Design Resource

Glass Beads - Varanasi

Decorative Objects

by
Prof. Bibhudutta Baral and Sandhya B.
NID Campus, Bengaluru

Source:
https://dsource.in/resource/glass-beads-varanasi

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2. Tools and Raw Materials
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Introduction

Beads are small decorative objects that have a see-through hole, they have been witnessed dating back to three thousand years and are one of the oldest forms of art. In earlier days they were also used for trade purposes. The very early manufacture of beads is accounted to be in Europe and the use of beads was most observed in West Africa, as neckpieces, bracelets and more. There are various shaped beads- spheres, oval, tube-shaped, square or even cube and seed beads (that is called for uniformly spheroidal beads). Antique beads are of great importance as it helps to study the composition and the sources used earlier to make beads. The beads are often seen with ornamental qualities and are made out of various media. They are seen in various forms and sizes ranging from a millimeter to a centimeter in materials such as stone, shell, wood, bone, plastic, glass or pearl. Beads are known for their decorative assets, they are used as jewellery and embellishment for clothing mostly.

Beads in India have played a vital role. There is a constant movement in the field of bead making, trading and the use of beads. There are various ancient centers in India for bead making and its trades. These centers have produced beads, gems and valuable ornaments which have been evidenced to be exported to distant places. Among the various materials used for making beads, there is an emergent demand for glass beads. One of the interesting places where talks of glass bead making and transporting in particular witnessed are Arikamedu, Puducherry, where the presence of Roman and Tamilnadu trade relation is observed. The presence of beads dates back to Roman times. Glass beads out of all the other kinds of beads are a good sign of trade and spread of bead making knowledge. Over the years bead making has transformed and bead making at present is carried out in bulk production where it includes machinery work mostly. Glass beads are manufactured in many ways, there are more than three methods where one can adopt to produce beads, among which are handmade beads, pressed beads and tube grinding method. One of the well-known glass beads manufacturers is Banaras Beads Limited, a government recognized export house, in Varanasi. The company is in the business and has grown over the last ten years. It stands out among all the others and is the biggest in the trade. The company has well-equipped machines that carry out standard performance and quality maintenance is ensured. The company is specialized in manufacturing fashion jewellery and all other types of related accessories. The beads are made by tube cutting or glass melting ways that go through washing and getting polished after. There are numerous kinds of beads produced and they have multiple cards displaying the variety of beads. There are Bugle beads, Chatons, Crystal beads, Delica beads, Faceted beads, flatbacks, Hex cut and more.

The beads are polished, faceted or matt finished, they come in various sizes, and some are hand-painted with imported acrylic colors. Beads are available in shades of opaque, transparent, luster, rainbow and pastel colors. The artist paints on the beads with a thin brush, another way is that the glass rods are melted and rolled to form a bead, and another rod is heated and the bead is decorated without actually having to paint on it. There are several handicrafts that are seen at Varanasi among which Banaras beads are well-known and are exported to foreign countries as well. The technique that is seen at Varanasi is called lamp winding making it stand out in which

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glass is altered to rods. They are melted at a small source of heat generally a hand torch or bench burner that looks similar to a lamp hence the name lamp winding. The glass is wound onto the mandrel and is shaped when it is still hot, the beads are decorated with the help of glass sticks. The price range and the quality of beads are maintained to retain strength in the business. The Banaras Beads Limited exports beads to European countries- Germany, United Kingdom, Russia and also to South Africa and USA. Beads are available at markets as strings and also at loose. Price ranges from INR 90 to INR 1900 per kilogram. Few facet designs are inspired by the diamond cuts. Bead sticking powders are used to attach the beads to the facets machine which is locally called as Chap-ari (mix of resin). Emery powder (Aluminium oxide), Sulphuric acid and nitric acid are used while polishing and washing beads. 700 to 800 employees work at Banaras Beads Ltd and the company also focuses on the welfare of women. Earlier about the beads, they were only plain round beads. Now there are countless shapes and forms. New colors and designs are adapted. There are endless designs to follow. The colors that are not available within the country are imported from China in order not to lose the orders and to satisfy and sustain the orders. In this way, the business of beads is saved and ongoing.

Map showing the holy city of Varanasi in north India on the banks of river Ganga in the state of Uttar Pradesh.

Bird view of A-1, Lehertara Industrial Estate, Varanasi, Uttar Pradesh.

Final Assembly & Quality Control area.

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Glass beads catalogue chart.

Glass beads with their sizes.

Swarivski faceted round beads.

