

Entrepreneur India

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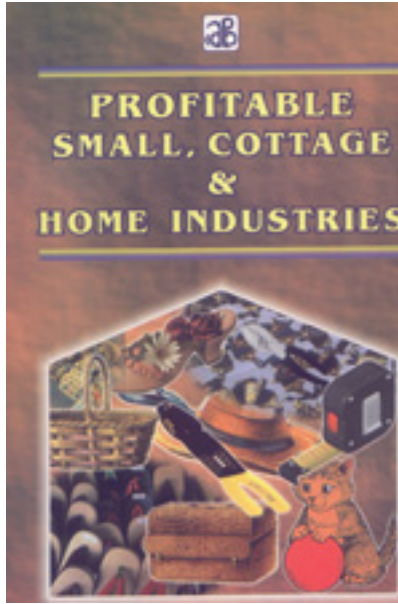
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Profitable Small, Cottage & Home Industries



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The small scale sector is assuming greater importance every day. Hundreds of thousands of people start their own businesses at home every year, and untold more dream about the possibility of becoming their own bosses. Starting a business at home is the best when you do not have enough funds. While entrepreneurship has its many potential rewards, it also carries unique challenges. Making a choice of the right project is a difficult decision for an entrepreneur and is an imperative decision. In fact, before starting a business also one has to be thorough with the requirements of current line of industry. Above all taking advantage of various schemes provided by government and other financial institutions. For the reason that rest of the challenges for setting up, a business is based on the type of the product and fund to invest. Entrepreneurship helps in the development of nation. A successful entrepreneur not only creates employment for himself but for hundreds. Deciding on a right project can lead you to the road to success. An entrepreneur requires a continuous flow of funds not only for setting up of his/ her business, but also for successful operation as well as regular up gradation/ modernization of the industrial unit. To meet this requirement, the Government (both at the Central and State level) has been undertaking several steps like setting up of banks and financial institutions; formulating various policies and schemes, etc. All such measures are specifically focused towards the promotion and development of small and medium enterprises. In both developed and developing countries, the Government is turning to small and medium scale industries and entrepreneurs, as a means of economic development and a veritable means of solving problems. It is a seedbed of innovations, inventions and employment.

Startup India Stand up

Our Prime Minister unveiled a 19-point action plan for start-up enterprises in India. Highlighting the importance of the Standup India Scheme, Hon'ble Prime minister said that the job seeker has to become a job creator. Prime Minister announced that the initiative envisages loans to at least two aspiring entrepreneurs from the Scheduled Castes, Scheduled Tribes, and Women categories. It was also announced that the loan shall be in the ten lakh to one crore rupee range.

A startup India hub will be created as a single point of contact for the entire startup ecosystem to enable knowledge exchange and access to funding. Startup India campaign is based on an action plan aimed at promoting bank financing for start-up ventures to boost entrepreneurship and encourage startups with jobs creation.

Startup India is a flagship initiative of the Government of India, intended to build a strong ecosystem for nurturing innovation and Startups in the country. This will drive sustainable economic growth and generate large scale employment opportunities. The Government, through this initiative aims to empower Startups to grow through innovation and design.

What is Startup India offering to the Entrepreneurs?

Stand up India backed up by Department of Financial Services (DFS) intends to bring up Women and SC/ST entrepreneurs. They have planned to support 2.5 lakh borrowers with Bank loans (with at least 2 borrowers in both the category per branch) which can be returned up to seven years.

PM announced that "There will be no income tax on startups' profits for three years"

PM plans to reduce the involvement of state government in the startups so that entrepreneurs can enjoy freedom.

No tax would be charged on any startup up to three years from the day of its establishment once it has been approved by Incubator.

Some of the major fundamentals of the book are steps in setting up an SSI, preparation of a project report, constitution of the firm, need for planning, registration/licences for SSI, resourcing, non financial, national level, state level, market survey, demand supply gap, major buying countries, plant economics, plastic

granules from scraps/waste, process of manufacture to produce colourless transparent plastic granules from waste, P.V.C. hand gloves, plant & machinery suppliers, H.D.P.E. tarpaulins, fibre reinforced plastics, polyester resin, plastic cooler body, disposable plastic cups and glass etc., bleaching, dyeing & finishing of textiles, etc.

The book contains the aspects to plan any business strategy step by step. The book explains about business planning, effective marketing matters, facing the competition, resourcing, economics of plants and more aspects that will help start and maintain a new business. The identification of a suitable project within the investment limit of a new entrepreneur is very difficult. The present book strives to meet this specific entrepreneurial need. The book contains processes formulae, brief profiles of various projects which can be started in small investment without much technical knowledge at small place. This is very resourceful publication for new entrepreneurs, professionals, libraries etc.

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Sample Chapter:

Steps in Setting Up an SSI

To set up an SSI is not difficult if you know the methods, start-up activities and operations. In this chapter this task is explained as a simple, step by step process. Figure (1) gives a diagrammatic overview. You would do well to give careful thought to each of the steps and considerations imperative in each such step. This will help you to successfully set up a business venture of your own and avoid costly mistakes, which other entrepreneurs have made.

The list of steps is designed to focus your thought, to help you climb the ladder for searching the role of having your own successful business enterprise. The list does not cover every thing: no list could. It is, at best, a good guide. Consider other aspects also that may be relevant. Possibly certain considerations may not be relevant; before ignoring any such aspect completely satisfy yourself that it does not apply to your business.

Step 1 : Know Yourself

Behind every successful project there is a strong entrepreneur. It is this person who is the key to success of the business. Any product/project that you see under the sun is technically feasible and economically viable. If this were not so, the item would not have been manufactured and would not continue to be available. Simple, but then why one project is more profitable than another. It is the man behind the project who brings the difference by using certain methods and management techniques. He matches his qualities with the resources and requirements of the environment. Therefore, know your qualities, strengths and weaknesses as an entrepreneur.

Fig. Steps in Setting up an Enterprise

It is elementary that you shall succeed in a business where you have strengths and likely to fail where you have weaknesses. Your strengths could be your qualifications, training, experience, upbringing, personality traits, family background, exposure, knowledge etc. The lack of such factors would be your weaknesses. If you do not possess the strong points you need not get dismayed: still you can become a successful entrepreneur. Only thing is to know such strengths, which you do not possess, or the weaknesses in you. Remember no man, not even the greatest (including the likes of Swami Vivekananda and Mahatma Gandhi), was ever perfect. Once you realize your weaknesses, take care to choose a business which will not be harmed by them and adopt suitable strategies.

Thus, if a non-technical entrepreneur takes up a high electronic project he should have on hand ready, sound technical advice. This can be arranged by hiring a good consultant on retainer or having a qualified electronic engineer as partner. Similarly, if one is shy or introvert it is a weakness in business, which can be taken care of by choosing an ancillary industry where not many customers have to be dealt with. It is a good idea to constantly strive to acquire such strengths, which are not possessed but essential for smooth running of business. Over a period of time it is possible. Neither Birla, Tata nor any of the country's big industrialists were engineers but with constant efforts they have built up an excellent reservoir of technical knowledge. Nothing impossible (The word IMPOSSIBLE is IMPOSSIBLE).

Every person, even the poorest, possesses sufficient strengths to become an entrepreneur. If you do not hail from a moneyed family, start with a low investment enterprise and slowly build it up. Do not start big just because money (bank loans etc.) are easily available. If you fail (or fall) investment (or injury) should be such that you are not hurt but instead can get up and spring back into action with victory (over your adversaries or adverse factors). If you do not come from a business family background still you can be like any successful entrepreneur. Only thing is recognize this weakness and start building a circle of friends, relatives and business associates who will be helpful to you in one way or the other in any of the business obligations, presently or at any time in future.

Once you are clear that you can build yourself to become an entrepreneur, set your goal and objectives. Acquaint yourself as to why you wish to have your own venture. Setting up a business is no child's play. Therefore, you have to be clear on what, why and how. During the course of planning, organizing and running an enterprise there will be many distractions, adverse circumstances, critical relatives, discouraging advisers and jeering friends. But once you are clear on your goal and objectives the going is smooth as nothing shall deter you. Remember all those who plunge in water do not sink, with a little bit of efforts they swim ashore. So also in business with some efforts, real enthusiasm and hope for the best, things take to an even word missing. Have you noticed in the Indian environment that those in business are more successful (in money terms) than those in employment? And this is when most people prefer a job as first choice failing which they are pushed into business. For you, business is by choice and not compulsion; so success is certain. Just keep trying with a clear goal.

It is advisable to consult your near and dear ones: wife (or husband) children, parents, friends, relatives, well wishers, teachers, peer groups, gurus etc. Those around you will have to sacrifice a lot when you undertake the business endeavor. Discussions with them will hold you in good stead later on. Even if their views, you know, are going to be negative and discouraging, consult them. At least some will encourage and later support. Those who are known for their negative views can be suitably discounted for the bias. Besides, the negative factors pointed out can be kept in mind and taken care of to ensure your success. Some excellent ventures have failed because the entrepreneur never bothered to take the people around him into confidence and had ultimately to succumb to their negative ways and means. A little bit of help, encouragement and support from well wishers goes a long way in ensuring enterprise success.

Lastly, discuss your decision to become an entrepreneur with the support system. Fortunately, a number of organizations have been set up by government, central in state, to help people like you to take the entrepreneurial decision. Such assistance and advice is rendered absolutely free of charge. Such organizations of support system are, Small Industries Service Institute (SISI), District Industries Centre (DIC), Institute of Entrepreneurship Development, Directorate of Industries, Entrepreneurship Development Cells in schools, colleges, universities, banks, financial institutions etc.

Once you have decided to become an entrepreneur, know your strengths and weaknesses and are familiarized with the pros and cons of an entrepreneurial career, the next step is to gear yourself for the endeavour. Possibly there is need for training.

Step 2 : Training

Over 700 Organizations provide different types of training to potential entrepreneurs. Most provide such training free of charge. Some may even give you a stipend for attending their courses. Now, this is quite encouraging and may motivate anyone to become an entrepreneur.

Such training that may be relevant for you could be Entrepreneurship development:

1. Technical
2. Managerial

Entrepreneurship development training is conducted by over 700 organizations all over the country by SISIs (Small Industries Service Institutes), District Industries Centres (DICs) Banks, State Financial Corporations, Institute or Centres of Entrepreneurship Development, Technical Consultancy Organizations, Small Industries of Entrepreneurs Association, Chambers of Commerce & Industries and, others. Such courses are usually advertised as EDPs (Entrepreneurship Development Programmes) in prominent local papers or one can contact the concerned EDP organization and register the name. Such training is usually given free and in certain cases you may even get a stipend particularly when EDPs are conducted by the SISIs.

As for technical training SISIs conduct trade and shop oriented training courses of short duration lasting a couple of weeks. The addresses of SISIs and other institutions providing technical training, workshop and

laboratory facilities is given in Annexure A. Such training can also be had from the ITIs (Industrial Training Institute) which you shall find in every district; the polytechnics; PTDCs (Prototype Training and Development Centres) which operate under the NSIC at New Delhi, Rajkot, Howrah, Madras and Hyderabad; PPDCs (Product and Process Development Central Electronic Engineering Research Institute) at Pilani in Rajasthan, CECRI (Central Footwear Training Centres at Agra and Madras; IIP (Indian Institute of Packaging) at Bombay and Delhi; Electronic Service & Training Centre at Ramnagar in UP; Central Machine Tool Institute at Bangalore for Machine Tools; Central Machine Tool Institute at Jalandhar in Punjab; State Electronics Development Corporations in various state capitals and other centres; National State and district productivity Councils for productivity and energy saving techniques; Oils Technological Research Institute at Anantpur in Andhra Pradesh; Integrated Training Centre at Nilokheri in Haryana for bakery, carpet weaving, electric motors, diesel engine repair etc; Training cum production centres in Coir set up by State Government at Varanasi, Pothavaran and Gannavaran in Andhra Pradesh; National Design Institute at Ahmedabad for Industrial Designing; National Institute at Ahmedabad for Industrial Designing; National Institute for Forgoing Technology at Ranchi; National Institute for Fashion Technology at New Delhi for readymade garments; Radio, Television and electrical appliance repair, air conditioning/refrigeration at Society for Self-employment, New Delhi; Press Tools, dies, jigs, fixtures, gauges etc. at Central Tool Room, Jalandhar; bakery and confectionery at Government Polytechnic, Coimbatore; and so on.

