



Participant Handbook

Sector
Handicrafts and Carpet

Sub-Sector
Handicraft (Agarbatti)

Occupation
Agarbatti Making and Finishing

SCPwD Reference ID :PWD/HCS/Q7901
Reference ID: **HCS/Q7901, Version 4.0**
NSQF Level 3



Agarbatti Maker
Divyangjan

For Lower Vision
For Visual impairment
For Locomotor Disability
For Speech and Hearing Impairment

This book is sponsored by Handicrafts and Carpet Sector Skill Council

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Note: SCPwD

SCPwD has borrowed the qualification of Agarbatti Maker from Handicrafts and Carpet SSC which is approved by NCVET in the 29th meeting of NSQC on 3rd May 2023 (Link of MOM <https://ncvet.gov.in/wp-content/uploads/2023/05/MoM-29th-NSQC.pdf> And uploaded on NQR WWW.nqr.gov.in

The book caters to the job role aligned to the following disabilities as per the NQR codes mentioned below:

LD - QG-03 -PD-00399-2023-V1-SCPWD

LV - QG-03 -PD-00401-2023-V1-SCPWD

LD: QG-03 -PD-00402-2023-V1-SCPWD

SHI:QG-03 -PD-00400-2023-V1-SCPWD



Shri Narendra Modi
Prime Minister of India

“ Skilling is building a better India.
If we have to move India towards
development then Skill Development
should be our mission. ”



Certificate

COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

Skill Council for Persons with Disability

for

SKILLING CONTENT: PARTICIPANT HANDBOOK

Complying to National Occupational Standards of

Job Role/ Qualification Pack: Agarbatti Maker (Divyangjan) , PWD/HCS/Q7901 NSQF Level: 3

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The preparation of this manual would not have been possible without the support of the Handicrafts and Carpet Industry. The industry feedback has been extremely encouraging from inception to conclusion & it is with their inputs that we have tried to bridge the skill gaps existing today in the industry.

This participant manual is dedicated to all the aspiring youth who desire to achieve special skills which would be a lifelong asset for their future endeavours and help them make a bright career in the Handicrafts and Carpet Sector.

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<https://youtu.be/wNAAQlh4si8>

Introduction to HCSSC

About this Book

This book is designed for up grading the knowledge and basic skills to take up the job of Agarbatti Maker in 'Handicrafts' sector. All the activities carried out by an Agarbatti Maker are covered in this course. Upon successful completion of this course, the candidate will be eligible to work as Agarbatti Maker.

This Participant Handbook is designed to enable training for the specific Qualification Pack (QP). Each National Occupational (NOS) is covered across Unit/s.

Key Learning Objectives for the specific NOS mark the beginning of the Unit/s for that NOS. The list of NOS covered in this book are:

- HCS/N7901 Carry out processing of raw materials
- HCS/N7902 Carry out rolling of agarbatti & post rolling operation
- HCS/N7903 Contribute to achieve quality in hand rolled agarbatti making
- HCS/N8004 Carry out sorting, counting and weighing of perfumed agarbatti
- HCS/N8005 Carry out packaging of perfumed agarbattis
- HCS/N8006 Contribute to achieve quality in packaging of perfumed agarbattis
- HCS/N9908 Working in a Team
- HCS/N9912 Maintain Work Area and Tools
- HCS/N9913 Maintain health, safety and security at workplace

Symbols Used



Key Learning
Outcomes



Steps



Time



Tips



Notes



Unit
Objectives



Exercise

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It is recommended that all trainings include the appropriate Employability skills Module.

Content for the same can be accessed here:

<https://www.skillindiadigital.gov.in/content/list>





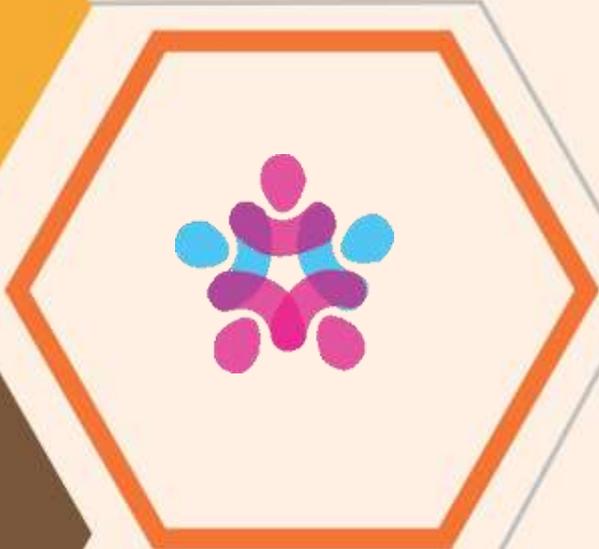
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<https://youtu.be/EFBcvdwYxZM>

Introduction to HCSSC Digital Initiative





1. Introduction

Unit 1.1 - Agarbatti Sector in India

Unit 1.2 - Job Role of Agarbatti Maker



Key Learning Outcomes

At the end of this module, participant will be able to:

1. Discuss the Agarbatti sector in India, and its sub-sectors
2. Define the artwork that comes under Agarbatti Making.
3. Identify the state leading the production of agarbatti in India.
4. Identify different type of agarbatti products.
5. Describe the work area of Hand Rolled Agarbatti Maker.
6. Identify the opportunities for Hand Rolled Agarbatti Maker.

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<https://www.youtube.com/watch?v=7BwKfN-ilko>

Introduction of Agarbatti Sector in India

Unit 1.1: Agarbatti Sector in India

Unit Objectives

At the end of this unit, participant will be able to:

1. Discuss the Agarbatti sector in India, and its sub-sectors.
2. Define the artwork that comes under Agarbatti Making.
3. Identify the state leading the production of agarbatti in India.
4. Identify different type of agarbatti products.

1.1.1 Introduction to Agarbatti

Incense sticks, additionally known as agarbathi (or agarbatti derived from sanskrit word agaravarthi, gara = odour, agar = aroma, varthi = wound) and joss sticks, wherein an incense paste is rolled or moulded around a bamboo stick, is one of the main varieties of incense in india. the bamboo approach originated in india, and is wonderful from the nepal/tibet and jap techniques of stick making wherein a bamboo stick is not used. even though the method is likewise used inside the west, in particular in the usa, it's far strongly associated with india. different predominant kinds of incense are cones and logs and benzoin resin (in sanskrit saambraani), which can be incense paste fashioned into pyramid shapes or log shapes, and then dried.

1.1.2 History of Agarbatti

The oldest supply on incense is the vedas, specifically, the atharva-veda and the rigveda. incense burning was used both to create alluring aromas and a medicinal tool. its use in medication is considered the primary phase of ayurveda, which makes use of incense as a technique to healing. incense-making changed into as a consequence nearly exclusively performed with the aid of clergymen.

The particular understanding of incense as a recovery device changed into assimilated into the non-secular practices of the time - early Hinduism. as Hinduism matured and buddhism become founded in India, incense have become an quintessential a part of buddhism as properly. around 200 ce, a set of wandering buddhist clergymen delivered incense-making to china.

1.1.3 Place of Origin

India has a wealthy subculture of using incense in lots of social and non-secular activities because time immemorial. incense sticks, additionally called Agarbatti (or Agarbatti derived from Sanskrit phrase agaravarthi, gara = odour, agar = aroma, varthi = wound) and joss sticks, wherein an incense paste is rolled or moulded round a bamboo stick, is one of the major kinds of incense in India. The bamboo method originated in India, and is distinct from the Nepal/Tibet and Japanese methods of stick making in which a bamboo stick is not used. Though the method is also used in the west, particularly in America, it is strongly associated with India. Other main forms of incense are cones and logs and Benzoin resin (In Sanskrit Saambraani), which are incense paste formed into pyramid shapes or log shapes, and then dried.

A uniform and codified system of incense-making first started in India. even though Vedic texts mention using incense for masking odors and growing a pleasing odor, the contemporary device of prepared incense-making changed into likely created via the medicinal clergymen of the time. therefore, current, organized incense-making is intrinsically connected to the Ayurveda medical gadget in which it's far rooted

1.1.4 Agarbatti Making in India

Agarbattis,' also known as 'incense sticks,' are made from aromatic flowers and essential oils extracted from plants or animal assets. while lightened, those release a fragrant smoke which finds use inside the spiritual activities, prayers, and healing and aesthetic functions. agarbattis have been used due to the fact that instances immemorial as a fundamental part of Hindu deity worship in India. There are approximately 10,000 agarbatti manufacturing gadgets within the country along with tiny, small and medium, besides any other 200 nicely-set up ones having over 50 branded Agarbatti. nearly 12 lakh human beings are without delay or not directly hired by way of the enterprise. Agarbatti industry in India is a labour in depth cottage industry. Karnataka state is the main manufacturer with Mysore and Bangalore towns being the focal facilities. Nearly a thousand units reportedly exist in the state of Karnataka. Moreover, it is a n export-orientated enterprise. India is exporting a wide variety of Agarbatti or incense sticks which have herbal, special fragrances extracted from jasmine, sandalwood (Chandan) and rose. Those fragrances spread the atmosphere and tranquillity. the incense sticks are packaged attractively.

The Agarbatti enterprise relies upon heavily on woodland products for uncooked materials —a natural advantage because nature has bestowed upon it huge fee of forests. capexcil (previously known as primary chemicals, prescribed drugs and cosmetics export advertising council), functioning underneath the aegis of ministry of trade and enterprise, authorities of India, over the years has been playing a crucial role in promoting exports of agarbattis from the country. besides, it's incense sticks enterprise released as a part of its strategic initiative to create multiple drivers of growth in rapid transferring customer goods quarter (fmcg) leverages the core strengths of the corporation in marketing and distribution, emblem building, supply chain control and paperboard and packaging to offer Indian purchasers extraordinary agarbattis.

India's Exports of Agarbattis to Major Countries During 2003-04 to 2005-06				
Item/country	2003-04	2004-05	2005-06	Per cent growth in 2005-06 over 2004-05
USA	33.36	25.49	35.57	39.54
UAE	13.12	12.90	16.58	28.53
Malaysia	9.78	7.80	10.43	33.32
Brazil	12.57	11.75	10.04	(-) 14.55
UK	8.71	7.26	9.19	26.58
Sri Lanka	5.68	5.68	8.97	57.92
Egypt	4.83	5.52	7.37	33.51
Mauritius	4.40	4.54	6.63	46.04
South Africa	4.84	5.18	6.58	26.78
Australia	4.29	4.13	6.35	53.75
Spain	4.84	3.92	5.74	46.43
Chile	5.89	3.95	5.49	38.99
France	6.96	5.45	5.26	(-) 3.49
Italy	8.95	8.66	4.88	(-) 48.45
Djibouti	2.06	2.48	4.78	92.74
Total (all India)	227.89	203.33	247.42	21.88

Source: Compiled from the data of DGCI&S, Monthly Statistics of Foreign Trade of India, Volume I: Exports & Re-Exports, March 2004, 2005 and 2006 issues, Kolkata

Table 1.1. 1 Export Data of Agarbatti

Tips



Where can we get the large order of agarbattis at low price?

Think about this. Where do you find the maximum production of agarbattis in India? So, Mysore and Bangalore are the cities producing maximum agarbattis in India.

Notes



Unit 1.2: Job Role of Agarbatti Maker

Unit Objectives



At the end of this unit, you will be able to:

1. Describe the work area of Hand Rolled Agarbatti Maker.
2. Identify the opportunities for Hand Rolled Agarbatti Maker.
3. Describe the requirements to become a Hand Rolled Agarbatti Maker.
4. Describe the benefits of becoming Hand Rolled Agarbatti Maker
5. Identify the market of hand rolled agarbattis.

1.2.1 Job of Agarbatti Maker

Agarbatti Maker is the one who produces agarbatti (perfumed or un-perfumed depending on ingredients) by rolling agarbatti masala dough over bamboo stick manually using hand. The major ingredients for hand rolled agarbatti are bamboo stick and agarbatti masala.

Agarbatti Maker should have good eyesight, hand-eye coordination and vision (including near vision, distance vision, colour vision, peripheral vision, depth perception and ability to change focus).



Figure 1.2. 1Hand Rolled Agarbatti Making

Following are the tasks; he needs to do in the job:

- 1) Carry out processing of raw material required for making agarbattis.
- 2) Carry out rolling operations for agarbatti.
- 3) Carry out post rolling operations like drying agarbattis, packing them and storing etc.
- 4) Carry out quality checks on agarbattis.
- 5) Maintaining work area properly

1.2.2 Opportunities for Hand Rolled Agarbatti Maker

There are great opportunities of Hand Rolled Agarbatti Maker in India as well as in foreign countries like China, Japan, USA, UK, and many other countries. A Hand Rolled Agarbatti Maker has following benefits:

- Very Low cost of equipment so easily start business
- Exclusive made agarbattis have good domestic and export markets
- Versatility in changing aroma.
- Possibility of more value addition in very small cost

A Hand Rolled Agarbatti Maker also gets job opportunities apart from easy entrepreneurship like,

he/she can be:

Hand Rolled Agarbatti Maker for both local demand and foreign demand industries

Exercise



1. Which place/region in India is highest production state for agarbattis?

2. Write down the history of agarbattis production in India.

2. Raw Material Preparation



Unit 2.1 – Raw Material for Agarbatti

Unit 2.2 – Preparing Agarbatti Masala Dough and Sticks



Key Learning Outcomes

At the end of this module, participant will be able to:

1. Identify the raw material required for making agarbatti.
2. Identify various ingredients of agarbatti raw material.
3. Identify the tools required to prepare raw material for agarbatti.
4. Describe the process of preparing raw material.
5. Describe the process of preparing sticks for agarbatti.

Scan the QR code or click on the link to check related video



<https://www.youtube.com/watch?v=J4UOqCigYc0>

Raw Material for Agarbatti

Unit 2.1: Raw Material for Agarbatti

Unit Objectives

At the end of this unit, participant will be able to:

1. Identify the raw material required for making agarbatti.
2. Identify various ingredients of agarbatti raw material.
3. Identify the tools required to prepare raw material for agarbatti

2.1.1 Raw Material and their uses

CHARCOAL: The wood becoming black on burning is pulverised to the required mesh and used as a filler for agarbatties. Dry wood is cut into pieces and put in a kiln like structure and fired from below and the entire layer is covered by mud. The charcoal thus formed is removed and sent to pulverising units. There are three grades available in markets:

1st Quality: This is water washed coal which contains no silica or mud.

2nd Quality: This grade contains 10 to 15% silica or mud.

Charcoal from bamboo is good substitute to wood charcoal and can be produced abundantly.

Testing of Charcoal: To test the grade of charcoal a measured quantity of pulverised coal is put into known quantity of water and stirred. Good quality charcoal does not leave any mud or silica to settle. If the silica contents are more than 20%, It is not suitable for agarbatti then as the stick will not burn properly till the end.



Figure 2.1. 1 Charcoal Pow

JIGATU: It has very good adhesive and combustible properties and found basically in the Southern State of India. It is available in 100-150 mesh powder. This material is available in two qualities, viz., Yelga and Kulirmavu.

Yelga variety is best for Agarbatti and is available as Teli or Teni and Kerala variety.

Kulirmavu is normally half the price of the Yelga variety. Sometimes adulterant like saw-dust is added and it is not advisable to purchase this mixed jigatu.



Figure 2.1. 2 Jigatu powder

SANDAL WOOD: Known botanically worldwide as *Santalum Album* Linn, it is a valuable, precious gift of nature to India. Available for agarbatti manufacture as Sandalwood Balloon Dust and Spent Wood Dust (waste product after oil has been extracted). It is used as filler in Agarbatti Manufacture



Figure 2.1. 3 Sandal Wood

SAWDUST: It is fine-grained wood small-grained to the mesh of one hundred - two hundred that has no dangerous odour on burning and is neutral in combustions.



Figure 2.1. 4 Saw Dust

NOORVA: It is mixture of odoriferous fibrous materials and other fragrant substances that have the property of combustion.

MELNOORVA: This is the same kind of Noorva Containing varied odoriferous fibrous materials that have the property of combustion, however is applied over the rolled mass, in order that the battis, once rolled mustn't persist with one another further on the hands of the employee World Health Organization rolls the mass over the stick.

This Melnoorva commonly contains Charcoal dirt within the magnitude relation 1:2 and Jigatu in 2-3%. The addition of Jigatu helps to keep the palms free from the sticky material once agarbathies area unit dried



Figure 2.1. 5 Various items used in Melnoorva

WAX PAPER: It is used for drying some recipes.

