

CRAFT PROCESSES AND OTHER DETAILS OF 32 CRAFTS

Zari	
	Zari is an even thread traditionally made of fine gold or silver used in traditional Indian, Pakistani and Persian garments and other materials such as curtains, etc. Zari is woven into fabrics, primarily made of silk, felt or velvet to create intricate patterns. The thread is also used as a raw material for Zardozi embroidery, which is one of the oldest and most beautiful embroidery styles of India. It is used extensively in clothing and home decoration. Four types of zari are produced in India, namely, real zari, semi real zari, imitation zari and plastic zari.
Main clusters:	Surat is the home of zari Industry in India. Other clusters producing zari are Bareilly, Varanasi, Agra, Hyderabad, Lucknow, Vadodara, Latur, Jaipur, Barmer, etc.
Artisans involved:	Surat, which caters about 55% ⁴² of the total zari demand, has over 15,700 zari units, employing about 1.05 lakh artisans ⁴³ . Furthermore, 50,000 artisans provide support service to the cluster.
Raw material used:	Real zari is made of silver and electroplated with gold, whereas Semi real zari has a composition of copper coated with silver and gold electroplating. Imitation Zari is made of copper electroplated with silver. Plastic zari, is manufactured using metallic yarn. Other materials used for making zari include cotton yarn, silk and art silk. Real zari is used in costly product; however, its use is limited compared to imitation and plastic



Real Zari



Imitation Zari



Semi-Real Zari

Tools used:

Rotating rollers, Electroplating apparatus. In a manual process, hammer is used to flatten the wire.

Process:

Production of pure zari (imitation zari) involves the following eleven stages:

**Zari products used as raw material for Zardozi work****Process machinery for preparation of Zari**



Saadi



Salma



Metallic
wires



Sequined
lace



Tilli (round
sequin)



Beads



Curved
hook



Crystals &
stones



Badla
wires



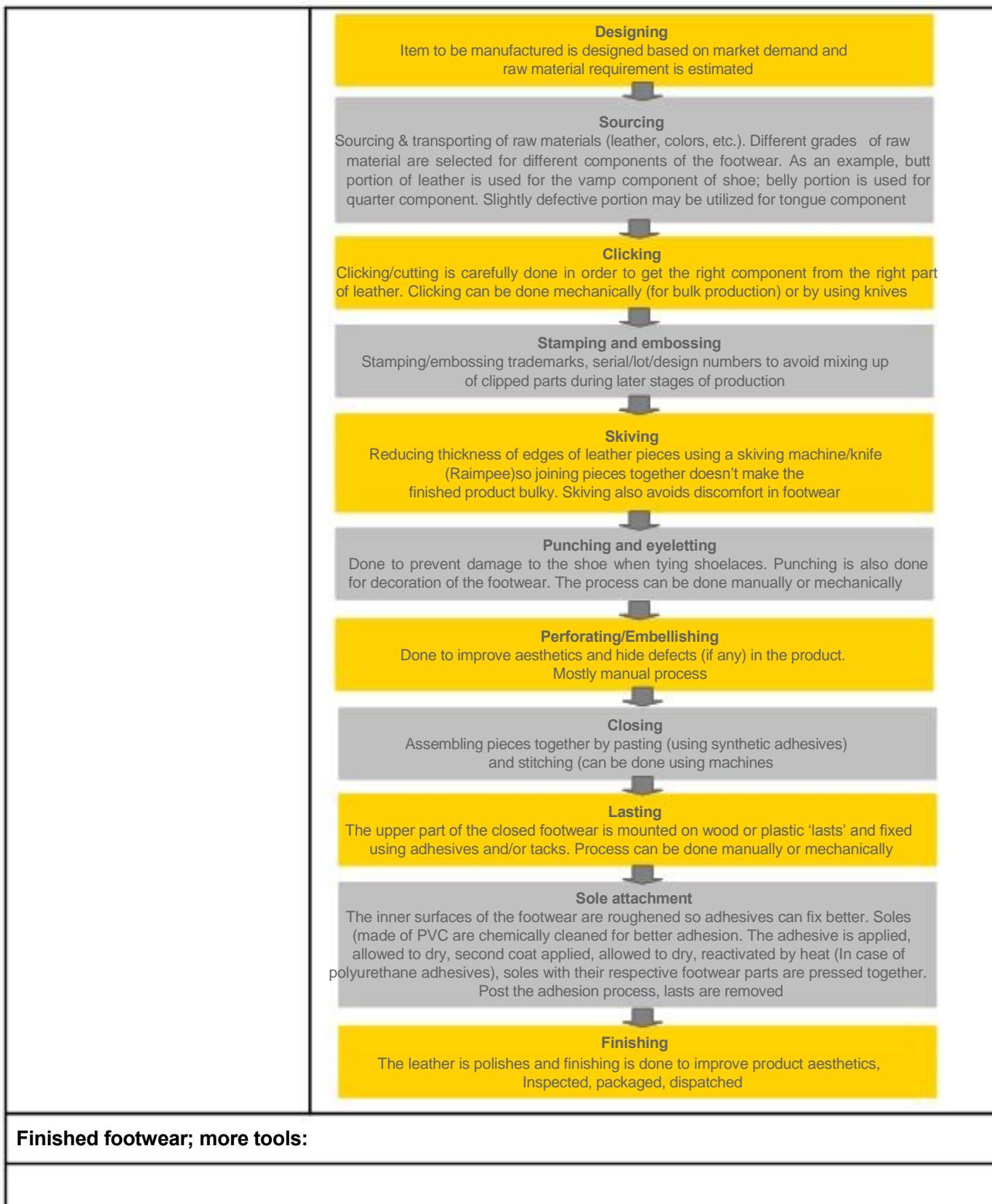
Tilli



Leather Footwear

	<p>The leather industry, including leather footwear, is one of the oldest traditional industries in India. India has a capacity of producing about 900 million pairs of leather footwear and 100 pairs of leather shoe uppers⁴⁴. Leather and allied industries in India play an important role in terms of providing employment to a large number of artisans and also earn foreign exchange through exports.</p>
Main clusters:	<p>The major production centers in India are Chennai and Ranipet in Tamil Nadu, Mumbai in Maharashtra, Agra, Lucknow and Kanpur in Uttar Pradesh, Jalandhar in Punjab, Delhi, Karnal and Faridabad in Haryana, Kolkata in West Bengal, Jaipur and Jodhpur in Rajasthan, Himachal Pradesh, Odisha, and Calicut in Kerala.</p>
Artisans involved: 	<p>Leather footwear manufacturing employs over one lakh people across the country⁴⁵. According to Central Leather Research Institute (CLRI), there are 2,091 tanneries functioning across the country²⁸.</p>
Raw material used: 	<p>Hides of cattle, buffalo, sheep and goat are the main raw materials used for leather footwear production. Generally, it takes 7 to 21 days for hides to reach the tannery after the animal has been skinned. Other raw materials used for manufacturing leather footwear are synthetic materials, laces, adhesives, MCR (micro cellular rubber) sheet, PVC (polyvinyl chloride) & TPR (thermo plastic rubber) unit soles.</p>
Tools used: 	<p>Mogri (beater), palta (stretching tool), Ari (awl), Rampa (skiving tool), Khurpi (scraping tool), Hammer, Cutting base, Stone working base, Deer horn to shape shoe, Kateni-awl for fine embroidery, Meenagadi-wooden mallet, Raapi-knife, Wooden/plastic lasts, Punches, Dies for embossing, etc.</p>

	
Process:     	<p>Leather footwear production process can be broadly categorized⁴⁶ into the following stages:</p>



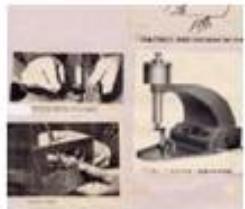


Leather (Other Articles)

	<p>India is known worldwide for its leather products. In the rural areas, hide from cattle and camel is locally cured and after tanning, it is used to make different items. Leather products such as jackets, lampshades, pouches, bags, belts, wallets, and stuffed toys are exported from India in large quantity. Leather bags & wallets account for major portion of total exports.</p>
Main clusters:	<p>Leather products are produced in several regions, as different regions have different leather products to offer. Tamil Nadu, West Bengal, UP are the top states in terms of manufacturing (leather products excluding footwear) units. The Council for Leather Exports plans to establish six more leather clusters in the country by 2017.</p>
Artisans involved:	<p>The leather industry employs about 25 lakh people⁴⁷, mostly from weaker sections of society. The country is facing acute shortage of human resources.</p>
Raw material used:	<p>India has plenty of raw materials, as the country has 21% of the world's cattle/buffalo, and 11% of sheep population.</p>
Tools used:  Thread burning tool	<p>Try squares, dividers, measuring tape, utility knives, rulers, cutting/clicking knife, paring/skiving knife, hammer, hand stamper, creasing tool, revolving punch, scissors, thread trimmers, framing tools, Frame lifter, Leather pushing tool, Frame- pressing tool, Button fitting/snap setting tool, Eyeleting tool, Riveting tool, Smooth rolling wheel, Circular slicker, Bone folder, Dauber, Awl, Thread trimming tool, Stitching awl, Tracer stippler, Outline modeler, Ball modelling tool, Mallet, Design punches, Spacing wheel, Lacing pony, Heat burnishing tool, Screwdrivers, Wrenches, Portable-electric hand drill, pliers, pincers, bench grinders, oil stone, oil can, etc.</p>
Process:  Assorting  Clicking	<p>Leather goods are manufactured using following processes:</p>



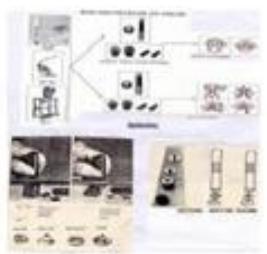
Embossing



Edge staining



Punching



Buttoning



Zip fastening



Gluing



Assembling

Pre-operative processes

Assorting

Leather assorting is done according to thickness needed for various parts of the product, size, colour, defects, texture, grain and stretch/elasticity.
Leather hide and skin may have suffered mechanical injuries and diseases.
The defects are distinctly marked by silver marking pencil

Clicking

Clicking/cutting is carefully done in order to get the right component from the right part of leather. Done mechanically (for bulk production) or by using hacksaw blade knives

Splitting

A splitting machine is used to reduce the thickness of leather and make it uniform .
The top grain layer is further processed to from the products.

Skiving

Reducing thickness of edges of leather pieces using a skiving machine/knife
so joining/folding pieces together doesn't make the finished product bulky. Reducing more thickness than is required could reduce the strength of the finished product

Embossing

Embossing/plating is done using a hydraulic embossing machine which works on vacuum pressure and has a heating device. Heat and pressure is used to iron out any wrinkles in the leather before assembling them together



Stitching



Bench work processes

Staining

The leather edges are smoothed and stained using water soluble segments. The stains are dried, wax polished and glossiness improved.

Creasing

Creasing helps to compress the cut fibers, strengthen them, give a darker glossy line to the edges and improve aesthetic appearance

Punching

Holes are made to fix buckles, buttons, eyelets, rivets, studs etc. Process can be done manually or mechanically using a treadle operated punching machine

Riveting

Riveting is done with rivets and rivet buttons using riveting tool for fixing handles, hinges, locks, etc. and also for joining assembled components.

Eyeleting

Eyeleting tool/machine as used to fasten key hooks in key cases. Fancy eyelets are used in bags

Buttoning

Buttoning is done using a button fitting tool. Buttons need to be hammered gently so as to not damage them. The process may be done manually, using a treadle/hand operated machine or an automatic process.

Zip fastening

Generally used in soft leather products. Three methods - slot seam, lapped seam, invisible seam (only plain seam and zip tab visible)

Gluing

Adhesion important process of assembling. Can be supported with stitching. Temporary or permanent adhesives may be used.

Lining

Lining is done to improve the aesthetics of the products. Lining pattern should always be bigger than the leather component. Excess glue should be avoided. Of different types including edge lining, full lining, drop in lining.

Edge folding

Process of folding leather uniformly across edges in straight lines or curves to enhance appearance of the product. Curved corners require hairline cuts.

Gussets making

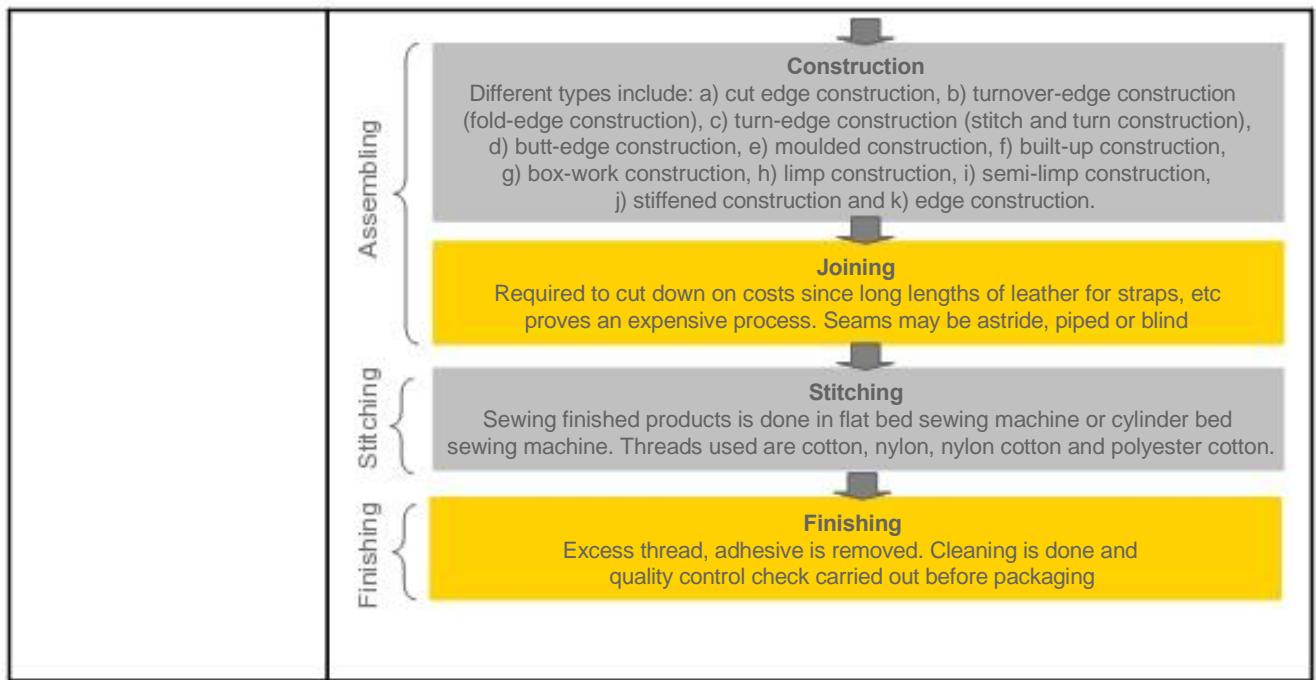
Inserted to increase holding capacity of leather goods. Different types including side gussets, continuous gussets, folding gussets.

Handle making

Handles may be lighter or heavier based on the holding capacity/size of the good. Can be round, flat or shaped.

Frame fixing

Done mostly in ladies purses and handbags. Fixed using framing tools. Requires high level of skill. May be chromium or brass plated.