State government has set up training-cum productions centres for trades like soap, embroidery, pattern making, dress making, durray weaving, silk reeling, chalk crayon, textile printing and dyeing, automobile repairs, battery charging and repair, book binding and printing etc. The Khadi & Village Industries Commission organizing technical training through its state-level boards and training institutions in 96 village industries that it promotes (e.g. Pulses, patta dona, baan etc.) just in case technical training is not available for manufacturing any product one can negotiate for it from the machinery manufacturer. For example, if you are setting up a project for industrial fasteners like screws, nuts, bolts etc. or flexographic printing or wire drawing then, negotiate for technical training and machinery operations from their respective plant and machinery suppliers. This should be done before placing an order. Most machinery suppliers agree to it.

Another solution can be to have in-plant training at an existing SSI through your own contact or through the aegis of any governmental organisation like the SISI or any EDP Organisation.

PLASTIC SPECTACLE FRAMES

INTRODUCTION

Spectacle frames are quite common and familiar production in all over the world. Spectacle frames are used by people with weak eyesight. These can be made of different material e.g. plastic, aluminium steel etc. most widely manufactured frames are of plastic materials because they are cheap comfortable and long lasting. Since the plastic technology development, spectacle frames are constantly produced in plastic through metallic frames, are also seen in the market. Metallic frames are more liked by youth as they give good look. Fashion conscious people also like them but with time as fashion changes their taste also changes. But plastic spectacle frames have regularly captured the market since the origin and still maximum sale as compared to other metallic frames.

Spectacle is indispensable item for the people with eyesight weakness.

The manufacturing process of plastic frames is very simple. The main raw materials in this industry are plastic sheets, requires thickness, wire for insertion, pins, hangs etc. and the plant and machineries are sheet cutting machine, shaping machine, drilling machine, wire insertion machine, buffering machine, dies etc.

USES AND APPLICATIONS

1. Plastic spectacle frames are very simple in processing and reprocessing.
2. They are very cheap and available in different sizes and qualities.
3. They are non breakable and long lasting whereas metallic frames easily get fatigue.
4. They normally don't leave any impression on nose but in case of regular wearing of metallic frames, an impression may be seen on the nose.
5. Plastic spectacle frames are smoothened and friction less.

RAW MATERIAL REQUIRED

There are different types of plastic material, which can be made from sheet, these sheets are Acrylic, cellulose acetate, cellulose nitrate, polypropylene etc. But generally cellulose nitrate sheets are only used for the manufacture of spectacle frames. The use from sheet, the spectacle frame manufacturing is only limited to the cellulose nitrate. Other raw material such as Acrylics polypropylene are used in the another form. These are either used in powder form or in pellet form, the use of Acrylic sheet or polypropylene sheet does not gives the required toughness of the frame, so the compression moulding or injection moulding is most efficient and useful method in these cases.

These days it is being seen that HDPE also used for the spectacle of children.

The printing of frame can be done by Flexography printing or Gravure printing, Big and bold letters are printed by Flexography printing and small and brighting letter are printed by Gravure printing.

B.I.S. SPECIFICATIONS

Frame Spectacle Glossary

IS: 8260 (Part II) - 1979 - It is a specification that the frame of spectacle should be complete specification of BIS. As it will be prescribed in BIS Specification. This BIS can be received from BIS. (Bureau of Indian Standard) but now a day there is no use of ISI because number of unit is manufacturing without BIS specification, they are selling in the market and facing no problem about product.

MARKET SURVEY

Spectacle frames are manufactured in various shapes and sizes, so as to meet consumer's choice. Spectacle particularly sun glasses are to day popular as fashion wear. So the design and size will change with change in fashion. The plastic frames are made either from cellulose acetate or cellulose nitrate. Manufacturing of spectacle frames are reserved for exclusive development in small scale sector. Most of the manufacturing units are established in Maharashtra and Gujarat and specifically in Mumbai, Ahmedabad and Baroda. More then 130 units are in Gujarat only. As all the firms comprising the industry are in small scale sector. The industry is understood to have grown at a rapid rate, trend rate of 14.26 percent p.a. The industry has not only grown in terms of production but also in terms of production but also in terms of quality, variety and Technical maturity. Increasing exports clearly indicates this the share of exports to total production is found almost 50.5 percent. Exports are being made to Russia and Iran mainly.

The demand for spectacle frame will depend upon like requirement of glasses due to weak eye, number of blind, fashion and requirement of goggles etc. All these are long terms and qualitative factors, which can be described but not measured. So the demand is estimated by trend rate of growth of last several years. The demand thus estimated is found to be of the order of 33280.26 thousand numbers.

Beyond this, some demand would arise from export market also. Prospects of exports are very good in the sense that India has good footing in international market and India may have comparative advantages in manufacturing these products. The share of export demand to total demand may be estimated at 18 percent per annum 1993-94, 1994-95 and 1995-96.

DEMAND SUPPLY GAP

		(â€~000 Nos.)
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1.	Present Production (1996-97)	70313.73
2.	Estimated demand by (1999-2000)	73049.06
3.	Gap between present Production & future demand	-3736.33
4.	New capacity required for bridging the Gap.	5919.00
5.	Conclusion :- Good scope for many new units.	

Demand to indigenous demand, total demand for 1999-2000 may estimated to 73,049.06 thousand numbers.

As this is reserved for small scale industries, it is different to estimate supply position. The gap between present production and future demand is very high.

MAJOR BUYING COUNTRIES

France, Iran, Kenya, Kuwait, Lebanon, United Kingdom, USSR, Nigeria, Bangladesh.

Major Importers of Spectacle Frames: -

M/s. I. Saka & Sons,
54, Insabere Street,
Lagoe, Nigeria.

M/s. International Stationery Mark,
Grand Shopping Circle,
Main Bazar, P.O. Box No. 513,
Greater 101, aden, P.O.r., of Yeman.

M/s. Ahmed A. Aziz Mirghani,
P.O. Box No. 2655,
Khartoum, Ludam.

QUALITY CONTROL AND STANDARD

For the manufacture of high quality of spectacle frame it should keep in mind that the product should be according to standard specification. For further information please contact the following address, from where you can get the specification.

BUREAU OF INDIAN STANDARDS
Manak Bhavan
9, Bahadurshah Zafar Marg,
New Delhi - 110 002.

From above address you can get the required specification.

PROCESS OF MANUFACTURE

The complete manufacturing process of spectacle frames (Plastic) consists of following major steps: -

1. Sheet Cutting.
2. Forming and Welding.
3. Wire Inserting.
4. Assembling.
5. Packing and Despatching.

1. Sheet Cutting

The plastic are available in the form of sheets of big lengths, it is for the requirement of length and size of frame.

Cutting operation is done in a cutter especially applicable for cutting of plastics.

Three lengths are cut for one spectacle frame. One for the main front portion of the frame and the other two for ear resting (Kamani). Sizes cut are, of course, different from the front portions. Now the lengths are sent for forming.

2. Forming and Welding

Both the operation of forming and welding of plastic frames are done in a single automatic machine. First of all, bigger length for front portion of frame of _____ is fed inside the machine where it is formed in die and pushed forward where it is welded. Plastic welding joints are so perfect that one cannot differentiate between _____ moulded and welding, but in case of metallic welding, one can easily differentiate between moulded and welded joints. One the front portion is formed, the _____ smaller length for the ear resting are also fed to the machine one by one with different set of dies where the lengths are also formed.

3. Wire Insertion

At this stage, to make the ear rest more rigid and strong, steel wire is inserted in middle of it with half of wire inserting machine and ends are closed. Steel wire is of 1 mm. diameter and 3 inches long. At times half of the portion of steel wire fattened before being inserted to give extra strength.

4. Assembling & Buffing

Once the lengths are formed, metallic hinges are fixed on both sides of ear rest to enable them to fold when not in use. The second portion of hinge is fixed on front portion of the frame and finally pins are inserted to give the folding action. Pins should be hammered at one end to form a rivet or they will come out the end the frame will be disassembled.

After assembling frames which are polished by buffing and sent for packing.

P.V.C. REXINE CLOTH

INTRODUCTION

For many years a range of leather like materials has been in use for stockings, linings and uppers. They are all made of fabrics, usually woven and mainly of cotton. These base cloths should be carefully selected to give the requisite physical properties for shoe uppers and they may be coated with oil or PVC or rubber compound, Cellulose derivatives or synthetic resin (plastics). The surface may be smooth, with high polish or matt effect, or embossed with designs, many of which simulate leather or fabrics. All these coated materials are totally impermeable to air and water, ventilation must therefore be achieved by suitable shoe design.

PVC leather cloth is also known in other words as artificial leather, which is becoming increasingly popular all over the world because of shortage of actual leather and high cost of the same. Artificial leather is specially suitable for upholstery, shoe upper, attaché cases, brief cases and all kinds of bags. It is water repellent and is chemically inert. Present inductions show that artificial leather goods have good export potential.

POLYVINYL CHLORIDE (P V C)

Common Name - P V C

Characteristics

Flexible and rubber like, or rigid according to grade, flexible type has considerable elongation and good recovery, high tensile and tearing strengths, inert to oxidation and weathering with freedom for cracking in use, negligible water absorption good electrical properties, noncracking at temperature down to -30°C, resistant to most erosive liquids and inert to most organic solvent great resistance to abrasion non-flammable and low specific gravity. P V C has low thermal conductivity and thus suitable as an insulating material. P V C has a softening point ranges from 80 - 140°C. It has not exceptional chemical resistance. It decomposes rapidly at 140°C liberating HCl. It can be stabilized at lower temperatures with acid

neutralizers such as alkali metal salts. Normal PVC is hard tough polymer soluble in most solvents.

USES AND APPLICATIONS

The prime use of PVC leather cloth is in the manufacture of heavy duty upholstery for seats, cushions backs and facings. It is used for wall covering and decoration of house furniture, auditorium and theater seats. Thin coated fabric is used in book binding and other decorative purposes.

MARKET SURVEY

The PVC leather cloth is being manufacturing in India by 15-16 firms, most of them located in Maharashtra. Their installed capacity is not well known, however the present production is quite in sufficient to need the growing demand. Manufacture of PVC goods began in India in 1958 with the establishment of imperial chemical industries. However it was only in 1960 after establishment of petrochemical complexes near, Mumbai the rapid progress was made which facilitated the greater availability of petroethylene to produce PVC. The coming up of plastic machinery manufacture and the availability of improved technical know-how gave further fillup to the industry progress. At present there are 5,089 plastic processing units in India providing employment to 3.89 lacs workers. The plastic industry is now operating with a capital investment of Rs. 3,802 million.

MANUFACTURING PROCESS

The manufacturing of PVC leather cloth has been divided into four categories. (i) PVC paste making (ii) Coating of PVC paste on the fabric (iii) Gelling and embossing and (iv) Winding.

For PVC paste, it is noted that the fresh paste is made in every batch of cloth coating. The pre-prepared paste is not preferred.

Dye pigment, titanium dioxide and lead stearate are mixed with 10% of DOP, which are ground and mixed in ball mill preferable porcelain lined. The dispersion is added to PVC (Paste grade) 90% dioctyl phthalate and trioxymethyl phosphate in a pug mill. Mixing is started at slow speed for one hour or so followed by medium speed and finally high speed for 3 hours. A free flowing paste composition thus obtained is left to stand overnight to allow entrapped air to escape. Now the paste is ready for coating.

The coating is carried out in the reverse roll coater or knife roller coated head. First the cloth is stretched between rolls so as to be wrinkle free and a thin coating of PVC paste 1/32 is spread by means of a straight edge, evenly over the cloth.