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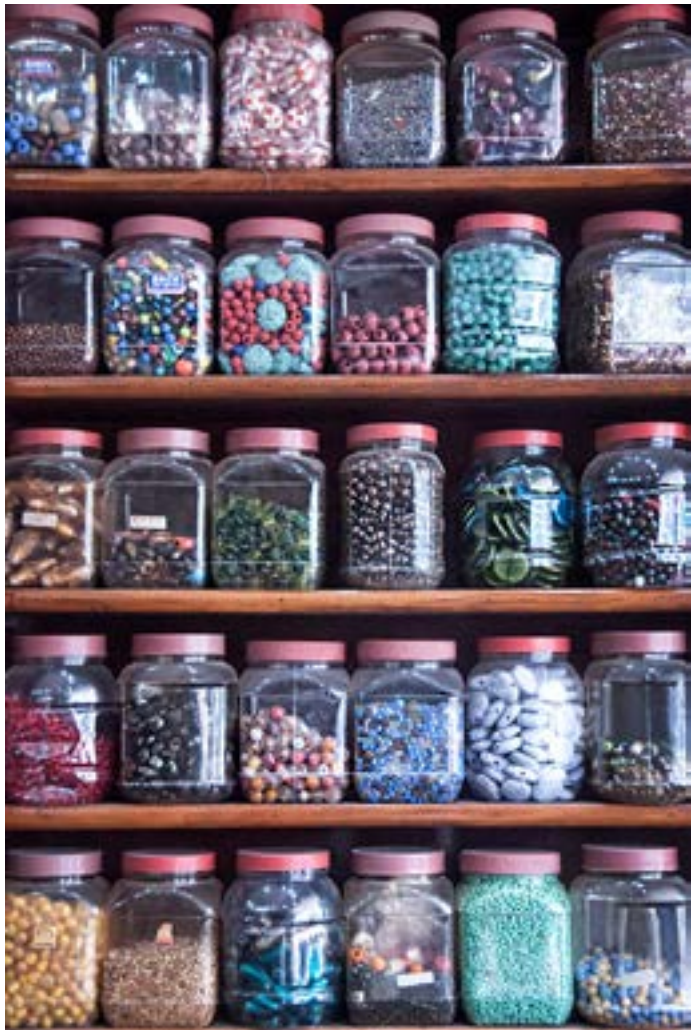

Mechanized produced and polished beads.

Mr. Gupta, Asst. Manager, Banaras Beads ltd.

Mr. Ateek Agrawal, Asst. Manager, Banaras Beads ltd.

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Tools and Raw Materials

The tools that are used to produce glass beads:

- **Mandrels:** Mandrels help to roll the melted glass to a bead.
- **Mandrel Release:** It is used to avoid sticking of glass on the mandrel.
- **Tube Cutting Machine:** It helps to cut the glass tubes into beads.
- **Electric Furnace:** It helps to melt the glass rods.
- **Grinding Machine:** It is used to dye the beads and also to wash with water.
- **Faceting Machines:** It is used to give facets to beads.
- **Weighing Machine:** It is used to measure beads in kilograms.
- **Marver:** It is used to roll hot glass in shape.
- **Dyes:** the beads are dyed with certain coating colors.
- **Colors:** Imported colors are used to paint the beads (pebeo).
- **Brushes:** Zero brushes are used to paint on the beads.
- **Bench Burner:** It is used to get stationery flame that helps to melt glass.
- **Molds:** Glass is pressed in graphite molds when it is hot.
- **Hand Torch:** It helps to melt fine glass sticks while designing on beads.
- **Paddle:** A graphite or metal marver attached to a handle that helps to shape a bead.
- **Shears:** Steel shears are used to cut the hot glass.
- **Lathe:** The glassworking lathe allows for precise rotation and manipulation of glass.

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Pebeo glass paints.

Sulphur powder in raw form.

Sulphur fine powder for polishing beads.

Glass rod pieces purchased from Firozabad.

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Resin powder used in proportion while polishing glass beads.

Weighing machine for checking the weight of finished goods.

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Air gun used in industries for cleaning finished products.

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Making Process

The making of glass beads can be accomplished in many methods, a few of which are handmade, tube cutting or pressing. The beads are produced in bulk with the help of well-equipped machines. The glass is melted and made into tubes or rods. The collection of certain glass tubes or glass rods is sometimes imported from China. The glass tubes and glass rods are often transported from the Firozabad factory and Purdilpur. Glass tubes have a hole which is why they are called tubes and glass rods are solid rods with no hole at the centre of the rod. The glass tubes are not melted while working with them. The glass tubes are put into a machine where they are cut into beads. The glass tubes are put into a bead cutting machine and the beads fall out from the machine and get collected. They are washed in water. Emery powder (aluminium oxide), Sulphuric acid and nitric acid are used while polishing and washing beads. In the first machine where the beads are washed emery powder of numbers, 600 and 1200 are used. The machine is run for seventy-two hours after which the machine is run for two hours again with nitric acid. The beads are washed and it takes twelve hours to dry. Then it is sent to the polishing section where sulphuric acid and safed (white) powder is added to the machine. This machine is also run for seventy-two hours and the process of polishing is complete. Working with glass tubes is an easy-go in gas it consumes less power and manual work. While the glass tubes are of cold process, the glass rods are often melted and pressed to make beads or they are melted and worked on them creating designs by hand. The glass rods are melted at high temperatures, melted glass rods are pressed with the help of a pressing machine. There are many sections such as glass tube godown, production section, tube cutting section, beads washing section and packing sections where respective works are carried on. Beads that are produced are dyed with help of coating dyes in a grinder. They are allowed dry and sent to the packing sections. Beads are filtered, they are sorted with the help of a sieve, the scrap beads are collected in a separate container, good ones or appropriate beads are divided into three groups and are sent to the polishing sections where they acquire luster, rainbow or other finishing. The beads are named according to their appearance- Round rocailles, 2cut beads, luminous, inside colors, fancy, metallic, dyed silver lines, transparent colors, and transparent Silver lines, transparent luster, opaque luster, Ceylonese, and so on. There are set of faceted beads which get colored. Faceted beads are beads that get cut like the one in diamonds followed by something like Tolkowsky. The colors used to paint on the faceted beads are transparent water-based colors. A few of them are Bengal Pink, Shimmer Bright Orange, VEL White, and Sun Yellow.

