



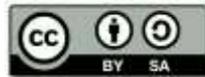
Training Manual for Bamboo Craft

Module III:
Lifestyle Products

Published by

Commonwealth Educational Media Centre for Asia
7/8 Sarv Priya Vihar
New Delhi - 110016

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Off Shaheed Jeeb Singh Marg, New Delhi – 110067



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Module III:

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Preface

Bamboo is an ancient woody grass widely distributed in tropical, subtropical and mild temperate zones. Traditionally seen as the “poor man’s tree”, in recent years bamboo has risen to a high-tech, industrial raw material and substitute for wood. Although the commercialization of planted bamboo has been slow, it is becoming an increasingly important economic asset in poverty eradication, economic and environmental development (FAO, 2005).

Bamboo is a group of perennial evergreens in the true grass family Poaceae and includes the largest members of the grass family. There are more than 70 genera of bamboo divided into about 1,450 species, of which only around 50 species are routinely cultivated (Hunter, 2003). Native bamboo grows in many parts of the world, including East Asia, Sub-Saharan Africa and the Americas. Bamboo is not limited to tropical climates, with some species able to withstand frost and survive in Northern Europe. It is an extremely

fast-growing plant, with some species obtaining growth surges of 100cm per 24 hour period. Most bamboo species grow to their full height within a single growing season. Over the following seasons the walls of each culm (or stem) dry and harden, reaching maturity within 3 to 5 years.

Bamboo has traditionally been used for basic construction and scaffolding, woven mats, basketry, incense sticks, and a wide variety of other handcrafted items. The utilization and trade of bamboo sector is dominated by a large informal sector comprising farmers, artisans, and family-owned cottage industries located in remote villages. Bamboo has been used as the primary raw material of the pulp and paper industry of North East India for many years. It is increasingly being exploited as a wood substitute for a range of industrial products including particleboard, bamboo mat boards, and bamboo mat corrugated sheets. Bamboo is cultivated in a small scale in homesteads but most of the material that is processed into finished products is extracted from state owned forests.

How to use the manuals

In order to promote vocational skill development through the use of technology enhanced learning, and open educational resources, training contents have been developed for training artisans / workers to enhance the quality and introduce new line of products with higher value addition that has acceptance in high-end markets.

Module 3 is designed to provide a pictorial step-by-step elaboration on the various applications of bamboo to create diverse products. It provides information regarding making of lifestyle products such as hangars, fruit bowls and trays. This manual can be used as a reference material for trainers, trainees and artisans who are learning to work with bamboo. An audio-visual guide has also been developed for the manual in order to enhance understanding. It is advisable to use both resources to derive the most of the manual.

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1. Introduction

Since the traditional times bamboo has been used for making many lifestyle products across the country, which is of utility value. The multiple properties of bamboo before and after conversion allows this material to create a wide array of products. Thus in the modern world also we can expect this material to create wonderful products by using its indigenous properties. Lifestyle bamboo products can replace plastics, steel and other



Artisans engaged in making lamp shade.



Artisans engaged in making lamp shade.

Artisans engaged in making a tray.



Artisans working in a typical production unit.

Artisans engaged in making fruit basket.

2. Tools & Raw Materials

There are various tools used for working with bamboo especially for making various products. The most important tool used is knife while other auxiliary tools are described below. Each tool has its own unique purpose in the product making. It starts from measuring to cutting, splitting, drilling, bending, grinding etc. The material for making products also should be selected carefully and treated well before using it.