Finished goods:



Carpet	
	<p>Carpet industry is one of the oldest industries in India, and is primarily export oriented industry. Various kinds of carpets are manufactured in India. These include hand-knotted woolen carpets, tufted woolen carpets, handmade woolen durries, and pure silk carpets.</p> <p>There different designs hold different meanings⁴⁸:</p> <ul style="list-style-type: none"> Circle – Eternity Zigzag – Water and Lightening Swastika – Guiding light in darkness Meandering line – Continuity of life Tree – Bounty Entire carpet – Emblem of Eternity Entire pattern – Visible world of change
Main clusters:	Over the years, various carpet weaving center have emerged in India. Each center has its own competitive advantage. Major centers of carpet production are Bhadohi, Varanasi, Mirzapur, Agra, Jaipur, Bikaner, Kashmir, and Panipat, Gwalior, West Bengal, Uttarakhand, Karnataka and Elluru in Andhra Pradesh.
Artisans involved:	Indian carpet industry has over 2,500 exporters-cum-manufacturers and two million artisans ⁴⁹ .
Raw material used: 	Major raw materials used for carpet manufacturing are fiber and or yarn form, dyes, chemicals, auxiliaries and ancillary materials.
Tools used:	Key tools used are looms, Vertical roller beam in case of knotted carpets), naksha (graph), talim (coded pattern), Kangi (comb), punja (beater), blade, spindle, scissors, brush, rod and knife.
Process: 	The handmade carpet manufacturing is a laborious intensive process. Broadly, carpet manufacturing ⁵⁰ involves the following techniques:



Raw material sourcing/ preparation

Sourcing and transporting raw materials including yarn, looms, and relevant tools and machineries

Dyeing/Designing

Dyeing of yarn and drafting the design on paper

Setting the loom

The loom is made of a frame of four beams. The horizontal beam is wedged against the vertical ones. Together, the set up leans against a wall.

Warp setting

The foundation thread is stretched over the top cross-beam, passed under lower horizontal beam, again over the top and so on. This is done till the required number of threads have been stretched

Pattern making

The weaver keeps the design before him, follows the pattern using wool/thread (yarn) and makes a knot over the foundation threads and cuts the yarn with a knife that hangs from his wrist.

Pattern making (2)

After every one row of knots, weaver passes a weft through the warp (alternately over & under) and presses thread against the row of knots with a 'kangi'. To add strength, knots could be stitched to warp threads.

After every few rows, the yarn is cropped using curved scissors.

Pattern making (3)

After the whole carpet is knotted & cropped, it is taken off the loom and warp threads are cut by another expert 4-8 inches away from the ends.

The threads are then knotted in pairs to bind the tufts.

Brushing and clipping

Careful brushing is carried out to remove remnants of yarn clippings

Polishing

Polishing the final piece with a machine, with a built-in sucking function

Finishing

Washing and surface finishing the polished carpet

A regular 5/8 feet carpet can be woven in 2-3 days. 2-3 days are taken for washing and another 2-3 for final trimming and finishing. The entire

	process takes about 7-10 days ⁵¹ depending on how many people are working.
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Finished Products:



Rugs & Durries

	<p>India is one the leading producers of rugs in the world. Various kinds of rugs produced in India are namda (felted rugs), gabba (embroidered rugs), wooden pile rugs, cotton rugs, etc.</p> <p>When compared to rugs and carpets, durries are light, often reversible, and usually made with cotton. Durries have found daily use in rural villages of India. Different parts of India have localized durrie tradition. The panja durrie is amongst multitude of styles.</p>
Main clusters:	<p>Rug production is concentrated in the following regions: Agra, Bhadoi, Mirzapur in UP, Jaipur in Rajasthan, Panipat in Haryana, and Kashmir in Jammu and Kashmir.</p> <p>Regions known for durrie making are Panipat, Bhavani in Tamil Nadu, Navalgund in Karnataka, Warangal in Andhra Pradesh, and Jaisalmer and Barmer in Rajasthan.</p>
Artisans involved:	<p>-</p>
Raw material used: 	<p>Generally, cotton and wool are used as primary raw material for durrie making. Main tool used is a vertical frame composed of two horizontal beams on which the warp is fitted.</p>
Tools used: 	<p>Tools used are horizontal floor loom, panja (metal comb), kalpu (piece of wood), kani (pencil shaped tool), suaa (needle), bristle brush, bamboo or wood shuttles, scissors, chhuri (knife) and chhura (blade).</p>
Process: 	<p>Panja durrie making involves the following techniques: The name comes from the claw-like tool used for setting threads in the warp⁵².</p>



Designing

Weavers use traditional designs or the ones provided by the client for whom the durries are being prepared.

Raw Material procurement

Cotton for the warp and cotton/wool for the weft is sourced.

Dyeing

The process is done manually in tubs or using automated machinery. Vegetable (indigo, harad, pomegranate peel) or chemical dyes (that fix faster) may be used.

Yarn opening for weft

The dyed thread is freed from tangles and stretched using a charkha

Warping

The master weaver puts the threads in the desired color combination using a warp machine or 'taana'. The ends of different colored threads are taken from the rolls, passed through a smaller frame that guides threads into a larger octagonal frame till the entire cylinder is wrapped with thread. This thread is then collected and given to the weaver.

Weaving

The warp is wound on the loom. The weaver keeps the design before him, follows the pattern using wool/thread (yarn) and pulling a few threads from the warp, fills gaps longitudinally using the weft. The warp is marked at for the number of threads to be taken depending on the design. Once one row is complete, the weft is beaten with a panja to settle it into the warp. The warp is tightened regularly by adjusting the beams of the loom. The design is made from bottom up.

Finishing

Once complete, the finishing work in the durrie is carried out by the master weaver. Stone washed durrie is washed again. Any loosening/tightening/shrinkage issues are taken care of at this stage. Clipper clips the ends, knots them and finishes the durrie.

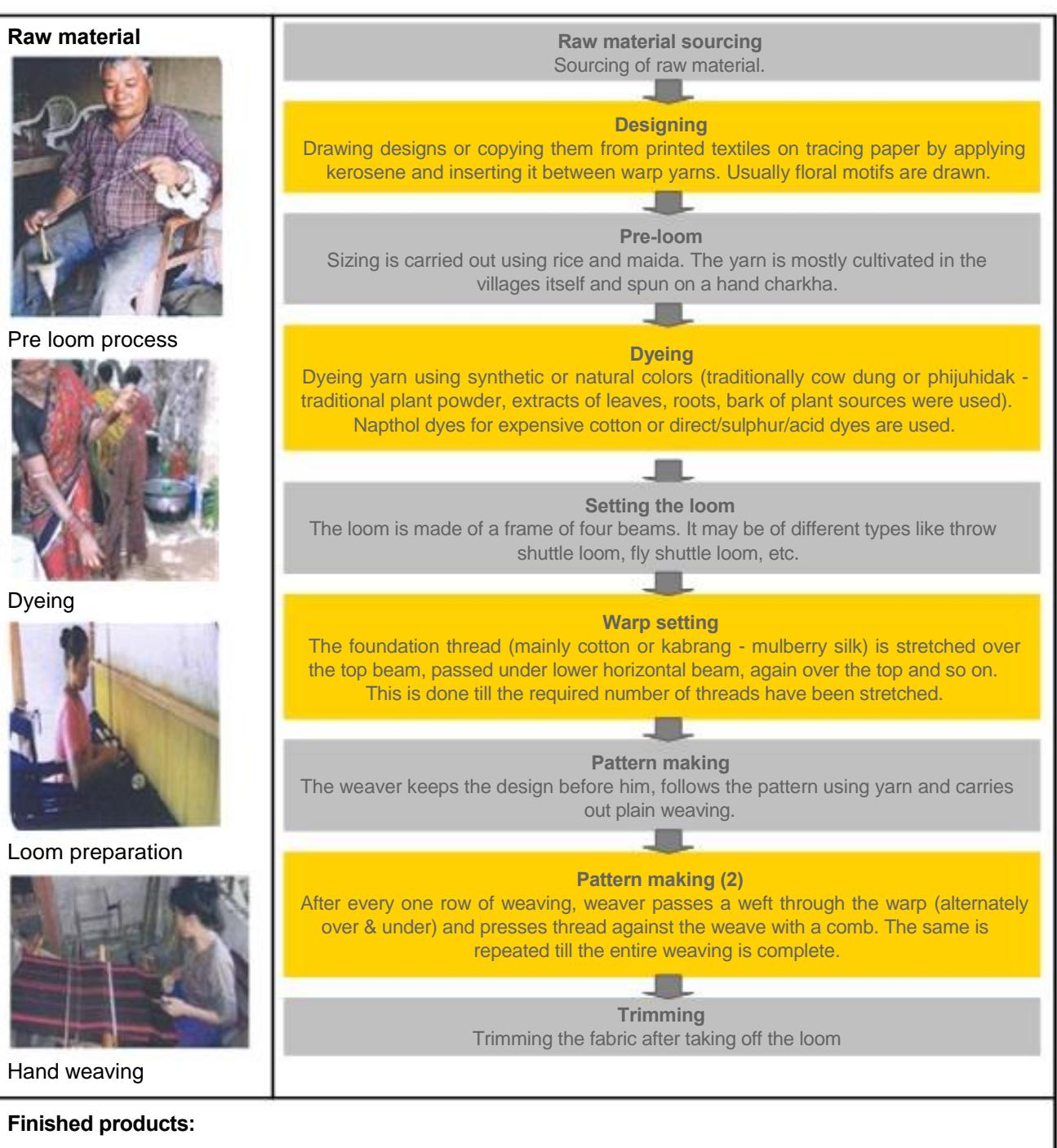
Finished products:





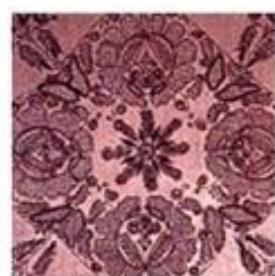
Textile (Handloom)

	<p>Handloom industry represents the rich cultural and traditional heritage unique to India. India is a major handloom producer in the world, accounting for 85% of the total production globally⁵³. India produces a variety of products using all kinds of fibers and yarns of varying counts to produce the widest range of products. Handloom contributes 14.6% to the total cloth production in the country (excluding wool, silk and yarn). In 2010-11, handloom production stood at 6.9 billion square meters. Further, the industry has the largest infrastructure with 23.8 lakh weaving looms⁵⁴.</p>
Main clusters:	<p>There are 470 handloom clusters, of which 230 clusters have more than 1,000 weaving looms. Out of these 230 clusters, 41 clusters have over 25,000 weaving looms⁵⁵. Major clusters in India are Bahraich, Bhuj, Karimnagar, Patan, Varanasi, Nawan, Shaher, Boudh, etc.</p>
Artisans involved:	<p>Handloom industry is second largest employment generator in India, next only to agriculture. It provides employment to the low income sections of the society, with 86 % handloom weavers/workers living in rural and semi-urban areas. As per the Handloom Census of 2009-10, there are 23.8 lakh handlooms, employing 43.3 lakh handloom weavers and allied workers¹.</p>
Raw material used: 	<p>Raw materials cost constitutes a major portion (40-60%) of the total production cost of handloom products. Yarn is the main raw material used in handloom production. Handloom industry consumes a diverse range of yarns from natural viz. cotton, wool, silk, jute to artificial viz. synthetic, cellulose and multiple blends of such yarns. Other materials used are chemicals, dyes, etc.</p>
Tools used:  Throw shuttle loom	<p>Tools used include loom (Loin loom, throw shuttle loom, fly shuttle loom in Manipur), bobbins, wooden/plastic spools, back strap, wooden beater and different sticks.</p>
Process: 	<p>Major processes involved in production handwoven textiles in Manipur are detailed below. Different types of woven fabric include phanek (sarong), khudei (lungi), bed sheets, phee matek (chaddar), scarf, salwar piece, phanek mayek naiba (color stripe sarong), leirum (shawl), etc.⁵⁶</p>

Raw material**Pre loom process****Dyeing****Loom preparation****Hand weaving**



Textile Hand Embroidery



In textile hand embroidery, embellishment is made on fabric with threads and sometimes with other materials. Various types of hand embroideries are practiced in India. Each type of embroidery is different from the other and has its own beauty and significant value. Zardozi, one of such embroidery, is one of the world famous textile hand embroidery craft.

Main clusters:

In India there are many popular embroidery clusters such as Chikankari and zardozi of Lucknow, katha of Bengal, fulkari of Punjab, kutchi embroidery of Gujarat and kashidakari of Kashmir. Zardozi has been traditionally prevalent in Lucknow and the six surrounding districts of Barabanki, Unnao, Sitapur, Rae Bareli, Hardoi and Amethi. Lucknow zardozi has been accorded the Geographical Indication (GI) registration.

Artisans involved:

The Lucknow zardozi cluster supports an estimated 1.75 lakh artisans. Around 2 lakh people directly involved in the supply and value chain in the cluster. Further, the Chikankari cluster of Lucknow provides employment to 2.5 lakh people.

Raw material used:

Basic materials used for this craft are cotton and silk threads of various colors, mirrors, beads, metal wire, cotton, silk, leather, fish skin, teeth, bones, feathers, horn, shells, beetle wings, tassels, coins. Raw material used for Chikankari embroidery includes untwisted mill yarn (Muga), silk, crepe, organies, cotton, terry-cotton, chiffon, muslin or Tussar Yarn.

Tools used:

General key tools required are needles, thread and hook. For Chikankari, tools used include fine metal needles (Number 8 steel needles), thimbles, scissors, wooden frames, wooden blocks for printing motifs, etc.

Process:



Block printing

Some forms of hand embroidery are difficult, as they involve significant intricacies. Chikankari embroidery practiced in Lucknow involves the following techniques⁵⁷. The entire process may take about 1-6 months.

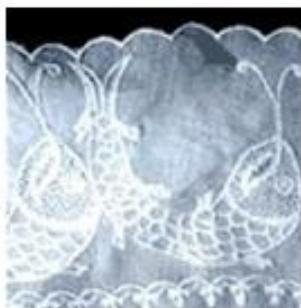
Cutting
Tailor cuts the fabric into required garment shape.

Designing

Bel (creeper) and fish are the most commonly used designs. Individual motifs (butis) of flowers or animals are also used.



Embroidery work



Fish Motif

Pre-embroidery

Pre-embroidery basic stitching is done to plan placement of the design by the block printer.

Printing

Fugitive colors (made mixing glue, indigo and water in a definite proportion) are used to print the design on the semi stitched garment using wooden blocks. Brass blocks may also be used for fine designs.

Embroidery

Embroidery work is carried out using mercerized cotton threads in all colors. About 40 different types of stitches may be used. Darn stitch is carried out on rough surface cotton fabric. Satin stitch is used on fabrics like silk, muslin, linen. Some stitches are used only for particular types of design (eg. Chain stitch is used only for final outline of leaf/petal/stem). More people may be involved in case of jaali work. Embroiderers specialize in different stitches.

Stitch completion

Post embroidery, final stitching of the garment is done.

Defect checking

Preliminary defects are found. However, the garment needs to first be washed so the defects are clearly detected.