The beads are handmade- the glass rods are melted under the fire set up (bench burner) and the melted glass is pulled with a steel wire (mandrel) from one end, a small glass stick (cane) is made by pulling the melted glass to a length, this helps while designing the bead when making it all by hand. The melted is wound to a steel rod (mandrel) under the fire. There is a mold with dye color, after rolling the melted glass onto a steel wire it is rolled in mold with dye color this shapes the bead to a round shape and also the bead gets colored. The small sticks of glass are used to design the beads. On top of the round beads, dots are placed they are pressed with a flat tool to flatten the bubble and another round of dots are placed on the flattened design. Likewise, many designs are made with good color combinations which are very attractive. The melted glass after rolling to steel wire can also

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be pressed and shaped in molds when the glass is still hot. Handmade glass beads are final products where that do not undergo a washing or polishing process.

Machine-made Beads

1. The glass is melted to make glass tubes and glass rods.
2. The glass tubes are put into glass tube cutting machines to make beads.
3. The beads are sent to the beads washing section. It is washed for 72hrs with emery powder.
4. The beads are washed again with nitric acid for 2hrs and dried for 12hrs.
5. Beads are polished with Sulphuric acid and Safed powder for 72hrs (polishing).
6. The polished and finalized (filtered) beads are sent to the packing section.

Handmade Beads

1. The glass rods are melted and pressed in glass pressing machines to make beads.
2. The glass rods are melted, and pulled with a tip of a mandrel to make fine glass canes.
3. Again the glass is melted and rolled onto a mandrel (steel rod with mandrel release).
4. Mandrel is rolled in a mould to shape the glass into a bead and also dye it.
5. Small glass canes are used to make designs on glass beads.
6. The glass beads can be pressed in moulds when it is hot to make a variety of designs.

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Guthai Section

Handmade Bead Section

Faceting Crystal Beads Production Section

Press Bead Section

Tube Cutting Section

Washing Section

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Bead Shorting Section

Bead Spay and Painting Section

Packaging Section

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Guthai Section

Accounts department of Guthai section.

Raw Material Storage.

Raw Material - Glass rod pieces.

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Raw material of glass rods in various shades for plain single color bead.

Generally export order beads are of primary and secondary colors.

Many times colors are selected as per the customer's requirement.

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Generally raw material weight upto 2 kgs for a bundle.

Raw material of millefiori Glass rod pieces.

Millefiori glass beads has special making process.

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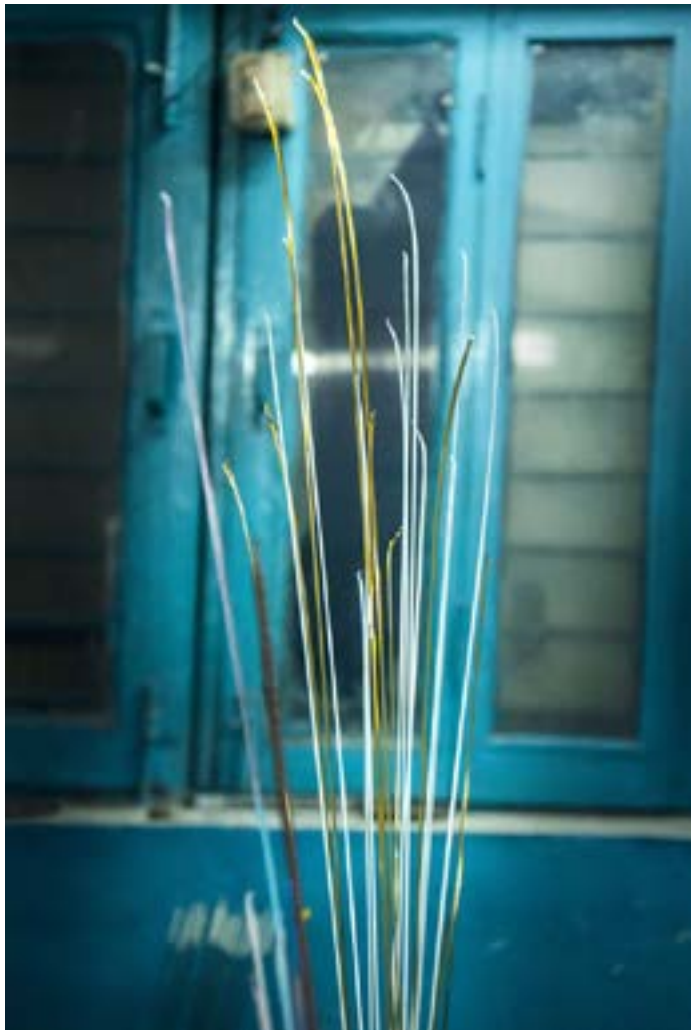
Handmade Bead Section