Steel rule



Right Angle

Angle scale



Measuring tape

Compass



Knife



Hand Saw



Mallet and Hammer



Cutting Pliers



Half round file



Nose Pliers



Marking tool



Flat file



Chisel



Hand splitter



Bench vice



Bench vice

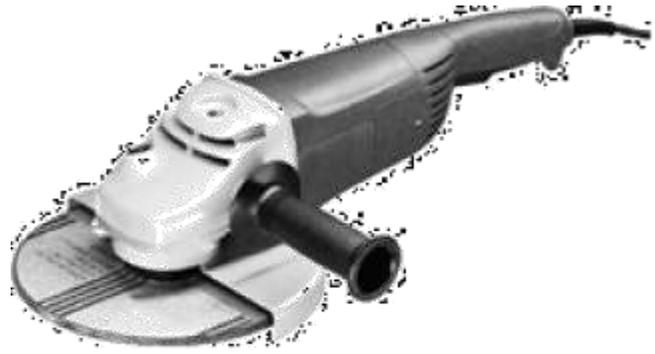


Hand planer

Hot air gun

Power drill

Sabre Saw



Hand held grinder



Bambusa bamboos



Hand held sander



Dendrocalamus brandissi



Hand held jig saw



Harvested bamboo poles

3. Product Making

3.1 Hanger 1

Hangers are one of the common products used by everyone at home, hotel, office and in retail stores especially apparel stores. Currently plastic and wooden hangers are used in these places in which wooden hangers and some of the plastic hangers can be replaced by bamboo hangers, thus tapping into the huge market potential of hangers due to its large demand.



Step 1. With a sharp knife, split the bamboo into thick slivers

Step 2. Using a heat gun, warm the bamboo slivers so they are pliable. Bend them to gain

Step 3. Use a sanding machine, hold the slivers firmly and smoothen rough edges/surfaces.

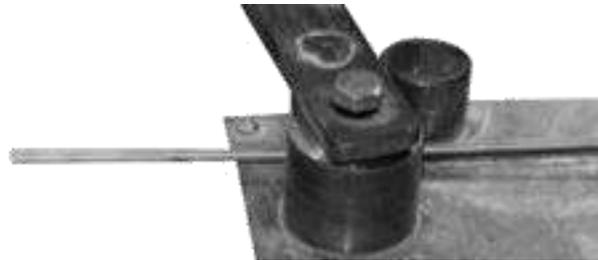
3.2 Hanger 2



Step 4: Cut the excess length using a hack saw.



Step 4: Using a drill, make a hole in the centre



Step 5: Place a 3mm S. S. rod on the jig.



Step 6: Bend of the S. S. rod for making hook.



Step 7: Bend the S. S rod into shape of a hook



Step 8: Fix hook through the hole on to the topper bead.



Step 9: Cut off the extra portion of the hook to complete the hanger



Step 1: Splitting the bamboo to thick slivers.



Step 2: Use the hand gun to bend the sliver into a curve



Step 3: Cutting the excess length.



Step 4: Using a sander, smoothen the surfaces



Step 5: sanding a solid bamboo piece (an inch)



Step 6: Drill a hole into the solid bamboo.



Step 7: Make a notch on hanger ends, the same diameter as the hole in the solid bamboo



Step 8: Fix the solid bamboo to the hanger.



Step 9: Drill into the centre



Step 10: Fix hook through the hole on to the topper bead



Final hanger

3.3 Hanger 3



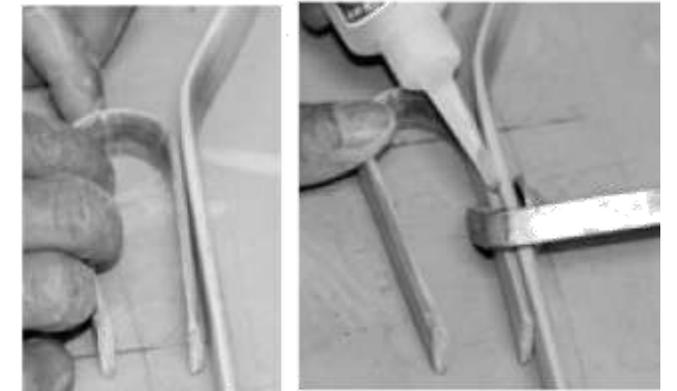
Step 1 Split the bamboo to thick slivers.



Step 2: Bend one sliver with a curve in the middle and flat on the sides with a hand gun.