Both knife and roll coaters are used for the process. After spreading is required in usual way. Force more procure coating roll coaters are preferred to doctor blade coaters. All system employ three or four rolls and there are various ways in which they may be arranged. The paste reservoir can be arranged above two of them. The paste is transferred to the fabric passing through one feed and one idler roll.

In the latter case, the coated material is passed over the steam chest in the usual way with a bank of infrared heaters above. In special PVC equipment only infrared heaters or conventional oven are used. It is essential that the getting temperature is reached and it will be between 160 and 200°C, therefore the heating equipment must be set much higher. The gelation may be checked by wrapping specimen round a material and immersion in ethyl acetate. After gelling or drying the coated cloth is embossed by embossing machine.

PLASTIC GRANULES FROM SCRAPS/WASTE

INTRODUCTION

A plastic is one of a large and varied group of materials, which consists of an essential ingredient combinations of carbon with oxygen, hydrogen, nitrogen and other organic and inorganic elements. While solid in the finished state, at some stage in its manufacture it has been or can be formed into various shapes by flow-usually through the application singly or together of heat and pressure.

Plastic Classification:

Plastics are classified in several ways. The most accepted division that covers the entire field is by the behaviour pattern.

- (1) Thermoplastic
- (2) Thermosetting plastics

Plastics today have a prominent place in the spectrum of materials frequently used by materials engineers and designers. Engineering properties as contrasted with data sheet properties. Needed are engineering criteria for rigidity, strength, endurance and temperature range, which are common to nearly all plastic applications, as well as more specialized performance characteristics that are important only in certain types of special product (e.g. electrical properties).

Among the plastics the various industrial grade plastic waste available, the following are the materials like A.B.S. (Acrylonitrile Butadiene Styrene), polypropylene, H.D.P.E., H.I.P.S., L.D.P.E. Polystyrene and Acrylic. By above polymers plastic granules will be prepared.

USES AND APPLICATIONS

Plastic have many applications, it can do a better job at a lower cost than other materials. Each plastic should be selected on the basis of its properties. It is used for the following purposes.

1. Injection Moulding purposes.
2. Extrusion Purposes.
3. Extruded Sheets.
4. Extruded Pipes.

Mechanical engineering applications like gears, cans bearings, brushes and valve seats.

Industrial applications like various components for Textiles, Transport Containers, Storage Containers, Tool Boxes, Bottle crates, Galvanised components for Automobiles and plumbing, woven sacks for packing a variety of products like fertilizers, powdered chemicals, pesticides, etc. Sheet lining of Tanks/Vessels for chemicals.

RESOURCES OF PLASTIC WASTE

Out of the whole spectrum of commercially available material the thermo plastics predominate and of these ten major polymers i.e. HDPE - High Density Poly Ethylene and LDPE-Low Density Poly Ethylene, Polystyrene, ABS, PP, HIPS, LDPE, OPP, OPS, Acrylic and mostly used for packaging and other different products. Their unique combination of properties e.g. their durability and resistance against a wide variety of environments, use in different ways and different products.

It has been noted that at times when the quantity becomes beyond the storage capacity they are crushed and dumped in the ocean, if the same is imported/ procured from these sources processed in India the project becomes highly viable. In India the big sources of high quality industrial plastic waste are:

1. Maruti Udyog.
2. ONGC
3. Electronics Corporation of India.
4. Hindustan Motors.
5. I.P.C.L.
6. Various Docks and Inland Containers Depots.
7. Ordnance Depots.
8. Food Corporation of India
9. Fertilizer Plants
10. All Plastic Units where Plastic Products are Manufactured.

FOREIGN SUPPLIERS OF PLASTIC WASTE

1. M/s. G.K. Sun International Trading Co. Ltd.,
410, Lafleur, Suite 33, Lasalle

Montreal, P.Q.,
Canada H 8R 3 H6.

2. M/s. Rank Trading Company,
2260, W. Pioneer Pkwy,
suite "D"™,
Pantego, Texas 76013,
U.S.A.
3. M/s. Bright Flax Co. Ltd.,
Ching Shiao East Road,
Sec. 4, Lane 194, Alley - 1,
No. 10 - 5, 6th Floor,
Taipei,
Taiwan.
4. M/s. Inter Plast Inc.
6821, Jetport Industrial Blvd.
Tempa, Fl. 3343,
U.S.A.
5. M/s. Jackstone & Johnson Inc.
E-385 Enford Road,
Richmond Hill, Ontario
Canada L 8C 3 G8.
6. M/s. Hongkong Plastic Co. Ltd.,
C9, 6/F Hongkong Industrial Centre,
Kowloon,
Hongkong.

WASTE RAW MATERIAL SUPPLIERS

1. M/s. Malvan Bio-Food & Chemicals
6, Shiv Darshan,
VG Pingle Marg,
Parel, Mumbai - 400 012
Tel. : 022-3756305
2. M/s. IBEX Overseas Pvt. Ltd.
182/B, Bhandarkar Bangalows,
15th Road, Chembur,
Mumbai - 400 071
Tel. : 022-5244450
Fax : 91-22-5564675
3. M/s. Marathe Engineering Industries,
Industrial Estate, Plot No. 7 & 8,
Miraj - 416 410 (Maharashtra)
Tel. : 023382, 822087
Fax : 91-23382-77236
4. M/s. Maruti Udyog Limited,
Jeevan Prakash, IIInd Floor,
25, K.G. Marg,
New Delhi - 110 001.

Tel. : 011-3316831, 3354831

Fax : 91-11-3318754

5. M/s. Indian Petrochemicals Corporation Limited,

P.O. Petrochemicals,

Distt. Vadodara - 391 346.

Tel. : 0265-72411, 72611

Fax : 91-265-73164

B.I.S. SPECIFICATIONS

There is no specific Indian Standard (I.S.) on Plastic Recycling but regarding the thermoplastic based products, I.S. Specifications are there. Some of them are

IS : 938 - Moulded Briefcase

IS : 10106 - Packaging Material

IS : 3287 - Reflectors, Lighting - Fittings.

IS : 3730 - 1965 - Polythene Buckets.

PROCESS OF MANUFACTURE TO PRODUCE COLOURLESS TRANSPARENT PLASTIC GRANULES FROM WASTE

SORTING

The plastic waste is taken for granules manufacture off contains many impurities like dust, mud, wires and vains. First of all the scrap is sorted out and the wire and nail are removed by a magnetic separator.

SMASHING

Then the plastic scrap is crushed by means of a scrap grinder or pulverizer small pieces of desired size.

WASHING

The crushed material is then fed to the washing unit where it is washed with water and detergent solution and oil HCL under this process, the scrap is cleaned and is ready for the next process.

CONCENTRATION OF BLENDING

After washing, the clean scrap is melted in a venal by direct firing. Now add DMPC (Dimethyl Phthalate) or DOP (Dioctyl Phthalate) or any other plasticizer. The ingredients are thoroughly mixed.

SOLVENT ADDITION

The above mass is taken to a mixer, where solvent is xylene, toluene, ethanol, cresol, Butanol etc. may be added and diluted thoroughly with the above solvents till the desired consistency of mass is obtained.

REMOVAL OF COLOUR TO OBTAIN TRANSPARENT

GRANULES BY ACTIVATED CARBON TREATMENT

The mass is treated with activated carbon to adsorb all the dyes, pigments, colours owing to the scrap.

This treatment of adding solvent and activated carbon is repeated two to three times till all the colour is removed.

FILTRATION

Now, the above mixture is filtered by passing through a rotary drum filter where the melted scrap is totally cleaned, the impurities being retained on the filter.

DISTILLATION

After the removal of colours, it is introduced into a distillation column (Tray Type) to remove the solvent and when a particular viscosity of the molten mass is attained, it is withdrawn out of the distillation column by means of vier- jorew type pump.

COOLING AND DEHUMIDIFYING

The molten mass is sent to the cooling unit and at the same time it is dehumidified from its moisture contents. The cooling is done to a temp of 60oC before it enters the granulator.

GRANULATION

The molten mass cooled to 60°C is passed through the granulator (with cutting arrangement) to obtain desired size granules.

P.V.C. HAND GLOVES

INTRODUCTION

The use of plastics of all types is increasing and will almost certainly continue to increase. Different kinds of plastics, being processed into numerous items by three different processes.

Injection Moulding are designed for moulding thermoplastic materials such as Polystyrene, Polyethene, High Density Polyethene, Polypropylene, Cellulose Acetate, Butyrate, P.V.C. Nylon. These machines are comparatively cheap, simple in operation, have high production capacity and require less overheads & space.

Following are a few of the hundreds of items produced on this machines : Fountain and ball pen bodies, Radio knobs, Push button-keys, Automobile parts, Nylon gears, Wheels and pulleys, Camera parts, lenses, Film spools, Textile accessories, Cosmetics and Pharmaceutical Containers, Caps and Stoppers, Plugs, Spoons and Measures, Buttons and Combs, Clothes line, Grips, Beads Hairlides, Buckles, Earrings, Toys, Coat Hangers, Small glasses and plates, Tumbler mats, Watch and Jewellery cases, Paper knives, Cigarette cases and Soap cases etc.

Hand gloves is the smallest safety appliance, which is widely used in the industries. In the electrical industry there is special type of hand gloves widely used in the field work. Gloves are manufactured from various raw materials like rubber, PVC, Cotton etc.

P.V.C. hand gloves is prepared basically from PVC resin. It is inert in water, it is non-toxic, light and non-corrosive material. It is ineffective towards acids and alkalies.

There is a several methods of manufacturing of hand gloves.

PROPERTIES

1. It should be easily handleable.
2. It should be leak proof.
3. It should be fit to the hand.
4. It should not be corrosive.
5. It should be acid and alkali proof.
6. It should be heat resistance at 50°C.

USES

1. It is used in the electrical work.
2. It is used for lifting acid or alkali.
3. It is used for handling of hot material.
4. It is used in pickup of surgical materials.
5. It is used in the food industry for sorting of treated sterilized can.

H.D.P.E. TARPAULINS

INTRODUCTION

High density polyethylene oriented tarpaulins are becoming increasingly popular all over the world. Tarpaulin is used for water proofing, for protection of food grains and other materials, which are stored in bulk.

HDPE Tarpaulin involves woven cloth of HDPE, over which thin layer of foam or film of HDPE, LDPE for restricting the flow of water.

The most important is the method of applying the film or foam over the woven HDPE base. The latter is done in two ways. In first type material is used as a solution in a suitable solvent or mixture of solvents either above or with added resins, colours and plasticizers. The material is applied by brushing,

centrifuging, dipping, gasket coating, roller coating, rubbing, spraying or tumbling. The second type employs a very viscous "Dough" of the plastics together with plasticizers and other agents, and supplying by rollers or otherwise coating on fabrics, paper sheets, iris etc. in continuous lengths.

The coating material is generally thermoplastic like HDPE or LDPE or may be thermosetting resin compared with pigments, colourants, fillers and other ingredients. In the extrusion process softened material is passed through orifice by applying a continuous pressure.

PROPERTIES OF HDPE

HDPE is a type of most widely used thermoplastic polyethylene (polythene). It is non toxic & resistant to solvents and corrosive solutions. The other properties are listed below:

1. Specific Gravity 0.945 - 0.965
2. Water Absorption 0.01% - 0.03%
3. Tensile Yield strength (100 psi) 3 - 5.5
4. Ultimate Elongation 100 - 1000 %
5. Compressive St. at yield 1000 psi 3.2
6. Rockwell hardness 45 - 70
7. Deflection Temperature (oF)
(at 66 psi fiber stress) 140 - 185

The advantages of HDPE over other thermoplastics includes cost, transparency, temp. resistance, impact strength, and moisture and chemical resistance. Among its disadvantages are poor grease resistance, permeability to odour, and gases, poor weatherability, flammability & poor resistance to high temperature.

USES AND APPLICATION

The tarpaulin finds following uses in general: -

1. It is most commonly used for covering the food grains & other products, which are stored in open and in bulk.
2. Tarpaulin is also used to make the temporary sheds for tenting purposes.
3. Largest use is in defence department where it is used for temporary shed tents.
4. HDPE tarpaulins are used widely in number of other places, like making of holdalls, covering on fruit & vegetable shops, shop front so to save from rains and sun.
5. They are used widely for tenting purpose in marriage parties, puja festivals other functions and occasions.