Artisan pulling the molten blob into a long string of glass.

Artisan can make 3 to 4 feet of glass stringer.



Glass stringers are used to decorate beads.

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Glass bead is kept on the mold to get bicone shape.

Beads are wind to give double shades.

Beads are heated to combine colors.

Beads being decorated with long string of glass.

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Beads are designed with Round spacer shape.

Artisan using Marver Paddle for bead shaping.

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Dotted black patterns of glass beads can be made depending on the craftsman.

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Glass bead being coiled on to the metal wire.

12mm size of dotted black lampwork rounded glass beads.

12mm size of dotted green lampwork bicone shaped glass beads.

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Faceting Crystal Beads Production Section

Un-polished rounded beads for faceting process.

Rounded beads are arranged in faceting machine frame.

Resin powder.

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Artisan put the beads frame in the machine.

Burning the crystal beads, so the resin powder will hold the beads very tight.

Sticking the resin powder to the outside part of the beads.

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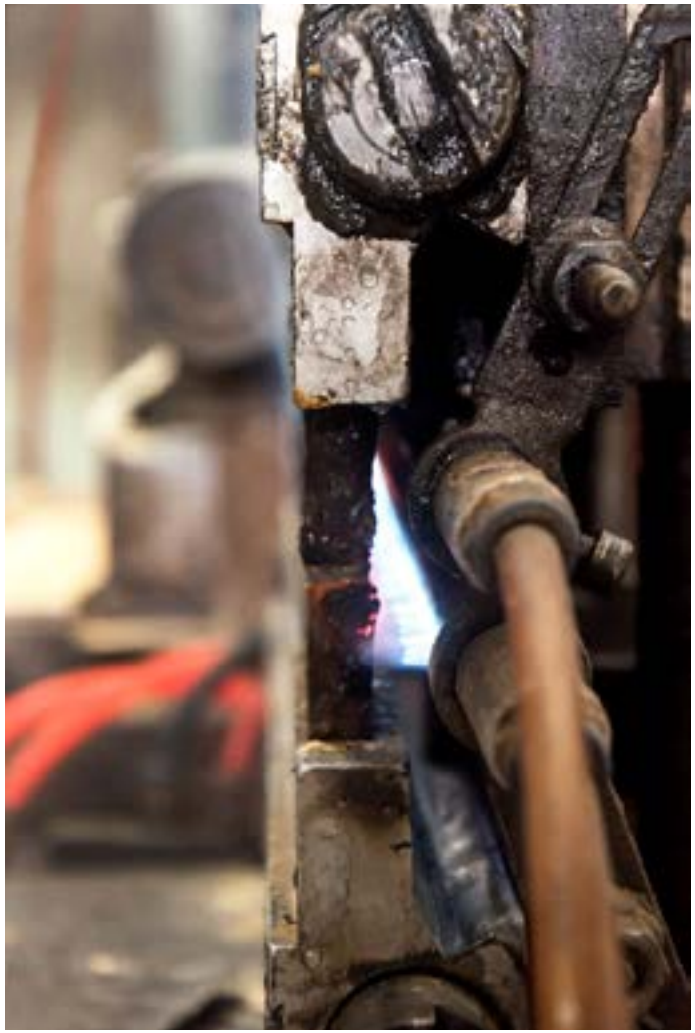

Burning the crystal beads, so the resin powder will hold the beads very tight.

Resin powder is stuck to the outside part of the beads.

The worker check carefully if all the beads sticked to the mould.

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Artisan washes the frame and cleaning with an air-blowing gun.

Resin powder is stuck to the outside part of the beads.

Faceted crystal beads making machine.

The proper quantity of these mould (stick with beads) in the auto faceted machine.