Step 3: Bend two slivers into U shaped curves and fix them using glue to flat ends of the first sliver



3.4 Hanger 4



Step 4: Glue a straight sliver below the curved pieces



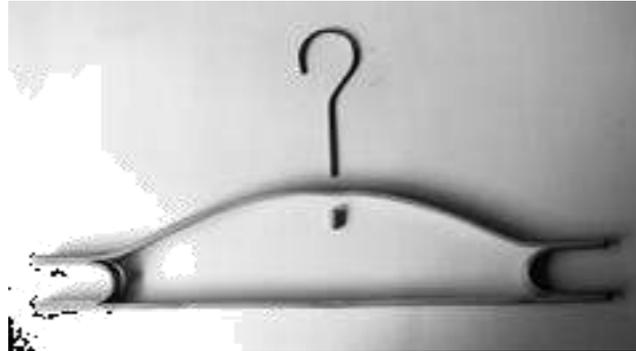
Step 5: Hold them in place to dry



Step 6: Cut the excess length at both end.



Step 7: Drill hole in the center of top sliver



Step 6: Fix hook through the hole on to the topper bead.



Final hanger



Step 1: Split the bamboo to thick sliver.



Step 2: Bend the sliver into a curve



Step 3: Mark on the bamboo for second bend.

Step 4: Prepare a straight sliver



Step 5: Glue both the slivers

3.5 Hanger 5



Step 6: Drill the hole in the center of the top sliver



Step 7: Fix the hook through the hole on to the topper bead.



Final Hanger



Step 1: Splitting the bamboo to thick slivers.



Step 3: Mark on the main sliver to make a notch the same diameter as the hole drilled into two solid bamboo pieces.

Step 2: Bend the sliver using a hand gun sand it to make surface



Step 4: Using a knife make notches in both sides of the main sliver to fit into the hole on the solid bamboo piece



Step 5: Sand the rough edges of the bamboo piece

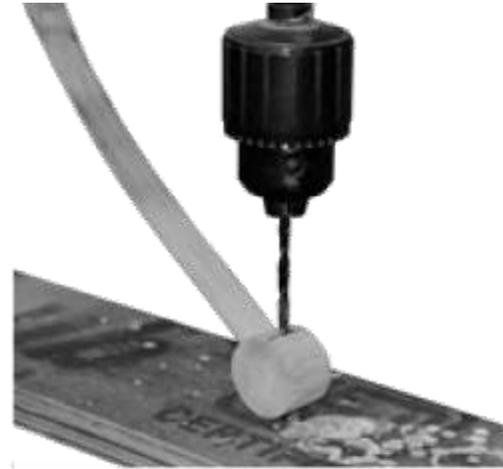


Step 10: Drilling second hole on the bottom of bamboo pieces

Step 6: Fix the main sliver to the holes in the bamboo pieces



Sep 6: Fix the notch into the solid bamboo piece.



Step 9: Fix hook through the hole on to the top sliver.



Step 11: Fix a flat, sanded sliver to the second holes of the bamboo



Step 8: Drill a hole through top sliver



Step 12: Final hanger

3.6 Tray 1

Tea tray is one of the common products used at homes, hotels, offices etc. Here the process of making two different types of trays using bamboo are shown.



Step 1: Split the bamboo to thick and wide splits.



Step 2: Remove the skin.



Step 3: Use grinder to make the splits straight and flat.



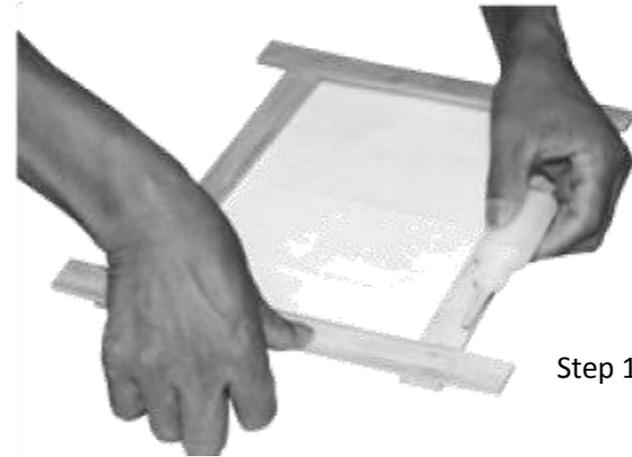
Step 4: Sand the splits to smoothen the surfaces



Step 5: Sand the edges.