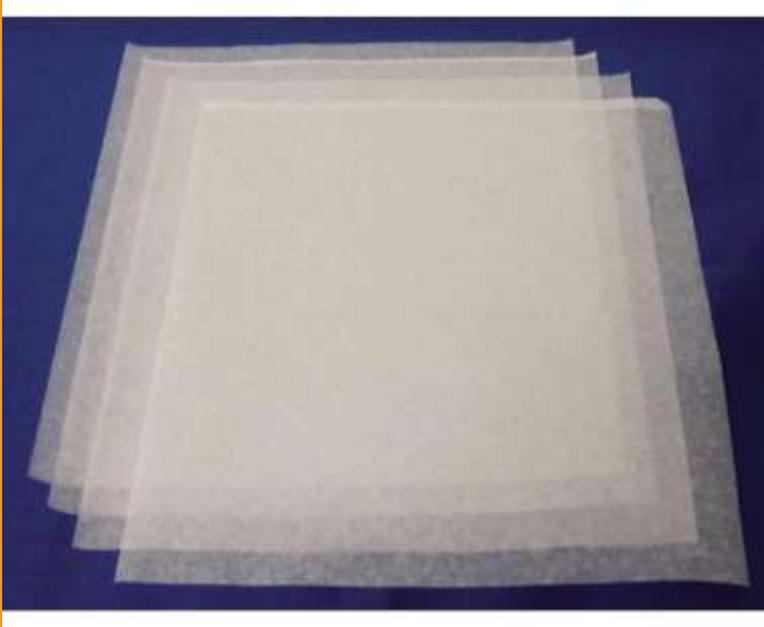


Figure 2.1. 6 Wax paper

BAMBOO: First you've got to cross cut bamboo to 10" or 7" inches size effort out nodes. Employing a knife, the items are split in to slates. The slates are slivered victimization little knives or blades. This can be however bamboo sticks are created.



Figure 2.1. 7 Bamboo Sticks

HERBS AND FLOWER:

Some of the Incense bearing barks, stems herbs & flowers are as follows:

F.N. Family Name.	B.N. - Botanical Name
	F.N. : Simarubaceae
1. Halmaddi	B.N. : Ailanthus Malabarca
	F.N. : Simarubaceae
	B.N. : Alianthus Triphysa Alston
2. Aarura, Perumavam	F.N. : Compositae
	B.N. : Saussurea Lappa Clake
	F.N. : Rutaceae
3. Kust, Pachuk	B.N. : Skimmaia Laureola Sieb& zucc
	F.N. : Apocyanaceae
4. Nair	B.N. : Tapernaemontana Coronaria Wild
	F.N. : Combrataceae
5. Chandini, Tagara	B.N. : Terminalia Tomenotosa W&A
	F.N. : Leguminosae
6. Ain, Asan	B.N. : Accacia Farnesiana Wild
	F.N. : Araccae
7. Divana Babul	B.N. : Acorus Calamum Linn
	F.N. : Rutaceae
8. Vacha, Gorbach	B.N. : Argle Marmelos Correa
	F.N. : Thymelaceae
9. Bel Bilva	B.N. : Aquilaria Agallocha Roxb
	F.N. : Burseraccae
10. Agar	B.N. : Boswellia Serrata Roxb
	F.N. : Gulliferae
11. Salai Dhup, Sallaki	B.N. : Calophyllum Inophyllum Linn
	F.N. : Annonacea
12. Punnaga, Sultana Champa	B.N. : Canangium Odoratum Baill
	F.N. : Lauracea
13. Cananga Ylang Ylang	B.N. : Chinnamomum Zeylanicum Breyn
	F.N. : Zingiberaceae
14. Dalchini	B.N. : Curcuma Zedoaria Rose
	F.N. : Cyperaceae
15. Amb Halad, Kachura	B.N. : cyperus Rotundus Linn
	F.N. : Ericaceae
16. Motha, Mustaka	B.N. : Gaultheria Fragrantissima Wall
	F.N. : Zingiberaceae
17. Jirhap, Machino	B.N. : Hedychium Coronarium Koenig
	F.N. : Zingiberaceae
18. Dulaba Champa	

19. Kapurkachari	F.N.	: Zingerberaceae
20. Henna, Mehndi	B.N.	: Hedychium Spicatum Buch- Ham
	F.N.	: Lytharaceae
21. Nagksar, Surigi, Surgini	B.N.	: Lawsonia Inermis Lin
	F.N.	: Gulliferae
	B.N.	: Mamea Longifolia Planch & Trian
22. Nagchampa	F.N.	: Gulliferae
	B.N.	: Mesua Ferrea Linn
23. Champaka	F.N.	: Magnoliaceae
	B.N.	: Michelia Champaca Linn
24. Bakul, Ovalli	F.N.	: Sapotaceae
	B.N.	: Mimusops Elengi Linn
25. Mungna, Sainjna	F.N.	: Moringaceae
	B.N.	: Moringa Oleifera Lam
26. Kamini Marchulla	F.N.	: Rutaceae
	B.N.	: Murraya Oleifera lam
27. Keora, Ketki, Ketuki	F.N.	: Pandanaceae
	B.N.	: Pandanus Tectorius Sol
28. Pachouli	F.N.	: Labiatae
	B.N.	: Pogostemom Heyneanus Benth
29. Ghela Maniphal	F.N.	: Rubiaceae
	B.N.	: Randia brandissi Gamble
30. Chandan	F.N.	: Santalaceae
	B.N.	: Santalum Album Linn
31. Methi, Fenugrek	F.N.	: Leguminaeaceae
	B.N.	: Trigonella Foenumgraecum Linn
32. Khus - Khus, Vativer	F.N.	: Gramineae
	B.N.	: Nativaria Zizanioides Nash
33. Banaf Shah, Violet	F.N.	: Vidaceae
	B.N.	: Viola odoranta Linn
34. Jiban, Charcoal Tree	F.N.	: Ulmaceae
	B.N.	: Trema Orientalis Blime
35. Sonchampa, Frangipani	F.N.	: Apocynaceae
	B.N.	: Flumeria Rubra Linn Forma Rubra & irani Comb Nov
36. Dhup	F.N.	: Burceraceae
	B.N.	: Canarium Euphyllum Kurz
37. Scedhup	F.N.	: Pinaceae
	B.N.	: Juniprus Macropopa Boiss
	F.N.	: Malvaeceae
38. Muskh Dana, Musk mallow	B.N.	: Amelmoschus Moschatus Medic
	F.N.	: Lauraceae
39. Rohu	B.N.	: Cinnamomum Cedidaphne Meissn
40. Luban	F.N.	: Burseraceae
	B.N.	: Boswellia Sernata Roxb
41. Ralu Doopa	F.N.	: Burseraceae

42. Kulirmauv, Gulmavu	B.N. :	Canarium Strictum Roxb
	F.N. :	Lauraceae
43. Deodar	B.N. :	Machilus Macrantha
44. Keshar Zafran	F.N. :	Pinaceae
	B.N. :	Cedrus Deodara Loud
45. Karpura	F.N. :	Iridaceae
	B.N. :	Crocus Sativus Linn
46. Halmaddu	F.N. :	Boraginaceae
	B.N. :	Ehretia Laevis Roxb
47. Guguladhoopa	F.N. :	Sapotaceae
	B.N. :	Mimusops Elengi L
	F.N. :	Simaroubaceae
	B.N. :	Ailanthus Triphysa, Nalabaricum

Herbs	Resins	Woods
<p> cassia Cinnamon Chips Calamus root Galangal root Ginger Hyssop Iris flowers/Orris Root Juniper berries Juniper Wood Juniper Tips Lavender flowers Lemongrass Marjoram Mugwort Musk Seeds Orange Powder Patchouli Rose Rosemary Saffron Sage, White incense Spikenard Star Anise Sweet Grass Thyme Tumeric Vanilla Vetiver </p>	<p> Amber Acacia Amber Balsam - Peru Balsam - Tolu Balsam - Copaiba Benzoin - Siam Benzoin - Sumatra Borneol Camphor Burgundy Pitch Colophony Copal-Gold Copal-Black Copal-White Dammar White Dammar Brown Dragon's Blood Elemi Frankincense Galbanum Guggul Labdanum Hibiscus Mastic Myrrh Opoponax Pinon Pine Sandarac Storax </p>	<p> Aloeswood and Agarwood Cedar Cedar – Red Juniper Sandalwood Palo Santo Pine </p>

Basic Tools for Preparing Agarbatti Masala

Mortar & Pestle: Using a large solid granite mortar and pestle for the heavy work of grinding resins is preferred.



Figure 2.1. 9 Mortar and Pestle

Grinders: There are any number of grinders that will work in making incense. We can use a few different grinders. The strength of "steel burrs" for grinding is the only requirement.

Hand-crank coffee mills with steel burrs can be used for Herbs, Roots, Seeds, Spices, Flowers.

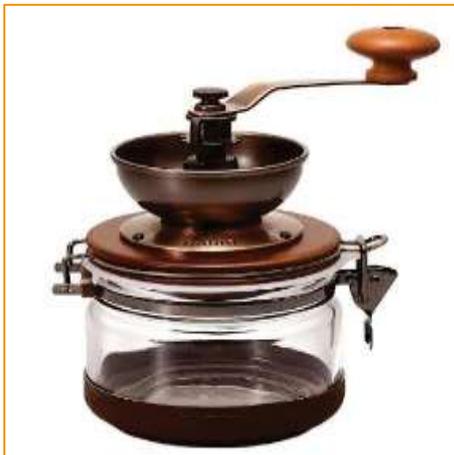


Figure 2.1. 10 Grinder

Scale / Measuring Spoons: Measuring by weight and using a scale that measures by as little as one- tenth of a gram (0.1 gram) to allow for small recipes to be made. Recipes by weight seem to be more reliable for consistency because volume measurements greatly depend upon granular size.



Figure 2.1. 11 Measuring Spoon

Extruders: Clay guns, beef-jerky and sausage extruders, and sugar-paste guns, etc. can be used as extruders to make incense sticks of all shapes. Stuff the gun with incense dough and squeeze the lever to create perfectly shaped sticks.



Figure 2.1. 12 Extruder Set

Storing Ingredients: Store all-natural ingredients and incense mixtures in colored glass or ceramic jars and keep them in a cool, dark, dry space. Interior closets usually work well.



Figure 2.1. 13 Storage Jars

Unit 2.2: Preparing Agarbatti Masala Dough and Sticks

Unit Objectives

At the end of this unit, participant will be able to:

1. Describe the process of preparing raw material.
2. Describe the process of preparing sticks for agarbatti.
3. Calculate the approximate ratio in which the ingredients are to be mixed
4. Check and justify that the masala dough is uniformly mixed with right level of viscosity
5. Carry out operations at a rate which maintains workflow
6. Respond appropriately in case of any major faults in the bamboo stick and other ingredients.
7. Minimize and dispose the waste materials in the approved manner

2.2.1 PREPARING AGARBATTI MASALA DOUGH

First of all, we have to select any specific recipe for which we are making the masala dough. Various agarbatti recipes are available some of them are as follows:

To make approximately, 1,400 gms of Natural Bathi different combinations are as follows:

Combination I

1	Jigatu	500
2	Charcoal	500
3	Bamboo	250-400
4	Melnoorva	100-150

Combination II

1	Jigatu	500
2	White Chips/Noorva	500
3	Bamboo	250-400
4	Melnoorva	100-150

Combination III

1	Jigatu	500
2	White Chips/Noorva	250
3	Charcoal	250
4	Bamboo	250-400
5	Melnoorva	100-150

Combination IV

1	Jigatu	500
2	Sandalwood dust	250
3	Charcoal	250
4	Bamboo	250-400
5	Melnoorva	100-150

Combination V

1	Jigatu	500
2	Spentwood dust/Noorva	500
3	Bamboo	250-400
4	Melnoorva	100-150

Combination VI

1	Jigatu	500
2	White Chips/Noorva	250
3	Sandalwood Dust	250
4	Bamboo	250-400
5	Melnoorva	100-150

The ingredients of masala agarbattis which contain chemicals as well as natural ingredients are given next.

AMBER CHANDAN BATHI

Charcoal / White Chips	250 g.
Jigatu	250 g.
Saltpetre	15 g.
Sandal Perfume	50 g.
Vanillin	25 g.
Phenyl Acetic Acid Flakes	25 g.
Amber	25 g.

AMBRI HEENA

Charcoal / White Chips	250 g.
Jigatu	250 g.
Saltpetre	15 g.
Amber Solid	50 g.
Henna	25 g.
Sandal	25 g.

KASTURI CHANDAN BATHI

Charcoal / White chips	250 g.
Jigatu	250 g.
Saltpetre	15 g.
Cedar wood	50 g.
Musk	50 g.

CHANDAN BATHI

Charcoal / White Chips	250 g.
Jigatu	250 g.
Saltpetre	15 g.
Sandal	100 g.
Vanillin	20 g.

Making Agarbatti Masala Dough

STEP 1:

Measure, Grind, and Measure Again: Measure each ingredient in your recipe either by weight using a scale (the preferred and more consistently reliable method), or by volume using measuring spoons and cups.

If using a weight scale, to make small recipe batches it's best to use a scale that measures by the gram (preferably by the tenth of a gram: 0.1 gram).



Figure 2.2. 1 Weighing Machine

If measuring by volume, use spoons that measure 1/4 TSP, 1/2 TSP, 1 TSP, and 1 TBSP. Measuring cups can also be used for making larger batches of incense.

TSP=teaspoon

TBSP = tablespoon

In each case, roughly live the ingredients in their whole type initial, then grind every and build your final activity once the ingredients are ground.



Figure 2.2. 2 Measuring Ingredients

Grinding Tips: Grind each ingredient separately using a mortar and pestle. If you're making loose incense, incense trails, or pellets, then grind all ingredients to a small granular form, about the consistency of sea salt or coarse sand. You may powder it all if you like, but it's not required.



Figure 2.2. 3 Grinding Solid Ingredients

If you're making incense sticks, cones, then all ingredients must be ground to a very fine powder. This allows the sticks, cones to burn more reliably and evenly. Sift the ground powders through a small metal sifter/strainer to make sure all larger grains have been removed.



Figure 2.2. 4 Filtering for coarse content

Gums & Resins: Freeze slightly gummy resins for 15 to 30 minutes prior to grinding for faster, easier, and more efficient grinding. Very soft gum resins like labdanum and elemi are best frozen overnight.

Resins must be ground or powdered in a mortar and pestle. They will clog, destroy and ruin any grinder, mill, blender, processor, etc. you put in their path. The old-fashioned way is still the only way.



Figure 2.2. 5 Granite Mortar and Pestle

We prefer using a large solid granite mortar and pestle for the heavy work of grinding resins. Some soft gum resins may stick to the granite so freezing the mortar and pestle as well as the gum resins prior to grinding can help prevent this.



Figure 2.2. 6 Freezing items in side fridge

Woods: Woods can be very difficult to powder and doing so can be a path of great patience and attention.

If you're making incense sticks, cones, it's often easier to purchase woods already in powder form.



Figure 2.2. 7 Cutting Wood to small pieces

If you're making loose incense, it's okay to use small wood chips about the size of grains of rice. Powders work well too but aren't necessary to make and heat a loose incense mixture.

To grind woods, use a small hammer and wood chisel to chip the wood into smaller and smaller pieces. Once into very small, rice-size chips or shavings, woods can then be ground into powders using coffee grinders or grain mills, either manual or electric.



Figure 2.2. 8 Grinding woods for masala

Herbs, Spices and Flowers: These are usually easily ground in coffee grinders or mills, either electric or manual. Though sometimes hard, whole pieces of ingredients like cloves, cinnamon sticks, nutmeg, musk seeds, etc. are often best ground in a mortar and pestle first and then run through a grinder or mill.

Fruit: Orange, lemon, lime and other citrus peels can be ground from the fruit by rubbing a cheese grater across the peel of the fruit. Scatter cut peels on a screen, wax paper, cutting board, or cardboard and let dry, turning occasionally. These dried peels can then be used as is for making loose incense, or can be ground into powders in a coffee mill for making incense sticks, cones



Figure 2.2. 9 Grating fruits for masala

STEP 2:

Mix: Combine the ultimate ground and measured ingredients along together mixture and grind it around a small amount within the mortar and pestle to assist "merge" the aromas.



Figure 2.2. 10 Combining ingredients

STEP 3:

Heat & Test: Congratulations, you've now made your very own "agarbatti masala dough " You're ready to heat it.

Even if you plan to continue on and make kneaded incense (agarbatti) pellets, trails, sticks, cones with this incense it's best to stop right now, heat it and see if you enjoy the aroma and/or energy of the incense. If it's not to your approval, make adjustments now before moving on.



Figure 2.2. 11 Heat testing of masala

STEP 4: Once you've heated your (loose incense) Agarbatti Masala Dough you can make adjustments to the recipe to suit your own tastes and desires. This is a completely subjective step in the process of making incense and so only your own nose, instincts, and experience can guide you.

PREPARING AGARBATTI STICKS: You need following materials to make bamboo sticks

Bamboo tree

Hand saw

Large knife

Small knife and blades

Step1. First you want to cross cut bamboo to ten or seven inches size going out nodes as follows



Figure 2.2. 12 Cross cut bamboo

Step 2. Using a knife, the pieces are split in to slats.



Figure 2.2. 13 Splitting bamboo in to slats

Step 3. The slates are slivered with small knives/blades as shown in below figure



Figure 2.2. 14 Slivered slates

Step 4. Now you should put sticks under sun to dry them and be ready to make incense sticks.



