

INSIDE UNDERWEAR

Lingerie is light, small and dainty. But there's more to lacy underwear than is allowed to meet the eye. There's a business that produces and sells it...so let's take a peek.



Valentine's Day is around the corner and there are ladies who would argue that the present of some lacy lingerie beats a bunch of prickly roses, hands down. Even outside the season of Valentine, lingerie lures... the buyer. Times have changed for Indian women. No longer do they refer to these articles of wear in hushed tones--or lower their gaze as they instruct the salesman to scour the racks for a size-36 bra. The generation x woman marches, chest out, into the costliest lingerie shop and picks the fanciest 'brand' sleepwear or underwear she can find.

There is nothing dainty about the size of the Indian lingerie market. It is a 1,700 crore affair. Indian manufacturers supplying that market have their plants

mostly in Mumbai, Bangalore, Delhi and Tripura. Groversons and BodyCare are based in Delhi. Vanity Fair and Daisy Dee are based in Mumbai. Foreign brands tend to set up in Bangalore and Mumbai -Enamor; Loveable and Jockey have established units in Bangalore. So how are these various manufacturers supplying the naked masses with bras and panties? Pssst, wanna take a peek at a lingerie factory?

Design

In the lingerie business, as in appare more generally, R&D is more simply known as design. There are peak times for design, typically in rhythm with the seasons. The fancier the lingerie, the more the business morphs from a commodity business into a fashion business. The design

process is tied to fashion trends. Hence, a lot of time and thought is put into styling. Here is how Nidha Adheni, Brand Manager for Enamor, an up-market brand summarises the process, "First and foremost our designs for the season are based on the latest fashion trends. Once the designs are approved, the technical team starts the fitting process. All our products are fitted on actual women to ensure that the end result is the best-fitting bra."

At Groversons designing is done three times a year. A new line is created on the basis of the designer's forecast, marketing feedback on the new product requirements, and, of course, the season in which the product is launched. The importance of the design process to final success drives recruitment policy. "We

only hire designers from the National Institute of Fashion Technology or other experienced designers with a masters degree," says Rakesh Grover, the Managing Director of Groversons.

Once the designs are selected, the sampling begins. Groversons has a sample room with fifteen machines and the same number of skilled operators. Prototypes of different fabrics and different patterns are sewn and tested on models. Designers along with marketing staff then order adjustments for the final sample. "All the final samples are then presented to the senior management and marketing team for the final selection, the approved samples are then fitted on models and modified, until they become a perfect fit," reports Grover.

Raw materials and inventory control

The raw materials that go into lingerie are, in order of volume, fabrics, elastics and accessories. Lingerie manufacturers in India buy fabric either in India, South East Asia or Europe. In South East Asia, China and Thailand are the main suppliers. Chinese imports are favoured by Indian manufacturers as they are forty per cent cheaper than European imports. While India still rules the market as far as cotton is concerned, China beats India's prices by a large margin when it comes to blends of fabric. For example an Indian-made polyester blend would cost about Rs 120/ meter, whereas the Chinese fabric will cost only Rs 95/ meter. All the high-quality fabric for lingerie in India comes from European countries.

Companies like Carvico SpA, Jersey Lomalina and Simplex Knitting are known for their warp knit, circular knit and simplex fabrics, respectively.

Groversons' mix seems to be typical. "We use both domestic and imported fabrics. Domestic fabrics are bought from Arvind Mill, Krishna lifestyle (Mumbai), Komal Tex Fab (Ahmedabad) and others. We buy imported fabrics from the likes of Bischoff (Swiss), Carvico (Italy), Femina Laces (Bangkok)," explains Grover. The fashion nature of the business also means that there must be many different colours and patterns. In a season Grosvenor will typically use 30-40 fabrics in different colours and patterns. At a given point of time, it keeps stock of about 18-22 different fabrics in an average quantity of about 2,500 metres each.