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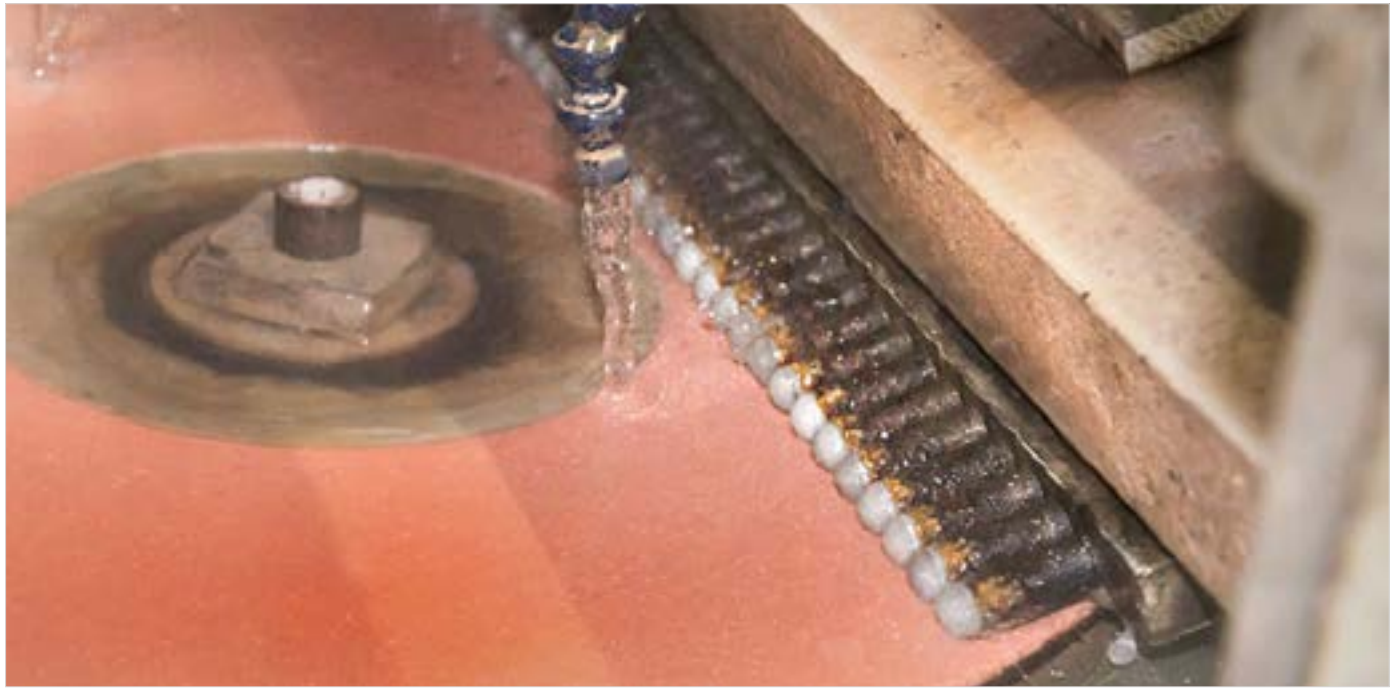
Artisan operates the auto faceted machine as per design requirement.

The auto machine cut the half part of the beads.



Another polish plate to polish the beads.

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Glass Beads - Varanasi

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Source:
https://dsource.in/resource/glass-beads-varanasi/making-process/faceting-crystal-beads-production-section

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The auto machine cut the half part of the beads, in the meantime, put another polish plate to polish the beads.

Finish the half part, take the beads out of the machine.

Artisan removes the crystal beads from the frame.

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Source:
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Press Bead Section

A bunch of glass rods are heated into the furnace.

Manually stamped by two opposing molds.

Generally, 450-500 degrees temperature is maintained.

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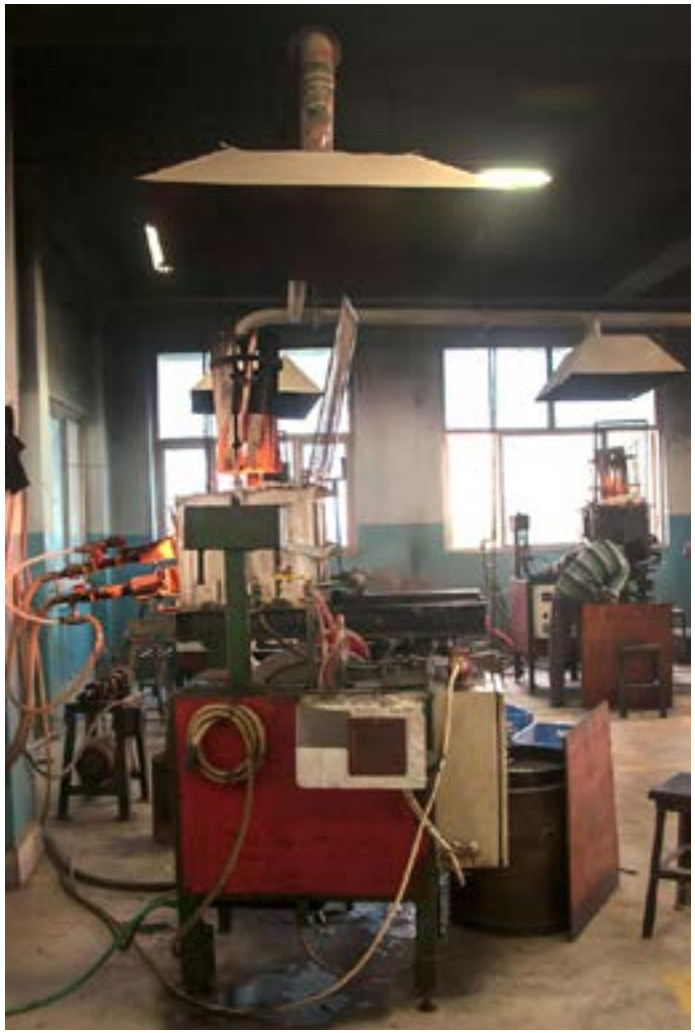
Manually stamped by two opposing molds.