Figure 2.2. 15 Bamboo sticks prepare

Notes



Exercise



1. What is Charcoal? Discuss its role in agarbatti.

2. Discuss the process of testing charcoal

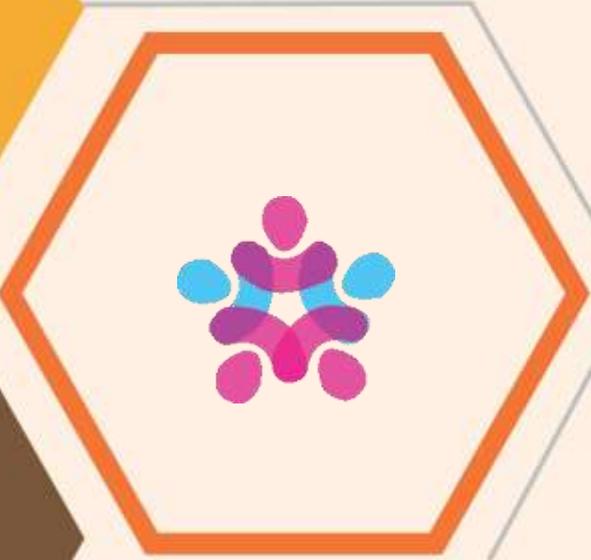
3. What is the role of Jigatu in agarbatti making?

4. What is the importance of sandal wood in agarbatti making?

5. Discuss the role of saw dust, noorva, and melnoorva in agarbatti making.

6. Write down the name of 10 common herbs that can be used in making agarbatti aroma?

7. Discuss in detail about tool used for hand rolled agarbatti making



3. Performing Rolling Operation

Unit 3.1 – Hand Rolling Agarbatti

Unit 3.2 – Post Rolling Operation



Key Learning Outcomes



At the end of this module, participant will be able to:

1. Learn the process of hand rolling masala dough on bamboo sticks.
2. Use various tools used in making agarbatti.
3. Describe the process of drying agarbatti after hand rolling.
4. Describe the process of storage of prepared agarbatti.
5. Describe the process of packing agarbatti.

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<https://www.youtube.com/watch?v=p8ls7E-GK5k>

Hand Rolling Agarbatti

Unit 3.1: Hand Rolling Agarbatti

Unit Objectives

At the end of this unit, participant will be able to:

1. Learn the process of hand rolling masala dough on bamboo sticks.
2. Use various tools used in making agarbatti.
3. Identify the appropriate rolling desk suitable for hand rolling
4. Check and ensure that the of rolling surface of the desk does not have any permanent rugged impression
5. Ensure that the rolling desk sits on the ground appropriately without any movement
6. Correctly hold bamboo stick for enhanced productivity
7. Roll the masala over the stick starting from one end (leaving the tip length) to the other end of the stick
8. Coat a layer of dry masala over the rolled stick

3.1.1 Hand Rolling Agarbatti

To make incense sticks, cones or trails, you first must begin with a finely powdered incense mixture called Agarbatti Masala Dough or Loose Incense. If you already have your powdered loose incense mix then you're ready to continue on with these step-by-step instructions and create your own incense (agarbatti) sticks, cones, or molds.

Grind each of your incense ingredients into a fine powder



Figure 3.1.1 Grinding ingredients to form fine powder

Sift your powder through a flour sifter – using only the fine powder for your mix.

Combine all ingredients into a bowl.

Add a percentage of makko powder to incense powder.

Note: high resin content in your recipe means it will need more makko to make it burn (add 40- 90% makko for high resin mixtures), incense made with mostly woods, spices and herbs will need only 5-30% makko



Figure 3.1.2 Makko

- Combine makko and fine incense and blend completely.
- It's best to check the mixture currently by burning it as associate incense path. - if it burns slow and steady as a path then it'll conjointly burn simply fine once its moistened, created into a dough, and fashioned into sticks, cones.

If the incense path does not burn well or goes out - add additional makko.

If the incense path burns too quick with a principally makko aroma, add additional incense mixture.

Fine-tune the aroma to your tastes by adjusting the quantity of every ingredient.

Test instruction once more by burning trails, keep adjusting and testing till you've got that final instruction and it is time to maneuver on.



Figure 3.1.3 Burning test

Set aside 10% of this combined dry incense/makko mixture in a separate bowl, leave this as emergency backup mix.

- In a little bowl, terribly slowly drizzle in heated water into the remaining ninetieth of your ready dry incense/makko combine.
- You will use hydrosols, essential oils, wines, liqueurs, etc. as a replacement for, or additionally to, the water content in step nine.
- Knead the nice and cozy water into the mixture till you produce a dough concerning the consistency of soppy sculptor's clay.
- You ought to be able to build a mitt and have the damp however not slimed wet dough squeeze through your fingers however be firm enough to keep up its new form while not revealing any dry cracks within.

Workable however not wet is that the goal.

Slowly add additional water if the dough is simply too dry however do thus terribly rigorously because of an excessive amount of water quickly makes the combo too soupy and impossible.

If you are adding an excessive amount of water, pour what liquid you'll be able to out of the bowl, then add your emergency backup dry to combine from step eight.

Knead the dough until you get a strong sticky paste.



Figure 3.1.4 Kneading the dough to form sticking paste

Now it's best to age the dough in a bowl overnight. Cover it with a damp towel and wait 24 hours.

The next day – knead the dough again, and if needed, slowly add more warm liquid (a spray bottle works best here).



Figure 3.1.5 Masala dough prepared

Pinch off a small piece of dough, roll it in your hands into a ball, place it down on a large flat surface that can be cleaned afterwards – i.e., cutting board, table, tile, etc.

With the palm of your hand roll the ball top to bottom on the prepared stick, first away from and then back towards you, and begin forming a stick.



Figure 3.1.6 Rolling masala dough on stick

Now switch from using your hands to using the bottom part of a small box that fits in your hand.

Roll the box bottom back and forth over stick and form to size and thickness desired.



Figure 3.1.7 Masala dough wrapped around stick

Use a butter knife to cut the ends – we usually keep cutting them until our sticks are about 7” long.

Roll your sticks until very thinner than a pencil.

Unit 3.2: Post Rolling Operations

Unit Objectives

At the end of this unit, participant will be able to:

1. Describe the process of drying agarbatti after hand rolling.
2. Describe the process of storage of prepared agarbatti.
3. Describe the process of packing agarbatti.

3.2.1 Dying

After the rolling operation is over you are required to put dry masala over the rolled agarbatti.

- Put the rolled agarbatti over a dry dust free tray or surface and allow them to dry under the sun.
- Carry out drying of rolled batti uniformly ensuring minimum moisture content. Use drying stand for best results.



Figure 3.2.1 Racks for drying agarbattis

- Let the agarbattis dry in the open sunlight so that they are dried to sufficient extent.



Figure 3.2. 2 Dried Agarbattis

3.2.2 STORAGE

After the drying operation you are required to put the agarbatti lot on the basis of the size to a dry area. Weigh the dried rolled batti and make bundles of unit weight (say 1 or half kg). Roll each bundle separately in paper to refrain rolled batti to catch moisture.

- Store the rolled batti lot in a dry area avoiding direct contact with ground so that they do not stress torn each other.
- Clean the rolling desk from any stains of masala that may create difficulty for next rolling batch.
- Select the area which is protected from rain and wind.



Figure 3.2.3 Dry storage for agarbatti sticks

3.2.3 PACKAGING

After taking all the steps correctly, the last step remains is packing and making it ready to deliver to consumers. Packing process is very important related to the safety of sticks during transport process. Also, the agarbatti sticks are packed in such a way that the fragrance last longer. The following steps which should be taken to pack Agarbatti sticks are as follows:

- Agarbatti Sticks are packed as a bundle of 20 to 30 sticks in a box.
- Before putting the agarbatti sticks into the box, the sticks are placed in a thin plastic bag.



Figure 3.2. 4 Agarbatti sticks in plastic bags

- The plastic bag is then delivered to related brands that process them in their brand paper boxes.

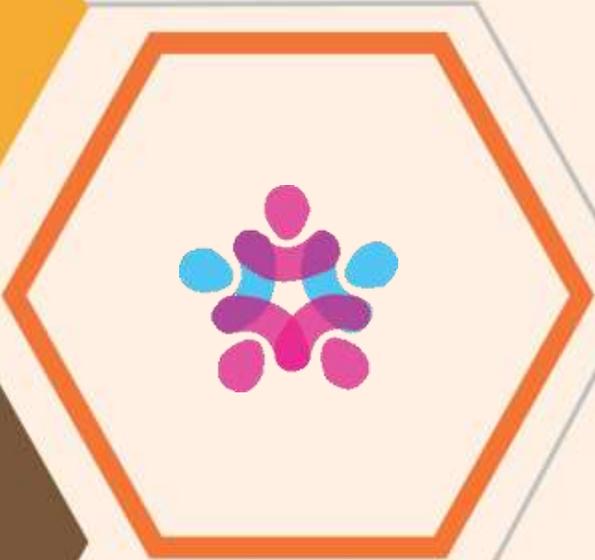


Figure 3.2.5 Agarbatti packs in market

Exercise

1. Write down the steps of making agarbatti sticks by hand rolling and perform then in workshop.

2. Write down the steps of drying agarbatti sticks.



4. Quality Management

Unit 4.1 – Defects and Rectification



Key Learning Outcomes

At the end of this module, participant will be able to:

1. Identify common defects in agarbattis and their reasons.
2. Describe the remedies of common defects.
3. Take the necessary action when materials do not conform to quality standards
4. Report and replace identified faulty materials and component parts which do not meet specification
5. Identify modifiable defects and rework on them
6. Carry out quality checks at specified intervals according to instructions
7. Apply the allowed tolerances
8. Identify faults and take appropriate action for rectification
9. Ensure standard stick length is 8-9 inches or as per the specification

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Defects and Rectification

Unit 4.1: Defects and Reflections

Unit Objectives

At the end of this unit, participant will be able to:

1. Identify common defects in agarbattis and their reasons.
2. Describe the remedies of common defects.
3. Take the necessary action when materials do not conform to quality standards
4. Report and replace identified faulty materials and component parts which do not meet specification
5. Identify modifiable defects and rework on them
6. Carry out quality checks at specified intervals according to instructions
7. Apply the allowed tolerances
8. Identify faults and take appropriate action for rectification
9. Ensure standard stick length is 8-9 inches or as per the specification

4.1.1 Common Defects and Remedy

FAULTY RECIPE

Sometimes the agarbatti sticks made contain faulty amount of ingredients which may lead us to faulty smell or rapid combustion. These defects take place due to following reasons:

- Inappropriate amount of Jigatu or makko powder.
- In appropriate amount of masala proportions.

Remedies:

- Taking appropriate amount of ingredient proportion like Wood glue + Charcoal powder + sawdusts + Sandalwood powder = 1:2:1:5
- Adding makko and then checking the loose masala dough by burning it before rolling over agarbatti stick

FAULTY DRYING

The agarbatti sticks and the agarbatti masala rolled over sticks need a certain amount of time to dry properly and to give out the best results. Faulty drying may cause following defects:

Loosening of the rolled masala over the sticks which may lead to falling off masala leaving the unrolled stick behind.

- Under dry sticks or wet sticks do not accumulate the masala rapidly.

Remedies:

- Continue kneading the masala over and over so that the dough thus formed have good adhesive property to hold on the sticks.
- Give the sticks proper time and sun light to dry completely.

STICKY LENGTH

The sticks used for agarbatti are usually of a size range between 7 to 10 inches. Making smaller or larger than the standard size involves defects as follows:

- Breaking of Sticks due to long length under slight compression as the sticks made are very thin.
- Short sticks undergo the burning process in no time.

Remedies:

- Do not overcut or undercut the bamboo sticks.
- Use any measuring scale for perfect cutting.

FAULTY STORAGE

Storing plays an important role in the transport and safety of agarbatti sticks. The following are the faults which can take place due to improper storage:

- Putting agarabatti lot over a wet surface results in overlapping of rolled masala dough.
- Putting the lot over dusty or rough surface results in odd smell, unburnt masala and breaking of dry masala.

Remedies:

- Always put the agarbatti lot over clean and dry surface.
- Avoid direct contact with ground.
-

Exercise



1. Discuss the reason of faulty recipe and remedies.

2. Discuss the reason of faulty drying and remedies

3. Discuss the reason of faulty stick length and remedies.

4. Discuss the reason of faulty storage and remedies.

5. Sorting, Counting and Weighing



Unit 3.1 – Sorting, Counting and Weighing



Key Learning Outcomes

At the end of this module, participant will be able to:

1. Be competent, the user/individual on the job must be able to:
2. Identify the right batch of scented agarbatti based on specifications like perfume, length of sticks, rolling process
3. Check if the perfume has spread over the full length & surface of rolled masala
4. Separate the appropriately scented agarbattis from partially scented agarbattis
5. Understand the instruction for deciding unit amount
6. Use a counting machine or manually count the required number of sticks per unit packet
7. Use a weighing machine for the required weight of sticks per unit packet

Unit 5.1: Sorting, Counting and Weighing

Unit Objectives

At the end of this unit, participant will be able to:

1. Be competent, the user/individual on the job must be able to:
2. Identify the right batch of scented agarbatti based on specifications like perfume, length of sticks, rolling process
3. Check if the perfume has spread over the full length & surface of rolled masala
4. Separate the appropriately scented agarbattis from partially scented agarbattis
5. Understand the instruction for deciding unit amount
6. Use a counting machine or manually count the required number of sticks per unit packet
7. Use a weighing machine for the required weight of sticks per unit packet

5.1.1 Process of Segregating the Incense

1. Sorting

Sorting can be done based on various factors such as the shape, form, etc. But the primary criteria is the smell of the incense. There are different flavors of smell like jasmine, rose, sandalwood, etc. But the sorting starts with the completeness of the fragrance.

You need to first identify the incenses which have the scented smell all over it. Separate the appropriately scented agarbattis from partially scented agarbattis. Then sort them based upon their form. Then you need to perform the burning test to confirm the consistency of scent in incense. When you burn the incense, you need to consider the following factors:

- Smell
- Burning time
- Burning consistency
- Smoke emitted

You then need to analyze and identify the incents that:

- Incense that loses fragrance before it completes burning
- Incense that emits lots of smoke
- Incense that doesn't burn completely.

Collect and segregate them separately so that you can inform the supervisor or manager regarding the same and make corrections. You can dispose these incenses after their confirmation.

2. Filling of packets based on the count

One way of packing the incenses are based upon their count. Segregate them based upon their forms and then count them and pack them according to the requirement. For example, 20 dhoops for Rs. 7.50. Ensure that you don't waste the good incense during the process of packing. Handle them carefully.

3. Filling of packets based on the weight

Another way of packing incenses is by weighing them using an appropriate weighing machine. For example, 100 grams of sticks for Rs. 20. Ensure that you don't waste the good incense during the process of packing. Handle them carefully. If you are not sure of something, always consult the supervisor or manager.

5.1.2 Burning Methods

1. Indirect burning

The raw materials are powdered and then mixed together with a binder to form a paste, which, for direct burning incense, are then cut and dried into pellets. Incense of the Athonite Orthodox Christian tradition are made by powdering frankincense or fir resin, mixing it with essential oils. Floral fragrances are the most common, but citrus such as lemon is not uncommon. The incense mixture is then rolled out into a slab approximately 1 cm thick and left until the slab has firmed. It is then cut into small cubes, coated with clay powder to prevent adhesion, and allowed to fully harden and dry. In Greece this rolled incense resin is called 'Moskolibano', and generally comes in either a pink or green color denoting the fragrance, with pink being rose and green being jasmine



Fig.5.1.1: Drying cored stick incense Vietnam

2. Direct burning

In order to obtain desired combustion qualities, attention has to be paid to certain proportions in direct burning incense mixtures:

- **Oil content:** Resinous materials such as myrrh and frankincense must not exceed the amount of dry materials in the mixture to such a degree that the incense will not smolder and burn. The higher the oil content relative to the dry mass, the less likely the mixture is to burn effect. Typically, the resinous or oily substances are balanced with "dry" materials such as wood, bark and leaf powders.
- **Oxidizer quantity:** The amount of chemical oxidizer in gum-bound incense must be carefully proportioned. If too little, the incense will not ignite, and if too much, the incense will burn too quickly and not produce fragrant smoke.
- **Mixture density:** Incense mixtures made with natural binders must not be combined with too much water in mixing, or over-compressed while being formed, which would result in either uneven air distribution or undesirable density in the mixture, causing the incense to burn unevenly, too slowly, or too quickly.
- **Particulate size:** The incense mixture has to be well pulverized with similarly sized particulates. Uneven and large particulates result in uneven burning and inconsistent aroma production when burned.
- **Binder:** Water-soluble binders such as "makko" have to be used in the right proportion to ensure that the incense mixture does not crumble when dry but also that the binder does not take up too much of the mixture.

Some kinds of direct-burning incense are created from "incense blanks" made of unscented combustible dust immersed into any suitable kind of essential or fragrance oil. These are often sold in America by flea-market and sidewalk vendors who have developed their own styles. Such items are often known as "dipped" or "hand-

dipped" incense. This form of incense requires the least skill and equipment to manufacture, since the blanks are pre-formed in China or South East Asia, then simply scented with essential oils.

Incense mixtures can be extruded or pressed into shapes. Small quantities of water are combined with the fragrance and incense base mixture and kneaded into a hard dough. The incense dough is then pressed into shaped forms to create cone and smaller coiled incense, or forced through a hydraulic press for solid stick incense. The formed incense is then trimmed and slowly dried. Incense produced in this fashion has a tendency to warp or become misshapen when improperly dried, and as such must be placed in climate-controlled rooms and rotated several times through the drying process.

Traditionally, the bamboo cores of cored stick incense is prepared by hand from *Phyllostachys heterocycla* cv. *pubescens* since this species produces thick wood and easily burns to ashes in the incense stick. Through this process, known as "splitting the foot of the incense stick", the bamboo is trimmed to length, soaked, peeled, and then continuously split in halves until thin sticks of bamboo with square cross sections of less than 3mm. This process has been largely been replaced by machines in modern incense production.