Washing and ironing

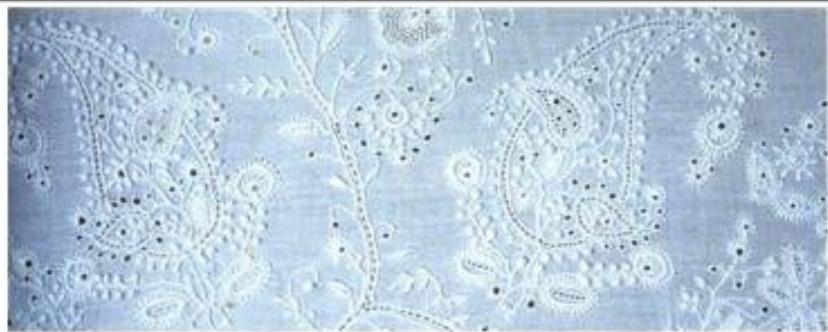
The garment is washed by dhobis (washermen), starched and ironed

Grading/Packaging/Dispatch

The garment is sent tot the seller who grades, packages and dispatches the garment to the retailer.

Finished products:





Textile Hand Printing



Hand printed textiles is a craft in which cloth is dyed with hand or printed using shapes. Various types of hand printing practiced in India are block printing, batik, kalmkari (hand printing by pen) and bandhani (tie and die).

Main clusters:

Some of the important centers of this craft are in the states of Andhra Pradesh (Hyderabad, Machalipatnam), Uttar Pradesh (Varanasi, Farrukabad), Orissa, Madhya Pradesh (Bagh, Behrongarh, Indore, Mandsar, Burhanpur), Gujarat (Ahmedabad, Rajkot, Kutch), Maharashtra and Rajasthan (Bagru, Chittroli, Sanganer, Jaipur, Jodhpur).

Artisans involved:

Raw material used:

Originally natural dyes were used for printing, however, in the current scenario they have been replaced by chemical and artificial colors. Hand printing is undertaken on both cotton and silk fabrics of varying counts.

Tools used:



Main tools for hand printing (block printing) are wooden/metal blocks of different shapes, paatiya (table padded with jute and covered with cloth on which the fabric to be printed is spread across), brushes (for cleaning the flocks of wax), heating vessel (to maintain temperature of the mendh), indigo vats, steel chisels, and metal sheets.

Process:



Sanganeri style printing

Block printing is a common art practiced all over India. Steps involved in Mendh ki chapai (block printing)⁵⁸ of Rajasthan are shown below. The process in its entirety takes about 15-20 days. Washing and drying are carried out after every step.

Sourcing of raw material

Grey fabric is sourced from Erode in Tamil Nadu.

Washing-Bleaching-Drying

The grey fabric is first washed and then sun bleached/hydrogen peroxide bleached. It is then sun dried.



Resist printing



Dyeing

Mordanting

Mordanting using 'harada' (turmeric) takes about an hour. This makes the fabric receptive to absorbing natural dyes. The fabric is dried post mordant application..

Sanganeri printing

Two colors are used in Sanganeri style of printing. Red color contains alum, gum, water and geru (a type of mud). Black color is obtained decomposing iron nails, jiggery and water for about 30 days

Washing-drying

Sanganeri style printing is followed by washing and drying of the fabric.

Mendh preparation

Mendh is prepared by mixing andoli oil, cheed oil, bee wax, paraffin wax in an earthen/iron vessel and heating over coal.

Resist printing

Hot mendh (wax at a temperature of about 65 degrees) is printed over the fabric.

Cooling-Drying

Post printing, the wax is cooled by placing a wet cloth over the fabric. The fabric is then shade dried.

Dying-Drying

The fabric is then indigo dyed (Two dips for green color and 4-5 dips for dark indigo) and shade dried.

Wax removing

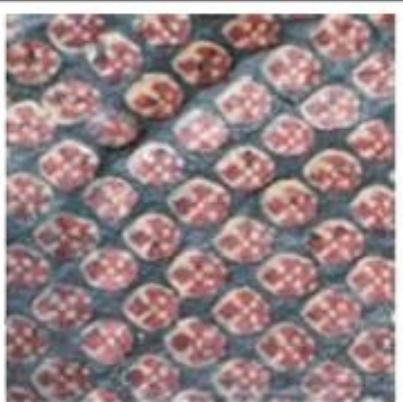
The wax is removed by washing the fabric in hot water. Soda is added to clean the fabric.

Washing-Drying

The fabric is finally washed, rinsed and dried.

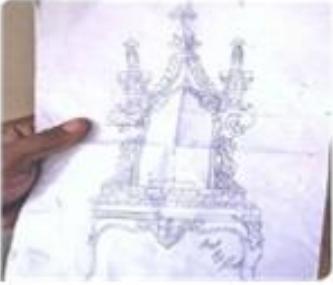
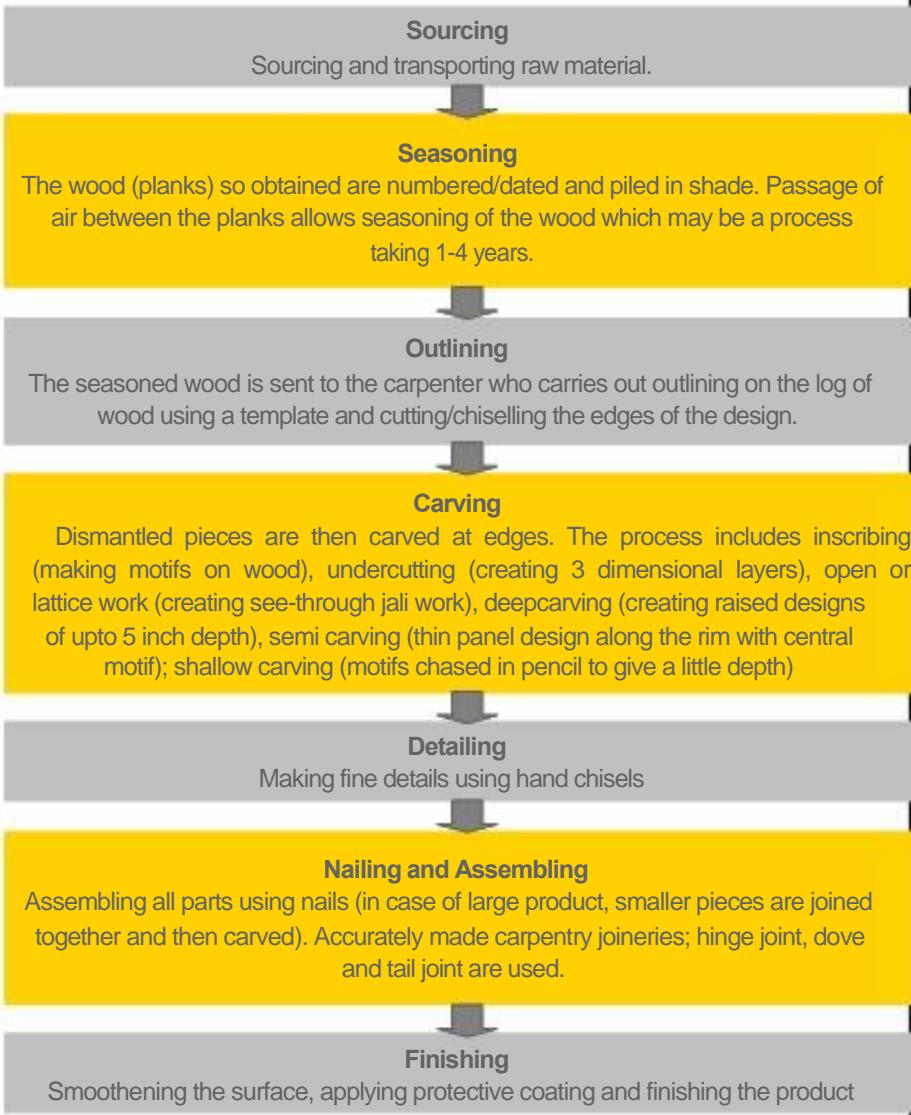
Finished products:





Wood Carving

	<p>Woodcarving is an ancient craft practiced in India long before the age of ancient stone sculptural age. It is the artistic practice of shaping and decorating wooden objects into diverse utilitarian and decorative handicrafts items. The most common varieties of wood used for this craft are teak, sal, oak, ebony, mango, sheesham, etc.</p> <p>Wood carving is a time consuming process. Small items of carved wooden handicrafts may take a week to be made. Large items requiring elaborate carving may take few months for their manufacture.</p>
Main clusters:	<p>Saharanpur is world famous for its wood carving and is known as "Shisham Wood Village" or "Wood City" of India. Other important centers of wood carving in India are Manipur, Bhopal, Nagpur, Chennai, Madurai, Mysore, etc. Kashmir is famous for walnut wood carving.</p>
Artisans involved: 	<p>Number of artisans involved in some of the clusters are⁵⁹:</p> <p>Saharanpur: Over 250 artisans and 15 self-help groups (SHGs)</p> <p>Manipur (Kakching): Over 266 artisans and 17 SHGs</p> <p>Bhopal (Sheopur Kalan): 300 artisans and 25 SHGs</p> <p>Nagpur (Bhandara): Over 300 artisans and 30 SHGs</p> <p>Khairpadar: Over 529 plus artisans and 25 SHGs</p>
Raw material used: 	<p>Raw materials used for wood carving are wood, babul gond (gum), potassium permanganate, chandras (lac grains in acid), harmach powder (for an antique finish), wood preservative, varnish, materials for embossing, fevicol, zinc, colors.</p>
Tools used: 	<p>Basic tools used are brushes for painting and polishing, knife, gouge, chisels, smoothening plane, hand drill and hammer.</p> <p>Saws are electric driven. Band saws cut off scrap wood effortlessly. Chain saws cut logs for large carving.</p> <p>Used to drill holes, drills are available with several attachments to perform sanding, sawing, mixing paint etc.</p> <p>Carving knives are used for whittling, chip carving and to smoothen wood surface.</p> <p>Wood-carving chisels have a sharp flat edge which is used to cut into the wood. They are available in bent, straight, and spoon shapes.</p> <p>U-gouges have curved cutting edges which form a 'u' shape. Craftsmen use them to remove large pieces of unwanted wood, to define large shapes, and to round out the edges.</p>

	V-gouges/Parting tools are used to cut fine outlines while carving intricate patterns.
Process:   carving  	<p>The following techniques⁶⁰ are involved in wood carving:</p>  <p>Sourcing Sourcing and transporting raw material.</p> <p>Seasoning The wood (planks) so obtained are numbered/dated and piled in shade. Passage of air between the planks allows seasoning of the wood which may be a process taking 1-4 years.</p> <p>Outlining The seasoned wood is sent to the carpenter who carries out outlining on the log of wood using a template and cutting/chiselling the edges of the design.</p> <p>Carving Dismantled pieces are then carved at edges. The process includes inscribing (making motifs on wood), undercutting (creating 3 dimensional layers), open or lattice work (creating see-through jali work), deepcarving (creating raised designs of upto 5 inch depth), semi carving (thin panel design along the rim with central motif); shallow carving (motifs chased in pencil to give a little depth)</p> <p>Detailing Making fine details using hand chisels</p> <p>Nailing and Assembling Assembling all parts using nails (in case of large product, smaller pieces are joined together and then carved). Accurately made carpentry joineries; hinge joint, dove and tail joint are used.</p> <p>Finishing Smoothening the surface, applying protective coating and finishing the product</p>
Finished products:	



Wood Inlay

	<p>Indian Wood Inlay / Marquetry is the process of decorating the surface of wood by setting in pieces of material such as ivory (traditionally), bone, plastic, shell or wood of different colors. Products with inlay include doors, jewelry boxes, plates, boxes, bowls, cigarette cases, and figures of animals, especially elephants. This craft form was brought to India from Persia in the 18th century. Mysore is home to heritage structures beautifully adorned using wood carvings with inlay work. Royal Indian processions, landscapes, pictures of Gods and Goddesses, scenes from the Mahabharata and Ramayana are depicted using shade effects in this craft.</p>
Main clusters:	<p>The craft is concentrated in Mysore and Bengaluru in Karnataka. Other places where this craft is practiced are Bijnor, Punjab, Saharanpur, Uttar Pradesh.</p>
Artisans involved:	<p>As reported in 2005, the craft involved over 2,000 artisans in Mysore cluster⁶¹.</p>
Raw material used:	<p>Maadi, lac, champa, yellow fanas, dark red rosewood along with plastic and bone, is used for inlay work⁶². Rosewood is sourced from auctions at Kushanagar, Tithimathi and Dandeli. Fibre boards are also used to cut down on the cost. Different color woods like white cedar, chill pine, rubber wood, red sandal, jackfruit wood etc. are used to add multiple colors to the art piece. A mixture of wax and charcoal is used to fill fine details.</p>
Tools used: 	<p>Chisels, files, blades, wood scraper, cutter, hammer are the tools used in wood inlay.</p>
Process: 	<p>Wood inlay comprises the following key techniques:</p>



Preparing

Selecting the base wood and composition & preparing the design

Designing

Tracing the design onto the wood, choosing colors & materials of inlay

Grooving

Making grooves on the areas to be inlaid

Cutting

Cutting the materials to be inlaid in various shapes
(using an electrical machine) and pasting them
using a strong adhesive into the groove in the base board

Beating

Beating the design to ensure the embedding is firmly
in place, hammering nails into the edges,
leaving design to dry for 24 hours and cleaned after that

Engraving

Engraving intricate designs (like eyes, ornaments, etc.),
polishing the pieces, applying bees wax
to highlight engravings and scraping off the excess wax

Finishing

After completion of inlay, a lacquer coating is given to
the composition for a glossy finish

Finished Products:



Wood (Turning and Lacquer Ware)



Wood turning involves the use of lathe on which a rapidly rotating piece of wood is shaped with a chisel to create cylinders spheres or cones. The beauty of this craft lies in painting the smooth wooden shapes. Usually, the turned piece is coated with colored lacquer. Today, lacquer ware production has diversified in response to changing markets. It now includes jewelry, decorative pieces, household utility articles and educational articles such as skipping rope handles, chess sets, pen holders, paper weights and rubber stamp holders.

The softwood lacquer ware toy business is on verge of closure due to government apathy, stringent export norms and rising input costs. The European Union, Australia and the US demand for certifications and ecofriendly compliance markings on this craft.

Main clusters:

Etikoppaka in Andhra Pradesh is the hometown of lacquer ware. Other important centers are Ernakulam, Chennapatna, Chitrakoot, Davanagere, Medak, Sankheda, and Varanasi

Artisans involved:

The Etikoppaka Mutually-Aided Cooperative Society comprises 165 artisans⁶³.

Raw material used:

The industry is totally dependent on forests for the primary raw materials. These forest-based products are the wood of the hale tree (or other species like teak, oak, ebony, redwood, rosewood, red cedar, pine, etc.), lac produced by the insect *Technadria lacca* and the leaves of the talegiri (*Pandanus odoratissimus*). Synthetic materials used are paints and pigments. Lithophane (compound of barium sulphate and zinc sulphide) is used to give opaqueness to the lac.

Tools used:



The most important tool for lac-turnery is the lathe. Hand saws, axes are used to prepare the wood. A variety of cutting tools are used to shape the turning wood. These include chisels, gauges and snappers. Sandpaper is also used.