Step 6: Arrange the splits as shown on an A4 sheet.



Step 7: Stick them using adhesive. This is the frame



Step 8: Place sliverson the frame as shown.



Step 9 Align them properly.



Step 10: Use adhesive to stick them



Step 11: Crop the edge.



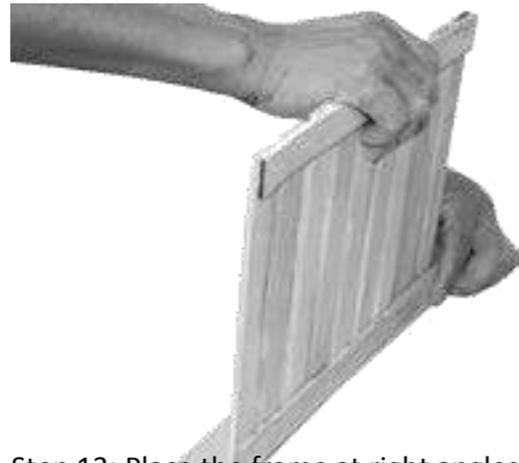
Step 11: Use a sander to further smoothen edges.



Step 11: Use a sander to further smoothen edges.



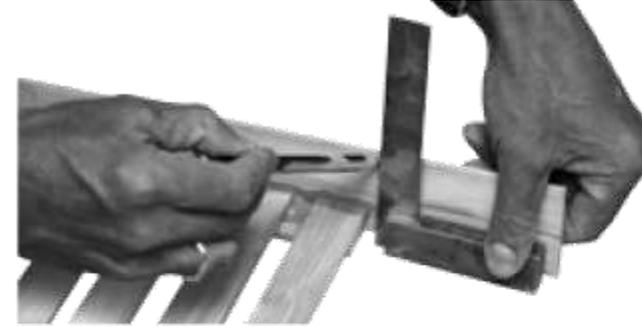
Step 12: Join two splits using an adhesive.



Step 13: Place the frame at right angles on the above split



Step 14: Stick it with an adhesive. Repeat on the other side



Step 15: Mark equal distances on the extended ends



Step 16: Set a split on the extended split, on the under side



Step 17: This is the handle- fix it with an adhesive.

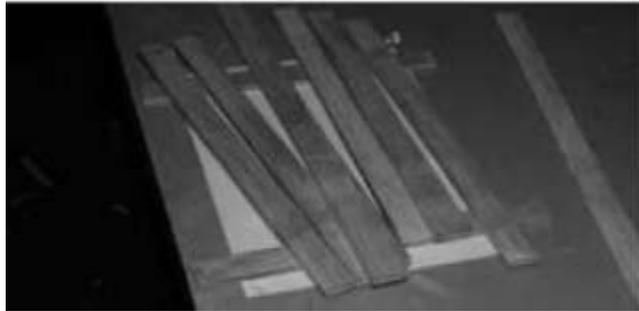


Step 18: Repeat same step on the other side.

Step 19: Cut the excess lengths (beyond the handles)

Step 20: Grind the edges to smoothen them

3.7 Tray 2



Step 1: Make the splits same as tray 1.



Step 2: Arrange it on an A4 sheet as shown.



Step 3: Align the splits as shown.



Step 4: Stick the splits using an adhesive



Step 5: Hold down firmly.



Step 6: Mark and align it with the paper edge.



Step 7: Crop the edges on a straight line.



Step 8: Sand the edges.