B.I.S. SPECIFICATIONS

The bureau of Indian Standards has published two specifications for the HDPE tarpaulins which are as under :

1. IS : 2789 - 1972, Specification for special purpose paulins (Tarpaulins).
2. IS : 7903 - 1984, Specification for Tarpaulins made from HDPE woven fabric.

MARKET SURVEY

Indian plastic industry made a widest start in 1926 with imported materials. Later in 1958 first plant was established in plastic & petrochemicals sector by ICI England.

The tarpaulins in India is being manufactured by about 120 units few of them being in organized sector. The installed capacity of units is estimated around 1130 millions meters and production is 1110 million meters. The demand was around 1150 millions meters. The demand is increasingly continuously due to rapid consumption of tarpaulin end use industries and in domestic life.

The HDPE has large number of uses and since it is produced and consumed by a very large number of industries.

Tarpaulins has a number of end uses and is consumed in bulk hence this industry has a good scope at

present and in future. They are resistant to damage by tear water and acids. They have excellent chemical resistance and are light in weight with high strength and can withstand such higher impact loads. Their Elongation at break is 15 to 25 %. They are much cleaner.

EXPORT POTENTIAL

There is a lot of export potential for this product now a days. It is required by various countries in large increasingly amount.

The statistical report is shown as :

Year	Quantity
1990-91	2,015 MT
1991-92	2,850 MT
1992-93	3,100 MT
1993-94	3,600 MT
1994-95	3,800 MT
1999-2000 (Estimated)	5,600 MT

From the above statistics it can be judged that there is ample scope of export of this product due to its rapidly increasing consumption.

PROCESS OF MANUFACTURE

High density polyethylene granules of extrusion grades are being used as a basic raw material manufacture of the tarpaulins.

HDPE granules are fed to the hobby of machine. It passes through barrel of extruder which is covered by a number of heaters working at different temperatures. The material is moved forward and passed on various temperatures. It starts melting and becomes in viscous form or semi liquid form. This semi liquid form of plastic is must for purpose of processing. Here it is completely plasticized and comes in molten stage. To control constant heating of the barrel and to prevent damage to barrel by way continuous heating water (cool) is circulated with help of pipeline fitted inside the barrel.

Molten material is then passed through cross head. Here it is filtered with help of fine sieve to remove foreign particles like dust, impurities etc. This filtered plasticized and molten material is then passed through the die-head and die which is attached just adjacent to cross head. Plasticized HDPE comes out in form of tape fabric from the die. The dimensions of tape can be controlled with the help of using different type of dies. The tape line is passed through water tank for the purpose of static formation of tape which is stretched by stretching unit which is just adjacent to water tank. The stretched tape is then reeled on bobbins giving 1st grade tapes that is used for weaving of fabric.

Lamination (or Sealing) By Hot Rolling

Lamination of HDPE woven fabrics coming out of plain looms are to sealed to make the fabric impermeable to the water. This can be done by passing the HDPE woven fabric and layer lamina of required material and thickness over the heated rolls to just plasticize them and then following it they are passed simultaneously through a pair of rolls which presses the heated layers to the required thickness. The thickness is controlled by adjusting the clearance between two rolls. Further the layers are cooled down and laminated fabric comes out which can be used as excellent tarpaulin.

P.V.C. BOTTLES FOR MINERAL WATER

INTRODUCTION

The use of plastics of all types is increasing and will almost certainly continue to increase. The development of existing plastics and possibly the discovery of new materials will mean that in the future plastics will be used for even more purposes than they are used today. Different kinds of plastics, being processed into numerous items by different processes.

INJECTION MOULDING MACHINES

Injection Moulding Machines are designed for moulding thermoplastic materials such as well Polystyrene, Polyethylene, High Density Polyethylene, polypropylene, Cellulose Acetates, Butyrate, P.V.C Nylon. These machines are comparatively cheap, simple in operation, have high production capacity and require less overheads & space.

Moulding Machines are the backbone of the Plastic industry organized on small as on medium scale. Many machines are in operation throughout the country and are engaged in the economical production of industrial and utility items. Following are a few of the hundreds of items produced on the machines. Fountain and Ball pen bodies, Radio knobs, Push button-keys, Automobile parts, Nylon gears, Wheels and pulleys, Camera parts, lenses, film spools, Textile accessories, Cosmetic and pharmaceutical containers, caps and stoppers, plugs, spoons and measures Buttons and Combs, clothes line, grips, beads hairlides, buckles, Earrings, Toys, Coat Hangers, small glasses and plates, Tumbler mats, watch and jewellery cases, paper knives, cigarette cases and soap cases etc.

PROPERTIES OF P.V.C. RESIN

P.V.C. versatility, durability and economics has made it one of the most popular plastic all over the world. A synthetic thermoplastic polymer, which with heat, can be easily moulded, blown and formed in to almost any shape and size desired. It offers rigidity/flexibility, hardness, corrosion resistance, colour in wide range so as to substitute or complement steel, rubber, tin, jute, cotton wood and many other natural materials in an ever increasing number of applications. Advanced technology has given nontoxicity, light weight with high strength and non-contaminating properties which adds to its growing popularity.

USES

1. It can be used for filling of mineral water.
2. It can be used for filling vegetable oil or other any liquid food material.

H.D.P.E. FILMS/SHEETS

INTRODUCTION

H.D.P.E. is High Density Polyethylene by general agreement in the plastic industry, plastic films are any plastic materials (mainly low density polyethylene, medium density polyethylene films, High Density polyethylene films) made in flat form with a thickness of 10 mils or less.

Flat stock with a thickness greater than 10 mils is referred to as sheet. This convention is not always strictly adhered to, however.

Films or sheets are made from any of the commonly used polyethylene (mainly low density & high density), however, the majority of films are thermoplastics and can thus be easily produced by the common process of solvent casting, extruding/or calendaring.

The base materials for the films are (with possible slight variations) identical to the materials used to make mouldings or extruders. The three most important of the special treatments are orientation, coating and lamination. In each cases, the special processing is used to obtain an improvement in some particular characteristic of the original material or in several related characteristics. In cases of lamination, the combination of two or more materials produces a synergistic effect, with the laminate properties superior to the properties of the original base films.

USES & APPLICATIONS OF HIGH DENSITY polyethylene SHEETS OR FILMS

The most common uses of H.D.P.E. films are for various packaging applications:

Heat-sealed bags for fresh produce and meat thermoformed skin packaging for meat, and thermoformed blister packages for dry goods, hardware items, and similar parts. The obvious advantages of visibility and reduction of pilferage as well as the light fit of the skin packages and will formed blisters, all add up to excellent acceptance by both commercial interest and the consuming public.

H.D.P.E. films are also used for such diverse applications as electronic capacitors (in the form of metallized foils), high temperature wire insulator, thermal insulation of space craft, and in fabrication of high altitude balloons for research purpose. The diversity in applications is accompanied by a similar diversity in requirements for the various applications.

PROPERTIES OF HIGH DENSITY polyethylene SHEET

	Specific Gravity	0.941-0.965
	Manufacturing method(extrusion, biaxial, orientation, casting, etc.)	extrusion, stress Calendering, relieving.
i.	Availability(In sheets, rolls, tapes)	Steel, rolls, tapes, tubes.
v.	Maximum width in	60
	Color ability	excellent
i.	Clarity	good
ii.	Self life	indefinite
iii.	Flammability	slow burning
k.	Maximum-minimum use	-
	temperature Range 0F	70 to 250
	Resistance to acids	excellent
i.	Resistance to alkalies	excellent
ii.	Resistance to Greases and oil	good
iii.	Tensile strength lbs sq. in @ RT	2,400-6,100
iv.	Elongation (%)	10-650

B.I.S. SPECIFICATION

IS : 10889 - 1984 High density polyethylene films

IS : 7328 - 1974 High density polyethylene materials for moulding and extrusion.

MARKET SURVEY

High density polyethylene is one of the very popular thermoplastic materials, which has been introduced in India during late 1960. Polyethylene treated at high pressure level is known as HDPE.

Production of HDPE was started in India by poly olefin industries limited in 1968. The technology was imported from Germany. The production has increased in last years. In 1994-95 it was 60,000 tonnes, which increased to 90,000 tonnes in 1995-96. The reason is non availability of high quality polyethylene and the scarcity of alcohol in indigenous market. The unit has installed capacity of 30,000 tonnes per annum.

At present these are only one unit polyolefin industries limited whose installation capacity is 50000 tonnes of HDPE. But it is expected that M.G.C.C., Reliance, Haldia Petrochemical industries whose installation capacity by 1997-98 will be 80000, 55000, 85000 tonnes respectively. It is also expected that demand of the product is expected 3 times than the future production. It should be noted that Government has fully liberalized imports of HDPE recently.

DEMAND SUPPLY GAP

There exists a certain demand supply gap. Due to higher consumption and lower production in our country, always a definite demand supply gap exists. So new entrepreneur can well venture in this field by installation one H.D.P.E. films and sheets unit to satisfy the peoples demand.

FIBRE REINFORCED PLASTICS

INTRODUCTION

Fibre Reinforced plastics are essentially structural materials that belong to the larger family of composite materials. Fibre-Reinforced Plastics (FRP) have been born out of sheer necessity imposed by the straight requirements of present day technology and in particular aerospace technology. Engg. materials for the present day high technology must combine very special mechanical, electrical, thermal, chemical properties etc. and at the same time have good aesthetic characteristic very often, the same material has to combine several desired quantities like light-weight, high strength, high stiffness, toughness, chemical resistance, electrical properties, aesthetic appeal etc.

Firstly they have excellent engineering properties, which naturally are as competitive. Secondly FRP can be easily moulded into any size and shape, the property not so easily or cheaply achieved in other construction materials like metals stones, or timber. Finally FRP offers considerable flexibility in the design of structures.

The current applications of FRP range from bathtubs, wash basins and suitcases to the heat shield of a satellite-launch vehicle, the nose cone of the SST concord and the hull of the mine sweeper HMS milder. About 60,000 different items have been identified that can be made out of FRP.

PROPERTIES

Fibre glass Reinforced Thermoplastic Consists of a thermoplastic Polymer, often referred to as the base polymer, in which fibre glass has been dispersed.

In FRP, the Fiberglass is the stronger and stiffer, although more brittle, material than the base Polymer which possesses less strength, the higher Co-efficient of thermal expansion and is tougher and more extensible.

USES AND APPLICATIONS

Fibre Glass Reinforced Thermoplastics, because of their unique combination of properties, represents today one of the fastest growing segments of the plastics industry. It is used in Textile, Chemical, Food & Beverage, Dairy, Pharmaceuticals, Electrical and Electronic, Automobile and General Engineering Industries. FRP have various applications like Rigidity and smoothly finished surfaces, excellent corrosion resistance, Non toxic, Non corrosive, higher impact strength at low temp., high dielectric strength, low dielectric constant, High volume and Resistivity, Good Stiffness, strength & weatherability, Electrical insulation is very safe, its self lubricating.

MARKET POTENTIAL

The average rate of growth of the glass fibre (and FRP) industry in India especially over the last few years has been in the range of 15%. This is much higher than the 4-5% average increase found in USA, Western Europe and Japan. The main reason for the higher rate of FRP in India compared to advanced countries is due to the continued efforts in the development and identification of new area of application. Over a decade back, the chemical and marine industries were considered to be the prime domain of FRP apart from its use in translucent roof light sheets by the construction industry. Presently FRP is finding increasing applications in the Transport (Road and Rail) Electrical/Electronic, Defence and Renewable Energy Sectors and that too with a great degree on success. These sectors have gradually began to realise the long-term benefits of FRP: in spite of its higher prime cost compared to conventional materials.