In the case of cored incensed sticks, several methods are employed to coat the sticks cores with incense mixture:

- **Paste rolling:** A wet, malleable paste of incense mixture is first rolled into a long, thin coil, using a paddle. Then, a thin stick is put next to the coil and the stick and paste are rolled together until the stick is centered in the mixture and the desired thickness is achieved. The stick is then cut to the desired length and dried.
- **Powder-coating:** Powder-coating is used mainly to produce cored incense of either larger coil (up to 1 meter in diameter) or cored stick forms. A bundle of the supporting material (typically thin bamboo or sandalwood slivers) is soaked in water or a thin water/glue mixture for a short time. The thin sticks are then evenly separated, then dipped into a tray of incense powder, consisting of fragrance materials and occasionally a plant-based binder. The dry incense powder is then tossed and piled over the stick while they are spread apart. The sticks are then gently rolled and packed to maintain roundness while more incense powder is repeatedly tossed onto the sticks. Three to four layers of powder are coated onto the sticks, forming a 2 mm thick layer of incense material on the stick. The coated incense is then allowed to dry in open air. Additional coatings of incense mixture can be applied after each period of successive drying. Incense sticks that are burned in temples of Chinese folk religion produced in this fashion can have a thickness between 2 to 4 millimeters.
- **Compression:** A damp powder is mechanically formed around a cored stick by compression, similar to the way uncored sticks are formed. This form is becoming more commonly found due to the higher labor cost of producing powder-coated or paste-rolled sticks.



Fig.5.1.2: Some incense sticks are uneven in thickness

5.1.3 Burning Test Analysis

By the burning of incense, particle (aerosols) and gas pollutants may be formed. Because it is mainly organic materials that is burned a series of different chemical compounds may be formed. The chemical substances contained in the incense may transform into other chemical substances during the burn besides a number of smoke particles. A total of 36 samples were purchased. The sampling stopped as repetitions of samples became more frequent. Of the 36 different incense sticks, cones, etc. collected, 12 samples were chosen in co-operation with the Danish Environmental Protection Agency for qualitative analysis. The qualitative analysis was conducted as a screening analysis by head-space. This should give an impression of which chemical substances to expect.

Qualitative analysis (Screening)

The examination is performed as a primary screening of different incense sticks and other incense types by a head-space analysis to elucidate which stimulating fragrances that are added. The screening should at the same time indicate which collecting absorbents to select in connection with monitoring and analysis of the emission from incense sticks during burning. 12 different kinds of incense with varying stimulating additives were screened:

Lab. no.	Type	Origin	Fragrance	Comment
1	Cone	Indian	lavender	
2	Stick	Chinese	Lemon	
3	Granulate/Herbs	German/Arabic	Arabic mixture	
4	Herbs	German/Arabic	Ayurvedic	
5	Stick	Indian	Cannabis	
6	Stick	Chinese	? green colour	Chinese text
7	Stick	Thailand	? yellow colour	Thai text, with elephants
8	Stick	Hong Kong	Musk	
9	Cone	Indian	Sandal	
10	Stick	Indian	Sali sai baba	
11	Stick	Japanese	Aloewood	
12	Stick	Japanese	Cedarwood	

Fig.5.1.3(a): Qualitative analysis (Screening)

12 different incense sticks/-cones/-granulates were examined for their emission of chemical substances after heating to 100°C using head-space – GC/MS analysis. A known quantity was measured in a 22 ml head-space glass container. The amount weighed is presented in the table below:

Lab. no.	Incense mrk.	Producing country	Weighed amount, grams
1	Lavender Cone	India	1.09
2	Lemon stick	China	0.94
3	Arabic mixture, powder	Germany	0.91
4	Ayurvedic, stick	Germany	0.98
5	Mysore Cannabis stick	India	1.43
6	Green stick	China	0.60
7	Elephant stick	Thailand	1.21
8	Wild Musk stick	Hong Kong	1.35
9	Maharaja sandal stick	India	0.87
10	Sali Sai Baba stick	India	1.00
11	Aloe Wood stick	Japan	0.71
12	Cedar Wood stick	Japan	0.58

Fig.5.1.4 (b): Qualitative analysis (Screening)

Quantitative analysis

Depending on which substances that were observed in the screening analysis an initial health evaluation of the identified substances was performed. The health screening was based on available literature and had the purpose to ascertain that the substances to be focused on in the quantitative analyses were the most relevant. The selection was performed in co-operation with the Danish Environmental Protection Agency.

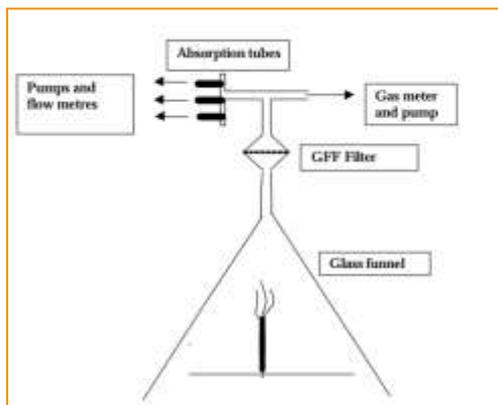


Fig.5.1.5(c): Qualitative analysis (Screening)

A. Selection of types for quantitative analysis

To measure the amount of pollution and which substances that are emitted from burning of incense, the incense material (incense sticks, -cones or granulate) was examined in laboratory tests. The incense material was placed under a funnel. Aerosols and vapours from the burning incense was sucked through diverse filters located in the test setup:

Aerosols were sampled on 47 mm glass fibre filters mrk. Whatman GF/F. The filters were previously glowed in an oven for 2 hours at 200°C, conditioned at 23°C and 50% relative humidity (RH) for 12 hours before they were weighed. After the exposure the filters were conditioned for minimum 12 hours at 23°C and 50% RH, and then weighed and analysed for organic components using GC-MS.

The filters were placed in a special filter holder, which was connected to a respirator pump with gas meter connection.

Gaseous VOC compounds were sampled on XAD2 filters mrk. Supelco Orbo 43. The VOC compounds were sampled in a partial air stream after the filter at a flow of 1.0 l/min. using a constant flow pump mrk. SKC.

Aldehydes were sampled on silicagel filters impregnated with 2,4-dinitrophenyl-hydrazin (DNPH) mrk. Supelco LPDNPH S10. The aldehydes were sampled in a partial air stream after the filter at a flow of 1.0 l/min. using a constant flow pump mrk. SKC.

The VOCs were sampled on charcoal filters mrk. SKC 266-09. The VOCs were sampled in a partial air stream after the filter at a flow of 1.0 l/min. using a constant flow pump mrk. SKC. Gas meter and pump Absorption tubes GFF Filter Glass funnel Pumps and flow metres 19.

The incense was weighed before being placed in the test set-up. The test sampling period was approx. 1 hour. Before the incense was placed in the test set-up it had been burning for 1 minute to secure an even burning. Double determinations were performed on all analyses and the relative standard deviation (%RSD) calculated.

The detection level for the different techniques will be depending on which compounds that are detected and the volume of air sucked through (dilution). By sampling one cubic metre of air, the detection limit would be as presented in the table below:

Method	Detection limit of the method, µg per component	Detection limit Concentration, µg/m ³	Uncertainty %
GC-MS, screening	0.1-0.5	--	--
GC-MS solid adsorbent	0.1-1	0.1-1	10
GC-MS (PAH)	0.002-0.01	0.002-0.01	10
HPLC solid adsorbent	0.03 – 0.1	0.03-0.1	10

Fig.5.1.6 (d): Qualitative analysis (Screening)

B. Data on the studied incense sticks/cones

In the table below, specified information is given on: weight of the incense, burning duration for 1 incense stick and the burning temperature in the glow of the incense stick.

Incense mrk.	Lab. no.	Weight of 1 stick/cone gram	Burning period for 1 stick/cone, minutes	Temperature in glow °C
Lavender Cone	1	1.07	25	340 - 360
Lemon Stick	2	1.17	40	280 - 290
Ayurvedic Stick	4	0.98	36	300 - 320
Wild Musk	8	1.35	45	220 - 240
Sali Sai Baba	10	1.00	50	220 - 230
Cedar Wood	12	0.36	30	200 - 210

Fig.5.1.7(f): Qualitative analysis (Screening)

5.1.4 Health Assessment

Evaluation Basis

Incense sticks are manufactured from incense mass of dried pulverised herbs and wood kept together with a binding agent. The incense sticks contain or is added different forms of aromatic (perfumed) or stimulating compounds that often are herbs or extracts from plants, wood, etc. The burning of incense sticks causes the emission of a strong smoke and fragrance. Because the burning in general takes place in confined environments (e.g. closed rooms) the influence may be heavy. Since incense sticks are not labelled, which substances they are manufactured from the smoke and the added stimulating substances may pose a health problem. Incense sticks can be purchased in specialised shops or on the Internet. The labelling usually concerns the country of origin (China, Indonesia, India, etc.), which fragrance is dominant or which effect the fragrances are stated to have or affect (headaches, stress, or similar).

After the qualitative analyses are performed, the results are evaluated. Data on the individual substances such as threshold limit values, effect levels, no observed adverse effect level (NOAEL) or lowest observed adverse effect level (LOAEL), or other relevant data are used, as they are available. If data are unavailable, alternatively information from analogous substances or data based on structure analyses on the chemical substance (QSAR: quantitative structure analysis relationship) may be used. A comparison with the EU classification criteria is performed. The exposure of the consumer is evaluated on basis of consumer scenarios. The principles for the evaluation will be based on the EU revised Technical Guidance Document (EC 2003) for risk assessments. The exposed consumers will in consideration of realistic worst case be adults with a body weight of 70 kg and children with a body weight of 10 kg. The primary exposure route for incense is considered to be via inhalation (i.e. inhalation of vapours and aerosols).

The exposure will depend on contact parameters such as frequency and duration of the use of the product, the amount of product used at each event and the concentration of the contained chemical substances. Because most often one incense stick is used at a time, the consumer scenario will be based on 1 incense stick burned in a room of limited volume of 20 m³ with an air change (ventilation) of 0.5 times per hour. The burning duration of the individual incense sticks varies between 25 to 50 minutes (cf. table 3.6). Therefore, to be able to compare the incenses, an exposure during the burning of one incense stick in a 20 m³ room is calculated as µg substance per 23 incense stick (µg/incense stick) and the exposure per hour by continuous burning for one hour (µg/hour). For the evaluation of the level of exposure, different scenarios based on the measured emission are calculated in a box model (standard room of 20 m³ with an air change of 0.5 times/hour)

Method

Of the chemical substances found in the emissions from the incense it was evaluated which substances appeared to be the most problematic. The selection was made in agreement with the Danish Environmental Protection Agency. Data on the individual substances were then procured from available sources with the purpose of a

health hazard evaluation based on known information from previous Danish and foreign monographs, reviews, etc. The data on toxicity found were then compared with the concentrations estimated in the used scenarios.

The methodology used is approximately the same as recommended in connection with risk assessment in the European Union (EU) i.e. Technical Guidance Document (TGD 2003). In the TGD the potential risk to the consumer is estimated as the ratio between the predicted exposure concentration (PEC) and the predicted no-effect concentration (no-adverse effect level (NOAEL)). NOAEL is usually based on mammalian data other than humans: typically rats, mice and rabbits. Therefore, safety factors are introduced to cover differences extrapolating from other animals to humans. This is expressed either by attaching a fixed safety factor (SF) or by expressing the margin of safety (MOS), which represents the distance of the estimated concentration to the NOAEL. Typically, MOS is preferred to be above 100.

The safety factor is interpreted as being a margin of safety applied to a NOAEL to produce a value below which exposures are presumed to be without significant health risk (i.e. safe). The safety factor is traditionally composed of a factor 10 for extrapolation between species (animal to human, interspecies variation), a factor 10 to protect the most sensitive individuals of the population (e.g., children: interspecies variation). A third factor is applied depending on the data and may vary. For instance, it is 10 if LOAEL (lowest observed adverse effect level) is used instead of NOAEL. The total safety factor is a result from multiplication of the three factors.

The effect level divided by the safety factors or the assessment factor is used to evaluate whether there is reason of concern (concern level) or a further refinement of methodology or data is necessary. Thus, the evaluation may be expressed on basis of concentration divided by the safety factor or MOS (number of humans).

The safety factor is derived by recalculating threshold limit value from the working environment based on 8 hours per day for 5 days a week to indoor values at 24 hours a day for 7 days a week ($24/8 \cdot 7/5 = 4.2$), applying an extra safety factor of 10 for sensitive individuals and an extra factor of 2: a total of 100. This means that a safety margin of 100 is used. The threshold limit values are based on 8-hour time weighted average (a working day). It is important to note that the threshold limit value does not include consumers at home.

Evaluation Methodology

- **Effect level**

The effect level for incense is based on evaluation of individual substances. The established Danish threshold limit values are used when they exist. When no Danish threshold limit values exist, foreign threshold limit values are used including description of their background, if available.

The indoor air quality depends of several factors (ventilation, temperature, etc.) and other sources. In this report only the contribution from incense is considered but it should be noted that other sources to the same chemical compound may exist in the consumer's residence (e.g., by smoking, cooking, volatiles from paint, lacquers, carpets, etc.).

The exposure of the consumer in the home is besides the concentration in the indoor air also dependent on the exposure duration. Because the exposure duration may vary considerably, a maximal exposure of 1 hour is assumed. However, the ventilation is included using an assumed air change in the indoor scenarios of 0.5 times per hour, i.e., 50% of the air is exchanged every hour.

- **Inhalation**

Exposure to the substance via inhalation may occur from inhalation of vapours and aerosols. The vapours are sampled on XAD2, DNPH and charcoal filters. The aerosols are sampled on Whatman Glass fibre filters, which also sample particles like smoke, soot, etc. The exposure period may theoretically extend from the acquisition or purchase of the incense until it is used. The substances, to which consumer is exposed during the holding period, may approximately be assumed to be the substances observed in the "head-space" analyses. The exposure via inhalation is expressed as the concentration of the chemical substance in the air in the breathing zone and expressed as an average concentration over a reference period, e.g., 8 hours for the working environment.

For the consumers of incense, the exposure period may be from the time, which 1 incense stick takes to burn to considerably longer time if more incense is burned and the duration for all emission products to be ventilated out of the room/home. For estimation of the exposure via inhalation, the inhalation rate must be known, the size of the room and the emission rate of the substance to the room or the concentration in the room. The inhalation rate for an average adult is set to 20 m³ /day corresponding to 0.83 m³ /hour (standard in TGD 2003) and for a child to 3 m³ /day corresponding to 0.125 m³ /hour. The concentration in closed rooms is assumed to be higher than in ventilated rooms. For the calculation of the concentration in the room it is assumed that the substance is emitted instantly to the entire room and is homogeneously dispersed. The size of the standard room is set to 8 m² and the height 2.5 meter, i.e., the volume of the room is 20 m³. The concentration in inhaled air can then be calculated according to the equation:

$$C_{inh} = \frac{Q_{prod} \times Q_{air}}{V_{room}} \quad (mg/m^3)$$

C_{inh}	Concentration in inhaled air	mg/m^3	
Q_{prod}	Quantity of incense (product) used in the room	g	
Q_{air}	Quantity substance emitted from the incense to the room	mg/g	
V_{room}	Volume of the room	m^3	Used: 20 m^3

Fig.5.1.8.: Evaluation Methodology

• Product Evaluation

A comparison of each product was not the purpose of this study. The survey was to focus on which substances could be found in a representative selection of incense types and if they could be expected to cause any problems to the consumer of incense. An attempt of comparison has been performed anyway considering only the range observed in the study. For comparison a common unit is needed and the effects from the emitted substances are widely different. Therefore, a comparison based on the emission of volatile organic compounds and the emission of aerosols is used. The aerosol emission expresses the amount of particle material emitted during burning of incense.



Fig.5.1.9: Product Evaluation

5.1.5 Batch Analysis

Batch analysis refers to an automated analysis in which all of the samples collected for a specific, non-emergent assay undergo the same testing process at the same time or sequentially. By contrast, samples collected for statistical analyses are not saved in batches.

The data which are to be produced are summarised in the Notice to Applicants. The section "batch analysis" must include the results obtained for all specifications at release, whether or not they are intended to be verified batch to batch. Where possible, the consecutive batches should correspond to production scale batches manufactured by all manufacturers and at all manufacturing sites declared in the marketing authorisation. If these data are not available for industrial scale batches, they should be supplied to the competent authorities as soon as possible after the marketing authorisation is granted.

5.1.6 Points to remember

- Follow the sorting instructions as mentioned by the supervisor/manager.
- Ensure that you report any damages to the supervisor/manager.
- Be cautious while handling incenses ensuring minimum damage of rolled surface.
- Always dispose the incenses that failed the burning tests.
- After sorting & weighing, update the batch list with the number of passes & the number of disposables.

5.1.7 Famous Products

Incense is aromatic biotic material which releases fragrant smoke when burned. It can be used for a variety of purposes, including the ceremonies of religion, to overcome bad smells, repel insects, spirituality, aromatherapy, meditation, or just for the aroma alone.