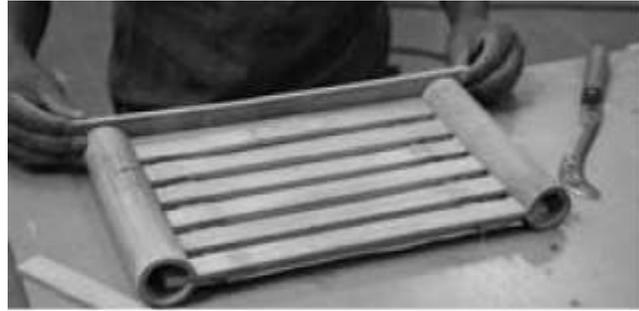
Step 9: Measures two bamboo pieces as shown

Step 10: Draw a line on the marking the distance between the ends of the bamboo and the last sliver

Step 11: Drill hole on the marking

Step 12: Cut a notch from hole to edge of bamboo

3.8 Fruit Basket



Step 13: Insert the sliver into the notch



Step 14: Fix another sliver perpendicular to the tray



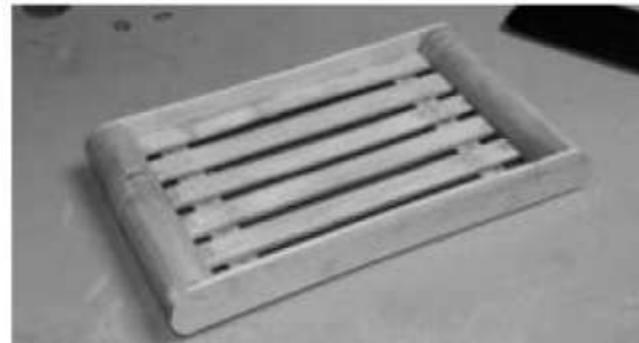
Step 15: Attach with adhesive on both sides



Step 16: Cut the extra length at the edge along the handle.



Step 17: Grind the split along the handle.



Final Tray

Fruit basket is a common product used at home, hotel rooms, restaurants etc. These are normally made of plastic, metal and wood. Below described are some fruit baskets made of bamboo along with plywood or wood for base. Images of making one fruit basket has been shown here. The same process can be used for making the other designs too.



Step 3: Use sand paper for finer finish.



Step 4: Divide the circle to 16 parts, mark them



Step 1: Cut a circle of 20 cms on a piece of plywood



Step 2: Sand the edges for better finish.



Step 5: With a 3-4mm drill bit, drill holes on marks



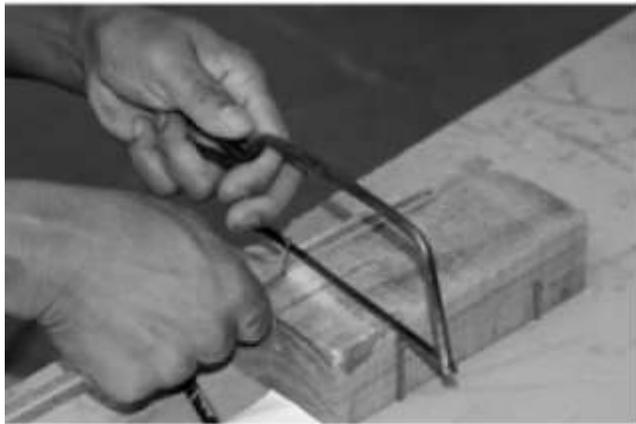
Step 6: Make thick slivers of reed bamboo and bend the bamboo slivers at one end.