Process:



Wood preparation

The manual lathe (pattari) consists of a rectangular block of wood (2" x 4" x 18") fixed into the ground and attached in a T-joint to another similar sized piece of wood with a cross section 3" x 1".

The wood is rotated with the help of a bamboo/cane bowshaped tool about four feet in length. This bowshaped tool is topped with a round wooden kit on which the thread or rope is twined. It has a hole in it to permit the reed or rope to pass through it. The bow is held with the rope tight, the rope going around the wooden kit to enable it to rotate.



Prepared wood



Shaping

Production of a wooden lacquer articles involves the following key processes:

Lacquer preparation

Wood preparation

Finishing

Heating

Lac is fixed on ends of wooden sticks and heated to make it plastic and malleable. The process may be repeated.

Beating

Lithophone is then beaten with the lac till a white tint appears.

Dyeing

Powdered dye mixed with water is then added to the warm lac and beaten again to reach a rubber like consistency.

Prepared lacquer

Reaheating is followed by removal of the lac from wood to form sticks 0.5cm thick, 3cm wide and 15-20 cm long. 4-5 sticks of one color and a shelf life of one month are prepared at a time. Wax may be added by boiling with the lacquer to add a glossy finish

Cutting-Seasoning

Cutting the wood into smaller pieces. Storing them away from heat and sunlight but in good air circulation for about 10-30 days.

Chiseling

Chiseling the wood to form cylinders

Shaping into articles

The wood is turned on a manual/electric lathe and a chisel is used to scrape off continuous chips till desired shape is achieved. The lathe can create only basic shapes oval, conical or round.

Smoothening

Shaping is followed by smoothening the surface using sandpaper

Coloring

Coloring skill defines the quality of the final product. Coloring of the wood is carried out from lac sticks. The stick is touched to the surface of the wood. The continuous revolving of the wood on the lathe causes friction between the lac and the wood which melts the lac and it spreads on the wood.

Polishing-Buffing

A screw pine leaf further spreads lac on the wood which is followed by polishing and buffing (for translucency). Kewda oil may be used for polishing.

Separating from lathe

A cutting tool is used to separate the wood from the lathe.

Painting

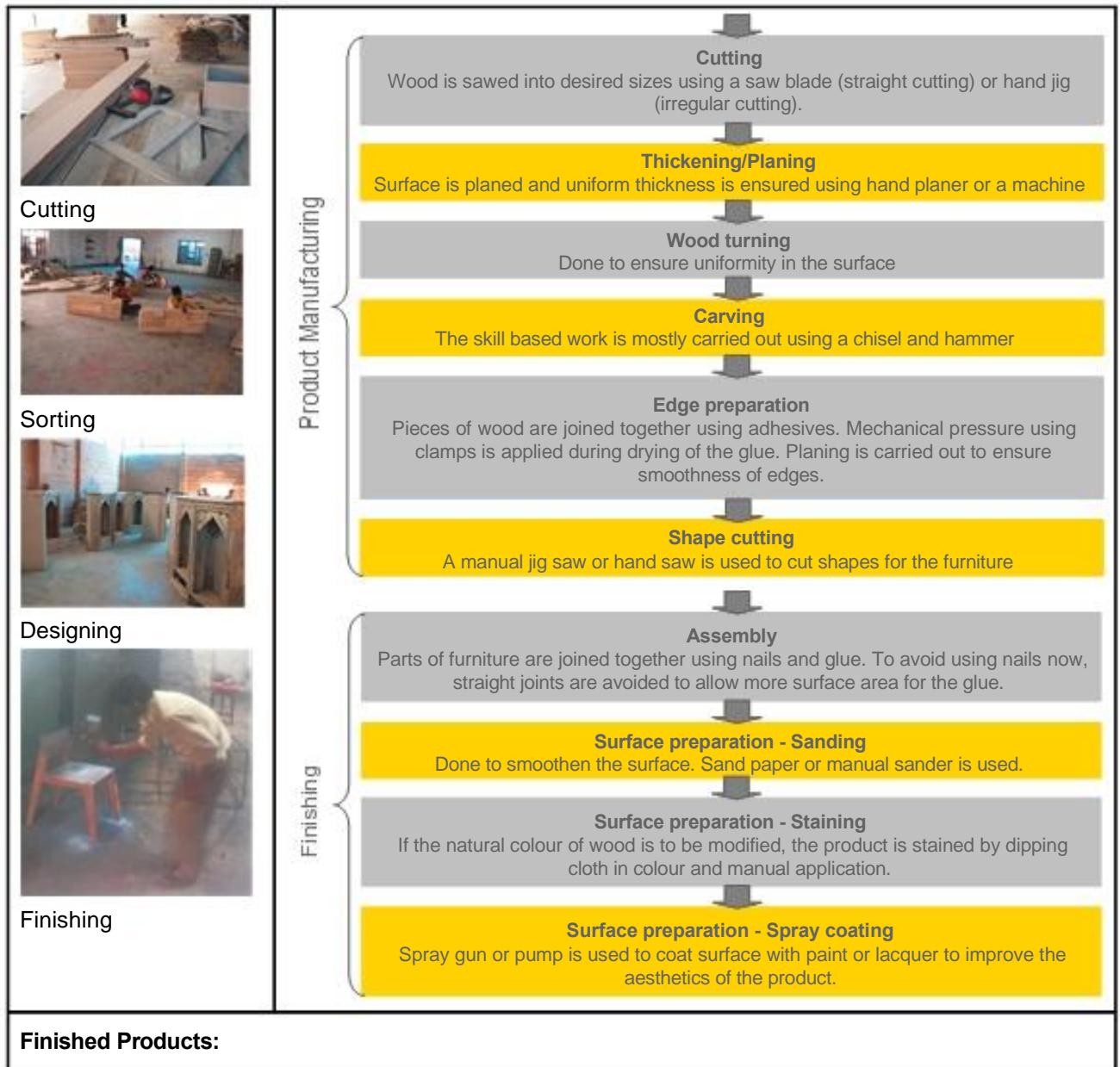
Paint may be used for final finishing

Finished products:



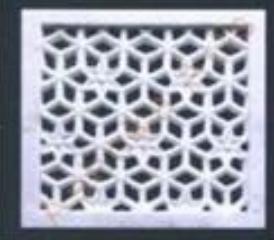
Furniture

	<p>Wooden furniture is the biggest component of the Indian furniture market, accounting for about 65% of the total furniture manufactured in India.</p>
Main clusters:	<p>Although, wooden furniture manufacturing activity is spread across India. Main centers are Guntur in Andhra Pradesh, Delhi, Ahmedabad, Jamnagar, Surat, and Vadodara in Gujarat, Srinagar in J&K, Jalandhar in Punjab, Sikar in Rajasthan, Cooch Bihar in West Bengal, Bareilly and Ghaziabad in UP</p>
Artisans involved:	<p>About 300,000 people are employed in the Indian furniture industry.</p>
Raw material used:	<p>Wood is the main raw material. Various types of woods are used with popular ones being Walnut, Sandalwood, Teak, Sheesham, Mango, Deodar, Ebony, Redwood, Rosewood, Red Cedar, and Sal. Teak account for 50% of the wooden furniture. Other materials used are adhesives, nails, and finishing materials such as stains, basecoats, glaziers, and enamels.</p>
Tools used: 	<p>Tools used include hand saw, hand planer, sand paper, hammer, nails, hand drill, chisel, brush, etc.</p>
Process:  Procurement  Chemical treatment	<p>In Jodhpur⁶⁴, manufacturing wooden furniture involves the following processes:</p> <p style="text-align: center;">Raw material preparation</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Procurement</p> <p>Wood is procured in the form of planks of 4.5 inch width and 3-6 feet length</p> </div> <div style="width: 30%;"> <p>Chemical treatment</p> <p>Standard chemicals like borax are applied to the wood using pressure to help in the chemical penetrating through the wood. The process takes about 7-10 days.</p> </div> <div style="width: 30%;"> <p>Seasoning</p> <p>Done in seasoning kilns/chambers to reduce moisture content of the wood to 9-11% by applying a certain temperature to wood. Process may take about 12-15 days. This process helps to bring out the natural grain and smoothness of wood.</p> </div> </div>





Stone Carving

	<p>Stone carving is an ancient art, in which pieces of rough natural stone are shaped by the controlled removal of stone. India produces an exquisite range of artistic and decorative stone crafts. The industry evolved from stone carvings for temples and mosques to utility items like candle stands, incense stick holders, jewelry boxes, etc.</p>
Main clusters:	<p>Stone carving clusters are Agra, Bhubaneswar, Puri, Jaisalmer, Cuttack, Cuddapah, Bankura, Kanchipuram, Patna, Mysore, Rajkot, Gwalior, Puducherry, Mahanandi, etc.</p>
Artisans involved:	<p>-</p>
Raw material used:	<p>Various forms of stone (marble, soapstone, granite, etc.) are used as basic material, along with araldite and wax polish and varnish.</p>
Tools used: 	<p>Few simple tools are also used in stone carving. These include saw, planer, chisel, hammer, driller and brush.</p>
Process:   	<p>Stone carving involves the following key processes⁶⁵:</p> <ul style="list-style-type: none"> Product Design Product design is made based on the experience and understanding of artisans depending on the desired final product. Most of this is carried out by using traditional techniques such as handmade drawings, concepts, imitating the drawing structures from the actual ones on papers, sheets etc. Raw Material The design is executed on the raw material selected from the range of soapstone (natural, grey, white), alabaster, white marble, sandstone, granite, etc. Stone Cutting/Drilling The stone is broken off into large portions of the rock to form the basic outline of the piece. The surface is drilled to various depths and unwanted material removed. Finer detailing takes up majority of the time of carving. Sanding Sanding is done on the structure to smooth the edges and to remove all the file marks. This can be carried out manually using a sand paper or same can be imposed on a smoothening plate.



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Raw Material

The design is executed on the raw material selected from the range of soapstone (natural, grey, white), alabaster, white marble, sandstone, granite, etc.

Stone Cutting/Drilling

The stone is broken off into large portions of the rock to form the basic outline of the piece. The surface is drilled to various depths and unwanted material removed. Finer detailing takes up majority of the time of carving.

Sanding

Sanding is done on the structure to smooth the edges and to remove all the file marks. This can be carried out manually using a sand paper or same can be imposed on a smoothening plate.

Finished Products:



Carved Lamps

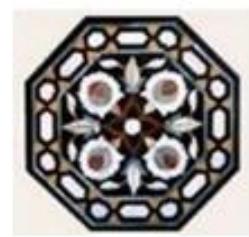


Ashtray



Candle stand

Stone Inlay



Indian artisans are skilled in making cut, shaped, and polished beautiful objects from odd blocks of stone and marble. One of the most attractive work of art that comes from various stones is stone inlay work. Marble inlay is one such exquisite art, which is integral part of the cultural heritage of India.

Stone inlay can be broadly divided in three categories:

- Fine inlay – This type of inlay is supremely intricate and involves minimal use of machinery. The skill of the craftsmen is rightly put to test in such type of inlay.
- Medium inlay – This is a little bigger than the fine inlay and hence can involve some use of machinery. The designs of this inlay are not very small and the pieces to be inlaid can be of bigger sizes.
- Monumental inlay – This is the largest type of inlay work and is not practiced in India currently Italy being the hub of this craft.

Main clusters:

Rajasthan is known for the inlay on table tops, flooring, and wall decorative. In Jodhpur, inlay is done on yellow Jaisalmer stone. Agra is famous for Parchinkari work which is a very minute and precise inlay work.

Artisans involved:

About 4,000 artisans working on this craft are members of Agra's Marble Udyog Vikas Samiti, which has applied to Geographical Indications Registry in Chennai for the tag⁶⁶.

Raw material used:

Stone is the main material used in this craft.

Tools used:



Key tools used are emery wheel, grinder and chisels.

Process:



Stages involved in stone inlay work are:

Product conceptualization and designing
involves choosing a design, setting a colour scheme and tonality of the design and choosing different types of stones based on their shades to be used in the product.

Raw material sourcing

Based on the design, base stone and inlay stone is sourced. The base stone may be white or black marble or soapstone. Various stones used as inlay are precious, semi-precious gem stones or any other stones which are of different colours.



Tracing

Craftsmen trace the design onto the base stone using a sharp tool

Stone cutting/shaping

The stones to be inlaid are cut and given the desired shape as per the design using a special instrument called emery wheel. Since each part of the design is shaped individually, it is time consuming.

Grooving

Grooves are cut into the design in the base stone using a chisel such that the shaped stone can perfectly fit in them.

Inlay of stones

Once the grooves are cut, the stones are inlaid into the base stone using glue. Traditional methods like charcoal or modern methods like araldite can be used.

Drying

Once inlaid, the stones need to be left for some time for drying so that they are properly pasted.

Finishing and Polishing

Hand polishing of the base article is done using a traditional polishing powder which is applied on the surface with a soft, moist muslin cloth. Grinding of the surface, if required, is done at this stage to make it soft. The final polishing is done using zinc powder.

Checking

The product is manually checked for any errors before packaging.

Packaging

The defective pieces are rectified and then sent for packaging.

Dispatching

The packaged products are then shipped to the desired destinations.