Consumption Pattern of FRP

The consumption of FRP in India is thousand tonnes in 1995 and 1260 thousands tons in 1996, in Western Europe it is 1700 thousands tons in 1995 & 1900 thousands tons in 1996, in USA, it is 1937 thousands tons in 1995 and 1950 thousands tons in 1996, shows that India is far behind as far as page of FRP is concerned.

PRESENT MANUFACTURERS

1. M/s. Thakkar & Co. Pvt. Ltd.

Quarry Road Malad (E),
Mumbai - 400 097
Tel. : 693251/52
Tlx. : 011-71057 BMT IN.

2. M/s. CEAT Tyres of India Ltd.

Glass fibres division,
6-1-79, Lakdi-ka-pul,
Hyderabad - 500 004
Tel : 235182, 230306
Tlx : 0155-6332

3. M/s. Fibro Chem. Industries

B-9, Chatkopar Industrial Estate,
L.B.S. Marg, Ghakkopar (W),
Mumbai - 400 086
Tel. : 022-5170960, 5170770
Fax : 91-22-5170770

4. M/s. Cenka Plastics

Division of Century Enke Limited
Bakthawar, Nariman Point,
Mumbai - 400 021
Tel. : 2027375
Tlx. : 3704 CENI IN.

FORMULATION & PROCESS OF MANUFACTURE

Formulation is the "designing" of a compound to bring about the desired properties in the finished moulding. Compounds may be formulated to provide strength, stiffness, toughness, electrical insulation fire resistance, etc. and often two or more qualities but the primary requirement is, however, mouldability.

The flow properties of the compound are determined by the degree to which the resin is absorbed by the fillers and Glassfibre. It depends upon viscosity, basic chemical construction, type and quantity of monomers, etc.

A high viscosity resin will carry reinforcement and filler well but made mixing more difficult.

Combinations of smaller amounts of high absorption fillers, such as china clay with low absorption one such as calcium carbonate or silica works fairly well.

The main mixing of the resin, filler and glass fibre is done in a sigma or spiral blade mixer.

Catalysts and Accelerators

In order to convert the resin to a hard and infusible solid within a reasonably short time so as to make their moulding a commercial possibility, catalysts/accelerator are added to resin shortly before the use.

For the hot curing system i.e. where external heat is applied to the moulding in the range of 80-130°C a peroxide catalyst such as benzoyl peroxide is widely used.

DISPOSABLE PLASTIC SYRINGES, NEEDLES & NEEDLE TUBE PLANT

INTRODUCTION

This project purposes to install entire equipments needed for an integrated Disposable syringe plant.

This means that the project aims at mfg. all the components of a syringe within the plant and assemble them into a complete syringe for sale under its own reliable brand name. To make its product economical, the project does not intend to import seamless extruded tubes of miniature diameters which happen to be quite expensive.

Disposable needle is widely used by doctors for injection purpose with the help of syringes. With the increase in population in our country, requirement of medicine and injections has increased. For more strength of people more number of needles are required with syringes. Tablets or capsules also play a great role in the life of human beings but injections are also to some extent. For quick relief, needles are used by surgeons, dental surgeons, Veterinary Surgeons, and by the breeders in the poultry farm, where the farm birds are periodically injected against epidemics. To avoid wastage and to reduce cost by quantity of syrup, needles find a wide scope with the veterinary surgeons/doctors.

With the development of pharmaceutical industries the use of syringes and disposable needles will also develop.

Disposable needles are becoming more popular in the medical world due to its lower cost and higher accuracy. Plastic can be used in place of metal without any problem. The procedure is also relatively easy and cheaper.

B.I.S SPECIFICATION

IS : 3317 - 1983

IS : 6525 - 1972

Above Specifications may be obtained from

Bureau of Indian Standards,

9, B. S. Zafar Marg,

New Delhi - 110 002.

NOTE :- The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made there under. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control, which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

MARKET SURVEY

Syringe barrel & piston along with needle-base and needle cover etc., are the injection moulded items that go into the assembly of a complete syringes injection moulding of plastic components is effected in a properly designed & constructed mould.

All basic designs of injection moulds have the cold-runner two-plate concept, for parts that require large gates. This results in the sprue, runners & gates solidification with the plastic melt material lying in the cavity. The "shot size"™ & clamp tonnage of the injection moulding m/c are decreased by the size of the sprue and runners. Use of one type of mould depends on the various factors that influence product qualities.

It is the flow property of the plastics in question that determines whether or not it can be injection moulded. Even under optimum moulding conditions, very long flow paths large surface areas of excessively thin sections may result in short shots. But, parts like syringe barrels, pistons and needle cover etc., are the most suitable sizes for injection moulding without difficulties.

The wall thickness is governed mainly by functional requirements, the size of the moulded part & length of flow path.

POLYESTER RESIN

INTRODUCTION

Polyester resin is prepared by reacting a dihydric alcohol with a mixture of unsaturated and saturated dibasic acids. The basic resin obtained is not usable because of its high viscosity and poor reactivity. It is

diluted with a reactive unsaturated compound called monomer and supplied to the user. The remaining polymer chemistry is carried out at the castomers and where with the help of a catalyst and an accelerator, the resin is further polymerized (cross-linked) to produce a three dimensional infusible structure.

Polyester resin is the unsaturated resin dissolved in and later cross-linked to thermoset copolymers with vinyl monomers-usually styrene.

Resins are used in a variety of applications which can be broadly classified under the categories of moulding, casting and coating.

Although the use of thermoplastic resins in composites is on the increase, thermosetting resins are still the materials of choice and of these unsaturated polyester resin occupy a major portion of the material. This is because of the high versatility of these products.

PROPERTIES AND USES

The over small properties of a polyester resin are decided by its formulation and reaction conditions. The properties that are decided by formulation are called "Formulation dependent" properties and the properties decided by reaction conditions are called (Reaction dependent by properties.). A list of these properties is given below:

A. Formulation dependent properties

1. Heat distortion temperature
2. Corrosion resistance
3. Reactivity
4. Flammability
5. Optical properties
6. Mechanical properties

B. Reaction dependent properties

1. Acid value
2. Curing characteristics gelatin, peak exotherm etc.
3. Viscosity.

The optical properties i.e. refractive index, clarity, and to some extent the mechanical properties of the resin are also formulation dependent.

As regards reaction dependent properties the acid value of the resin is a measure of the available acid functionality in a resin and is closely related to the molecular weight of the resin. For a given formulation as the reaction proceeds acid value decreases. Resin with lower acid value could have higher molecular weight and thus better mechanical, chemical and thermal resistance properties workability of polyester resins also allow higher filler loading.

It is common practice to establish specifications on the following physical constants of the liquid resins.

1. Acid numbers
2. Viscosity
3. Specific Gravity
4. S.P.I. Gel.

Characteristic of jet under the conditions of cure: Cured resin properties :

1. Physical properties - Mechanical Physical Constant
2. Electrical properties
3. Chemical Resistance
4. Weathering characteristic.

A wide variety of household appliances and other articles are now made from polyester laminates. Furnitures, luggages, ornamental, sinks, trays, handles, washing machines and toys are among extensive

range.

INDIAN STANDARD SPECIFICATIONS

The following specifications are available for reference:

I.S. 6411 - 1972 Gal Coated glass fibre reinforced polyester resin bath tubs. Lays down requirements for materials construction, workmanship, finish, performance as well as testing procedure.

I.S. 6746 - 1972 Unsaturated Polyester resins systems for low pressure fibre reinforced plastics.

Prescribes requirements, methods of sampling and test for polyester resin systems for fibre reinforced plastics within the pressure range 0 to 14 kgf/cm². Requirements for 5 types depending on the use and resistance to heat and flammability are also covered.

ELECTROPLATING OF PLASTICS

INTRODUCTION

Now a days plastics are used in almost all fields. It has a wide application in variety of automotive, appliance and hard ware. It is also used for the decoration purpose, to give attractiveness and long-life it is worth while to electroplate it by some suitable material such as nickel or chromium or copper, according to the choice and requirement of the consumer. It is customarily important to increase the surface hardness and moisture permeability of the plastic unless it may be unsuitable for the purposes i.e., to make gramophone recording, reflectors, electrical condensers, antistatic devices etc.

The metallisation of plastic moulds for electroforms and electrotypes including gramophone stamper can also be done. The plastics which are most suitable for the Electroplating are phenol-formaldehyde (Bakelite) or Urea-formaldehyde and injection moulding ABS (Acrylonitrile-Butadiene-Styrene terpolymer) special plating grade moulding compounds are generally preferred for better quality plating. Also, for successful plating basic design criteria should be observed avoiding blind holes, large flat surfaces, and sharp corners. On the other hand a special attention should be given on the moulding operation, prior to plating. Polypropylene may also be used for electroplating.

The process of electroplating of plastics is a branch of metal finishing.

Electrode position is mainly based on the conductive properties of the substrate, on which the plating is to be done. Since plastics are non-conductors : thus there is some difficulty of direct electrode position. Thus special techniques are involved for electroplating. It is necessary that surface of that medium be made conductive in some way : after making the surface conductive: electroplating may be done directly as that for metals or conductors.

All nonconductors can be electrolessly plated but only a few can be plated to give good adhesion and appearance. A highly active, unstabilized electroless bath will coat any object it contacts, including its container. This process is called encapsulation because there is little or no adhesion between the metal deposit and the substrate.

PROPERTIES

Electroless films have two functions: -

1. They provide an electrically conductive layer, which allows further coating by electroplating.
2. They provide a secure bond between the plastic & the electroplated layer.

Plated plastics have several disadvantages, plating normally lowers impact strength. The coefficient of thermal expansion is much higher for plastics than for metals, so stress build-up and adhesion loss can occur on severe thermal cycling. Blistering can occur during corrosion. The relatively low heat distortion temperature of most plated plastics can also limit applications.

One of the most important advantages is that weight savings can be as much as 60% as compared to an equivalent all metal part. The moulded plastic parts need no buffing or other finishing step before plating. Plastics plated have improved coefficient of thermal expansion, and improved abrasion and weathering

resistance. Whereas a metal part may completely corrode away and fail in service, only the surface of a plated plastic can be corroded.

USES AND APPLICATIONS

The Electrodeposited plastics are mainly made due to artistic or sentimental purposes, such as bronzing of baby shoes, and other items in our daily life. These are also used in plating the decoration pieces which are primarily made of plastic.

Recently, these techniques are widely applied to electronic fields to make printed circuits on PVC.

B.I.S. SPECIFICATION

IS 9342 - 1979 Sodium Hypo Phosphite for electroless plating - (Reaffirmed 988)

IS 9909 - 1981 Succinic acid for electrolyze plating

IS 8436 - 1977 Method for thermal cycling test for evaluation of electroplated plastics.

IS 8435 - 1977 Methods for measurement of thickness metallic coating on plastics.

NOTE : The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations were chalked out under its frame. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

MARKET SURVEY

The use of electroplating has increased steadily for last few years. New applications are found regularly and continuous growth prospects exist.

These are attached to electronic Industry, Production of cycle and automobile parts.

Electroplating plastics work, have been established in the larger cities and undertaken a variety of Jobs, such as plating of hospital instrument, decorative items, electrical and hardware items, and especially representation articles.

The future of electroplating plastic finishing industry depends not only upon the technical improvements in operation but also the availability of the necessary raw materials at a reasonable cost. The main raw materials used for electroplating and finishing industry in India are chromium, Nickel, zinc cadmium and copper.

Requirements of Chromium and Zinc etc. are barely met by indigenous resources.

However the demand of Nickel and Cadmium etc. is mostly met by imports of these metals from various countries.

Registration/Licences for SSI

While setting up a business enterprise, particularly SSI, certain statutory requirements have to be fulfilled. Some of these requirements are optional and some are compulsory. This chapter gives details of all such important aspects that an entrepreneur should consider.

(a) **Provisional (Temporary) Registration:** Provisional registration enables the entrepreneur to initiate necessary steps to bring the unit into existence. Once the unit comes into existence it is required to be converted into regular/final/permanent registration. The provisional registration can be done at the district headquarters with the DIC and is given automatically with 7 days of receipt of application on prescribed form by the General Manager. It is valid for one year in the first instance and may be renewed for a further period upto one year in two monthly extensions on submission of satisfactory proof that the party is taking effective step. If production could not be commenced for reasons outside the entrepreneur's control, extension of provisional registration period is usually considered.