Incense is most often composed of aromatic plant materials combined with essential oils and can generally be separated into two main types: "indirect-burning" and "direct-burning". Indirect-burning incense cannot burn on its own, and thus requires a separate heat source. Direct-burning incense is lit directly by a flame and then fanned or blown out, leaving a glowing ember that smoulders and releases fragrance. Direct-burning incense is either a paste formed around a bamboo stick, or a paste that is extruded into a stick or cone shape. Direct-burning incense is the most commonly used in the U.S.

While there are thousands of incenses available today, these six incense products have proven to be the most popular.

1. Morning Star Sandalwood Incense

This incense package from Morning Star contains 200 4.75-inch-long Sandalwood incense sticks that evokes an aroma of sweet, soft-smelling, pine-like wood with a hint of balsamic. The sticks burn for an average of 30 minutes, and the package also includes a ceramic stick holder.



Fig.5.1.10: Sandalwood Incense

2. Palo Santo Holy Wood Incense Sticks

Palo Santo is a natural wood aromatic incense used for centuries by the Incas and indigenous people of the Andes as a spiritual remedy for purifying and cleansing, as well as to get rid of evil spirits and misfortune. It has a fine citrus aroma with underlying notes of frankincense, which is very similar.



Fig.5.1.11: Holy Wood Incense Sticks

3. HEM Incense Precious Lavender 120 Sticks Box

This incense made by HEM features a lavender scent that has subtle hints of wood, creating a peaceful and pleasant environment wherever it is burned. The package includes six boxes that each have 20 sticks, all hand-rolled in India.



Fig.5.1.12: Incense Precious Lavender

4. White Sage Smudging Stick

White Sage has been used by Native Americans for thousands of years for cleansing, purifying ones self, and purifying others in addition to cleansing a space or home. The sage is dried and bundled up into stick that is burned on one end, and gives off a potent yet soft, soothing fragrance in abundance.



Fig.5.1.13: White Sage Smudging Stick

5. Sai Baba Nag Champa Incense 250 Gram

Bearing the name of Sai Baba, one of the most widely known and recognized spiritual teachers of our time, this incense proves very popular in India as well as abroad. Each hand-rolled stick contains a blend of herbs, resins, flowers and oils. Mysore sandalwood oil mixed with fragrant gums help to hold the incense together, giving it a 50-minute burn time. There is a slight perfume to the scent that is fresh, woody and exotic, without being overpowering.



Fig 5.1.14: Sai Baba Nag Champa Incense

6. HEM Patchouli Incense

Based on essential oil made from the patchouli plant, the earthy, exotic fragrance contained in this patchouli incense is widely regarded as "the scent of the 60's." It features a rich, earthy, woody aroma with a slightly fruity note, and also a hint of musk. Patchouli is a perennial favorite scent. The incense sticks are hand-rolled in India, and have a 40-minute burn time.



Fig.5.1.15: Patchouli Incense





6. Packing of Agarbattis

Unit 6.1 – Post Compression Activities



Key Learning Outcomes

At the end of this module, participant will be able to:

1. Identify the correct lot of sorted & counted/ weighed agarbattis
2. Identify the composition of unit packets/ pouches comprising of inner pouch and outer packet as per packaging instructions
3. Carry out sealing of pouches/ inner pouches using a sealing machine or heating arrangement
4. Identify & ensure the appropriate combination of different scented agarbatti inner pouches for filling in outer packet as per instructions
5. Identify the level of bulk packaging, say dozen packaging, cfc packaging etc.
6. Use the appropriate packaging materials based on size of unit packets, brand etc.

Unit 6.1: Packing of Agarbatti

Unit Objectives

At the end of this unit, participant will be able to:

1. Identify the correct lot of sorted & counted/ weighed agarbattis
2. Identify the composition of unit packets/ pouches comprising of inner pouch and outer packet as per packaging instructions
3. Carry out sealing of pouches/ inner pouches using a sealing machine or heating arrangement
4. Identify & ensure the appropriate combination of different scented agarbatti inner pouches for filling in outer packet as per instructions
5. Identify the level of bulk packaging, say dozen packaging, cfc packaging etc.
6. Use the appropriate packaging materials based on size of unit packets, brand etc.

6.1.1 Pre-requisites for Packing

We need the following before we start packing the incense:

1. Different types of boxes according to the incense form.
2. Different types of pouches according to the incense form.
3. Different types of inner polythene covers/pouches.
4. Cello tapes.
5. Other sealing machines to seal the inner covers/pouches.
6. Huge cartons for bulk packing.
7. Polythene wrappers/covers

6.1.2 Types of Packing

Shipping companies know that not every client will be able to ship their goods in standard cardboard boxes, so they offer a broader assortment of options. Here are the most common types of packing materials that can accommodate a wide variety of company needs.

1. Crates and Pallets

No matter what kind of product you need to move, crates and pallets are an important part of the shipping and packaging process. They act as secondary wrapping and keep the actual goods safe until they are delivered. Pallets keep packages raised off of the surface they are sitting on—whether it is the ground or the bed of a delivery truck. Keeping products off the ground keeps the packaging in good condition, and protects against dirt and moisture. Almost all packaging companies from Toronto to Tennessee use crates and pallets when preparing their clients' products for shipment. Some companies, like Pack-All International, use wooden materials that can easily be reused or recycled. Other shipping locations, like Nelson Company, use reusable and recyclable plastic crates and pallets. Both materials have their advantages and disadvantages, but either will keep your products safe and dry in their packaging.

2. Shrink Wrap

Shrink wrap is used as both/either primary and secondary packaging. You can shrink wrap your actual product, like the shrink wrap around CD cases or loose notebook paper, or you can shrink wrap an entire pallet of packages to hold the packages together and make them easier to move. Shrink wrap does more than keep packages together. It also provides puncture and abrasion protection as well as impact resistance. Plastic is also cheaper and more recyclable than corrugated boxes. Shrink wrap provides the same protection when it is used as individual product packaging, plus it gives the contents visual appeal.

3. Vacuum Packaging

Vacuum packaging is a great option for goods that need to be sealed, which makes it a preferred option for perishable foods. Their compact design also makes them popular for dehydrated goods, or food intended for camping and backpacking trips. Vacuum wrapping eliminates oxygen from the packaged food, which keeps out bacteria, mold, and yeast. Food that comes in vacuum packaging will also stay fresh in the freezer longer than food wrapped in other types of packages. If your company ships any kind of perishable food, vacuum packaging will efficiently meet your needs. Vacuum packaging is also used for medical materials, or anything that needs to be hermetically sealed.

4. Preservation Packaging

Preservation packaging includes both shrink wrapping and vacuum packaging, as well as other forms of packaging such as jar canning, aluminium cans, and other types of protective packages like egg cartons and milk jugs. These packaging materials have one goal—keep the product safe, protected, and fresh.

Another type of preservation packaging material that doesn't necessarily have to do with food is bubble wrap. Bubble wrap is a lightweight, inexpensive way to cushion your products and provide them with impact protection throughout the shipping process.

3. Shock Mount Packaging

For items that are extremely fragile, shock mount packaging is one of the safest options. The packaging contains built-in shock absorption, protecting the contents from shock and vibration as well as humidity, dust, and moisture. This heavy-duty type of packaging is typically used for fragile electronic equipment, or unstable chemical compounds.

There are many different ways to package and ship your products. Evaluate the needs of your company and products, and decide which of these options will work best for you, and will keep your products safe throughout the shipping process.

4. Plastic

It is one of the most common packaging materials used for food products. Resin is most common to plastic packaging as it can be made flexible or rigid depending on the need of packaging. This is commonly used for sodas, milk carton and egg trays. Rigid plastics are usually used for manufacturing food cartons (for to go) and other plastic trays.

5. Metal or Aluminium

This type of packaging is normally used for canned goods, sodas and alcoholic drinks like beer. Although aluminium is good for packaging, challenge is it is quite expensive to make one that is why you would hear people trying target all the used cans that they can find so that they can have it for recycling.

8. Cardboard

This is used when the product is already wrapped in something that is already well protected and secured. This material is also highly recyclable. This material is also used in manufacturing corrugated boxes. Some products use bubble wrap for protective purposes before putting it in a well-sealed box. Taping machines are commonly used for sealing these corrugated boxes just to make sure that product is delivered intact.

9. Glass

It is frequently used for preserved foods such as jams and honey. This type of packaging is easy to use and can be recycled over and over again. Glass is also used for consumable goods such as sodas, beer and wine. Although this packaging is fragile, it is still widely used across almost all industries.

11. Foam

You would notice this type of packaging on gadgets, TVs, furniture, glass and anything with sharp edges. Foams are custom made to make sure that it fits the product accurately.

6.1.3 Process of Packing

1. Filling in inner pouches

Collect the different types of incenses and sort them based upon their forms. Now identify the correct size of inner pouches to fit in those incenses. You also need to make sure that the inner pouch's diameter fits in the outer packet. Fill in the agarbattis based upon the count or weighing method in the respective pouches as per the instructions provided.

Handle them with care so that you end up in minimal wastage of products while packing. Because sometimes, the incense may break or the stick might break.

2. Filling in outer Packet & Sealing

Now you need to identify the correct size of the outer packet to fit in the inner pouch which is filled with incenses. Seal the inner pouches using a sealing machine or a heating burner as shown below:



Fig.6.1.1: Filling in outer Packet & Sealing



Fig.6.1.2: heating burner



Fig.6.1.3: Seal the inner pouches

Seal the inner pouches so that the fragrance doesn't get evaporated.

Then fill in the outer packets with the required number of inner pouches. Finally seal the outer packets too either using the sealing machine or the cello tape.



Fig.6.1.4: Finally seal the outer packet

3. Bulk packing

Bulk packing is the way to pack multiple packets into his huge carton. This packing will come into picture if the company is sending goods to its clients based upon their order. For example, 20 cartons each weighing 5 kgs. And use appropriate internal packaging materials like:

- Bubble wrap
- Foam sheeting
- Polystyrene surrounds and ends – minimum for electrical goods
- Moulded and shaped foam – cosmetic protection only
- Polystyrene peanuts / chips – eliminating movement of packaged items

Once you fill in every carton, ensure that you seal them appropriately so that you can avoid wastage during transportation. Then print appropriate batch labels on each carton based upon their content inside.



Fig.6.1.5: Bulk packing

6.1.4 Packing Tips

Making sure you have all the appropriate moving supplies is an essential step in preparing for your move. When preparing your belongings before a move, make sure ALL items, whether fragile or not, are packed using the correct materials.

Choose the right box: Use a box that's strong enough to protect the contents and large enough to leave space for adequate cushioning. New boxes are best, but if you choose a previously used box, make sure you remove old shipping labels, and make sure the box is in good shape with no weak spots or cracks.

Protect and Pack: Don't skimp on cushioning material! Use 1-inch bubble wrap. Pack items tightly to avoid shifting, and make sure the cushioning material covers all sides of the object. If you're shipping several items together, wrap each one separately and provide enough cushioning to prevent movement.

Seal Carefully: After packing, gently shake the box. If nothing moves, it's ready to be sealed. For a strong seal, always use packing tape that is designed for shipping.

Label Your Boxes: Remember, your boxes will be going long distance on a truck with other boxes. So label each box with your name and the destination address

Shipping Insurance: This is not a packing tip, but it is important: If your items are being shipped long-distance, make sure you have the proper shipping insurance

6.1.5 How to Properly Pack a Box

Understanding how to properly pack a box is not nearly as simple as people think, and how you pack them makes all the difference in the world. No matter how careful movers are with your items if your boxes aren't properly packed items may still arrive damaged!

Start by grouping items of similar size and weight together. Try not to put unlike items in the same box (this also makes it easier once you try to unpack your boxes). For example, keep pots and pans in one box and your frames and photos in another.

Wrap any items that you want to protect from breaking or water damage. Books should be wrapped in plastic bags that seal (this also protects photos and paintings). Kitchen items that are breakable can be wrapped in extra kitchen towels, or small blankets. Bubble wrap can be used as well.

Layer and Fill the Whole Box! Use extra bubble wrap and packing peanuts – Fill All the Space. Boxes with nothing in the top space can collapse and get crushed when other boxes are stacked on top. If you do not have packing peanuts or bubble wrap – use other things to fill the unfilled space, like old newspapers or clothing. This also prevents your items from moving around in the box during transport. Keep in mind that heavier items should be on the bottom.

Keep your box around 30 lbs. Boxes that are too heavy can break open (spilling the contents everywhere) and cause injury if you lift them incorrectly. But, be careful not to under pack boxes! If there is extra space in your box it can be easily smashed, not to mention the extra space leaves more room for your belongings to bounce around and break.

Tape the box correctly! Tape the top, the bottom and around the entire box, along the seams too – tape helps to reinforce the box so it won't break or split open

Finally, label all sides with your name and address in case they are misplaced.

6.1.6 Sealing Methods

Select a Packet Sealer of your need

Packet sealers help to make packet sealing faster. Packet sealers are classified according to the technology used to make them. Modern packet sealers are sophisticated gadgets that are much different from the manual packet sealers used several decades back. The material used to make packets has also undergone a sea change. Likewise, we have a wide product range of packet sealers to choose from. Selection of Packet sealers must be done only after a thorough analysis of the entire present requirements and the future needs that may arise.

Decades back, only cloth packets were in wide use around the world. Then the use of packets made from jute and other eco-friendly products became widespread. Fast technological progress replaced manual packet sealing and now small packet sealing machines are available for sealing cloth packets, jute and even gunny packets. The use of these machines made packet sealing quicker and more efficient. While manual sealing is time consuming, error prone and labour intensive, packet-sealing machines gave better output with less labour.

Types of packet sealers

Packet sealers of different type and make are now available to seal packets made from a wide range of materials. Industries can choose manual, semi-automatic or even automatic Packet sealers according to the type of packet materials used for packing the various products. There are packet-sealing machines that even seal the packets and do the labelling simultaneously.

A wide range of packet sealers is available for sealing plastic packets. Today no modern food processing industry can afford to do away with the packet sealer. Processed foods need to be preserved for long periods and transported to huge distances across the globe. Food preservation through refrigeration and freezing is costly. A processed food item may reach the hands of the customer only after several months or even years. Such processed foods need to be preserved from air and water contamination and also from decaying bacteria and fungi. Thus carbon dioxide gas was filled in the plastic packets along with the processed food products to protect them from decaying bacteria and fungi and also to improve their shelf life. For packing fried food items for a long time and to keep them crisp nitrogen gas was used. Plastic packets filled with carbon dioxide or nitrogen gas needed airtight packing, so that the processed foods will not be contaminated. Not only that, the sealing must be strong and durable. The technology employed has advanced to such an extent that today even vacuum packing and sealing is possible

Small and medium industries needed small manually operated packet sealers. But the needs of heavy industries are different. Large factories producing sugar, animal feeds, plant fertilizers and even cement weigh and pack the produce in an assembly line and the Packet sealers simultaneously seals and labels them.

Such huge industries use big packet sealers. They come in different models and the industry mostly prefers the automated ones. Simultaneous sealing and labelling is a recent innovation. Such packet sealers were earlier electronically controlled. But now even computerized Packet sealers are available. This ensured better output from the packet sealers and the labelling and numbering became error free.

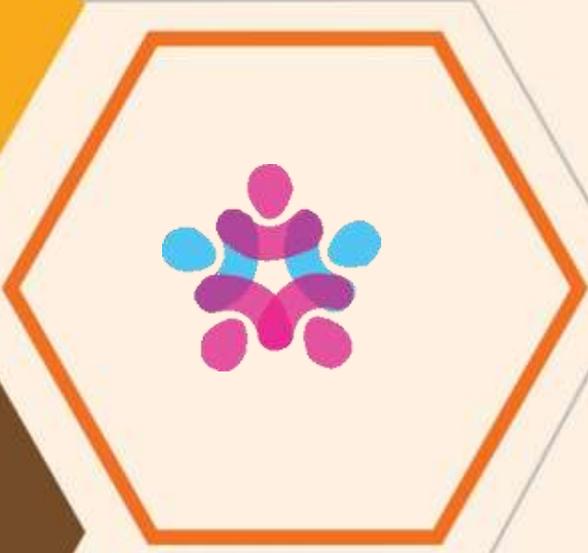
Materials used in packet sealing

In age-old times small cloth pieces or even jute threads were used for tying the mouth of a cloth or jute packet. Nowadays even the cloth and jute packets are sealed perfectly using nylon or cotton threads which are so thin but strong. For example, in a sugar factory, sugar is packed in large jute packets and the packet sealer uses either nylon or cotton threads to seal the packets. The sealing process is very similar to the working of a sewing machine. But the methods used for sealing plastic and paper packets are different.

Till a few decades ago cement was packed in plastic packets. The disposal of the plastic packets became a problem. Here again, the need for the packet sealer to seal these cement paper packets became a necessity. Paper packets cannot be sealed using the methods adopted for sealing jute and cloth packets. Cement of a particular quantity is weighed and filled in the paper

packets. The packets are closed automatically and the packet sealer simultaneously applies the quick setting glue and a drier is used to dry the glue immediately.