Gas powered machine.

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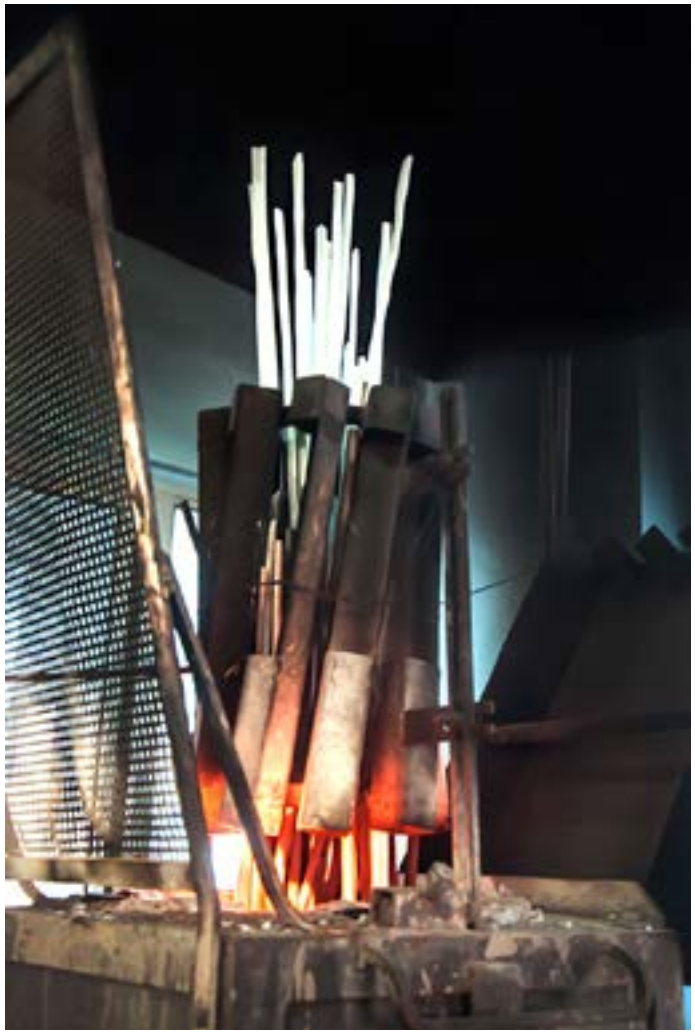
Under craftsman's observation hot pressed shapes are collected in the vat to cool.



The Glass rods are entered into this pressing machine at the top.

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Source:
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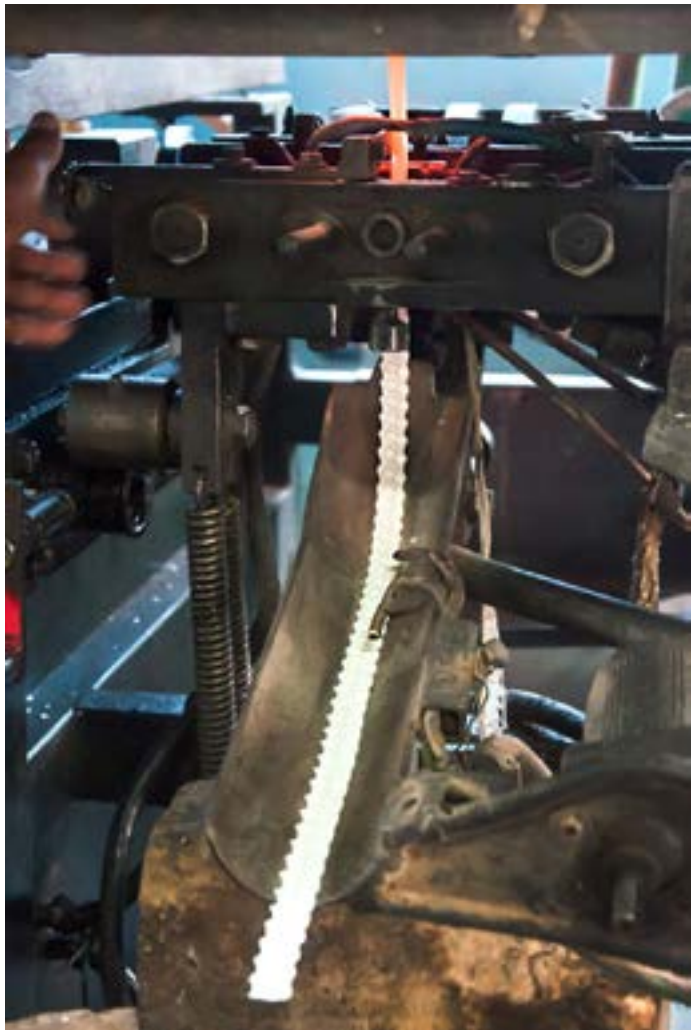
The rods enter the kilin area, the glass melts.