Where there is no DIC, for instance in the four metropolitan cities of Bombay, Calcutta, Delhi and Madras, provisional registration is to be obtained from the directorate of Industries or the designated office located in these cities. In case of any difficulty in obtaining of the provisional certificate the respective Directorate of Industries of the state can be approached.

(b) **Permanent (final) Registration:** After the entrepreneur has taken all steps to set up the unit, that is, (i) constructed/acquired the factory building. (ii) installed all requisite machinery, testing equipment and pollution control gadgets (where required), (iii) obtained power connection, he can apply for permanent registration certificate to the DIC/DI. Within seven days of receipt of application the entrepreneur is informed of the date/time of unit inspection by the GM/Competent Officer nominated by the DIC. The inspection includes capacity assessment. On being satisfied of production capability a recommendation for issuance of permanent registration is made to the DI.

The application for permanent registration should normally have following documents attached:

1. Rent receipt/lease or purchase of sale deed/municipal tax receipt.
2. Shop Act Licence/Factory Act Licence (where applicable).
3. Municipal/Industrial Licence (in municipal corporation area).
4. Partnership deed/Certificate of Incorporation (if a Pvt./Public Ltd. Company)/income tax assessment order.
5. Other essential licences like Central Excise Licence/Drug Control Licence/NOC from Water Pollution Control Board (whatever is applicable).
6. Bills for machinery purchased together with the list of machinery certified by a Chartered Accountant.
7. Sanction for electricity/power or current electricity bills.
8. Extracts of purchase register for preceding fifteen days, in case the unit has already gone in production.
9. Extracts of sales register for preceding fifteen days, in case the unit has already gone in production.
10. First three sale notes cash memos (if applicable).
11. Extracts of the preceding one month from Workers' Muster roll (in case unit is already in production).
12. Extract of the preceding fifteen days from production register (in case unit is already in production).

(c) **Registration as Ancillary Unit:** The entrepreneur has to fill up the specific application form to get his unit declared as "Small scale ancillary unit" (the investment limit here in plant and machinery is upto Rs. 75 lakhs). This form is to be submitted to the Directorate of Industries with a copy of the Small Industries Service Institute (SISI) in the State. SISI examines the facts stated by the unit and on satisfying itself regarding the eligibility, recommends it to the State Directorate of Industries for registration of such unit "ancillary unit". On receipt of such a recommendation, the concerned authority (General Manager of the District Industries Centre or any other officer empowered to grant SSI registration) will grant the registration as Small Scale Ancillary unit.

(d) **Benefits of Registration:** Provisional registration entitles the new entrepreneur to (i) apply for a shed or plot in an industrial estate or a developed area; (ii) apply for Corporation/Municipality for other licences; (iii) apply for power/water connection; (iv) apply for financial assistance from banks and other institutions, (v) apply to the National Small Industries Corpn./State Small Scale Industries basis; (vi) obtain sales tax, excise registration, etc. wherever required; (vii) take other steps/approvals that may be necessary to import licence for capital goods/raw materials.

(e) **Registration of Existing Unit:** An existing unit which has not registered itself earlier can also

apply for registration at any stage.

(f) **Restrictions on Registration:** Certain categories of undertakings cannot get the registering as Small Scale industrial units. General guidelines in this regard are discussed below:

Undertakings to which Chapter-III of MRTP Act, 1969 applies, are not eligible for recommendation as SSI. Similarly, undertaking owned by foreign companies, their branches or by companies in respect of which more than 40% of the paid-up equity share capital is held directly by foreign companies, their branches or subsidiaries or by foreign nationals or non-resident Indians (on non repatriation basis are not eligible for registration as small scale industry).

No SSI registration can be granted to an undertaking which is a subsidiary or owned or controlled by any other undertaking.

Units producing items which have been banned either by the Central or State Government cannot be registered (for list of such items refer Annexure B).

(g) Deregistration/Cancellation of Registration may be deregistered on any one or more of the following grounds:

(a) If the unit remained closed continuously for a period exceeding one year.

(b) If the unit failed/refused or avoided to give full and truthful information as called upon by the registration authority from time to time and in particular the half yearly report.

(c) If the unit has been proved to misuse the raw materials allocated to it.

(d) If the unit is found to be subsidiary of or owned or controlled by medium or large scale undertakings.

The orders for de-registration will have to be signed by an officer not below the rank of Joint Director of Industries or the General Manager of District Industries Centre Under whose jurisdiction the unit is located. A show cause notice to the party will be sent by registered post at the address given in the application form with 30 days time for reply. If a show cause notice could not be served to the party concerned either because of the party refusing to accept it or the unit was found to be closed, the notice may be duly pasted on the premises. Action to deregister the unit may be taken only after the expiry of 30 daysTM time from the day of pasting of the notice. Any unit aggrieved by the order of de-registration may appeal to the next higher prescribed authority as notified by the State Governments within one month of receipt of the intimation for de-registration. The appellate authority may, after examining the records of the case and after making necessary enquiries, pass suitable orders whether to set aside the order of de-registration or maintain it. The names and addresses of all units de-registered by the Director of Industries are communicated to the DC (SSI).

(h) **Expansion/Diversification:** A unit wishing to expand by increasing the production of the item for which it was already licensed, need not obtain any fresh registration or any endorsement on its registration certificate unless it involves the addition of new plant and machinery (indigenous or imported) and consumption of additional scarce and imported raw material. A unit, which may like to diversify its productions, adding one or more items for which it was not earlier registered, will have to get its registration duly endorsed for such items after a technical inspection. An application indicating the new products proposed to be manufactured, the additional machinery installed or proposed to be installed and the requirements of additional imported and scarce raw materials will have to be submitted to the registering authority for the purpose.

(i) Upon-Graduating from small to medium scale unit: When a unit crosses the investment limit prescribed for a small scale/ancillary unit by the process of natural growth, it will need registration with DGTD or other technical authorities. Then the following situation will arise.

The unit engaged in the manufacture of such items which are not eligible for exemption from the licensing provisions in terms of the notification issued from time to time by the Ministry of Industrial

Development e.g. units engaged in the manufacture of items exclusively reserved for small scale sector or units requiring foreign exchange for imports of components and raw materials in excess of the prescribed on Business (COB) licence on crossing this limit. Such units will have to submit their application in the prescribed manner to the Secretariat for Industrial Approvals. In granting the registration with DGTD/Technical Authorities for the COB licence, Government may impose, in part, obligations on such units consistent with the policy of protection to the small scale sector. However, if a small scale wishes to have some more time for the transfer to the DGTD list, a grace period upto two years will be allowed during which period it will continue to enjoy all the facilities under the small scale industries programme. A special report, however, on such units will be made by the State Directorate of Industries to the Development Commissioner, Small Scale Industries.

Special Approvals

Some formalities are required to be completed by all categories of entrepreneurs while others by specific category of entrepreneur depending upon their industry line, or equipment installed or size of the unit. The various legal requirements are listed as below:

Resourcing

For successful establishment and running of a business enterprise, particularly a manufacturing concern, a lot many factors have to be considered and inputs resourced. Fortunately, the Government has built up a wide and comprehensive network of institutions at Central, State and District level throughout the country. For practically every step that you have to take for establishing your enterprise, there is a support agency available. Details of such institutions are briefly described under two categories:

(a) Non-Financial

(b) Financial

(A) Non-Financial

I. National Level

(a) Small industries Development Organization (SIDO):

- Policy formulating, coordinating and monitoring agency
- Maintaining close liaison with the Central ministries, Planning Commission. State Government and other Organizations concerned with Small Industry Development and serves as the secretariat for All-Indian Small Scale Industries Board.

- Provides a comprehensive range of industrial extension services including technical, managerial, economic and marketing assistance through its network of 26 small industries service institutes, 32 branches of SISIs, 41 extension centres, four regional testing centres, one product and process development centre, two footwear training centres and four production centres. In addition, 20 field testing stations are being established in areas of concentration of specific industries for providing testing facilities to small industries.

(b) National Small Industries Corporation (NSIC) with four regional offices):

- Supply of machinery on hire purchase basis
- Registration of units for participation in the purchase programmes of the Central and State Governments and other central institutions

- Marketing assistance - internal and export

- Development of prototype of machinery and equipment, and other facilities.

- Basic and advanced training in selected trades and technologies through its four prototype development and training centres.

(c) Commissioner for Industrial Cooperatives Coordination of Policies for Industrial Cooperatives.

(d) Specialized Institutions:

(i) National Institute of Small Industry Extension Training (NISIET), Hyderabad Inter disciplinary

approach in the areas of training, research and consultancy relating to development and management of small and village industries (earlier known as Small Industry Extension Training Institute - SIET)

(ii) National Institute for Entrepreneurship and Small Business Development (NIESBUD), New Delhi

Coordinates research and training in entrepreneurship development and devises specific training programmes suited to various categories of entrepreneurs/trainers/promoters.

(iii) Entrepreneurship Development Institute of India (EDII), Ahmedabad-promoted by IDBI, IFCI, ICICI and SBI

Industries requiring air pollution control should obtain consent of the SPCB before commencing production.

Typically the following industries would require such consent (the list is indicative not exhaustive):

1. Asbestos
2. Cement
3. Ceramic
4. Chemical
5. Coal/Lignite
6. Engineering
7. Ferros/metallurgical
8. Fertiliser
9. Foundries
10. Food & Agricultural Products
11. Mining
12. Non-ferrous metallurgical
13. Ores/mineral (Beneficiation, pelletisation etc.)
14. Power, generating/boiling plants
15. Paper and Pulp
16. Textile
17. Petroleum refinery
18. Petro-chemical
19. Plant for recovery from and disposal of wastes
20. Incinerators

(vi) Central Institute of Tool Design (CITD), Hyderabad Training in the design and manufacture of tools, jigs, fixtures, dies and moulds

- Advisory and consultancy services including assistance in the design and development of tools.

- Recommend measures to standardize tools, tooling elements components etc.

(v) Central Tool Room and Training Centres (at Ludhiana, Delhi, Calcutta and Bangalore)

- Provision of tool room service and facilities in designs, manufacture and training, Tool rooms at Delhi and Bangalore and owned by the respective State Government.

(vi) Central Institute of Hand Tools (CIHT), Jalandhar

- Provision of improved technology, raw materials, designs and testing for hand tools industry

(vii) Institute for Design of Electrical Measuring Instruments (IDEMI), Bombay

Provision of technical consultancy in the design and development of electrical and electronic instruments, calibration and testing, tool design, tool fabrication, prototype fabrication and training.

(viii) Central Machine Tool Institute Bangalore

(ix) Central Institute for Plastics Engineering and Tools, Madras (Ministry of Petroleum and Chemicals)

(x) National Institute of Foundry and Forge Technology Ranchi.

II. State Level

(a) Directorate of Industries

With a network of District Industries Centres at the district level, industries officers at the sub-division level and extension officers at the block level:

- * registration of small scale units and recommending cases of large/medium industries to appropriate authorities.
- * raw material quota
- * import quota
- * financial assistance under the State Aid to Industries Act
- * industrial estates
- * technical consultancy
- * training of entrepreneurs
- * industrial cooperatives
- * compilation of statistics
- * overall administration of the village and small industry sector and maintaining close liaison with the central and state level organizations concerned with industrial development.