Finished products:



Marble Inlay work

Cane and Bamboo

	<p>Cane and bamboo act as an alternative to wood which takes more time to grow and is costlier. Cane and bamboo are renewable resources that are abundantly available, especially in the North Eastern Region of the country. Cane is largely used for furniture making, whereas bamboo is used for making jewelry and decorative utility items like lamp-stand, umbrella handles, partition, screen, flower pots, baskets, walking sticks, tool handles, fishing rods, tent poles, ladders, toys, fans, cups, mugs, mats etc. In recent years, uses of cane furniture have considerably increased in different classes of population.</p>
Main clusters:	<p>Assam (Lakhimpur, Bongaigaon, Guwahati, etc.) and Tripura (Agartala, Nelaghlar, etc.) are recognized as prominent places for cane and bamboo products both nationally as well as internationally. Assam is home to about 50 species⁶⁷ of bamboo. Other major cane and bamboo handicraft centers are Manipur, Arunachal Pradesh in North Eastern region, West Bengal, Kerala, and Orissa.</p>
Artisans involved:	<p>In Manipur cluster, around 1.5 lakh⁶⁸ artisans are involved in production of cane and bamboo handicrafts.</p>
Raw material used: 	<p>Major materials used are different Species of canes [Jati (Calamus tenuis), Tita (Calamus leptesadix), Lejai (Calamus floribundus), Sundi (Calamus garuba) and Raidang (Calamus flagellum)], bamboo[Muli (Malocanna Bambusoides), Hill Jati (Oxytenanthera Parvifolia), Kako (Dendrocalamus Hamiltoni), Dalu (Teinostachyum Dalloa)], nails, glass, varnish, plywood, kerosene oil, turpentine oil, adhesive, plastic traps, and gums. Materials used for colour and varnish of the products are bhatar phen' (boiled rice juice), amrapata, tamarind leaves, mezenta (a kind of chemical dye stuff), kalabati chach (lac) resin, methylated spirit, rabi mustafi, etc.</p>
Tools used: 	<p>'Dao' (bill-hook knife), 'jak' ('v' shaped wooden frame), "bakai kol" (bending frame), 'narum' (sharp and pointed carving blade), files, saws, knives, poker, scales, blowpipes, tongs, sandpaper, kerosene lamp, hammer, kattu, hexa, kulhari (axe), Tangiya (axe), screw driver, wooden file, try square, leather punch, sandstone, scissor, Ghoda (stand), Katuri (sickle shaped tool), cutter, handsaw, rope, oven, hammers, pliers and pincers.</p>  <p style="text-align: right;">Dao</p>

	 knives
Process:	Major processes ⁶⁹ involved in the production of bamboo handicrafts are as follows. Similar process is followed for cane as well.
 Cross cut bamboo stalks	<p>Harvesting May involve cutting/ splitting, de-starching, bleaching, etc depending on the product</p> <p>Cross cutting Cutting culms transversally to required lengths using machines, or daos/handsaws/ hacksaws for transportation and further processing steps</p> <p>Knot removing Removing bulging/protruding portions on the surface using machines or a dao</p> <p>Preservation treatment processes Physical processes: Necessary to improve the durability of the product Processes include: Scorching/Baking (Burning by blow lamp) drying, etc Chemical processes: Using ammonia, boric acid and the likes</p> <p>Cleaning The optional process involves removing outer burnt skin in case of scorching</p> <p>Polishing Smoothening of surface using sandpaper (coarse, medium, fine)</p> <p>Radial Splitting Split in two to convert the bamboo stalks into more manageable split chunks depending on the product to be manufactured. Can be done using machines or a dao/simple knife.</p> <p>Sliver making Splitting/slicing so the bamboo becomes easier to weave. The slivers are then also dyed and dried.</p> <p>Production fabrication (weaving, tying) Mats produced are either woven using different techniques or coiled</p> <p>Varnishing Varnish is composed of drying oil, resin and thinner/solvent. The process is done to give a glossy/semi glossy finish to the product.</p> <p>Drying Drying involves evaporation of the solvent in varnish and is done in the open before the product can be packaged and transported to the market</p>
 Radial splitting	
 Sliver making	
 Production	

Finished products



Filigree and Silverware

	<p>Filigree is an extremely ancient technique dating back to 4000 years ago. The silver filigree work in India encompasses various steps that are required to give the items a perfect grandeur.</p> <p>Silver filigree work is a style unique in itself. Filigree work is performed on silver and involves significant precision and technicality. The artifacts manufactured comprises alloy that contains over 90% of silver. With changing times, artists have been using new methods to compete in the market.</p>
Main clusters:	<p>Two major clusters of silver filigree in India are Karimnagar in Andhra Pradesh and Cuttack in Orissa. The practice in Karimnagar is about two centuries old. However it is also practiced in Warangal in Andhra Pradesh.</p>
Artisans involved:	<p>Karimnagar has one silver filigree cooperative society with 65 artisans and 150 families⁷⁰. Whereas, only 200 artisans are engaged in silver filigree work in Cuttack⁷¹.</p>
Raw material used:	<p>Key raw materials used are silver wire, tracing sheet, copper, charcoal, dilute sulphuric acid.</p>
Tools used:	<p>Hammer, moulds, files, chisels, anvil, pliers, pincers and scissors are the key tools used for this work. Metal die and pestle is used for shaping the silver sheet in case of select products such as trays, bowls, etc.</p> <div data-bbox="615 1146 1329 1460">  </div>
Process:  Outer frame	<p>On an average 3 to 4 days are required for making a 5 to 6 inch product involving 4 to 5 artisans. Artisans in Karimnagar have facility to prepare sheets of maximum 6 inches in Karimnagar and in case they require sheets with more widths they go to Hyderabad for the process.</p> <p>The main difference in the work of Karimnagar and Cuttack is in the process. While in Karimnagar, two round wires are intertwined adding tensility to the frame; in Orissa only one square wire is used.</p>



Fixing of pieces on wooden block



Soldering the article

Sourcing
Sourcing silver bars, blocks or biscuits from local markets or other cities.

Melting/ moulding
Melting of the sourced material/ silver and moulding into rods by pouring into cylindrical moulds

Wire drawing
Drawing of rods into wires or thin strips for work. Twisting of wires is done to give it a corrugated finish.

Designing
Tracing the design on a paper before shaping the wires.

Preparing basic design
Creating a framework using a thin silver strip and thereafter inner textures are weaved and fixed in the basic object.

Fixing
Fixing the basic object on mica sheet with an indigenous paste and is soldered.

Framing
Pouring melted wax on a wooden board and putting a frame on the wax my making outer boundary with thick silver strip and placing thin silver strips for inner frame.

Assembling
Preparing individual design pieces using twisted wire and soldering them onto the main framework.

Heating and adhesive mixing
Final piece is heated and detached from wooden plank and reversed on cement plank. An adhesive is poured on the product to make all parts joint.

Cooling and smoothening
The product is left to cool and mould is taken out and smoothened by iron filer.

Polishing, value addition and lacquering
Polishing by shikakai, sulphur, polish paper, sand paper, etc.
Painting, enamelling, engraving, meenakari, etc.as value addition.
And oxidising by lacquering in the end.

Note: The above process depicted is as followed in Karimnagar cluster.

Finished products:



Metal Ware

	<p>The metal crafts of India display intricate craftsmanship and fine art in shaping gold, silver, brass, copper into exquisite designed images, idols, jewelry, and utility items. Different categories of handicrafts that come under metal ware are brass metal ware of Moradabad, metal bidri work and bell metal in Madhya Pradesh, Odisha, and so on. India is the largest brassware producer in the world. Moradabad cluster alone reports ~INR2,500 crore annual turnover of brassware⁷².</p>
Main clusters:	<p>Major clusters of metal ware are Brassware: Moradabad, Murshidabad, Madurai, Salem, Cuttack and Haryana. Whereas, major centers of bell metal ware are Salem, Cuttack, Murshidabad, and Tiruchirappalli.</p>
Artisans involved:	<p>Moradabad cluster has 850 export units and 25,000 metal craft industrial units, and is said to house ~29% of the metalwork-artisans in India⁷³.</p>
Raw material used:	<p>Bell metal consists of copper, zinc, tin, iron and mercury. acid.</p>
Tools used: 	<p>Basic tools required for making brassware include oven, lathe, hammer, tongs, pincers, files, scrapers, hand operated drill, chisel, vessels, crucible, wax, mallet, hand blower, buffing machine, etc.</p>
Process:  <p>Sheets</p>	<p>The following techniques are involved in bell metal ware⁷⁴ utensil work:</p> <ul style="list-style-type: none"> Raw material Bell metal is made up of copper, zinc, tin, iron and mercury Ingots Metals are mixed to form ingots Heating Ingots are heated to become malleable Beating Beating these shapes using a mallet with varying weights and a wooden support, until the metal naturally bends along a concave or convex curve as required. The rim is curved.



Beating



Coating



Assembling



Gold shine

Cooling

Post shaping, the metal is allowed to cool.

Assembling

Parts are assembled and welded into a unanimous whole. Beating improves the tensile strength and malleability of the metal. The vessel therefore is the weakest at the points where it has been welded. Handles are not attached in this form of cookware and tongs are used instead.

Scraping

Vessels are sooty black in color and the outside of cooking vessels is left sooty but the inside sooty layer is scraped off.

Coating

The bottom surface of the vessel is heated, stuck to lac and coated with tin oil. This is done to increase the thickness of the base so that food does not stick to the insides of the vessel during cooking.

Finishing

Washing with acid to make them appear like gold. To decorate, flat metal pieces are cut and beaten onto the ware with a hammer. Designs may also be carved out on the metal using an iron pointed tip pen. Etching on a smoky base creates a gold-black pattern too.

Finished products:

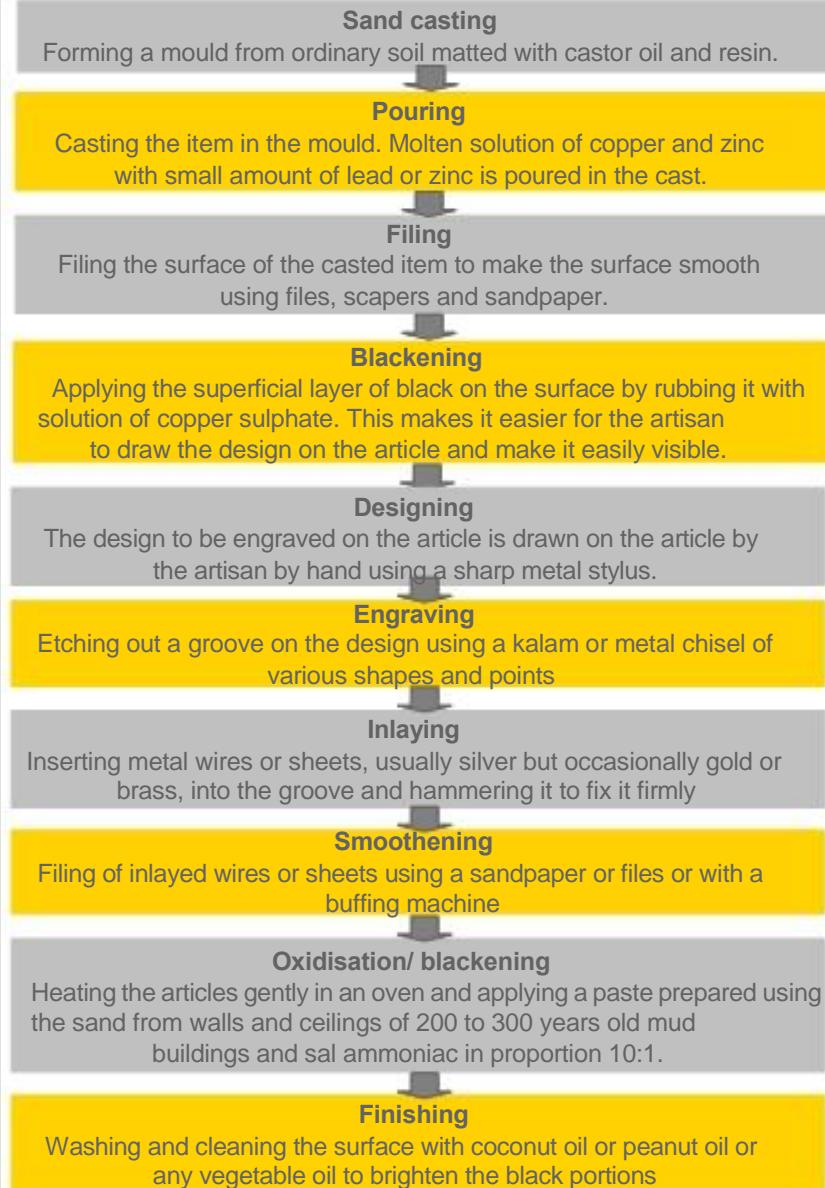




Bidriware

	<p>Bidriware is a metal handicraft that originated in Bidar, Karnataka. The term 'Bidriware' originates from the township of Bidar, which is still the chief center of the unique metal ware. It is a form of encrusted metal ware, where one metal is inlaid on to another. Bidri products include a diverse range of objects including hukka bases, bowls, boxes, candle stands, trays, jewelry and buttons.</p> <p>The craft contains complicated sequences of metal inlay on a zinc and tin alloy base. Bidri has its roots in the Persian technique of inlaying gold and silver on steel or copper. It travelled from Iran to Ajmer in Rajasthan in the 13th century AD, and from there to Bijapur and flourished during the reign of the Deccan Sultanate.</p>
Main clusters:	<p>The art is mainly practiced in Bidar in Karnataka and Hyderabad in Andhra Pradesh. Apart from these, it is also practiced in Aurangabad district in the state of Maharashtra and Hyderabad in Andhra Pradesh.</p>
Artisans involved:	<p>Bidar Bidri Youth Mandal has 600 artisans⁷⁵ registered with it.</p>
Raw material used:	<p>The basic metal used for Bidri is the alloy of zinc and copper mixed in the proportion of 16:1. The metal used is a blackened alloy of zinc and copper inlaid with thin sheets or wires of pure silver. Other materials used are ordinary soil, castor oil, resin, lead/ zinc, solution of copper sulphate, pure silver wire or sheets for inlay, sal ammoniac for oxidization and vegetable oil.</p>
Tools used:	<p>Tools used for this craft are engraving tools, a kalam or metal chisel of varied shapes, hammer, files, scrapers, sandpaper and buffing machine.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Engraving tools</p> </div> <div style="text-align: center;">  <p>Tools used to make wires</p> </div> </div>

It involves four distinct processes-casting, engraving, inlaying and finishing. Each broad stage comprises of additional stages as depicted in the chart below.



It uses a range of inlaying methods such as tarkashi, using wires; taihnishan, with sheet metal; mehatabi kaam, reversal of surfaces where the design is cut out in sheet metal and is inlaid; munnavat kari, embossed design work.

Note: The above process is as followed in Bidar, Karnataka.

Finished products:



Jewelry

	<p>Jewelry making is considered as the most distinctive and highly artistic craft in India. India has well-established capabilities for hand-made jewelry, both in traditional and modern designs. Currently, Indian imitation jewelry market is around INR 8,000 crore, which is expected to reach INR 15,000 crore by 2015⁷⁶.</p>
Main clusters:	<p>Major centers of handmade jewelry are Delhi, Moradabad, Sambhal, Jaipur, Kohima (Tribal), Nellore, Mysore, Nalgonda, Nizamabad, etc.</p>
Artisans involved:	<p>Nearly 500,000 goldsmiths and 6,000 diamond processors are estimated to be present in India⁷⁷.</p>
Raw material used:	<p>Raw materials used are metal, lac, glass, terracotta, seeds, grasses, bone, silver, hardeners, colors, gold polish and stone.</p>
Tools used: 	<p>Basic tools required are kiln, Salai (etching tool), cheni, engraver hammer, burner and stone-setter, mortar and pestle, metal palette, plucker or forceps, metal bangles, Kalam/Taqva (tool used to apply enamel), small scrubbing brush, Takala (needle like tool used for applying colours), Agate stone for smoothing/sanding, Brass dye etc.</p>
Process:  Sheet casting  Cutting	<p>Major processes involved in manufacturing Kundan-Meena⁷⁸ jewelry are:</p> <div style="text-align: center; margin-bottom: 10px;"> Sourcing & transportation Sourcing and transporting raw materials </div> <div style="text-align: center; margin-bottom: 10px;"> Design drawing Drafting the design </div> <div style="text-align: center;"> Melting and sheet casting Annealing/heating metal at predetermined temperature by the goldsmith. Pouring gold/silver into sheet mould to form a small bar. Earlier only gold was used. Silver, copper and other metals are also used now. </div>



Soldering



Forming



Polishing

Sawing and cutting

Goldsmith gives desired shape to the gold/silver.

Pre meenakari

The piece of metal on which meenakari is to be done is fixed on a lac stick.

Engraving

The designer engravess the pattern on gold using steel. Depressed pattern surfaces are serrated so that the enamel is secured. Designs like flowers, birds and fishes are engraved on the surface.

Meenakari

Enameller applies colours. Colors are applied in the order of ability to resist fire (white is applied first). Enamel dust (color) is applied onto the grooves. The color is then fired in a furnace at a temperature range of 750-850° C. This melts the color and causes it to spread in the groove. The firing is done after every color is applied.