- **Impulse:** Impulse heat packet sealers are very popular. Impulse heat sealers use a stationary heated element. An Impulse sealer is a system, usually found on a "Bottom weld" machine. This type of machine uses two sealing elements, an upper and lower which fuse the material from both sides at the same time. The purpose of "Impulse sealing" is to improve the bounding of the two layers of film. This gives a faster and better seal for thicker or hard to seal material. Ideal for small to medium scale use. Heat sealing can be adopted for sealing plastic and polythene packets. Impulse sealers come in different models and with added accessories. Some of them even have electronic controls that can be used to adjust the heat required to seal packets made from particular materials. The use of electronic circuits helps to ensure long life and keep operating costs to the minimum. The hand-operated model is enough for small home industries but the foot pedal operated model helps to make packet sealing faster. The foot pedal operated model frees both hands to manage both the package and the product. The automatic Packet sealers have options that help to control the sealing time and the sealing interval.
- **Continuous:** Continuous heat sealers utilize heated moving belts. Ideal for large volume use.



7. Product Quality

Unit- 7.1 Product Quality



(HCS/N 8006)

Key Learning Outcomes



At the end of this module, participant will be able to:

1. Identify and use different packaging materials as per the specifications provided
2. Take the necessary action when materials do not confirm to quality standards
3. Report and replace identified faulty materials and component parts which do not meet specification
4. Ensure the packaging is not damaged before or during packing
5. Ensure the sealing is done properly
6. Identify modifiable defects and rework on them

Unit 7.1: Product Quality

Unit Objectives

At the end of this unit, participant will be able to:

1. Identify and use different packaging materials as per the specifications provided. Take the necessary action when materials do not confirm to quality standards
2. Report and replace identified faulty materials and component parts which do not meet specification
3. Ensure the packaging is not damaged before or during packing

7.1.1 Why is Quality Important for a Business

“Quality is a lovable journey and not a destination”

Managing quality is crucial for small businesses. Quality products help to maintain customer satisfaction and loyalty and reduce the risk and cost of replacing faulty goods. Companies can build a reputation for quality by gaining accreditation with a recognized quality standard, such as ISO 9001, published by the International Organization for Standardization. Quality concentrates on the following 4 factors:



Fig.7.1.1.1: Stamp

Customer Expectations

Your customers expect you to deliver quality products. If you do not, they will quickly look for alternatives. Quality is critical to satisfying your customers and retaining their loyalty so they continue to buy from you in the future. Quality products make an important contribution to long-term revenue and profitability. They also enable you to charge and maintain higher prices.

Reputation

Quality influences your company's reputation. The growing importance of social media means that customers and prospects can easily share both favourable opinions and criticism of your product quality on forums, product review sites and social networking sites, such as Facebook and Twitter. A strong reputation for quality can be an important differentiator in markets that are very competitive. Poor quality or a product failure that results in a product recall campaign can create negative publicity and damage your reputation

Meeting Standards

Accreditation to a recognized quality standard may be essential for dealing with certain customers or complying with legislation. Public sector companies, for example, may insist that their suppliers achieve accreditation with quality standards. If you sell products in regulated markets, such as health care, food or electrical goods, you must be able to comply with health and safety standards designed to protect consumers. Accredited quality control systems play a crucial role in complying with those standards. Accreditation can also help you win new customers or enter new markets by giving prospects independent confirmation of your company's ability to supply quality products.

Costs

Poor quality increases costs. If you do not have an effective quality control system in place, you may incur the cost of analysing nonconforming goods or services to determine the root causes and retesting products after reworking them. In some cases, you may have to scrap defective products and incur additional production costs to replace them. If defective products reach customers, you will have to pay for returns and replacements and, in serious cases; you could incur legal costs for failure to comply with customer or industry standards.

7.1.2 8 Dimensions of Quality

Eight dimensions of product quality management can be used at a strategic level to analyze quality characteristics. The concept was defined by David Garvin. Some of the dimensions are mutually reinforcing, whereas others are not—improvement in one may be at the expense of others. Understanding the trade-offs desired by customers among these dimensions can help build a competitive advantage. Garvin's eight dimensions can be summarized as follows



Fig.7.1.2.1: dimensions of product quality

1. **Performance:** Performance refers to a product's primary operating characteristics. This dimension of quality involves measurable attributes; brands can usually be ranked objectively on individual aspects of performance.
2. **Features:** Features are additional characteristics that enhance the appeal of the product or service to the user
3. **Reliability:** Reliability is the likelihood that a product will not fail within a specific time period. This is a key element for users who need the product to work without fail.
4. **Conformance:** Conformance is the precision with which the product or service meets the specified standards.
5. **Durability:** Durability measures the length of a product's life. When the product can be repaired, estimating durability is more complicated. The item will be used until it is no longer economical to operate it. This happens when the repair rate and the associated costs increase significantly.
6. **Serviceability:** Serviceability is the speed with which the product can be put into service when it breaks down, as well as the competence and the behavior of the serviceperson.
7. **Aesthetics:** Aesthetics is the subjective dimension indicating the kind of response a user has to a product. It represents the individual's personal preference.
8. **Perceived Quality:** Perceived Quality is the quality attributed to a good or service based on indirect measures.

7.1.3 Total Quality Management (TQM) and Continuous Improvement

Continuous improvement is based on a Japanese Concept called Kaizen, is the philosophy of continually seeking ways to improve operations. It involves identifying benchmarks of excellent practices and instilling a sense of employee ownership of the process. The focus can be on:

- Reducing the length of time required to process requests for loans in bank
- The amount of scrap generated at a milling machine or the number of employee injuries.
- Continuous improvement can also focus on problems with customers or suppliers, such as customers who request frequent changes in shipping quantities and suppliers that to maintain high quality

The bases of the continuous improvement philosophy are the beliefs that virtually any aspect of an operation can be improved and that the people most closely associated with an operation are in the best position to identify the changes that should be made. Consequently, employee involvement plays a big role in continuous improvement programs.

TQM is mainly concerned with continuous improvement in all work, from high level strategic planning and decision-making, to detailed execution of work elements on the shop floor. It stems from the belief that mistakes can be avoided and defects can be prevented. It leads to continuously improving results, in all aspects of work, as a result of continuously improving capabilities, people, processes, and technology and machine capabilities



Fig.7.1.3.1: Continuous improvement

Continuous improvement must deal not only with improving results, but more importantly with improving capabilities to produce better results in the future. The five major areas of focus for capability improvement are demand generation, supply generation, technology, operations and people capability.

A central principle of TQM is that mistakes may be made by people, but most of them are caused, or at least permitted, by faulty systems and processes. This means that the root cause of such mistakes can be identified and eliminated, and repetition can be prevented by changing the process. There are three major mechanisms of prevention:

1. Preventing mistakes (defects) from occurring (Mistake - proofing or Poka-Yoke).
2. Where mistakes can't be absolutely prevented, detecting them early to prevent them being passed down the value-added chain (Inspection at source or by the next operation).
3. Where mistakes recur, stopping production until the process can be corrected, to prevent the production of more defects. (Stop in time).

The basis for TQM implementation is the establishment of a quality management system which involves the organizational structure, responsibilities, procedures and processes. The most frequently used guidelines for quality management systems are the ISO 9000 international standards, which emphasize the establishment of a well- documented, standardized quality system. The role of the ISO 9000 standards within the TQM circle of continuous improvement is presented in the following figure.

Continuous improvement is a circular process that links the diagnostic, planning, implementation and evaluation phases. Within this circular process, the ISO 9000 standards are commonly applied in the implementation phase. An ISO 9000 quality system also requires the establishment of procedures that standardize the way an organization handles the diagnostic and evaluation phases. However, the ISO 9000 standards do not prescribe particular quality management techniques or quality-control methods. Because it is a generic organizational standard, ISO 9000 does not define quality or provide any specifications of products or processes. ISO 9000 certification only assures that the organization has in place a well-operated quality system that conforms to the ISO 9000 standards. Consequently, an organization may be certified but still manufacture poor-quality products

5.1.4 Incense Quality

With very high-quality incense sticks, exclusively natural ingredients and no synthetic oils or artificial fragrances are used. Synthetic fragrances are suspected of creating health problems such as a headache trigger. Therefore, please pay attention to quality information like "Only natural ingredients and no synthetic additives are used." Price is also an important quality criterion. Pure essential oils are very expensive. Cheap Incense for pennies is likely to contain a large proportion of synthetic flavor oils and fragrances.

These artificially perfumed incense sticks you can normally detect in the smell: the smell is usually very intense and exudes not a particularly pleasant smell and subtle aroma quality of the incense.

If a product fulfils the customer's expectations, the customer will be pleased and consider that the product is of acceptable or even high quality. If his or her expectations are not fulfilled, the customer will consider that the product is of low quality. This means that the quality of a product may be defined as "its ability to fulfil the customer's needs and expectations".

Quality needs to be defined firstly in terms of parameters or characteristics, which vary from product to product. For example, for a mechanical or electronic product these are performance, reliability, safety and appearance. For pharmaceutical products, parameters such as physical and chemical characteristics, medicinal effect, toxicity, taste and shelf life may be important. For a food product, they will include taste, nutritional properties, texture, and shelf life and so on.

To ensure product quality, the entire process of producing the product must be established and streamlined. It includes fixing product specifications, preparing product design, procuring suitable raw materials, preparation for manufacture, manufacture, and post manufacturing until it gets into the hands of the consumer.

In many instances, however, the correction of quality deficiencies is also required at the end of the process since in spite of all the efforts made, the required quality will sometimes not be attained and a company may be faced with a pile of scrap and rework. Corrective and preventative actions have to be taken to avoid unnecessary wastage and rework. A manufacturer who is determined to ensure product quality could also maintain strict adherence to specifications and product characteristics. Examples of these may be:

- Dimensions, such as length, diameter, thickness or area.
- Physical properties, such as weight, volume or strength.
- Electrical properties, such as resistance, voltage or current.
- Appearance, such as finish, colour or texture.
- Functional qualities, such as output or kilometre per litre.
- Effects on service, such as taste, feel or noise level

Buyers should choose natural incense for the best results. The ingredients of natural incense include essential oils, resins, crushed flowers, herbs, and fragranced woods. Distilled or spring water that is added to the powdered plant material, oils, and resins form a thick paste. Water that is free from impurities is used to ensure pure, natural incense that burns evenly and does not interfere with the fragrance of the plant materials. The mixture is dipped and rolled onto high-quality wood or bamboo sticks and dried. Then it is ready to burn.

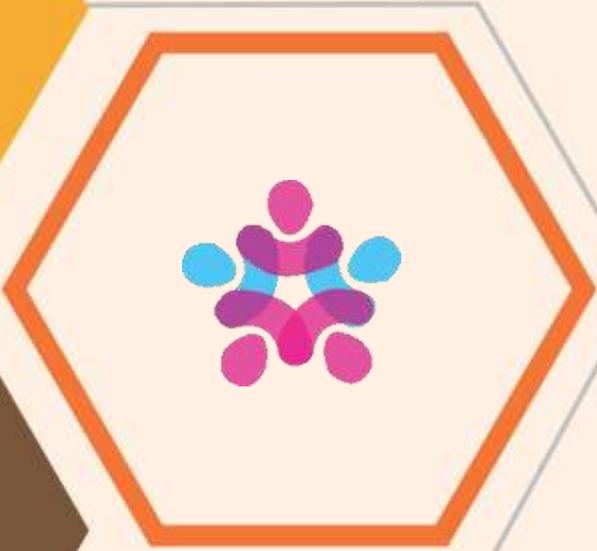
Users should stay away from blended incenses that do not describe specifically what the fragrance is. Blended synthetic types do not offer the best, long-lasting fragrance, and often includes synthetic fragrances that are not derived from plants. The best-quality incense sticks typically come from Nepal, Tibet, Japan, and India. Incense producers in these countries offer quality, hand-dipped sticks made from essential oils and plants.

7.1.5 Quality Parameters

As we discussed before, the quality of incense is determined based upon the following factors:

- Guaranteed Quality Assurance for products and packaging
- Finest incense used for all products
- International Packaging Standards
- Best Packaging design with international appeal.
- Quality Standards maintained from sourcing the raw material to packaging and dispatch.
- On time delivery of products





8. Working in a team

Unit 8.1 – Working in a Team



Key Learning Outcomes



At the end of this module, participant will be able to:

1. Know the benefits of team work.
2. Describe the stages of team building.
3. Describe the methods of working in a team effectively.
4. Work effectively and efficiently at workplace
5. Properly communicate about organization policies
6. Talk politely with other team members and colleagues
7. Adjust in different work situations
8. Give due importance to others' point of view
9. Avoid conflicting situations
10. Develop new ideas for work procedures

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<https://youtu.be/HEkGrPDCu2k>

Team Work

Unit 8.1: Working in a Team

Unit Objectives

At the end of this unit, participant will be able to:

1. Describe the benefits of team work.
2. Identify the stages of team building.
3. Identify the methods of working in a team effectively

8.1.1 Why work in teams?

There are several good reasons:

- Everyone learns by imitating. Hence, those who are slow to learn will eventually come at same level as rest of the team.
- When working on complex job, a team can do individually do collective tasks.
- Teamwork helps in developing interpersonal skills like coping with conflict.

8.1.2 Effective teams

Why do some groups accomplish very little, while others achieve much more?

This difference is caused by internal compatibility of team members and their vision for common goal. The features of an effective team include:

- every team member giving their best
- clear vision of their goal
- each group member willing to learn
- trusting each other and supporting each other
- Free flow of knowledge within team
- Open feedback system.

8.1.3 Making the most of your team

There are many advantages of working collaboratively with other team members. To make the most of your experience as a team member, remember to:

- Not wait for others to pull you. You should take initiatives.
- Share your ideas with other team members.
- Cooperate with your team members and follow the instructions.
- Respect your team members and try to build a healthy competitive environment.
- Use your time efficiently towards achieving the common goal.
- Always be positive for your hard work.
- Keep note of your team members regularly.
- Ask your team leader for frequent feedback.
- Try to be gentle with other.
- During hard times, do not blame others. Keep calm and help others achieve the goal.

8.1.4 Group development Process

There are five stages of a group development. These are sometimes defined as:

- Forming, or coming together
- Storming, or conflict
- Norming, or working out the rules
- Performing, or getting the job done
- Mourning, or breaking up.

The length of time different groups take to pass through each of these developmental stages will vary, but you cannot get a high performance until your group has passed through at least the first three stages. The duration of each stage will depend on factors such as individual and team maturity, task complexity, and so on.

8.1.4.1 Forming

At this stage new members are found by possible team leader and they get together to know each other.

The objectives to be considered when finding people for team are:

- Grasp of goals and objectives by people
- tasks and roles to be performed by team members
- clear idea about work plan
- understanding in behavioural pattern of people

They will:

- demonstrate excitement
- participate hesitantly
- show tentative attachment to the group
- discuss problems peripheral to the task
- be uncomfortable and anxious about the new situation
- accomplish minimal work

This stage is complete when new members start thinking of themselves as part of a group.

8.1.4.2 Storming

At this stage of newly recruited members of team can become hostile or over-conscious about themselves as individual and resist group formation.

They will express:

- infighting, defensiveness and competition
- doubts about success
- low group morale
- polarisation of group members
- concern over excessive work
- disunity and increased tension

Many groups do not go beyond this stage if they lack the ability to listen to each other and overcome the issues.

8.1.4.3 Norming

At this stage members start accept the team, create the team norms and their own roles. At this stage there will be a few emotional conflicts.

Group members will try to:

- achieve maximum harmony by avoiding conflict

- develop a high level of trust and respect for others in the group
- discuss group dynamics constructively
- form friendships
- develop a sense of team cohesion with a common spirit and goals
- have high group morale
- establish and maintain group boundaries
- accomplish a moderate amount of work

At this stage, the real leader of team will emerge or should be agreed upon who can focus the group resources to solve problems.

8.1.4.4 Performing

A properly grouped team at this stage is capable of diagnosing and solving problems. This stage is not always reached by all teams.

Group members at this stage will:

- be willing to sort through group problems
- develop high conflict resolution skills
- understand members' strengths and weaknesses
- undertake constructive self-change
- accomplish a great deal of work

Groups reaching this stage will be effective and will devote energy to maintain good group relations.

8.1.4.5 Mourning

This is the final stage of teams that were developed temporarily as task groups or committees.

8.1.5 Working with People having Disabilities

There are a lot of misconceptions when people with disabilities are involved in Team. It is generally assumed that they will need help in doing their work from other team members. If one can understand that people with disabilities are people just like any other team members then it would be more productive for the team. It is better to focus on the abilities of PwD (People with Disabilities) rather than focusing on their disabilities. There are a few etiquettes to be followed when interacting with People with Disabilities:

8.1.5.1 Golden Rule for Interaction

The golden rule for interacting with anyone including People with Disabilities is the simplest to understand. "You should treat everyone in the same way as you want to be treated when placed in their situation." Imagine what you would want to hear when you had the disabilities similar to the person in front of you.

8.1.5.2 Ask before Assisting

Just because someone has disabilities does not mean he/she will need your assistance in doing their work. Most of the time people cause problems for person with disabilities rather than helping them. It is also a rude gesture when helping PwD without asking them first. Most of the time People with Disabilities have unique ways to do the same work which you may not even imagine.

8.1.5.3 Do not Label

You should not use label language with interacting with PwD. Example of label are deaf, dumb, insane, dwarf, and so on. In place of using labels, it is better to use People First language. The people first language equivalent to insane is “person with mental illness”. You can also use survivor language which can also boost morale of PwD like you should say, “person is survivor of xxxx mental illness”.