As the hot glass leaves the kiln, it is stamped or pressed by two opposing molds.

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Source:
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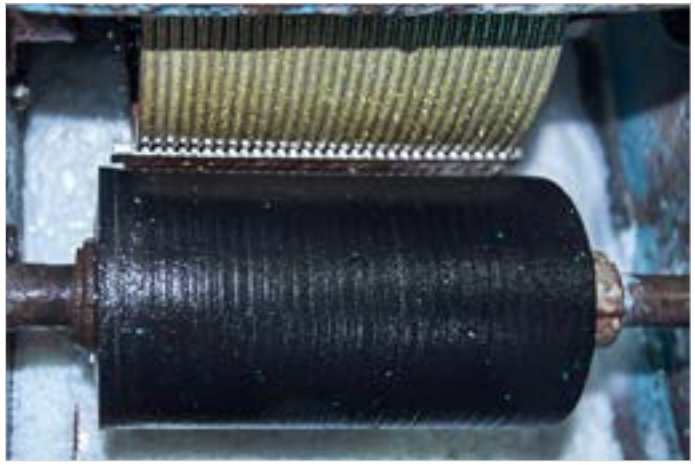
Tube Cutting Section

Tube cutting section.



Diamond coated grinding wheels.

Piling of glass rods.

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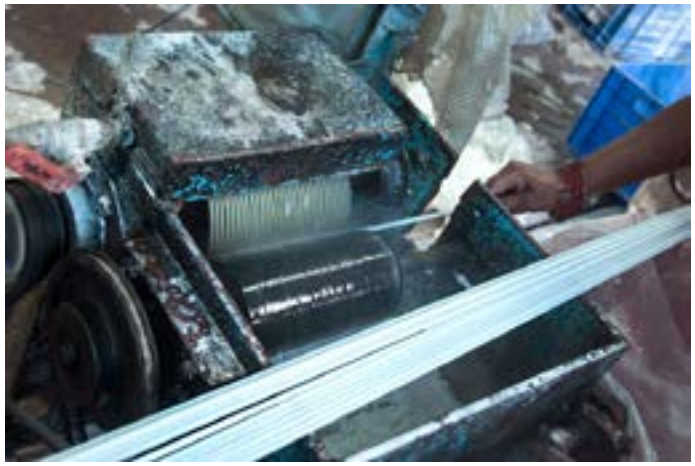
Making Process of round shaped glass beads.



This machine produces 600 to 800 beads in 1 minute.

Source:
https://dsource.in/resource/glass-beads-varanasi/making-process/tube-cutting-section

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Piling of 6mm size glass beads.

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Source:
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Lady artisan manually operate the machine.

Making Process of round shaped glass beads.

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Source:
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Washing Section

Artisan put beads into a tumbling machine for washing purpose.

Artisan uses Emery powder 600/1200 for washing.

After adding the chemical powders in the tumbling machine doors are closed by the artisan.

The beads will be briefly tumbled for a brief time.

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Washed glass beads in tumbling machine.

Washed beads are putting in vibrate barrel for magnificent.

Adding sulphuric powder for beads softness.

Adding safedh powder for beads shining.

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Adding water for spin.

Beads in the vibrate barrel.

Beads in the vibrate barrel.

Rice glass beads are polished in large tubs.

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Rice glass beads tub is made of plastic tub and it runs at low speed (100RPM) to protect beads.

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Bead Shorting Section

Women artisans are involved in the beads sorting process.

Glass bead filtering.

Glass beads separation machine.

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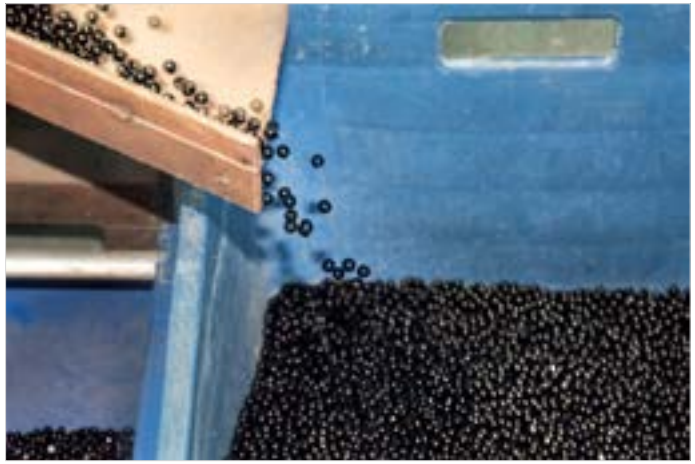
Glass Bead filtering.