(b) Small Industry Development Corporation

- * supply of scarce raw materials through raw material depot
- * machinery on hire purchase
- * marketing assistance
- * joint ventures in the small scale sector
- * entrepreneurship development
- * trade centres
- * industrial estates

(c) Industrial Infrastructure Corporation; Industrial Area Development Board/Authority:

- * plans and develops industrial estates and industrial areas

(d) Industrial Development Corporation:

* Promotion of industrial units in the medium and large scale sector including joint and public sector ventures

- * Planning and development of industrial estates and industrial areas (in some states)

(e) Industrial Investment Corporation:

* finances medium and large units up to a certain investment ceiling with direct participation in share capital and underwrites new issues

(f) Agro Industries Corporation:

- * supply of agricultural machinery/equipment on hire
- * development of agro-based industries
- * sale of agro-inputs like fertilizers and pesticides

(g) Electronics Development Corporation:

* Promotion of industries in the field of electronics including joint sector and public sector projects

- * Leather Industry Development Corporation and other similar commodity corporations:
- * development of specific types of village and tiny sector units relating to a particular trade

(i) Rural Industries Marketing Corporation:

* marketing of village industry products and provision of a variety of services needed by village and tiny units (Gujarat state has set up this corporation)

- (i) Industrial and Technical Consultancy Organization (sponsored by IDBI/IFCI/CICI):
 - * technical consultancy services to small and medium scale projects

(B) Financial

- (A) Reserve Bank of India (RBI)

The country's central bank, responsible for currency and monetary regulation and other central banking functions besides being banker to the government. Also responsible for supervision of all banking institution provision of rural credit and exchange central.

Entrusted with the administration of the Credit Guarantee Scheme, under which government guarantee is provided for advances granted by banks and other credit in situations to small industrial units.

- (B) All-India Term Lending Institutions

(i) Industrial Development Bank of India (IDBI) coordinates in conformity with national priorities the activities of institution engaged in financing, promoting, developing industry operated with schemes such as:

- * direct assistance
- * soft loan scheme
- * technical development fund
- * refinance of industrial loans
- * automatic refinance
- * special refinancing facility
- * rediscounting of bills
- * seed capital assistance
- * subscription to share and bonds of financial institutions
- * development assistance fund

- (ii) Industrial Finance Corporation of India (IFCI)

- * long term loans of new industrial units as also for expansion, diversification, renovation or modernization of existing units both in rupees and foreign currencies, underwriting of equity, preference and debentures issues, subscribing to equity, preference and debenture capital
- * risk capital foundation provides soft loan as part of equity capital to new entrepreneurs, particularly technologists and professionals
- * benevolent reserve fund provides assistance for developmental purposes.

- (iii) Industrial Credit and Investment Corporation of India (ICICI):

- * currency loans to small enterprises under its Rupees assistance programme and foreign currency loan

- (iv) Industrial Reconstruction Bank of India (IRBI):

- * provides financial and other types of assistance to sick or closed industrial concerns, and operates, in the case of small units, through state level agencies by way of sanctioning "Line of Credit".

- * provide managerial assistance
- * guidance for renovation and modernization

- (v) Export Import Bank of India (EXIM Bank):

- * finances, facilitates and promotes foreign trade of India
- * coordinates the working of institutions engaged in financing export and import
- * finances export of consultancy and related services, assists Indian Joint ventures in the third countries, conducts export market studies, finances export oriented industries and provides international merchant banking services

- (vi) National Bank for Agriculture and Rural Development (NABARD):

refinancing the farm and non-farm operations in rural areas as in the non-farm sector, village and tiny sector industries located in rural areas are supported through refinancing

(vii) National Cooperative Development Corporation (NCDC):

* promotes and finance cooperative enterprises in processing marketing storage and export relating to agro based industries

* agro-service centres

* promotion of units for formulation of fertilizers, pesticides and insecticides

* workshop for fabrication of agricultural machinery/implements

* margin money processing units

* technical training

(C) Other Financial Institutions

(i) Export Credit Guarantee Corporation (ECGC)

* supports and strengthens export promotion drive (a) by providing a range of risk insurance covers to exporters against loss in export of goods and services, (b) by offering guarantee to banks and financial institutions to enable exporters to obtain better facilities from them, (c) to give customer satisfying service at low cost and with high efficiency.

(ii) Deposit Insurance and Credit Guarantee Corporation (DICGC):

* operates four guarantee schemes: (a) small loans guarantee scheme, (b) small loans (small scale industries) guarantee scheme, (c) small loans (financial corporations) guarantee scheme, and (d) service cooperative society guarantee scheme

(iii) State Financial Corporation (SFC):

* provides long and medium term loans for acquisition of fixed assets of small and medium industries

* guarantees payment for purchase of machinery of suppliers within India

* guarantee loans raised by industries from commercial banks, cooperative banks etc.

* foreign exchange loans under World Bank line of credit

* special capital assistance upto Rs. 200,000

(iv) Commercial Banks:

* provide term finance and working capital advances classified under cash credit, overdrafts, demand loans, purchased/discounted/advanced against inland bills, purchased/discounted advances against import bills and clean advance

(v) Regional Rural Banks (RRBs)

* provide banking facilities in remote and unbanked areas among other places of the selected districts and provide credit to agriculturists, artisans and other self employed persons belonging to weaker sections. The loans are given in kind

(vi) Cooperative Bank:

* provide credit to farm and non-farm cooperative societies.

For specific details, care and precautions refer Chapter II. For example, for land acquisition aspects like residential, industrial, non-conforming, Lal Dora land open and covered area provision for expansion, etc. are discussed in Step 11: Arranging Land & Building. It also describes care for materials required in construction, plant layout and other related factors.

For the machinery step 12: Procuring Plant & Machinery. Details out role of NSIC/SSIDC, import procedures and other relevant factors. Significance of utilities, single/three phase power connections, transformer and wiring connections, voltage requirements are described in Step 13: Utilities. For raw materials (import procedures, scarce items, quotas, etc.) refer Step 14: Raw Materials. While this Chapter gives you information on financial institutions and assistance offered Step 9 may be referred to for

procedures on arranging finance.

Whom to contact for what?

A publication like this cannot give addresses of nearest offices of all support organizations that would be helpful as that would be a directory in itself. An illustrative list of institutions with addresses and their role in setting up household, cottage, tiny or small scale industry in Delhi is given in Annexure G. A similar list can be prepared for your area/State with the help of the telephone directory or by contacting the nearest DIC/SISI.

Bleaching, Dyeing & Finishing of Textiles

Introduction

The basic object of bleaching of textiles is to accomplish whiteness and of dyeing for various shades through bringing about a permanent union between the dyes and the fibres. The textiles are so coloured that the colour is fast and is not ordinarily removed by such operations viz. washing, rubbing, sunlight etc.

Better dyeing effects can be achieved when it is conducted in solution or indispensed colloidal condition or freely divided state. The fibre being subjected to this dye in solution condition and subsequent the dye being rendered insoluble or fixed by some means, when observed upon or within the fibres or through direct contact with the fibres.

Finishing of the textiles encompasses all processes which fabrics undergo including bleaching and dyeing.

Finishing improves the attractiveness as well as serviceability of the fabrics. Thus finishing may be regarded as the final stage in the embellishment of the fabrics.

However, finishing processes may broadly be classified into two main classes:-

(1) *Physical:* Physical and mechanical processes range from simple drying over steam heated rollers or stretches which both dries as well as stretches the cloth.

(2) *Chemical:* Finishing methods may comprise by the application or deposition of chemical compounds or the performance of chemical reaction with the fibre itself.

Marker Survey

Cotton textile industry by and large occupies a unique place in the industrial map of the country. There are both single large organized industries as well as a large number of ancillary industries depending upon the sector. However, the Indian textile industries undergoing bleaching, dyeing and finishing of textile has witnessed a phenomenal growth in the industrial balance. The growth of the loom age has, however, been significant as a result of the government policy. The new textile policy envisages that capacity be created by introduction of new units to meet the demand supply gap.

Adhesives (Fevicol and Vamicol Etc.)

Introduction

Chemical materials required for joining or sticking two same or different surfaces, are generally known as adhesives. A good industrial adhesive must satisfy the conditions such as, maximum mechanical strength of the bond, ease and rapidity of application, minimum setting or drying time or quick development of bond strength, resistance to moisture, ability to withstand temperature variations, resistance to the deterioration by aging, chemically inert to the surfaces to be joined and finally should not have objectionable odour or be otherwise harmful to health.

Adhesives may be applied by one of the following methods depending upon the type of adhesive to be used:-

- (a) Directly by brush
- (b) By gumming machines
- (c) By automatic machines
- (d) By spraying

- (e) By glazing
- (f) By two solution process
- (g) By dry method.

Some adhesives such as gums and natural resins etc. are applied in cold and known as cold adhesives while animal glues and bituminous adhesives are applied in hot and known as hot adhesives.

Lamination is the process of combining two or more plies of material into a new composite. This plies may be alike or different. The product may thus be designed to possess unique properties not inherent in any of the constituents. An adhesive solution is applied to one or both surfaces to be joined. A great variety of adhesive materials are in current use in wood lamination industry. The solution depends on many factors such as tradition, cost, production, laminations and performance requirements.

Formaldehyde-based condensates with phenol, resorcinol, urea and melamine are of greatest importance in the wood industries, but urea formaldehyde resins are utilized in conjunction with starch to provide improved water resistance. The formaldehyde based condensates are used now-a-days for making decorative laminates for paper, for furniture laminating etc. Such as sungloss and sun mica etc. A good adhesive for these types should have the properties of low cost, indefinite pot-life, quick tack, good adhesion to the materials, rapid cure at relatively low temperature and resistance of cure bond to moisture, solvents, heat and micro-organism.

Phenol Formaldehyde Resin

These resins have extremely high water resistance property and are of tremendous importance for gluing wood, in this application they are the most durable class of wood adhesives known. The cold-curing type, and especially that prepared from resorcinol, is widely used in the construction of lamination where strength and great durability are required.

Phenol is reacted with 37-50% formaldehyde at 50-100°C. In the presence of excess formaldehyde and a basic catalyst such as sodium hydroxide, ammonia or tertiary amine, the condensation goes through three stages. Phenol formaldehyde resins have properties of good resistance to moisture, acids, solvents and heat.

Urea Formaldehyde Resin

These UF resins are important adhesive resins in plywood manufacture and lamination. Urea and formaldehyde react to form first a water soluble substance called dimethylol urea which can be prepared in various concentrations and viscosities. This substance can be further insolubilized by further treatment. Dimethylol urea has been modified with casein and used as a glue for plywood manufacture by setting in a press at a temperature of 100°C. The U.F. adhesives are suitable for bonding only cellulosic materials such as wood, paper or cork etc. U.F. adhesives incorporate hardeners according to whether they are in powder, liquid or foam form. These adhesives have high bond strength and joints made with these adhesives are highly durable.

Urea and formaldehyde are boiled in aqueous solution in the molecular ratio 1:2 in presence of an acid catalyst such as formic acid. These resins are strong and rigid, free of odour and taste.

Thermoplastic Resin

Thermoplastic resins used in adhesive manufacture are polyvinyl acetate, polyvinyl alcohol, acrylated resins, etc. Of major importance in the manufacture of adhesives are the first two. Polyvinyl Alcohol (p.v.a.) is a water soluble synthetic resin made by hydrolysis of polyvinyl acetate. This is used in the water resistant laminating adhesives, remoistenable adhesives and many other adhesives used in industry.

Market Survey

There are various types of adhesives based on different raw materials meant for diversified industrial applications. viz. wooden furniture, leather plastics, plywood, ceramics, etc.

Thus their use being manifold, these adhesives find high market potential and better future prospects.

As some type of adhesives are imported, to cater to the outgrowing needs of the country, this implies additional units installation, thereby inviting new entrepreneurs for the lucrative trade.

Computer Ribbons

Introduction

Computer ribbon is a narrow woollen fabric (tape) of varying width, made of cotton, silk or nylon and has the highest thread count of any fabric in general use.

The origin and growth of this ribbon industry has been closely interlinked with the typewriter industry. In the early stages long ribbons of cotton, coated with carbon black were used, but later these were replaced by ribbons of silk, coated with colour pigments. These ribbons can be classified in the two types viz. single coloured and bicoloured. Single coloured ribbons are blue black in colour, while the bicoloured ribbons are combinations of blue-red and black-red.

The fabric used for the production of ribbons should be closely woollen and control more thread counts than in ordinary cloth.

Uses & Applications

Computer ribbons find extensive application in computer printers.