8.1.5.4 Do not show Pity or Patronize

After assigning label, this is the second most common mistake anyone does when interacting with PwD. Always keep in mind that person with disabilities deserves same dignity and respect as any other abled person. Person with disability is not a victim, he/she is survivor and you should treat them in the same manner.

8.1.5.5 Make Eye Contact

It is first nature of human to see the differences in people rather than seeing similarities. When interacting with PwD, you should keep eye contact with the person when talking. This gesture shows that you take them equal to yourself. If the person in front of you uses wheel chair, then you should talk to them while sitting in chair hence making same eye level. Kneeling before wheel chaired person will make them look like child in their eyes.

Sometimes people avoid to eye contact with person with disabilities because they fear that they may say something offensive to that person. This behaviour is misinterpreted as ignoring by them hence causing more disrespect because no one in a group would like to be ignored. Always try to find common ground if you are hesitant in interactive with PwD.

8.1.5.6 Understanding Abilities of Disabled Person

Disabled persons generally add new ideas and ways to perform tasks in a team. You should understand their way of working on the projects before assigning jobs to them. If you are a team leader then you should always assign the most appropriate and safe job to disabled person based on their abilities.

8.1.5.7 Speak Direct First

If the disabled person is accompanied by a caregiver, then you should first try to talk directly with disabled person and once it is established that the person cannot communicated directly

then only you can switch to caregiver for interaction. Doing this makes the disabled person understand that you see him/her as your equal.



Figure 8.1.1 Persons with disabilities

8.1.6 Gender Sensitisation

Gender sensitisation refers to the process of making people aware about gender equality and making people understand that there are no predefined task limits for men and women. It is written in our constitution that equal status and opportunities are legal right of every man and woman as citizen of India. Note that gender is not sex here. Sex is the biological state of human. A person will be male, female or intersex due to biological conditions and genitals. Sex defines anatomical and physiological property of human. Gender is the role and expectations defined based on one's sex. Due to these social definitions defined on the basis of sex; dress codes, routines, freedom of expression, rights and opportunities are also divided between genders.

8.1.6.1. Gender Construction in Society

The root of gender construction begins in boys and girls as soon as they become aware to them self. They will be constantly bombarded with statement when growing up that a boy and a girl are different and they play different roles in society. There are various levels in society at which gender inequality is taught:

- Family Level
- School Level
- Religion Level
- Local Society Level
- Community Level

Once you place this bias against questions given next then you will understand how baseless this inequality is:

- What will happen if a girl is not taught household work and caring others?
- What will happen if a girl is taught to perform all the tasks which are reserved by society for boys?
- What happens if a boy is taught to perform household works and caring other rather than giving him tasks reserved for boys?
- Does being born as girls makes you learn household works automatically?
- Does being born as boy makes you learn outdoor activities automatically?

Answers to all these questions can be summed up in one line: It is the upbringing by parents and society that determines how a child grows and what he/she becomes.

8.1.6.2 Patriarchy

Patriarchy is the social system derived from gender biasness which considers men superior to women in social status. Due to this social system men are generally considered as head of family even if they are incompetent. Due to this system, men are considered as the one who will carry family name, inherit property and make all the family decisions. Patriarchy is a double edge sword because it also puts the burden of expectations on men and limiting this freedom of choices. For example, boy is expected to become dancer, musician, tailor or cook. Women are the biggest victim of this patriarchy system because they are limited in almost all their choices starting from their dressing to their interaction in society.

Although the society is changing and women are coming forward to become scientists, drivers, pilots, athletes, entrepreneurs but the pace of this change is very slow.

8.1.6.3. Gender Equality

Gender equality is not sex equality. It does not mean men and women are same. It means that there should be no constraint/restriction in access to social opportunities and decisions based on gender for men and women. Following are the steps to achieve gender equality in society:

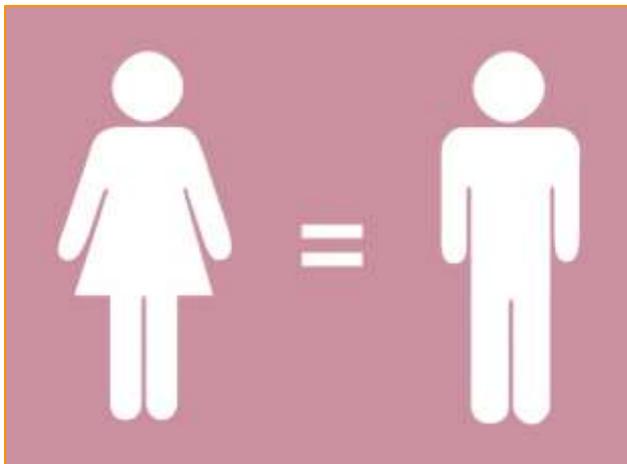


Figure 8.1.2 Gender equality

- Changing regressive norms: Our social system is full of such norms like woman is paid less than a man for same work, household work is the primary work of women, and so on. These norms should be removed from our society for establishing equality.
- Equal Access: For establishing gender equality, women/girls should have equal rights in inheritance, family assets, loans, credits, opportunities, and so on.
- Changing Mindset: From centuries it has been the mindset of society that girl/woman is inferior to man. This has generated many secondary problems in society. Common examples

- of such mindset are like; a girl cannot choose her life partner, a women cannot leave home town for job, and so on.
- Changing Biased Social Practice: Social practice like dowry, restricted dress codes, Child birth selection, and so on put the girl/woman at disadvantage in society. Such social practice must be changed.

8.1.6.4 How to Promote Gender Equality

- In daily life, all the adult members should share the household chores. Do not think that kitchen work and other household work are responsibilities of females only.
- Do not ignore comments that discourage women to come forward and take a stand against them.
- If you see violence against women or harassment then provide support and help them.
- Consider female candidates equal to male candidates when voting.
- To achieve equality at work, be fair in hiring process and do not eliminate female from race.
- Provide equal wages to women for same work.
- Encourage a safe and healthy environment for working women in your organization.
- Do not allow offensive jokes and comments against female workers in your organization.

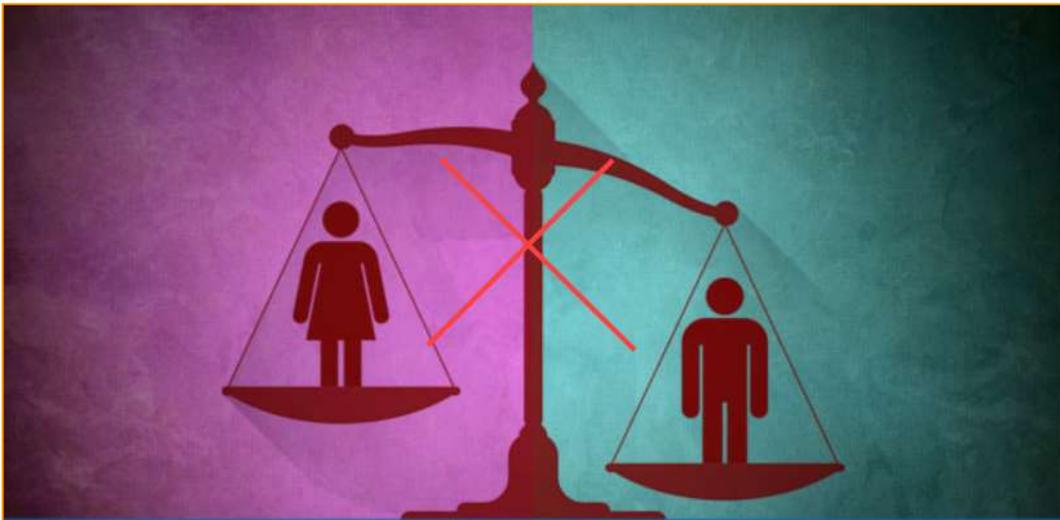


Figure8.1.3 No to gender bias

Exercise

1. Why should we work in a team?

9. Maintain work area & tools

Unit 9.1 – Work Area Management



Key Learning Outcomes



At the end of this module, participant will be able to:

1. Handle materials and tools safely and correctly
2. Use materials to minimize waste
3. Maintain a clean and hazard free working area
4. Maintain the tools
5. Carry out maintenance and/or cleaning within one's responsibility
6. Dispose of waste safely in the designated location
7. Store cleaning equipment safely after use
8. Carry out cleaning according to schedules and limits of responsibility

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<https://youtu.be/WWp30glVGrM>

Work Area Management

Unit 9.1: Work Area Management

Unit Objectives

At the end of this unit, participant will be able to:

1. Describe the importance of managing work area properly.
2. Describe the benefits of work area management.
3. Describe how to build a good housekeeping plan
4. Identify the elements of housekeeping
5. Handle materials and tools safely and correctly
6. Use materials to minimize waste
7. Maintain a clean and hazard free working area
8. Maintain the tools
9. Carry out maintenance and/or cleaning within one's responsibility
10. Dispose of waste safely in the designated location
11. Store cleaning equipment safely after use
12. Carry out cleaning according to schedules and limits of responsibility

9.1.1 Reasons to Manage Workplace

Cleaning work place does not mean just shining floors and walls, it safe and healthy environment as well for workers. When working conditions are hazardous then it becomes more important to keep workplace healthy. If you want to avoid workplace induced injuries then here are some guidelines to be followed.

1. **Do not leave floors wet.**

Keeping your floors dry is important to avoid accidents caused by slippery floors. There are various types of floor cleaners available in market. You can use alkaline cleaners when there is high foot-fall of people. If your work place is rusty then you can use acidic cleaners. Some floor cleaners can contain harmful chemicals that might not be suitable for your specific working conditions. For example, if you are working on clothes then make sure acids do not touch the clothes. You can also use other materials like mats, carpets, rubber rolls, and so on to keep your floor dry and clean. Although, it may cause to increase the initial cost because in such cases, vacuum cleaners are required for cleaning.



Figure 9.1.1 Using Mop on floor

2. Kill the germs and infection causing bugs.

Killing germs, bacteria, and viruses is important for healthy conditions at work place. In recent years, we have seen what single virus Covid-19 can do to the world.



Figure 9.1.2 Applying Disinfectants on work area

3. Air cleaning.

Most of the time air contains dusts and various other particles which if left unchecked can cause health issues. A good ventilation design can help in reducing airborne transmission of respiratory infections. If you work in environment where cutting and grinding of metal, ceramics, and other materials is performed then having a good ventilation must be your top priority considering health of your workers. If you have installed an HVAC system in your work area then regularly cleaning it is important to increase efficiency of HVAC system as well as prevent growth of moulds and

bacteria in the system. If you want to specifically remove fine dust particles in your work area then you can use a vacuum cleaner which has HEPA filters. General value of healthy humidity is 30 to 50 percent. You can maintain this humidity by using a dehumidifier if your work area has dry air based on geographical location. Humid air is heavy and it eliminates air pollutants hence providing clean air in the workplace.



Figure 9.1.3 Air Filtration

4. Good lighting system.

Do not keep your lights dirty or it will reduce this effectiveness. Good light is important for working with concentration. Also, stairways and aisles should always have clear visibility by lights to preventing accidents.



Figure 9.1.4 Cleaning Light Bulbs

5. Use eco-friendly products.

These days just cleaning your work place is not enough. It is important to use environment friendly solutions for cleaning. If we do not start using eco-friendly products now, then Earth will reach to the point of pollution where there is no turning back.



Figure 9.1.5 Eco-friendly cleaning

6. Use properly marked dust bins.

Categorise your dust bins based on the wastage you produce at your work place. You can use separate dust bins for wet and dry garbage. If your waste materials include papers, glass, plastic, or metal then you can use same number of dust bins so that recycling these materials becomes easy and efficient.



Figure 9.1.6 Trash Bin Types

9.1.2 Benefits of Maintaining Workplace

Properly maintained work place means:

- Reduction in material handling time and effort.
- Lesser slips that can cause fatal accidents.
- Reduction in possible fire accidents.
- Lower frequency of illness in your workers due to respiratory problems
- Better management of tools and raw material

- Easy cleaning and maintenance of equipment.
- Improved health of workers due to hygienic conditions.
- Better utilization of your space.
- Reduction in property damage.
- Improvement in mood and morale of workers
- Increase in productivity of workers.



Figure 9.1.7 Growth representation

9.1.3 Planning a Housekeeping program

When you are creating a housekeeping program then you should consider easy and efficient storage of tools and raw materials. You should also try to reduce the movements of tools and raw materials from point A to B in your work area. For example, if your work includes cutting of a part then you should try to place cutting tools and related raw materials nearby and put a garbage bin of related type near your work area.



Figure 9.1.8 Planning

If you are worried about the extra cost caused by housekeeping then note that this cost will be over-shadowed by increase in efficiency at your work place. Storages that are not planned properly can result in accidents due to improper materials handling. If you have access to layout of your plant then this can reduce the time required for housekeeping planning.

Training your workers in housekeeping is important if you want to increase efficiency using a good housekeeping plan. If your workers do not follow the plans then there is no point in even making a housekeeping plan.

Housekeeping is not a one-time affair. Housekeeping is a continuous cycle and it should be maintained every day. You should plan the job of your workers in such a way that housekeeping gets integrated in their daily activity. A good housekeeping program should assign:

- Cleaning workplace between shifts
- Day wise clean up
- Disposing the waste material
- Returning unused material to its storage
- Inspection by a supervisor for proper maintenance

Keep not of the places that are not used regularly and hence get ignored by workers when performing housekeeping maintenance. You should assign a days and workers to maintain those areas as well. Such areas can include boiler room, furnaces, generators, water tanks, and so on.

Creating a housekeeping program is just the beginning of improving your work place. You should always check for deficiencies in your program and update it accordingly based on feedbacks.

Notes

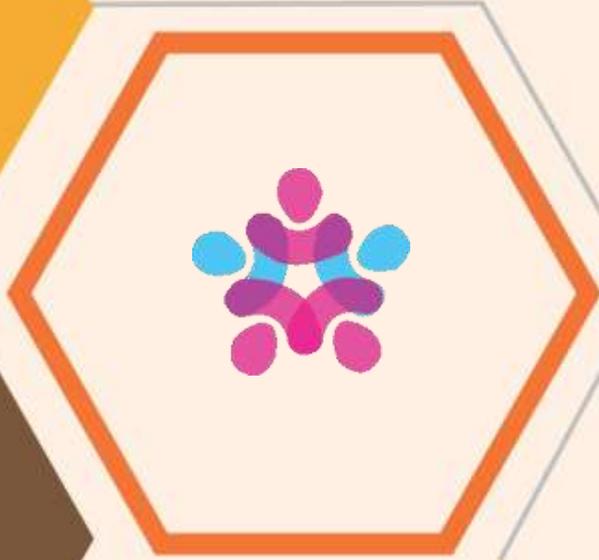


Exercise



1. Discuss some important reasons to manage workplace properly.

2. What are the benefits of managing workplace?



10. Maintain health, safety and security at workplace

Unit 10.1 – Safety, Health, and Hygiene

Unit 10.2 – First Aid



Key Learning Outcomes



At the end of this module, participant will be able to:

1. State some common reasons of accidents at site.
2. State common accidents and prevention techniques
3. State ways to stay healthy and hygienic (personal hygiene)
4. Perform First-Aid for emergency

Scan the QR code or click on the link to check related video



<https://youtu.be/w9TbAwkx71I>

Health and Safety



https://youtu.be/-h1HFXM_ScE

First Aid

Unit 10.1: Safety, Health, and Hygiene

Unit Objectives

At the end of this unit, participant will be able to:

1. State some common reasons of accidents at site.
2. State common accidents and prevention techniques
3. State ways to stay healthy and hygienic (personal hygiene)

10.1.1 General Safety Rules

General safety rules are applicable in all types work places which are discussed next.

10.1.1.1 Work intelligently

- Substitute safer materials when possible.
- It is better to water-based products over solvent-based chemical products.
- Try to use products that do not generate dust.
- Do not put brushes or tools in your mouth it can cause injury.
- Do not eat, drink, or smoke in studios.
- Put the tools at their designated places.
- Read the labels on your materials. If you cannot get a specific smell from a toxic material then it does not mean it is safe.
- Never use materials in unintended ways. For example, don't use standard paint for skin-painting.

10.1.1.2 Keep studio space neat and orderly

- Keep floors clean and dry.
- Arrange extension cords, pipes, hoses in such a way that to do not become obstruction for passing by people.
- Keep dangerous items in enclosed areas with proper markings.
- Keep your working area separate for pantry, janitor room, and other sections.

10.1.1.3 Ensure appropriate ventilation

- The mouth, nose, and skin can absorb hazardous materials. Ensure ventilation provides fresh air activity to decrease exposures to dusts, fumes, gases, mists, and vapours. Adequate ventilation means that clean air is flowing toward the artist and contaminated air is flowing away. Blowing air around with a fan without a source of clean air is not adequate ventilation, and can actually increase exposures to harmful substances.
- Prevent the accumulation of flammable vapours or spray mists to limit fire hazards with proper ventilation.

10.1.1.4 Have proper protective gear and cleaning supplies available

- Keep your dress separate from your regular clothes. Your work dress can have contaminants that require special care.
- Cleaning supplies should be placed at designated area.
- Always try to clean spillage immediately, even if it is a small spill. If there is a chemical spill then clean it properly.
- If the material spilled can catch fire, then you can use activated charcoal, sand, or deodorant-free cat litter.
- If there is a possibility of accidental exposure to poisonous chemicals then you should rush to hospital or call an ambulance.