Filling and forming

The article is cooled, cleaned and agate/tamarind polished.

Stone setting

Inserting or mounting beautiful stones in the jewelry (Kundan work).

Assembling, Polishing and plating

Final assembly, adding of pearls, beads, etc. and polishing the final piece with a help of polishing motor.

Finished Products:





Pottery and Clay Objects

	<p>Pottery has been called the lyric of handicrafts because of its irresistible and universal appeal. There is a wide range of pottery and clay crafts in India. Some of the most popular forms of pottery include blue pottery, black and red pottery, roulette ware, and dull red & grey ware. The craft faces severe competition from industrial goods made up of aluminum and plastic.</p>
Main clusters:	<p>India has a rich tradition of clay crafts and pottery throughout the country. Asharikandi in Assam is the largest cluster in India, where terracotta and pottery craft is found. Other clusters are Bhadrawati, Bulandshahar, Nizamabad, Pune, Chandrapur, etc.</p>
Artisans involved:	<p>Potters is the fourth largest amongst the artisanal groups in India. It is estimated that about 10 lakh people⁷⁹ are involved in this craft.</p>
Raw material used:	<p>The main raw material for this craft is ordinary clay, derived from the beds of water bodies. One major challenge for the potters is the rapid depletion of suitable clay. Water, catechu, red-soil, cattle dung, firewood, sand paper, hay, wood, ash, bricks for the kiln etc. are other materials used in pottery.</p>
Tools used: 	<p>Key tools used in this craft are potter's wheel, wooden stick to rotate wheel, clay modelling tools, kamachi (hollow cylindrical tube), and hammer.</p>
Process:  Sieving  Clay work	<p>Pottery involves the following key processes:</p> <div style="display: flex; align-items: center;"> <div style="flex-grow: 1; margin-right: 20px;"> Raw material preparation </div> <div style="flex-grow: 1;"> <div style="background-color: #f0f0f0; padding: 10px; border-radius: 5px;"> <p>Sieving</p> <p>Different varieties of clay obtained are first cleaned by sieving/fine sieving it of any organic particles, other sievable impurities</p> </div> <div style="margin-top: 20px; background-color: #ffffcc; padding: 10px; border-radius: 5px;"> <p>Mixing</p> <p>Mixing two types of clay and adding sand, ash, cattle dung, etc. is carried out depending on local availability of these substances to improve the texture of clay. The composition of the clay could be different for different parts of the same product.</p> </div> <div style="margin-top: 20px; background-color: #f0f0f0; padding: 10px; border-radius: 5px;"> <p>Kneading</p> <p>Done with hands and feet to increase elasticity of the clay. Intermediately, clay is cut vertically so as to remove any foreign particles</p> </div> </div> </div>



Hand moulding



Potters' wheel



Production Process

Product manufacturing
2 techniques could be used.

Hand moulding

Involves 4 sub processes.

Pressing

The lump of clay is given various forms by pressing it between the thumb and fingers.

Moulding

Rolled out sheets of clay are placed on a plaster of Paris mould and pressed onto it with fingers to get the desired shape. The clay is then sun dried and removed from the mould.

Strip method

Also called coiled pottery, in this technique, rolled out clay is used as the base and edges are moulded inwards in a bowl like shape. To raise the height, strips of clay are joined together. The strips may be rolls or flat.

Smearing

Clay and cattle dung mixture may be used for reconsolidation of the product.

Firing

To increase life of the sun baked clay and strengthening, the article is subjected to firing. Open or closed firing may be carried out and covered with husk, wood, ignited cattle dung, etc during the firing process. Kilns are made of dung, bricks in closed firing. Smoke firing may be carried out to give black colour to the pottery.

Wheel throwing

The technique makes it faster to mould round articles using circular motion of the wheel on which the lump of clay is fitted.

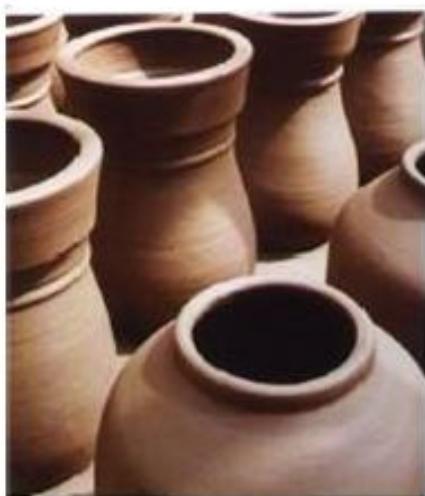
Wheel

The wheel is made of sun baked clay or wood or sandstone. The rim is bound using mixture of clay, cattle/human hair, ropes, creepers.

Process

The potter shapes the lump of clay using both hands while the wheel is rotating.

Finished Products:





Terracotta

	<p>Terracotta is similar to pottery, in which craftspeople use local clay available in river beds to make items such as lamps, candle stands, figures of deities and animals, etc. Terracotta is the hard, moistureless, partially burnt clay used for pottery. In this craft, the objects are not made on potter's wheel, as done in pottery.</p>
Main clusters:	Like pottery, terracotta is also practiced in several parts of the country.
Artisans involved:	
Raw material used: 	Apart from clay, other materials used are starch/gum, mustard oil, paddy husk, grass, dung cakes, coal/firewood, sand, and ash. Colour and pigments may be used if required in the article.
Tools used: 	Potter's wheel (to make basic shapes of the parts to be later joined), wooden stick, cutters blade, other moulding tools.
Process:  Kneading 	<p>A number of different articles of daily use, utilities, decoratives, toys can be made using terracotta. Making the Bankura (in West Bengal) horse involves the following key processes⁸⁰:</p> <p style="text-align: center;">Raw material preparation</p> <div style="display: flex; justify-content: space-between;"> <div style="flex: 1;"> <p>Sieving Different varieties of clay obtained are first cleaned by sieving/fine sieving it of any organic particles, other sievable impurities</p> </div> <div style="flex: 1;"> <p>Mixing Mixing two types of clay and adding sand, ash, cattle dung, etc. is carried out depending on local availability of these substances to improve the texture of clay. The composition of the clay could be different for different parts of the same product.</p> </div> <div style="flex: 1;"> <p>Kneading Done with hands and feet to increase elasticity of the clay. Intermediately, clay is cut vertically so as to remove any foreign particles. Mixing and kneading may take about 5-6 hours.</p> </div> </div>

Wheel work



Drying



Hand work



Motif work



Coloring



Firing

Finished products:

Wheel work

Basic shapes for the horse such as cylinders (belly), cones (legs, jaws) are made using the wheel

Drying

The parts made on the wheel are sun dried for 1-2 days. Care is taken to protect them from rain and also that they do not become too hard.

Hand work

Joining parts together and assembling them to give shape to the product. The 4 conical legs are placed first and then joined by the cylindrical body. Filling gaps required patience and skill. The tail is joined later.

Detailed Motifs work

All parts are joined together as also smoothening of the surface and filling of gaps is ensured before motif work is done so that the motif is uniform. Post designing, a wet cloth is applied to the surface to help the motif stick and to sort out errors, if any. The process may take about 45 minutes for a 3 feet horse with average detail of design.

Final Drying

Some sun drying is first carried out and then small holes are made in the surface to ensure uniform drying of inner and outer parts. The process takes about 6-7 days for slow dehydration in a room, lest cracks may develop in the surface.

Colouring

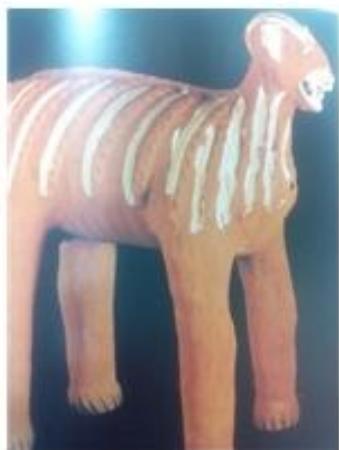
Sun drying is again carried out post which the figures are colored using natural colors of earth found in the region [Khadigad (white, chalky), Bhalogad (yellow, oily), Banak (brownish, oily)].

Firing

Firing is done in circular/parabolic kilns. The process takes about 15 days to a month depending on the size of the kiln. If the smoke is let out of the kiln, the figures are red; if it is let to remain inside, the figures are black.

Testing/Sorting

The pieces are inspected for defects, if any. The defected goods are sorted out and sold at a lower price/ discarded.



Horn & Bone



Horn and bone carving is the act of creating art forms by carving into animal bones and often includes the carving of antlers and horns.

Main clusters:

The important centers for bone carving/horn craft are Lucknow, Moradabad, Sambhal and Sarai Tarin in Uttar Pradesh, Honawar in Karnataka, Gajapati in Orissa, Jodhpur in Rajasthan and Thiruvananthapuram in Kerala.

Artisans involved:

After the ban imposed on ivory in 1989, many artisans took to carving bones and horns to keep the craft alive.

Raw material used:

Different types of animal bone are used for bone carving. For horn craft, cow horns, buffalo horns, stag antlers and tusks are widely used. For bone, camel and buffalo bones are used.

Tools used:

Simple instruments like chisel, small saw, sand paper, mallet, etching tool, file, hammer and a few patterns are used on the dried bones.

Process:

Process for making products from horns:

Buffalo horn is commonly used due to its large size and tapered base; bullock horns are smaller and hence, useful for making smaller objects. The horns of the bull is only occasionally used since it is hollow and suitable only for carving the form of a peacock with a sweeping tail.

Striping

The upper layer of the horn is striped off using chisels

Marking

The desired shape is marked with chalk and the extra areas are sawn or chiseled

Softening

Horn may be moulded into the desired shape by softening it through heating

Polishing

It is thereafter tempered with water and polished. Polishing is done with a sandpaper or leaf of jackfruit tree, in effect producing a milky liquid to settle on the surface of horn

Shining

A sooty black paste made from burning palm leaves and mixing the residual ash with water is rubbed on the surface to give it shine

Designing

Patterns are etched onto the surface and the mixture of chalk and adhesive is applied to bring out the design (the polished areas gleam while the etched areas catch colour)

Note: the above process is as followed in Thiruvananthapuram.

Process for making products from bones:

Burning

Bones and horns are processed in a workshop by heating them in a furnace so that extra fibre and extensions are burnt

Bleaching

The bones are chemically bleached for colour

Cutting and softening

Cutting raw bones of dead animals and softening them by putting them in water

Cleaning

Scraping, cleaning and shaping them into the desired shape on a lathe

Carving

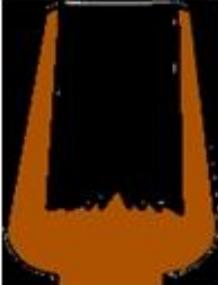
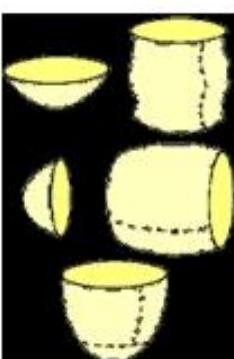
Carving the design onto the bone using a fire drill

Finished products:

Horn and bone artifacts include jewelry, ornate table lamps, chess-sets, cigarette holders, napkin rings, salt and pepper sets, animal figures, etc.



Musical Instruments

	<p>Most of India's musical instruments need to be made with precision using very specific materials for different parts of the instrument. Indian musical instruments have high level of structural design and complexities to derive the unique sound for making it rhythmic to extract Indian music. Some of the popular instruments are sitar, flute, shehnai, tabla, sarangi, and ghatam.</p>
Main clusters:	<p>Jodhpur, Ranchi, Tiruchirappalli, Vishakhapatnam, and Kolhapur are important centers for musical instruments craft.</p>
Artisans involved:	
Raw material used:	<p>Materials used depend on the type of instrument; however, some basic materials used are wood, leather (sheep skin, buffalo skin, goat skin), twine or cotton thread, brass, ivory and yarn.</p>
Tools used:	<p>Key tools used are handsaw, chisel, gauge, hammer, planer, file drill, and screwdriver. Lathe machine is also used.</p>
Process:  Siddha shell  Dagga shell	<p>Tabla - Parts of the instrument:</p> <ol style="list-style-type: none"> Small wooden drum called sidda (tabla, dayan, or dahina) – played with right hand Larger metal drum called dagga (banya) – played with left hand The pair of tabla is positioned on two toroidal bundles called chutta, consisting of plant fiber wrapped in cloth. <p>Stages involved in tabla manufacturing are⁸¹:</p> <div style="display: flex; align-items: center;"> Fashioning the Siddha shell <div style="flex-grow: 1;"> <div style="background-color: #ffffcc; padding: 5px; margin-bottom: 10px;"> Raw material selection Teak, rosewood and, jackwood are used to make good quality Siddas. Length: Not less than 10 -12 inches, diameter: about 6-8 inches; should not have cracks, should be insect resistant, absence of knot holes, heavy weight. </div> <div style="background-color: #e0e0ff; padding: 5px; margin-bottom: 10px;"> Grooving The selected wood is chiseled and placed on a lathe which shapes it further and makes the grooves. </div> <div style="background-color: #ffffcc; padding: 5px; margin-bottom: 10px;"> Hollowing The grooved wood is then about 4 inches depth is hollowed using gauges and chisels. A thick portion of the base is not chiseled. </div> <div style="background-color: #e0e0ff; padding: 5px;"> Seasoning Allowing the wood to dry in a cool dry place for a period of about 2 years. Faster drying may result in cracks being developed. </div> </div> </div>



Dagga hammering



Tuning straps



Shai Masala

Fashioning the Dagga shell

Raw material selection

Clay, wood, copper, brass, steel , aluminium may be used to make the dagga shell.
Brass is preferred. Coating of nickel or lead may be done

Molding and joining

A brass disc is cut to a diameter of 8 inches and beaten to a bowl shape. Another sheet rolled to form a cylinder of 10 inch diameter is crimped and welded to the bowl using a metallic powder (dag) and heating till red hot.

Rim preparing and final shaping

The brass rim is folded over an iron ring of 9 inch diameter. The raised disc base is made. Also, the shell is beaten to dent it to a fish scale surface.

Polishing

The shell is then put on a lathe where it is smoothed, polished to remove the dents and chrome plated to complete the dagga.

Covering the open top

Seasoned goat skin (thicker, the better sound at higher pitches) called 'puri' is wrapped on the siddha and dagga. Once one layer covers the top, another layer covers the edges overlapping the first layer.