Beads are separating.

Sorting process.

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Lady artisan in separating process.

Separated black glass beads.

Beads run through a set of filters to separate the bead from the scrap glass.

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Beads run through a set of filters to separate the bead from the scrap glass.

Beads are under quality checking.

Glass beads winnowing.

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Bead Spay and Painting Section

Pebeo colors.

Artisan engaged in glass beads painting.

Skilled artisan engaged in bead painting.

Bead painting process.

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Painted beads.

Deferent design paintings on glass beads.

Lady artisan arranging beads for giving a rainbow iridescent treatment.

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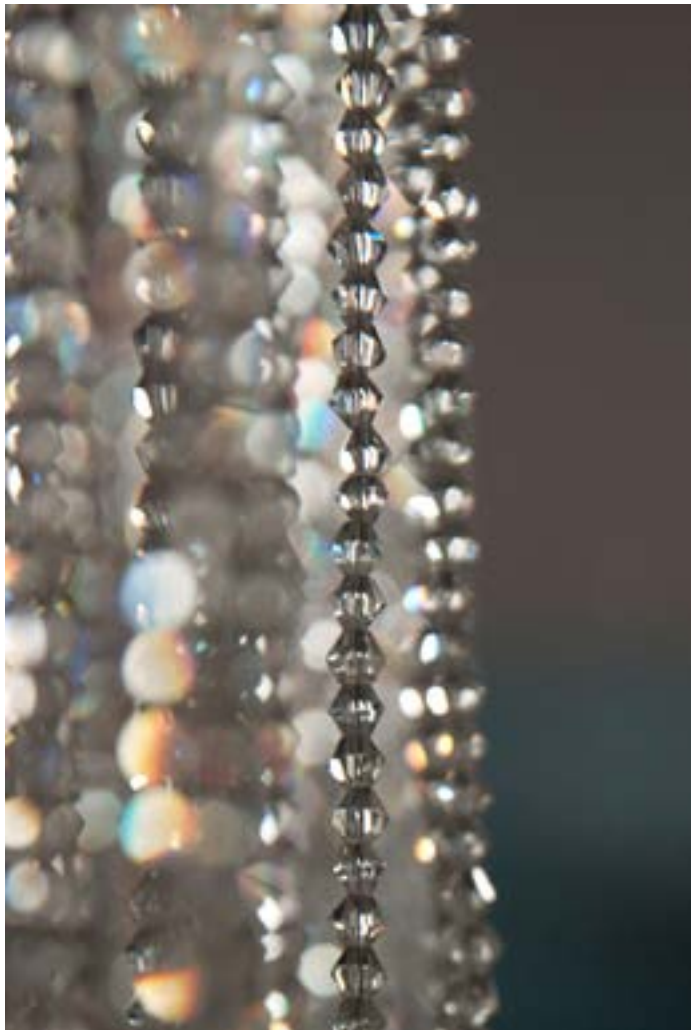
Glass beads are ready for iridescent treatment.

Artisan engaged in making iridescent beads making.



Glass beads are ready for iridescent treatment.

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Artisan put the beads frame into Vacking coating machine.

Vacking coating machine.

Iridescent glass beads.

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Packaging Section

Wooden beads calculate frame.

Yellow 4mm round glass beads.

Artisan engaged in tying the beads.

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Lady artisan involved in beads packaging.

Amber glass beads.

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Place of beads packing.

Finished glass beads putting in bead kit.

Bead kit weight checking.

Lady artisan involved in beads packaging.

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Bead box of 18 varieties.

Heat sealers to seal the tops of polythene bags.

Set of bead box.

Artisan operating Seal less steel strapping tool for packaging.

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Source:
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Products

Glass beads are seen in ornaments creations like bracelets, wreaths, crowns, decorative textiles – sarees, dupatta, kurtas and more. Glass beads are used in various ways to decorate bags, clutches, and handicraft items, wood and mostly in clothing. Glass beads from ages have been playing its important role, there has always been the demand for beads and especially for glass beads, and they have been an ornamental symbol and will last for more thousands of years in belief. There are more than three thousand shapes, hundred colors and more than two thousand varieties of beads Banaras Beads Limited carry which form the product range.

Trays of beads.

Glass bead bracelets.

Glass bead bracelets.

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Millefiori beads.

Glass bead bracelets.

Glass bead bracelets.

Glass bead multi-strand necklace.

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Designed metal and glass bead necklaces.

Designed metal and glass bead necklaces.

Designed metal and glass bead necklaces.

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Video

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Contact Details

This documentation was done by Professor Bibhudutta Baral and Sandhya B. at NID, Bengaluru.

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