10.1.1.5 Wash hands when working with chemicals or hazard material

- Avoid using toluene, turpentine, kerosene, or other solvents to clean your skin.
- Use soap and water or baby oil or a skin cleanser.
- Wash under fingernails. Keep nails trim and do not bite nails.

10.1.1.6 Maintain your physical and mental health

- Recognize your physical, emotional, and mental limits.
 - o Alertness decreases with hunger and fatigue.
 - o Anger, sadness, hurrying and frustration increase chances of accidents and mistakes.

- Have regular health check-ups.
- Make sure your health care provider is familiar with the art and craft materials you use, your level of exposure, and your studio environment.

10.1.2 What is an Accident?

An **accident** is a specific, unpredictable, unusual, and unintended external action which occurs in a particular time and place, with no apparent and deliberate cause but with marked effects.

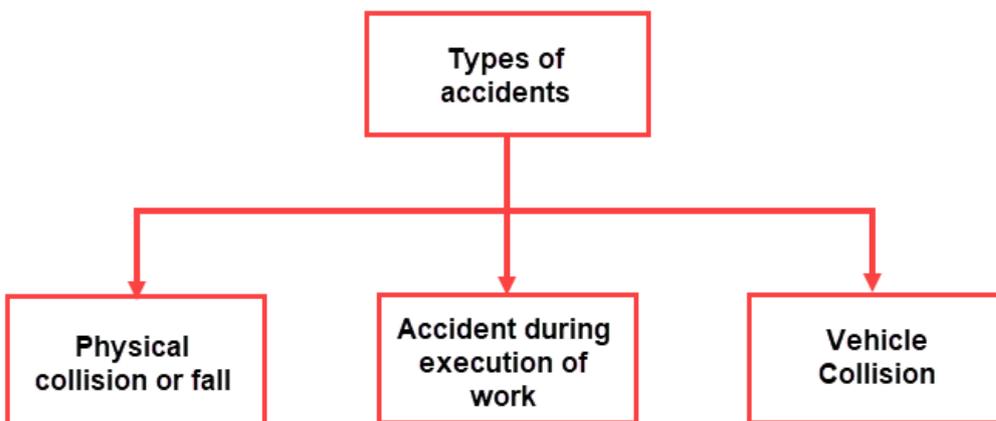


Figure 10.1.1 Types of accidents

10.1.2.1 Frequently occurring accidents/hazards in Workshop

Some of the more frequently encountered hazards include:

- Electrical hazards
- Hazard due to scissors and needle
- Falling object hazards
- Equipment failure
- Fire Hazard
- Slipping on Floor
- Missing steps and falling on stairs

10.1.3 What is a Fire Extinguisher?

Fire extinguishers are a fire protection device used to extinguish or control small fires.



Figure 10.1.2 Fire Extinguisher

10.1.3.1 How does a fire Extinguisher Work?

Fire extinguishers contain carbon dioxide, which is the chemical that creates the pressure over the extinguishing agent. Once the lever is pushed, Carbon dioxide will push the agent and project it through the hose.

Types of Fire Extinguishers

Fire extinguishers are classified based on the type of burning material. This classification is shown in next figure.



Figure 10.1.3 Classification of Fire Extinguisher

10.1.3.2 General method to operate a Fire Extinguisher

P A S S

Pull the Pin at the top of the extinguisher. The pin releases a locking mechanism and will allow you to discharge the extinguisher.

Aim at the base of the fire, not the flames. This is important - in order to put out the fire, you must extinguish the fuel.

Squeeze the lever slowly. This will release the extinguishing agent in the extinguisher. If the handle is released, the discharge will stop.

Sweep from side to side. Using a sweeping motion, move the fire extinguisher back and forth until the fire is completely out. Operate the extinguisher from a safe distance, several feet away, and then move towards the fire once it starts to diminish. Be sure to read the instructions on your fire extinguisher - different fire extinguishers recommend operating them from different distances. Remember: Aim at the base of the fire, not at the flames!!!!

10.1.4 What is Health?

Traditionally, health is defined as the absence of illness. WHO defines health in this positive way:

Health is a state of complete physical, mental and social well-being – and not merely the absence of disease or infirmity.

Maintaining clean environment at work:

- Designate storage space for everything.
- Provide sufficient housekeeping tools, including brooms, clean rags, and spill absorbers.
- Define areas for scrap storage and schedule regular collection, removal, and disposal.
- Assign clean-up responsibilities and make sure work sites are cleaned and cleared before quitting time.

Hygiene – It is a set of practices performed for preservation of health. It is maintained in personal, home, food and workplace.

Personal Hygiene - The cornerstone of hygiene. The body is the source and entry point of many illnesses. Appropriate personal hygiene can prevent all sorts of diseases

Hygiene at home – When you spend your time at home you may as well maintain hygiene as the air you breathe can affect your breath.

Food - Whether in the home, in industry or in catering, food hygiene should be second nature at this time when new food risks are sharply on the increase

Instilling hygiene rules and basics - These should rapidly become second nature and act as a safeguard for the health of the population at large. Setting an example, repetition and education are most important in successfully applying personal, domestic, food or pet hygiene. Likewise, vaccination is an invaluable preventive measure, and should be undertaken at the appropriate time, and booster schedule adhered to.

Each of us has a contribution to make to health, and this starts with basic day-to-day ground rules for hygiene.

Effective hygiene should be instilled in us from a young age so that it becomes second nature. Hygiene is essentially a healthy attitude towards life in general, including a balanced diet, a well-ordered lifestyle, balanced sleeping patterns and avoiding smoking, alcohol and drugs. Living hygienically is the first step towards a healthier society

Unit 10.2: First Aid

Unit Objectives

At the end of this unit, participant will be able to:

1. Know the common components of First Aid Kit.
2. Perform emergency procedures of First Aid in different situations
3. Report hazards and potential risks/ threats to supervisors or other authorized personnel
4. Participate in mock drills/ evacuation procedures organized at the workplace
5. Undertake first aid, fire-fighting and emergency response training, if asked to do so
6. Take action based on instructions in the event of fire, emergencies or accidents

10.2.1 First Aid and First Aid Kit

First aid is the assistance given to any person suffering a sudden illness or injury with care provided to preserve life, prevent the condition from worsening, or promote recovery.

10.2.1.1 Components of First Aid kit

Kits vary in contents but most kits have the following items:

- Band-aids / Adhesive bandages
- Gauze pads and tape
- Scissors, cold pack
- Wound bandage / compress
- Eye pads / eye wash solution
- First aid / burn cream
- Antibiotic ointment
- Face shield or barrier mask for providing CPR
- Forceps / tweezers
- Disposable thermometers
- First aid instruction booklet



Figure 10.2.1 First aid box

Unit 10.2.2 Common Procedures for First Aid in various situations

10.2.2.1 Adult / Child Choking: Severe Airway



Blockage

Quickly ask, “are you choking?”

- If the victim nods yes, or is unable to talk, speak, or cough – act quickly.
- Stand behind the victim.
- Make a fist and place the thumb side of that hand against the victim’s abdomen, just above the navel and below the ribs. Grasp fist with the other hand.
- Quickly thrust inward and upward into the abdomen.
- Repeat thrusts until object is expelled or victim becomes unresponsive.



Figure 10.2.2 Choking illustration

Victim is unresponsive:

- If needed, help the victim to the ground and call an ambulance.
- Begin chest thrusts as you would with CPR. Each time the airway is opened look for the object in the victim’s throat and if you can see it, remove it – being careful not to lodge the object further into the victim’s throat.
- Continue chest thrusts until EMS / Paramedics arrive, or the victim shows signs of breathing /responsiveness.

10.2.2.2 Minor Wounds

Signs and Symptoms:

- Break, cut or opening in the skin
- Bleeding – may be minor, moderate or severe
- Bruising and pain
- Infection
- Progressing shock

First Aid:

- If bleeding, apply direct pressure with a clean cloth or absorbent pad.
- Wash area with antibacterial soap and clean until there appears to be no foreign matter in the wound.
- Cover area with an adhesive bandage or gauze wrap.



Figure 10.2.3 Minor wound

10.2.2.3 Bruising

It is caused by broken blood vessels leaking blood under the skin. Bruising can be minimal or large and severe.



Figure 10.2.4 Bruising

Signs and Symptoms:

- Pain and swelling
- Discoloration: new bruising will be dark purple / older bruising will fade to greenish yellow

First Aid:

- Apply ice to injury to reduce pain, bleeding and swelling.
- To prevent frost bite to the injured area, place a thin towel or cloth between the skin and ice. Limit ice application to 20 minutes on, 20 off.

10.2.2.4 Shock

Shock develops when not enough blood flows to the vital organs of the body. Victims with shock may stop responding.

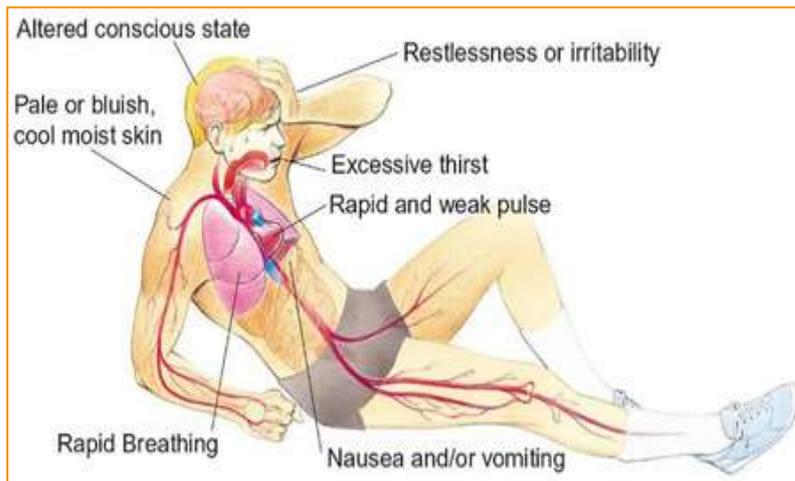


Figure 10.2.5 Shock

Signs and Symptoms:

- Dizziness, faint or weak feeling
- Rapid, shallow breathing
- Anxiety, restlessness, agitation, or confusion
- Cool and clammy to the touch
- Pale or greyish skin
- Thirst
- Nausea or vomiting

First Aid:

- Help person lie on their back.
- Keep victim lying flat with feet slightly elevated if possible.
- Cover person to keep him/her warm, but prevent overheating.
- Ensure an open airway for victim and adequate breathing.
- Monitor victim and administer CPR if necessary.

10.2.2.5 Burns

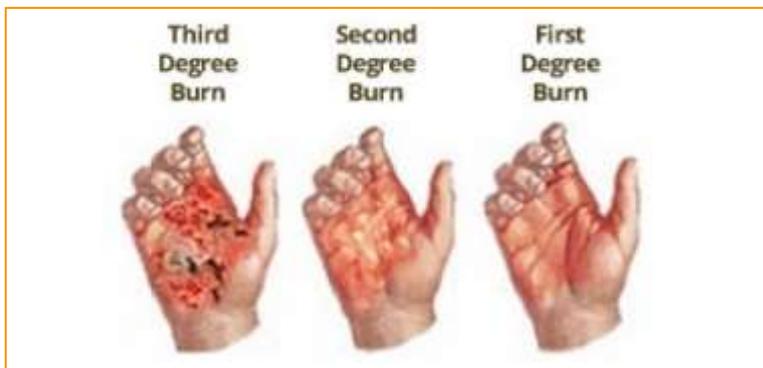


Figure 10.2.6 Burn

Signs and Symptoms:

- Pain, Redness
- Swelling, Blisters

First Aid:

- Expose the burn.
- Cool burns with cold water and continue until pain lessens.
- After cooling, cover with a dry, sterile bandage or clean dressing.
- Protect from friction /pressure
- Do not pop blisters or apply any ointment.

10.2.2.6 Bites and Stings First Aid



Figure 10.2.7 Bite or sting

General Signs and Symptoms:

- Redness
- Swelling
- Pain
- Itching
- Nausea
- Problems breathing

First Aid:

- Remove jewellery and constrictive clothing
- Wash the area with soap and clean water
- Cover the area with an adhesive bandage or gauze wrap
- Apply ice if needed to reduce pain and swelling

10.2.2.7 Heat Exhaustion First Aid

Figure 10.2.8 Heat Exhaustion

Signs and Symptoms:

- Cool, moist skin with goose bumps when in the heat
- Heavy sweating
- Faintness
- Dizziness
- Fatigue
- Weak, rapid pulse
- Low blood pressure upon standing
- Muscle cramps
- Nausea
- Headache

First Aid:

- Stop all activity and rest.
- Move to a cooler place.
- Drink cool water or sports drinks.
- Contact your doctor if your signs or symptoms worsen or if they don't improve within one hour. Seek immediate medical attention if your body temperature reaches 104°F (40°C) or higher.

10.2.3 Personal Protective Equipment (PPE)

Personal protective equipment (PPE) refers to **protective** clothing, helmets, goggles, or other garments or **equipment** designed to protect the wearer's body from injury or infection. The hazards addressed by **protective equipment** include physical, electrical, heat, chemicals, biohazards, and airborne particulate matter.



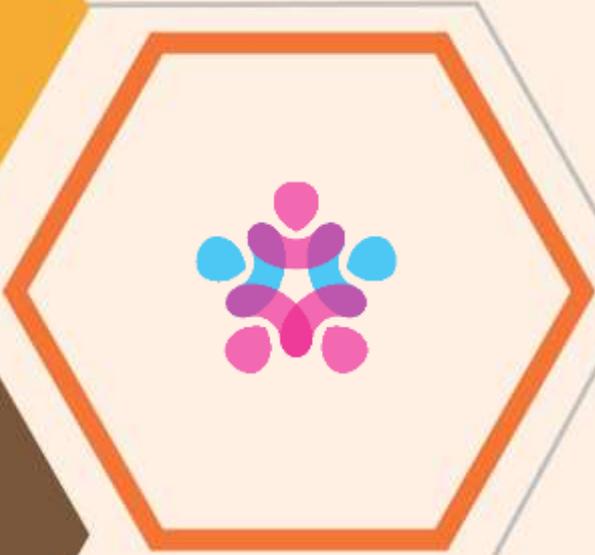
Figure10.2.9 Personal Protective Equipment components

4. Discuss the types of fire-extinguishers and their uses.

5. Write a short note on health and hygiene.

6. What are the common components of First-Aid kit?

7. What are the symptoms of shock and what should be the first-aid?



11. Annexure

Annexure 1 – Details of QR codes given in the Units



Annexure 1: Details of QR codes given in Units

Sr. No.	Module Name	Unit Name	Name of Topic	URL	Page No.	QR Code
1.	Module 1. Introduction	Unit 1.1: Agarbatti Sector in India	1.1.2 History of Agarbatti 1.1.3 Agarbatti Making in India	https://www.youtube.com/watch?v=7BwKfN-ilko	3	
		Unit 1.2: Job Role of Agarbatti Maker	1.2.1 Job of Agarbatti Maker 1.2.2 Opportunities for Hand Rolled Agarbatti Maker	https://www.youtube.com/watch?v=7BwKfN-ilko	6	
2.	Module 2. Raw Material Preparation	Unit 2.1: Raw Material for Agarbatti	2.1.1 Raw Material and their uses	https://www.youtube.com/watch?v=J4UOqCigYc0	11	
		Unit 2.2: Preparing Agarbatti Masala Dough and Sticks	2.2.1 Preparing Agarbatti Masala dough	https://www.youtube.com/watch?v=J4UOqCigYc0	23	
3.	Module 3. Performing Rolling Operation	Unit 3.1: Hand Rolling Agarbatti	3.1.1 Hand Rolling Agarbatti	https://www.youtube.com/watch?v=p8ls7E-GK5k	39	
		Unit 3.2: Post Rolling Operations	3.2.1 Dying 3.2.2 Storage 3.2.3 Packaging	https://www.youtube.com/watch?v=p8ls7E-GK5k	45	

4.	Module 4. Quality Management	Unit 4.1: Defects and Rectifications	4.1.1 Common Defects and Remedy	https://www.youtube.com/watch?v=ZDpbZVR925k	52	
5.	Module 8. Working in a team	Unit 8.1: Working in a team	8.1.1 Why work in teams? 8.1.4 Group development Process 8.1.5 Working with People having Disabilities 8.1.6 Gender Sensitisation	https://www.youtube.com/watch?v=Q62UwEPPnrg	97	
6.	Module 9. Maintain work area & tools	Unit 9.1: Work Area Management	9.1.1 Reasons to Manage Workplace 9.1.3 Planning a Housekeeping program	https://www.youtube.com/watch?v=Ztk6PXD1EjU	108	
7.	Module 10. Maintain health, safety and security at workplace	Unit 10.1: Safety, Health, and Hygiene	10.1.1 General Safety Rules 10.1.2 What is an Accident? 10.1.3 What is a Fire Extinguisher? 10.1.4 What is Health?	https://www.youtube.com/watch?v=5n-ZpBo7cHI	118	
		Unit 10.2: First Aid	10.2.1 First Aid and First Aid Kit Unit 10.2.2 Common Procedures for First Aid in various situations	https://www.youtube.com/watch?v=dCi5fp9D7hM	124	



Department of Empowerment of Persons with Disabilities (Divyangjan)
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Skill Council for Persons with Disability

Skill Council for Persons with Disability

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