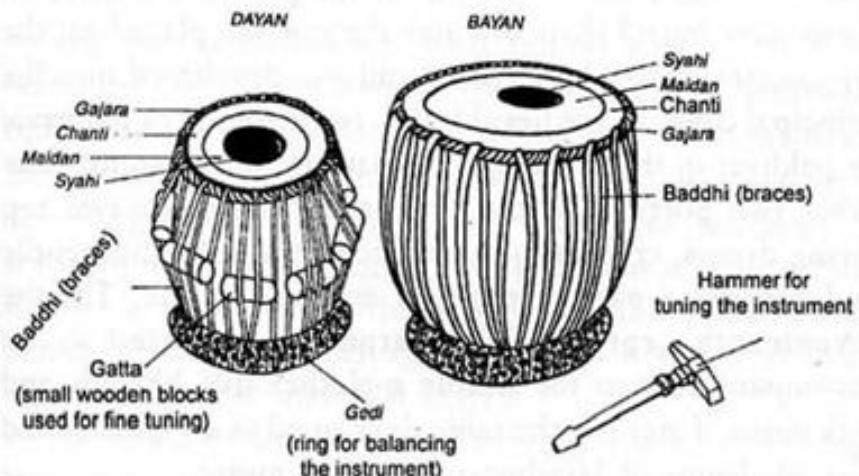
Assembly

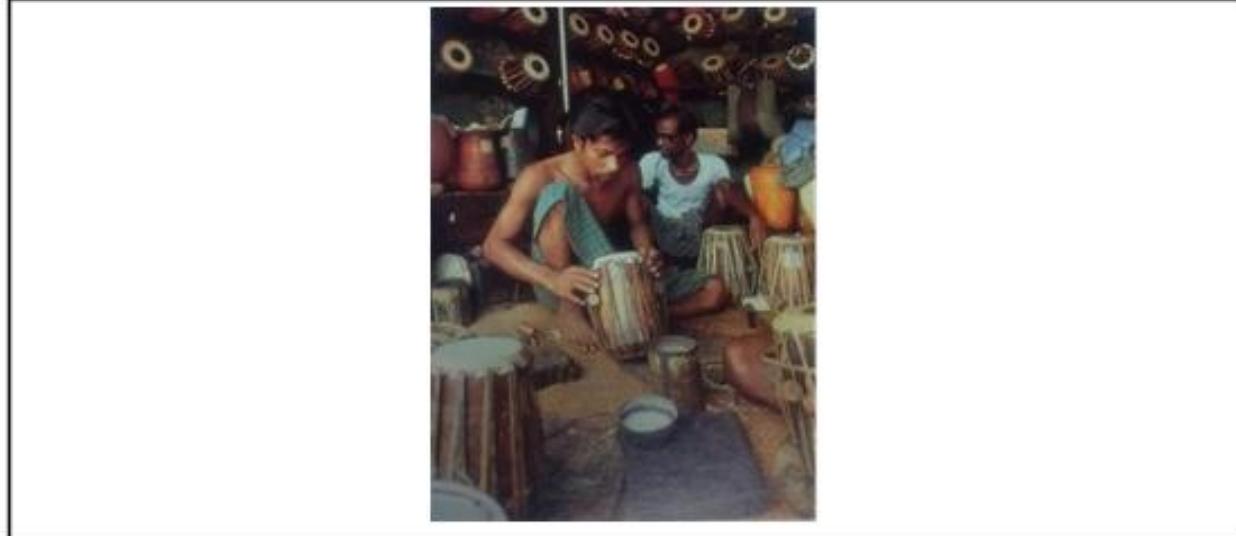
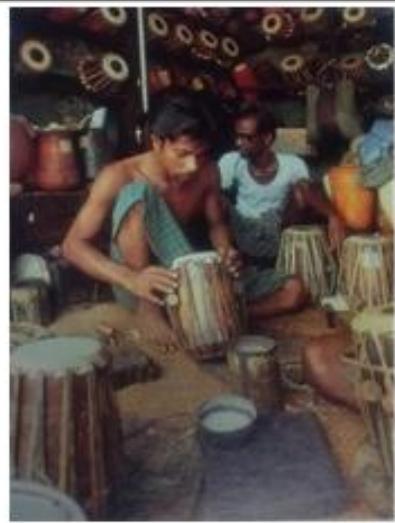
Tuning straps are fastened, wooden blocks (to tighten/loosen the skin) are inserted. Both the siddha and dagga are rested on rings and a gaddi (made of straws and covered with cloth) while playing.

Shai Masala

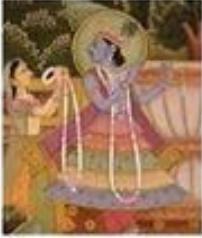
The black spot on the tabla is essential in defining its tonal color. The shai contains shai masala (ink powder) which is sourced from Bhavnagar, Gujarat (Mixture of metallic dust, soot , rice flour, gum and other plant extracts). The shai masala is coated on the centre of the Dagga and Sidda

Finished products:





Folk Painting

	<p>Indian Folk paintings are pictorial expressions of village painters which are marked by the subjects chosen from epics like Ramayana and Mahabharata, Indian Puranas as well as daily events. There are several vibrant folk painting types in India in different stages. They are distinctively different. The styles are related to their folk mythology.</p>
Main clusters:	<p>The Gond tribe of Madhya Pradesh is engaged in floor and wall painting. Warli is vivid expression of daily and social events of Warli tribe in Maharashtra. Rajasthan is famous for Phad painting done on cloth. Other types of paintings are Pithora painting in Gujarat and Madhya Pradesh, Madhubani painting of Bihar, Chitrakar painting of West Bengal, Patachitras in Orissa, and Kalamkari in Srikantham (Andhra Pradesh).</p>
Artisans involved:	
Raw material used:	<p>All the different types of folk painting mainly use mineral colors and homemade canvases, if not drawn on walls and floors. Painting on walls and floors is done with help of white rice paste, ochre or yellow earth colors.</p> <p>Different sands are used to prepare the base for the paintings, geru, kali mitti, etc.</p> <p>Pithora art requires clay, and designs made from grains, herbs, spices, etc. The paintings may be made on canvas, paper and cloth surfaces.</p>
Tools used:	<p>Paint, bamboo brushes for Warli paintings.</p> <p>Cotton strings, bamboo sticks/brushes, arrow heads, wooden stencils, for Pithora paintings. Brushes and paint bowls are made of khakhra leaf.</p>
Process:  Clay work in Pithora	<p>Key techniques involved in folk painting are:</p> <p>Warli paintings⁸²:</p>



Base making in Pithora

Base

Traditionally, Warli married women choose a sacred wall of their house for the painting which is then cleaned and hand polished using cowdung followed by geru mitti (red mud). The painting are even done on cloth (typically 'Latha' cloth).

Base paint

The base paint is done with a brush in a square shape.

Designs

The designs are usually in square or round in shape and white in color. Circles represent the art of Warli depicting it does not have an end or a beginning. Designs made in Warli paintings show weddings scenes, mela (fair), manir ki puja, etc.

Color

Warli paintings are usually made with white on a mud colored base. Rice powder solution was applied with bamboo sticks traditionally. Cowdung was used for dark green color, kali mitti (sand) for black color. Poster colors are now used.

Pithora paintings⁸³ are made in the following way.

Base

Traditional Pithora paintings of Gujarat and Madhya Pradesh are made on floors, courtyards or walls of houses. The art may be in the form of paintings or as bas relief (clay designs made when the walls are wet during construction and recoated occasionally).

Design making

Mud walls are painted with lime (chalk) solution making lines and shapes with their hands creating a tapestry/lattice of white lines on a dull mud surface

Design making (2)

Border of the painting is made with geru mitti and three petalled flowers are made from white flour

Design making (3)

Red (vermillion), yellow (turmeric), ochre (mix of turmeric and vermillion) colors are used in some paintings.

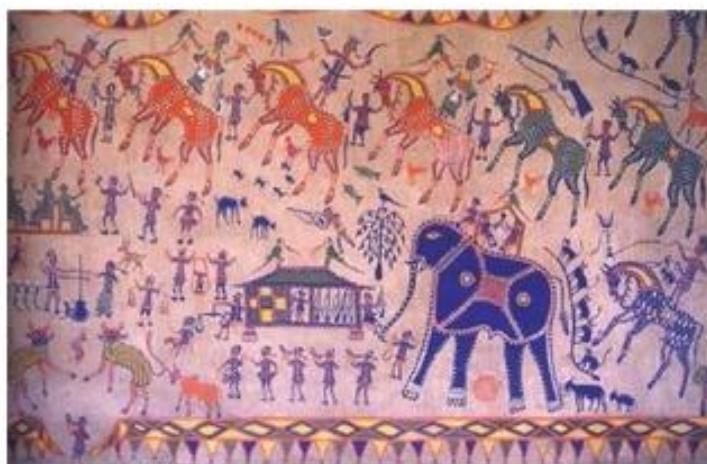
Design making (4)

Between different communities making Pithora paintings, designs include humans, flora, fauna, legend, culture, religion, events, rituals, myths and the like. The paintings also are used for story telling. Layering of visual effects in the image (images within images) may also be done.

Finished Products:



Warli painting



Pithora painting

Conch Shell



Conch shell craft has social and religious significance in India. Conch shell bangles are widely used in West Bengal. Whole conch shell used in marriages is often intricately carved. Shell craft also includes engraving, painting and sculpting of seashells. The shells are used to produce a variety of products, starting from attractively designed animals to human figures depicting ethnic costumes of various sizes.

Main clusters:

West Bengal is the main center for products made from conch and cowrie (small closed shells) shells. Shallow carving and etching is done on conch shells, which can be used as decorated pieces. Small shells are used to decorate bags, shawls etc. Along the Eastern coastline, especially Tamil Nadu, many people are engaged in this craft.

Artisans involved:

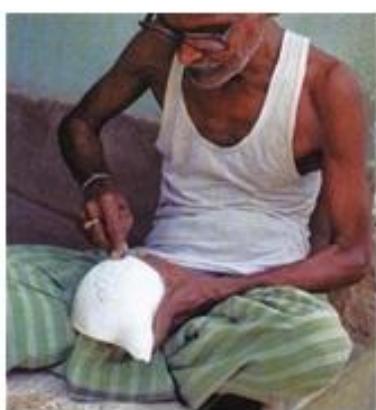
The carvers belong to Saankhari community in West Bengal and mainly reside in Bishnupur, Saaspur, Hatgram and Rampur.

Raw material used:

Dried and empty shells are the main raw material which are sent to Kolkata from Tuticorin beach in Chennai.

Tools used:

Key equipment used for conch carvings are file, chisels, hammer, grinder etc. The chisels are used in different sizes depending on the detailing and intricacies of the pattern.

Process:**Artisan engraving on shell****Conch shell cut into pieces to make bangles****Sourcing**

Mainly sourced from Chennai two types of conches: thinner for blowing and thicker for carving

Cleaning

Cleaning the shells to remove all impurities of the sea by washing it

Shaping and smoothening

Smoothening the shell using the required tools such as grinding machine

Washing

After shaping they are again washed in hydrochloric acid to give them a whitish colour and make them lighter

Filing and polishing

This is done to provide the shells the desired luster

Tracing

Tracing of the design on the conch shell using a pencil

Cutting

The conch is cut into desired shapes to make bangles and start engraving

Engraving

Grooving the design using the different sized chisels and hammer depending on the design

Polishing

After engraving, the final piece is polished to smoothen the surface

Finished products:

Shells cut in different ways make good paperweights and decorative pieces.

Small shells are used in the production of intricately designed chandeliers, hangers and curtains. Utilitarian items such as key chains, fork and spoons, table lamps, ashtrays, jewelry, buttons, pen stands, small boxes are also made from shells. Decorative shells or shells which are rare and tastefully decorated by nature are also sold as items of decoration.



Coir Twisting

	<p>Coir is a natural, eco-friendly, water proof and exceptionally tensile fiber extracted from the nuts of coconut palms. It is found in abundance and is used for manufacturing a wide range of eco-friendly toys, mats, brushes, mattresses, wall hangings, key rings, pen stands and other home decoratives.</p> <p>Coir comes in 2 varieties: Brown and white. Brown coir (from ripe coconut) is less flexible but stronger and used in sacking, upholstery padding. White coir (from unripe coconut) is finer and weaker and used for making fishing nets, strings, ropes.</p>
Main clusters:	<p>Craft is primarily produced in Orissa (Sakhigopal, Puri, Pipili, Bhubaneswar Batamangala and Kendrapara). It is also produced in Kerala (Ernakulam)</p>
Artisans involved:	
Raw material used:	<p>Raw material required for making coir toys and other coir products are very few and basic. These include are coir, wool, fevicol, cardboard and cotton thread. Main tools used are scissor, plier, and needle.</p>
Tools used: 	<p>Tools used include manual spinnerets, Dye vats, Frames, Pressing machines, Katuri (scissors), Sui (needle), looms, hardboard moulds (for mats)</p>
Process:  Retting	<p>Coir twisting is done using the following process⁸⁴:</p> <div style="background-color: #e0e0e0; padding: 5px; margin-bottom: 10px;"> <p style="margin: 0;">Sourcing</p> <p style="margin: 0;">Sourcing and transporting raw material and raw material preparation.</p> </div> <div style="background-color: #ffffcc; padding: 5px; border: 1px solid #ffcc00; margin-bottom: 10px;"> <p style="margin: 0; color: #ffcc00;">Retting</p> <p style="margin: 0;">Retting the coconut husks in which the shredded coconut husks are left immersed in water for 6-10 months to facilitate fibre extraction.</p> </div>



Pounding



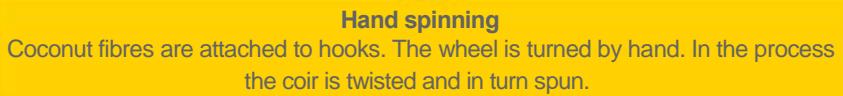
Hand spinning



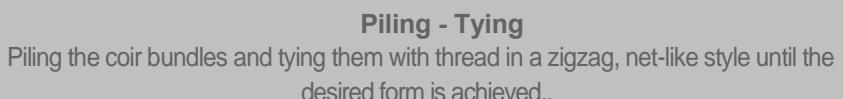
Playing/twisting



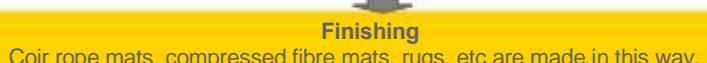
Retwisting/playing



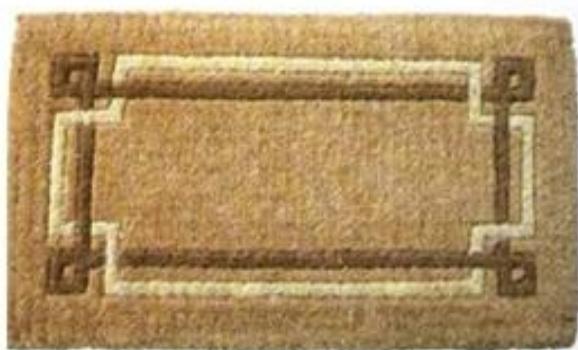
When crafts such as toys are made of twisted coir, the process followed is as follows:



In Kerala (Alappuzha), mats, rugs are made using the following process:



Finished Products:



Theatre, Costumes & Puppet

	<p>This craft involves making objects related to the festivals and for use in performing arts. Puppet is one of such crafts, which has a rich tradition in India. There are four types of puppets - glove, rod, shadow and string. They are differentiated based on the different ways of manipulation of puppets. These types have further varieties under them.</p>
Main clusters:	<p>Puppets from different parts of the country have their own identity. These are produced in several states including Odisha (Kundhei nach, Kathi Kandhe, Ravanachhaya), Karnataka (Gombeyatta, Togalu Gombe-atta), Andhra Pradesh (Tholu Bommalata), Tamil Nadu (Thol Bommalattam, Tolpavaikoothu), Rajasthan (Kathputli), Bihar (Yampuri) and Kerala (Tolpavakoothu, Pava-kathakali).</p>
Artisans involved:	
Raw material used:	<p>Tholu Bommalata, a famous form of leather puppet produced in Andhra Pradesh, is prepared using goat hide and sheepskin. Vegetables dyes/chemicals, ash are also used.</p>
Tools used:	<p>Tools used include hammer, pencil/charcoal, wooden bamboo sticks, chisel (used to drill holes in the leather), needle, scissors, paint-brush and mould. Oil lamps/electric lights are used to create the shadow effect.</p>
Process:  Leather cutting  Joining the parts	<p>The shadow puppet making or Tholu Bommalata (Tholu -leather, Bommalata – puppet dance)⁸⁵ of Andhra Pradesh involves the following key processes. Other types of shadow puppetry practiced in the state are Sutram Bommalata (string puppets) and the Koyya Bommalata (wooden puppets).</p> <div style="background-color: #ffffcc; padding: 10px; margin-bottom: 10px;"> <p>Raw material Puppets were earlier made of deer leather. They are now made using goat hide. The large puppets could be at tall as 6-8 feet.</p> </div> <div style="background-color: #cccccc; padding: 10px; margin-bottom: 10px;"> <p>Cleaning The leather is cleaned via a few days long laborious process to make it translucent. The leather is stretched tight by nailing it at the corners. It is then rubbed with ash and sun dried.</p> </div> <div style="background-color: #ffffcc; padding: 10px;"> <p>Outlining An outline of the body and limbs of the puppet are drawn on leather using a pencil or charcoal.</p> </div>



Shadow effect

Dyeing

The puppet is dyed using vegetable dyes (earlier only red and black) or chemical dyes (varied colors). These dyes maintain the translucence of leather. Colors are assigned for some characters of folklore. Negative characters are usually given darker colors.

