Products

4.1. Glass Bangle

4.2. **Bhatti Beads**

4.3. Millefiori Beads

4.4. Torch Beads

5. Panorama

6. Contact Details

Design Resource

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Millefiori Beads



Different layered millefiori beads used in various ornaments.

1. Introduction
2. Tools and Raw Materials
3. Making Process
4. Products
 - 4.1. Glass Bangle
 - 4.2. Bhatti Beads
 - 4.3. **Millefiori Beads**
 - 4.4. Torch Beads
5. Panorama
6. Contact Details

Design Resource

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Glass - The Exquisite Material

by

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Source:

<http://www.dsource.in/resource/glass-making-purdilnagar-uttar-pradesh/products/millefiori-beads>

1. Introduction
2. Tools and Raw Materials
3. Making Process
4. Products
 - 4.1. Glass Bangle
 - 4.2. Bhatti Beads
 - 4.3. **Millefiori Beads**
 - 4.4. Torch Beads
5. Panorama
6. Contact Details



Various colors of glass material used for beads of different patterns.



Varieties of millefiori beads.



Mosaic beads in various shapes and sizes.



Several color blend beads for different end use.

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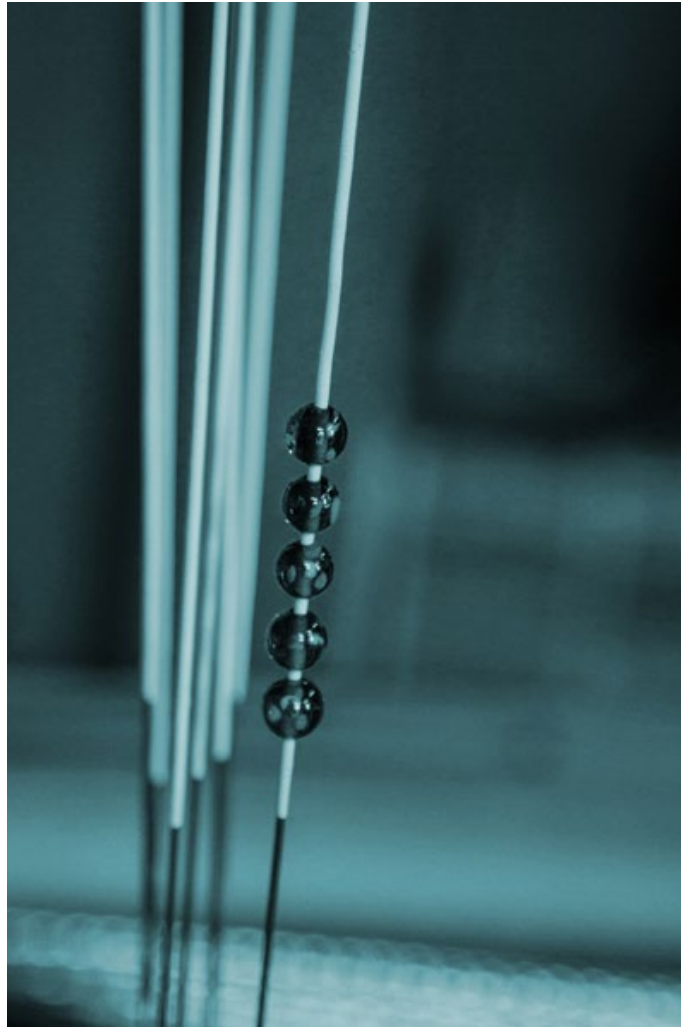
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Torch Beads



Round shaped beads which are largely used in handmade craft articles.



Different shapes of beads, which is ideally used in different purposes such as imitation jewelry or fashion accessories.

1. Introduction
2. Tools and Raw Materials
3. Making Process
4. Products
 - 4.1. Glass Bangle
 - 4.2. Bhatti Beads
 - 4.3. Millefiori Beads
 - 4.4. **Torch Beads**
5. Panorama
6. Contact Details

Design Resource

Glass Making - Purdilnagar, Uttar Pradesh

Glass - The Exquisite Material

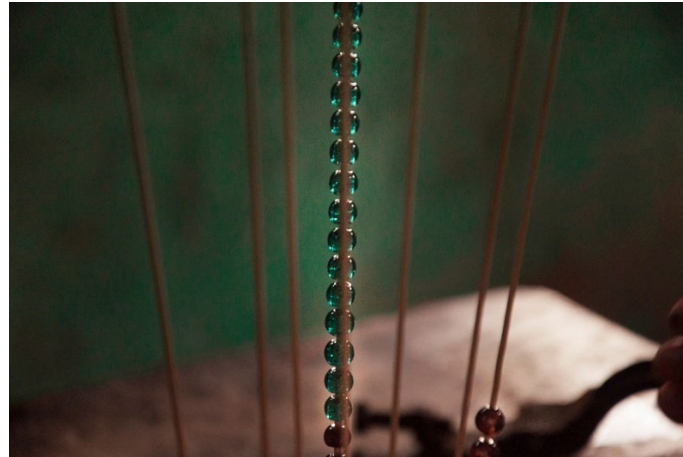
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Glass products made on the metal wire applied with clay to avoid sticking of glass.



Flat beads which are used in key chains, anklets and various other purposes.



Beads of glass link together on the fabric as per the design pattern to enhance the ornamentation.

1. Introduction
2. Tools and Raw Materials
3. Making Process
4. Products
 - 4.1. Glass Bangle
 - 4.2. Bhatti Beads
 - 4.3. Millefiori Beads
 - 4.4. **Torch Beads**
5. Panorama
6. Contact Details

Design Resource

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1. Introduction
2. Tools and Raw Materials
3. Making Process
4. Products
5. **Panorama**
6. Contact Details

Design Resource

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1. Introduction

2. Tools and Raw Materials

3. Making Process

4. Products

5. Panorama

6. **Contact Details**