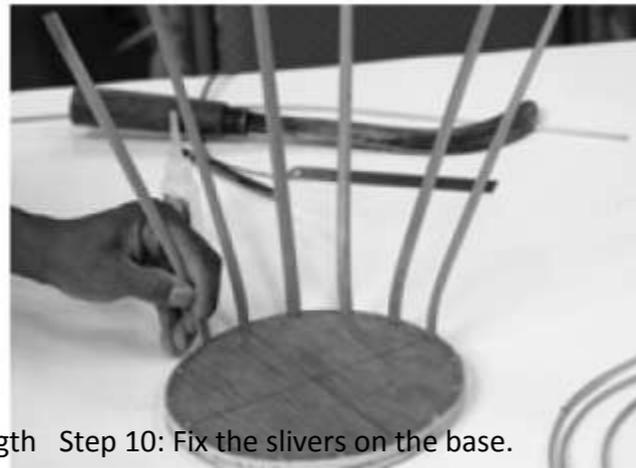
Step 7: Mark 30 cm lengths on the slivers.



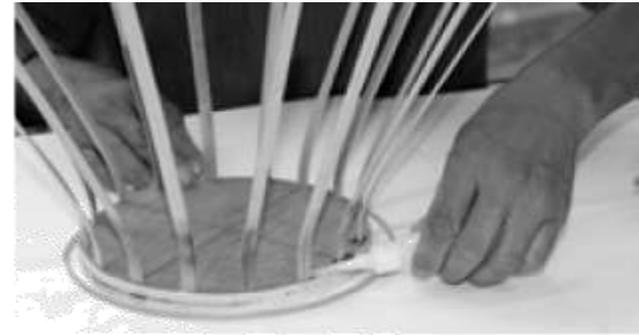
Step 9: Make notches at the bottom of sliver.



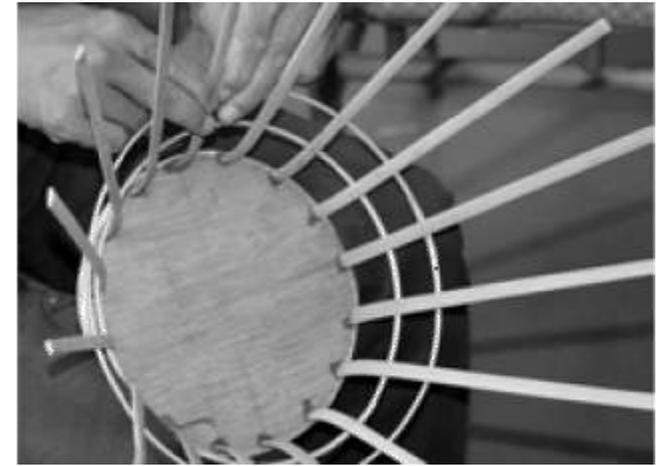
Step 8: Cut the slivers on the mark to get equal length inside.



Step 10: Fix the slivers on the base.



Step 11: Glue the slivers to the base



Step 14: Similarly fix the second ring as shown.



Step 12; Make a ring of bamboo and fix it at the bottom.



Step 13: Tie the ring using thin copper wire.

Step 15: Similarly fix the third ring as shown.

Step 16: Use another sliver and start fixing it

3.9 Other Fruit Baskets

The fruit baskets described pictorially below can also be made using the same techniques. However the base can be made of wood or ply wood as per the availability of material.



Step 17: Fix the inside ring to the outside ring and tie it.



Step 19: Use an adhesive to stick all the joints.



Step 18: Cut excess length of the slivers



Final structure of fruit basket.



Various fruit basket designs

4. Workshop Safety

Workshop is the place where various kinds of machineries are being used and it contains many potential safety hazards. The purpose of safety measures is to prevent fatal accidents and provide emergency help. Therefore, it is very important that the rules and guidelines are followed.

It is not possible for this section to cover every conceivable situation and therefore staff who have management or supervisory responsibilities must also establish and enforce safety rules to cover specific hazards in their workshops. The laws that govern occupational health and safety in a bamboo processing workplace is very important to each and every learner. The learner should be able to identify typical workplace hazards and follow procedures that will control the risks associated with those hazards to prevent injury, illness and death. The knowledge of workshop safety measures will enable the learners to respond correctly and safely in an emergency situation that may arise in a bamboo processing workplace and to take appropriate safety measures.