Ornamentation

Tiny perforations are made in the leather using chisels. When light passes through these perforations, an effect of jewels glittering is created.

Joints

Body parts are joined together. A single puppet may have as many as 18 body joints. Dance puppets have more joints than the others

Sticks

Wooden/bamboo sticks are then attached vertically at the back of the leather to facilitate puppet movement and prevent it from bending.

Lighting

The puppet show is carried out with oil lamps/electric lights placed about 2 feet behind a white screen (usually a white dhoti) to create the shadow effect.

Stage

The stage is made at knee length. The screen is made of white dhoti and the 3 sides are covered with gunny bags. Dimensions are as follows: The stage is 21 x 6 x 10 feet. The screen is 8 x 6 feet to 12 x 8 feet and leans 1.5 feet forward. Behind the screen, 2 wooden planks are placed one above the other. A sound effect is created by stamping on these as necessitated by situations in the play.

Storing

Puppets when not in use are stored in bamboo or tin boxes.

Finished products:





Dolls and Toys



Different regions of India are known for specific toys. The difference lies not only in the availability of raw material, but also in the local culture, idiom and culture. Various types of toys produced in India are clay toys, wood based toys, cloth toys, and palm leaf based toys. Doll making is usually a family enterprise.

Main clusters:

Toys and dolls craft is practiced in many parts of India, including Lucknow in UP , Katwa, Gondalpara, and Krishna Nagar in West Bengal, Khetri, Bassi and Jodhpur in Rajasthan, Baliapatna, Siriapur, Barpali in Orissa, Nasik, Nagpur and Mumbai in Maharashtra, etc.

Artisans involved:

Raw material used:

Main materials used for toll and doll making are clay, wood, and cloth, depending upon the type of craft. Other materials used are colors and oil.

For wooden toys of Kondapally, tella poniki wood is used as raw material.

Tools used:



Files, chisels, saw, bow saw, hammer, carving tools, cutting tools are used for wooden toy making.

Process:

Kondapalli wooden toy making involves following key processes⁸⁶. The toys are known as 'koyya bommalu' locally:

Wood seasoning

Pieces of Poniki wood are slowly heated for about 15 to 20 days to facilitate moisture removal. Moisture removal makes the wood light and malleable.

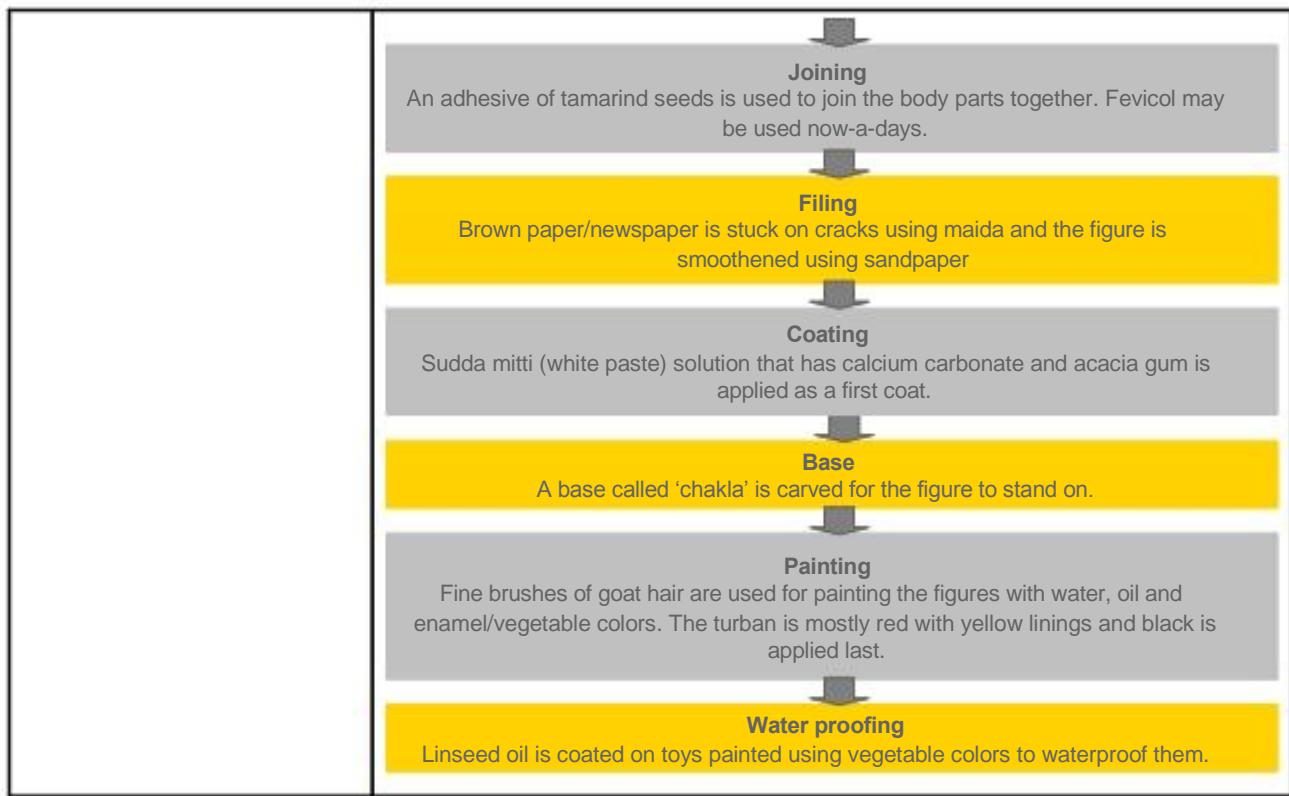


Pre carving

The pieces are heated over burning sawdust filled terracotta bowl to make it easier to carve.

Carving

The main body is carved first followed by the limbs. After carving the part, it is heated again before details are sculpted. Deities, natural scenes, animals, birds, human figures are mostly carved



Finished products:





Grass, Leaf, Reed & Fiber

	<p>Traditionally, natural fibers have been used in all cultures for making utilitarian products. Different parts of the plant are used for preparing various handicrafts such as footwear, basketry, mats, chik, bags, lampshades, and boxes. Fibers can be extracted from the bark (banana, jute, hemp, ramie), stem (banana, palm, bamboo), leaf (palm, screw pine, sisal, agave), husk (coir), seeds (cotton), and grass (sikki, madhurkati, benakati, munj).</p>
Main clusters:	<p>Fiber is found in many states including Maharashtra (sisal), Kerala (palm leaf, korai grass), Tamil Nadu (palm leaf, korai grass), Assam (shitalpatti), Meghalaya (shitalpatti), Bihar (Sikki and Munj grass), etc.</p> <p>Major centers of this craft are Almora and Dehradun in Uttarakhand, Goa, Ernakulam in Kerala, Kullu in Himachal Pradesh, Midnapur in West Bengal, etc.</p>
Artisans involved:	
Raw material used: 	<p>Locally available natural fibers like Plant fiber (hemp, sisal, jute, coir, reed, grass, etc), Animal fiber (wool, mohair, cashmere, angora, yak wool, alpaca wool, camel hair, etc) and Insect fiber (silk) are used as basic raw materials⁸⁷.</p>
Tools used: 	<p>Dyes, blades, knives, scissors, ruler, measuring tape, taana (octagonal warping frame), comb, cardboard template, sewing machine, loom and bricks are used.</p>
Process:  taana 	<p>Following is the process used for making mats from natural fibers in West Bengal:</p> <div style="background-color: #f0f0f0; padding: 5px; margin-bottom: 10px;"> <p style="margin: 0;">Preparing raw material</p> <p style="margin: 0;">Sticks of grass (madhurkati) of length about 56 cm are sourced. Soaking, splicing, and cleaning the grass</p> </div> <div style="background-color: #ffff00; padding: 10px; text-align: center;"> <p style="color: #0070C0; font-weight: bold; margin: 0;">Dyeing</p> <p style="margin: 0;">Dyeing the sticks using natural or synthetic dyes</p> </div>

Mat making



Weaving



Drying

Post dyeing, drying is ensured before mats are woven on looms.

Disentangling

The dyed/undyed warp yarn is disentangled using a charkha and bundled

Warping

The tread bundles are passed through a reed frame and wound on the taana, thus preparing the warp which is then transferred on the loom. The weft is a combination of sticks and yarn.

Weaving

The thread is at one end and weaver at another and pedals in the loom are used to separate the warp threads and fill in the weft yarn and grass sticks. A comb is used to beat the weft in the warp. Using this process the mat is completed.

Accessorising

The mat is taken off the loom and the ends are cut and covered with fabric.

Finishing

The mat material is also used to make other products using cardboard as a template. Pouches, bags, wallets are lined with cotton and stitched using a sewing machine.

Finished Products:





Metal Images (classical)



Dhokra is a famous type of metal images (classical) craft, which uses the lost wax casting method to draw images on metal. It is one of the earliest known methods of metal casting. It is believed that Dhokra is perhaps the only living tradition of metal image making in Eastern India. The biggest advantage with tribal art is that it is performed with simple easily available raw materials.

Main clusters:

Dhokra is practiced in Orissa, West Bengal, Bihar, Chhattisgarh and parts of Andhra Pradesh. In Chhattisgarh, the Dhokra clusters are spread in and around Kondagaon and Jagdalpur.

Artisans involved:

Over 600 artisans work in these clusters⁸⁸.

Raw material used:

The craft uses an alloy of brass, nickel and zinc that gives antique effects of the castings. Apart from this farm clay and rice husk, riverside clay or mud and charcoal, bean leaves, bees wax, unrefined soil (Bhami mitti), pieces of bronze and brass or bell metal utensils, wood and coal are also required to fuel the furnaces

Tools used:

Farni, mutni, dhokna, chimta, sooja, hathawri, dhorkin, darga, pinachaku are the key tools used in Dhokra metal casting.



Mathani: Shaping tool

Process:**Basic model of farm clay****Wax string mounting****Openings in model****Sourcing**

Sourcing the raw material from local markets, etc.

Basic modeling and drying

Preparing basic clay model with farm or terracotta clay. Clay is mixed with rice husk and water to make pliable mixture. The basic model is then left in sun for drying.

Clay layering

Applying the river side clay uniformly on the dried model and left to dry under the sun

Shaping and filing

Shaping the dried clay structure with the help of a file tool.

Paste layering

A green paste made of bean leaves is applied all over the model and dried. The paste being sticky, keeps the clay particles together and prevents the clay from sticking to the metal.

Wax preparation

Raw bee wax is melted and filtered through a coarse cloth into a pan of cold water, thereby forming refined wax. It is taken through sieves to yield long strings of wax

Wax layering

These strings are then wrapped over the contour to give it a uniform layer of wax. A hand tool Mathani is used to give shape to the model

Riverside clay and charcoal layering

A layer of mixture of riverside clay and charcoal is applied on model and dried. Multiple openings are left to pour the metal in the model

Soil layering

A layer of fine clay obtained from termite bills with rice husk is applied on the model and left for drying

Firing

Wax melting and bell metal melting are undertaken in a furnace. Metal is poured into the model to take place of wax.

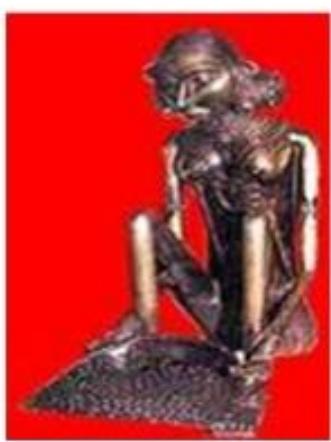
Cooling

Large models are allowed to cool for 5 to 8 hours and small models for 1 to 2 hours.

Finishing

When the model cools down artisans break the outer mould and remove the clay particles. The final shape is given through the finishing operation with the help of file tool, buffing machines etc.

Finished products:



Metal images (folk)

	<p>In India, a variety of metal crafts are being practiced. One of such important craft is metal images (folk). It is an art which uses the metal sheet as a base and has intricate designs embossed on the surface. These designs are usually then painted in bronze or golden colour. The metal images (folk) is mainly used as a wall hanging/ painting for decorative purposes.</p>
Main clusters:	<p>Main clusters of this craft are Ujjain in Bhopal, Varanasi in UP, Khurai in Manipur, and Bishnugarh in Jharkhand.</p>
Artisans involved:	<p>Number of artisans practicing this craft in the above clusters is: Ujjain-225 plus artisans & 18 SHGs, Varanasi-200 plus artisans & 15 SHGs, Khurai-203 plus artisans & 14 SHGs, and Bishnugarh-302 plus artisans & 21 SHGs⁸⁹.</p>
Raw material used: 	<p>The craft involves use of a metal sheet (mostly aluminum, however can be copper or brass as well) as a base, embossing tools, anti rust colours (black, bronze and golden), ball point pen, kerosene, cotton, painting brushes and a piece of cloth.</p>
Tools used: 	<p>Embossing tools and ball point pen to emboss on the metal sheet.</p>
Process: 	<p>Production involves the following stages:</p>



Preparing

Preparing the design sketch which has to be traced on the metal sheet

Sourcing

Sourcing and transporting metal sheets, anti rust colours, and relevant tools to emboss such as ball point pen, etc.

Tracing

Tracing involves applying force draw on the metal sheet so that impression of design comes out prominently

Colouring

Outlining the design in black colour and painting the background with the golden anti rust colour. Kerosene may be mixed to give the colour a lighter shade.

Drying

Leaving the sheet for drying for a day

Finishing

Giving the finishing touches to the painted metal sheet

Finished products