Market Survey

The computer industry in our country made spectacular progress in the 1980s and has become a part and parcel of our life. In spite of this dramatic increase in production and utilization of computers and their peripherals, this industry offers a vast scope for increasing production so as to meet the domestic demand fully and also to earn valuable foreign exchange through exports.

The new policy announced by Government of India recently is very encouraging and provides great opportunity for the new entrepreneurs. But the entrepreneurs will have to provide quality product at competitive prices. Competition from imports would be there and entrepreneurs will have to plan accordingly. Secondly the market at present is concentrated in major cities, though it is likely to grow fast in semi-urban areas in coming years. Thirdly the technology is likely to change very rapidly and entrepreneurs will have to be dynamic so as to accommodate the new technologies and satisfy the growing demand.

Formulation of Inks

Black Ink

Ingredients	Parts by Wt.		Number of Formulations
	1	2	3
Carbon Black	34	36	12
Nigrosine base	10	6	18
Oleic Acid	50	12	
Mineral Oil	106		
Petrolatum		146	
Tricresyl Phosphate			30
Biglycol Laurate			30

Blue Ink

Ingredients	Parts by Wt.	Parts by Wt.
	1	2
Blue Toner	40	
Hard Oil	80	
Castor Oil	80	

Victoria Blue		52
Neutral Oil		50
Oleic Acid		100

Cosmetics

Introduction

The word "cosmetics" to the average user, means preparations for beautifying complexion, skin, hair etc. But cosmetics covers a number of things to make human beings complete in all sense.

Classification

Antidandruff: "Dandruff" or scaly disease of the scalp exists with the continuous but normally imperceptible sloughing of the outer epidermal layers of the skin becomes glossy visible. A product which cleans the scalp, frees it from adherent debris, and regulates the amount of residual scalp and hair oils to retain healthful scalp condition is an "antidandruff" preparation of the first class.

Antiperspirants & Deodorants: A variety of substances which have a stringent action inhibit the flow of perspiration. This type of substances is thought to react with proteins of the skin, causing coagulation accompanied by blocking the openings and reducing the flow of sweat. A wide variety of products which are deodorants and antiperspirants have been successfully marketed.

Balely Oils: The most convenient method of cleaning the diaper area is by the use of light mineral oil and lotions, followed by dusting with talcum powder.

Creams: Creams are both oil-in-water and water-in-oil type emulsions.

Creams are of many types such as

1. Cold Creams
2. Vanishing Creams
3. Foundation Creams
4. Skin Creams
5. Hand Creams
6. Hormone Creams
7. Bleach Creams etc.

All these creams are stable emulsions and their general process of manufacturing is discussed.

Cosmetic Colours: The colours used for colouring cosmetic can be classified into following manner:

1. Natural Colours
2. Inorganic Colours
3. Synthetic Dyes

Eye Lotions: Only those solutions, which neither affect nor claim to affect the structure and functioning of the eye, and are not used for the cure, instigation or prevention of diseases, may be included in the cosmetic category.

Depilatories: Present day fashions in women's apparel have created a large demand for depilatories. Good grooming required that one keeps legs, arms, and armpits free from unsightly hair.

1. Depilatory Compositions
2. Chemical Depilatories

Hair Dyes: The development of hair colouring followed the traditional use of simple and complex substances from plants, metallic compounds, and mixtures of these two types.

Lipsticks: Used by almost all women to brighten the colour of their lips, has become a leading and rather uniform item of makeup. Composed essentially of an oil-wax base stiff enough to form a stick.

Nail Lacquers: These are used to decorate and enhance the appearance of nails. The major ingredients of nail lacquers are film formers, resin, plasticizer and solvent.

Powders: A face powder is a cosmetic product, which is applied to the face by means of powder puff. It is usually employed at the end of the makeup process, as a finishing touch, either directly to the face, or over a powder base.

Shampoo: Shampoo may be defined as a product having some cleansing and foaming action, which leaves the hair soft, lustrous, and manageable.

Properties and Characteristics

Antidandruff: A product cleans the scalp, frees it of adherent debris, and regulates and amount of residual scalp and hair oils. They contain specific germicidal and bacteriostatic agents and other additives

Antiperspirants and Deodorants: Antiperspirants have a stringent properties and thus reduce the flow of perspiration. Deodorants kill the bacteria, present in the skin, which decompose sweat. Antiperspirant creams and lotions are emulsified preparations containing low proportions of oils and fats so that the products do not grease or soil clothing.

Creams: They contain high proportions of oily and fatty materials together with emollients and are prepared either as oil-in-water or water-in-oils or in some cases as mixed emulsions. When these products are applied to the skin the loss of moisture is slowed down. These creams tend to be sticky and greasy but maybe modified with fatty acid esters and acetylated glycerins, which have good spreading properties.

Cosmetic Colour: Colour in cosmetics are very important from the point of view of consumer appeal. The term pigment generally denotes a coloured or white chemical compound, which is insoluble in a particular solvent.

Emulsions: These are the products, which make it possible to unite aqueous and oily liquids intimately. As the proportion of internal phase increases, the viscosity of the emulsions increases to a point where the emulsion is no longer fluid.

Enamel Remover: All solvents particularly the fast evaporating types cause dehydration and remove natural glasses from the nail.

Depilatories: It should have following properties:

1. Should convert human hair completely in 2 to 5 minutes to a soft, plastic mass easily removed from the skin by wiping or rinsing.
2. Should be non-toxic systematically and on irritating to the skin even no long contact.
3. Should be easily applied, economical to use, and stable in the tube or jar.
4. Should be cosmetically elegant, odorless or pleasantly perfumed, white or neutral in colour, stainless to the skin and non-injurious to clothing.

Hair Dyes: They should have following properties:

1. Non-irritating to the skin
2. They must be dry hair, not the skin
3. They must produce shades that are natural in appearance and lasting
4. Should not be injurious to hair and health
5. Dyeing should take reasonable time.

Lipsticks: A good lipstick should have the following characteristics:

1. Ease of Application
2. Smooth and Shiny Appearance
3. Non-drying and non-gritting
4. Good odour and flavour
5. Suitable firmness even under different climatic conditions.
6. Free from sweating or blooming.

Nail Lacquers: These are based on nitrocellulose, which acts as a film former. A good product should be quick drying, harden quickly, easy to apply, resistant to abrasion and chipping and have good adhesion to the nail.

Powders: A good talcum powder should be white, possess good "slip"™ and be lustrous without being glittery.

Shampoos: A good shampoo is required to have the following properties:

It should remove soil and residues on hair and scalp, should be pleasant and it should leave the hair in soft, lustrous and easily manageable conditions.

Uses & Applications

Antidandruff: It controls the accumulation of dandruff. It may be designed to be effective for massage, stimulation or cleansing and cosmetic care, it may contain an anti-infectious agent; or it may contain nutritional agents.

Antiperspirants & Deodorants: Deodorants are preparations which remove or decrease perspiration odors or prevent their development or both.

Barley Oils: Used for wiping the folds of the infant's skin in the buttocks area, with application of sterile oil to the skin at each diaper change.

Creams: Used for preventing a rough, dry skin and to treat this condition.

Enamel Removers: These are used to remove the enamel, without smudging or leaving a lacquer residue on the nails or on the adjoining skin areas.

Depilatories: It is used for removal of unwanted hair or to prevent its regrowth.

Hair Dye: To change the natural colour of the hairs, hair dye is used.

Lipsticks: It is used to brighten the colour of the lips.

Nail Lacquers: It is used to decorate and enhance the appearance of the nails

Powders: A face powder is a cosmetic product, which is applied to the face by means of a powder puff. It is usually employed at the end of the make-up process, as a finishing touch, either directly to the face, or over a powder base.

Shampoos: These are having some cleaning and foaming action, which leaves the hair soft, lustrous and manageable.

Market Survey

In the modern world of new styles and varying fashions, cosmetics play a vital role in beautification.

Particularly modern fashion conscious ladies and modern gents too, use them considerably for a better get up in their personality appeal.

Now to cater to their outgrowing demand, the production in the cosmetic industry is needed on a higher pedestal. Besides, the present demand, the future prospects of this industry, too are very promising.

Thus, an adventurous entrepreneur can safely pick up this industry and instantaneously procure prolific returns with a smile on his face.

Raw Material Required

Antidandruff

Salicylic Acid, Resorcinol, Cetyl Alcohol, Alcohol.

Antiperspirants & Deodorants

Aluminium Chloride, Tegacid, Spermaceti, Bees Wax, Magnesium Oxide, Water.

Deodorant

Aluminium Chloride, Aluminium Sulphate, Borax, Water.

Baby Oils

Mineral oil-light, Hexachlorophene and perfume.

Creams

Sunflower Oil, Isopropyl Linoleate, Cetyl Alcohol, Glyceryl Monostearate.

Enamel Remover

Ethyl Acetate, Water.

Eye Lotion

Boric Acid, Sodium Borate, Phenyl Cetyl Alcohol, Rose Water.

Depilatories

Rosin, Beeswax, Carnauba Wax and Mineral Oil.

Hair Dyes

Lead Acetate, Precipitated Sulphur, Glycerol, Distilled Water.

Hair Fixers

Gum Tragacanth, Methyl Para Hydroxy Benzoate, Rose Water perfume.

Lipsticks

Carnauba Wax, Beeswax, Lanolin, Cetyl Alcohol, Castor Oil.

Nail Lacquers

Nitrocellulose, Santolite, Dibutyl Phthalate, Butyl Acetate, Ethyl Alcohol, Butyl Alcohol, Toluene.

Powder

Kaolin, Calcium Carbonate, Zinc Oxide, Zinc Stearate, Magnesium Carbonate, Perfume.

Shampoos

Sodium Lauryl Sulphate, Stearic Acid, Lanolin, Caustic Soda, Cetyl Alcohol and Water

Tooth Paste and Powder

Dicalcium Phosphate, Sodium Lauryl Sulphate, Glycerine, Propylene Glycol, Sodium Saccharin, Gum Tragacanth.

Tooth Powder

Precipitated Chalk, Sodium Bicarbonate, Tricalcium Phosphate, White Powdered Caustic Soap, Saccharine, Flavour.

Electric Mixer

Introduction

Electric mixer is a motor driven appliance used for processing/cooking food. It can perform functions like mixing, grinding, blending, liquiding, kneading, mincing, juice extraction etc. It consists essentially of a stand or pedestal to which a speed regulated electric motor is fitted, a pair of food beaters, and a large bowl in which the food to be processes is placed. In operation, the food is beaten or mixed by the revolving beaters, which are attached to the motor and gear assembly. However, in addition, most electrically operated mixers are designed to use other attachments that lend themselves to the performance of various assignments, viz. meat grinding, pea shelling etc, all of which serve to enhance the usefulness of the mixer.

Electric mixer has become an indispensable gadget for a house wife. Since it is a consumer durable item, it must be beautiful to look and should give trouble free service. Due to the high standard of living the demand for electric mixer is likely to increase. So there is good scope for small entrepreneurs to start this industry.

Market Survey

Domestic electrical appliances are being produced in our country in large numbers, which constitute almost the basic requirement of any family. It is easy to handle quicker in service and keep the place like kitchen clean.

In pre-independence, the domestic electrical appliances were all being imported from abroad and it was only after independence that with a definite governmental backing of allowing the import of appliances only on restrict basis, the industry has now been able to establish itself.

Electric mixers are now being manufactured by many small units and are utilized by the middle and upper middle income group families in the country.

Domestic electric appliances can be manufactured by even tiny units since the cost of capital involved in it can be really very low.

The process is highly labour intensive and as such as highly suited to the small sector in the country.

Though there are hardly a few units in the organized sector for manufacture of domestic electrical appliances, but the major growth of the industry has taken place in the small scale sector. The small scale sector has, therefore, been responsible to the market demand and have been manufacturing varieties of domestic appliances as per the choice of the consumer.

The industry has high bright future not only for the internal market but also for the export market.

As for the export prospects, recognizing the export potentiality in electrical appliances industry, the Trade Development Authority has included this item in their select list of products for export to developing markets.

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