The trainer should explain the warning or reporting procedures of unsafe situations in the workplace. In case of an emergency situation, the trainer or the trainee should inform the nearest hospital for treatment.

There are various safety measures followed in bamboo processing working environment. The following are some of the important safety clothing and equipment one should strictly wear while working with bamboo in the workshop. They are a) safety glass, b) mask, c) apron, d) hand gloves. and e) first aid kit.

a) Safety goggles

Safety goggles protect the eyes while working in the workshop. There are many types of goggles available in the market like toughened glass, laminated glass and wire mesh glass for workshop safety.

b) Mask

When working in the bamboo workshop, one can breathe in lot of dust that can cause serious respiratory diseases. It is therefore advised to use dust masks to protect oneself. A dust mask is a pad held over the nose and mouth by elastic or rubber straps to protect against dust encountered during workshop activities.

c) Apron

An apron is an outer protective garment that covers primarily the front of the body. It is worn for various safety reasons in the workshop to protect oneself from several hazards. Aprons are available in a variety of materials and the learner should wear a thick cloth apron for bamboo activities in the workshop.

d) Hand gloves

Hand gloves are worn to protect hands from cuts and abrasions, chemicals, heat and most work environments. Hand gloves are made from leather, cotton, synthetics, nitrile, latex etc. to offer maximum protection and comfort.

e) First aid kit

A first aid kit consists of equipment for treating minor injuries by an individual. Typical contents include adhesive bandages, crepe bandage, finger bandage, scissors, hypo allergic tape, disposable gloves, regular pain medication, gauze and disinfectant. It is important to keep all kits in a clean condition and waterproof container to keep them safe and aseptic. The contents of the kit should be checked regularly and stocked if any items are damaged or expired out of date. Other than the above mentioned safety measure one should keep in mind the following strictly.

- No causal attitude in the workshop premise.
- Wear suitable personal clothing to the workshop conditions.
- Appropriate footwear should be worn.
- Never run in the workshop.
- Label safety equipment and maintain in good condition.
- Keep all fire-escape routes completely clear at all times.

- Ensure that all safety equipment remains accessible to the workshop personnel at all times.

Artificial Respiration

Artificial respiration is a procedure used to restore or maintain respiration in a person who has stopped breathing due to drowning,



electric shock, choking, gas or smoke inhalation, or poisoning. This method uses mechanical or manual means to force air into and out of the lungs in a rhythmic fashion. In emergency situations, however when no professional help is available rescuers undertake the natural method mouth-to-mouth or nose-to-nose for artificial respiration.

In the first place to perform this method, any foreign material is swept out of the mouth with the hand. The patient is placed on his/her back with the head tilted backward and chin pointing upward just to avoid the tongue blocking the throat. The rescuer's mouth is then placed tightly over the victim's mouth or nose with the victim's mouth or nostrils shut. The rescuer then takes a deep breath and blows into the victim's mouth, nose or both. The breathing should be vigorous at the rate of 12 breaths per minute. Breathing exercise should be continued until natural breathing resumes or until professional help arrives.

Foundation for MSME Clusters

FMC is a non-government, not-for-profit Public Charitable Trust, registered under India Trust Act set up in the year 2005. It was conceived in the year 2004 at the suggestion of the then Ministry of Small Scale Industries (SSI) and now renamed as Ministry of MSME, Govt. of India. United Nations Industrial Development Organisation (UNIDO) helped to draw up its business plan and Entrepreneurship Development Institute of India (EDII) gave legal birth to FMC. The Foundation is an apex national body known worldwide as a pioneer organization for the development of MSMEs through cluster development approach. FMC has rich experience of working with MSMEs and has provided services in the areas of advocacy, implementation and coordination, training and research to more than 150 clusters nationally and globally across 10 countries. It has its head office located in New Delhi and regional/project offices in Hyderabad, Phagwara, Ludhiana, Jaipur and Kolkata

Acknowledgement

This manual development is sponsored by CEMCA

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