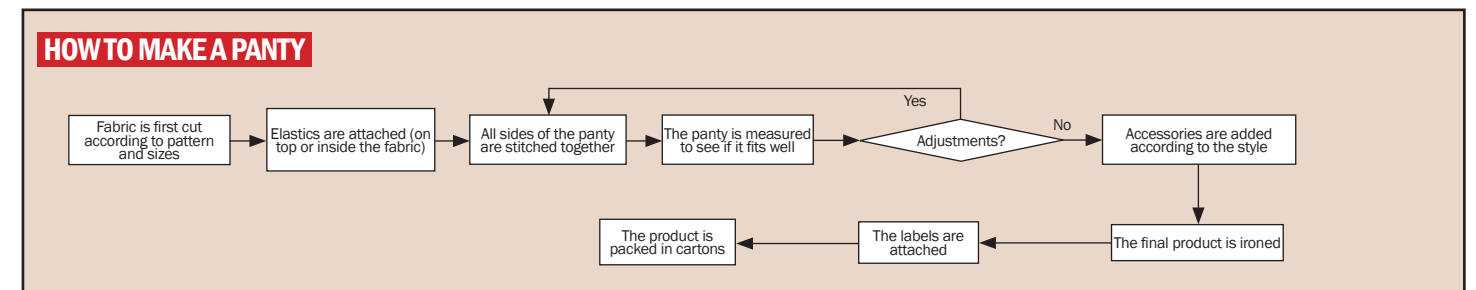
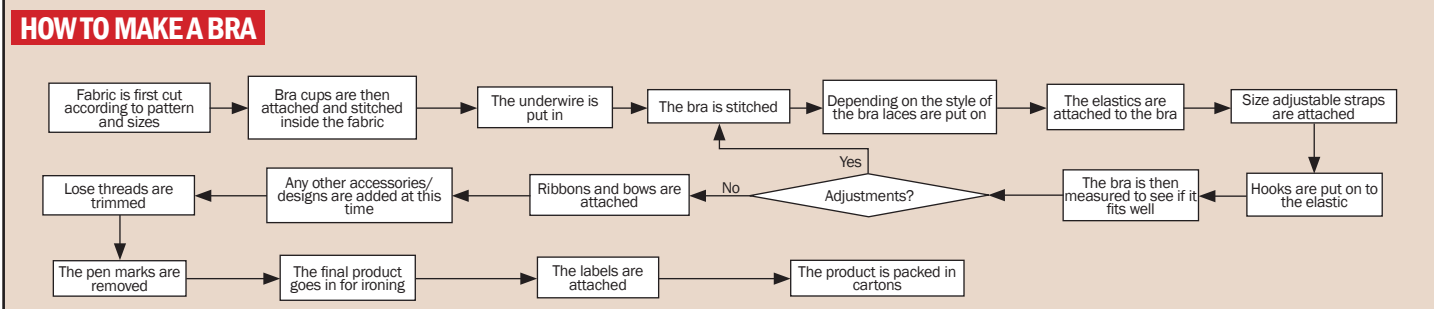
There is not only the matter of colours and patterns, but also of material types. In other words, it is not only fashion, but also technology in the form of fabric innovation, that complicates the life of the lingerie manufacturer. Here is how Ujwal Khanna, partner of Golden Hosiery puts it: "There has been great innovation in fabrics. Today there are several fabrics that include lycra, satin, hosiery, net, etc. Viscose fibre is another fabric that is extremely comfortable and makes for a snug fit. For the mass-market brands, lycra lace is by far the most difficult to produce, it is also the most expensive. Woven tricots rank amongst the cheapest. Lycra is difficult to produce because of its instability, it is a flimsy fabric and has to be stitched and cut by experienced workers, or the size may go wrong."

After fabrics, there are elastics. A wide variety is available, costing anywhere between Rs 15 to Rs 100 per metre, depending on the finish, shine, feel and durability. "We procure elastics from India, Sri Lanka as well as China," "Some of the companies selling elastics in India are Ginza Industries, Lion Tapes, Juliet and Sachinam Elastics; in Srilanka we buy from Stretchline," reports Vineet Nagpal, GM Production at Groversons. Lingerie consumes

kilometres of the stuff. For example, a 30 inch panty requires about 20 inches of elastic. So 1 million Indian panties would require some 500 km of elastic. Prior to its researches GO had not thought of panties this way.

A more recent development is the proliferation of accessories. The bras now come complete with plastic and metal rings, underwire, side bones, laces, knitted fabric, crochet elastics, ribbons, transparent straps etc. Sounds almost like accoutrement worn by joustors in medieval tournaments. Grover points out the importance of accessories to the business: "We deem it essential to store accessories such as bra cups-silute, ring slides and hook eyes, which we buy from China. Underwires are mainly bought from S and S Industries in India."

All these raw materials are stored in a warehouse in the manufacturing unit. The fabrics are held at the ready on racks or on pallets while the elastics and accessories are stored in boxes. The number of stock keeping units (SKUs), and hence the complexity of managing the inventory, depends on the market segment served by the manufacturer. The high-end, fashion-driven segments require more fabrics and more accessories and make the



LINGERIE MANUFACTURERS				
Company Name	Year Founded	Main Brands	Production (Units)	Price Range (Rs)
Groversons Apparels Pvt Ltd	1956	Paris Beauty / Sparsh / Miss T / Poems	Manesar, New Delhi, Karnal Road Industrial Area, Tronica City(National Capital Region)	300-1500
Golden Hosiery	1971	Prince, Princess	Delhi, Kolkata, Tirupur, Coimbatore	50-1500
Bodycare International Ltd	1992	Bodycare	Delhi	100-250
Major Brands (India) Pvt. Ltd	2001	Mango, Aldo, La Senza, Promod, Nine West, Charles & Keith, Okaidi, Aldo Accessories and Inglot	Abroad	390-3940
Gokaldas Intimate Wear Pvt Ltd	2002	Enamor	Bangalore	500-2500
Etam Future Fashion Pvt Ltd	2007	Etam Lingerie	France	395-1695

Source: GO research

manufacturer's inventory control task more arduous.

Many companies use computerised inventory control systems. For basic items, when inventory falls below a margin known as the reorder level, an order for an amount calculated by the computerised system is automatically sent out. Only seasonal or high-price item orders will be calculated manually rather than automatically by the system. This is now the case at Groversons as Nagpal explains, "On an average we have about 30,000 pieces of each accessory. Of course the numbers differ from product to product, we might have about 50,000 pieces of elastics stocked but only 10,000 pieces of underwires at a given time. It was becoming too time-consuming to figure out manually when to reorder all the different types of items we have. Hence, we have recently installed a software system which

tracks inventory levels, and at a given minimum level suggests a reorder."

Production

Lingerie is a batch manufacturing business. Batches of a certain product are created in response to customer orders. A master scheduling process determines which batches to produce on what day, based on delivery dates, and on machine and operator availability. A work order specifying the item type, operations, quantity and due date will accompany the batch

through the three major stages, cutting, sewing, finishing and packing.

Looking inside a factory, Golden Hosiery's for example, the division of labour looks as follows. There are twenty sewers, eight workers on finishing, six employees each assigned to ironing and packing. About ten helpers assist in the whole process, and three masters who ensure that the pattern cutting, sewing and finishing is done correctly. Five employees are responsible for dispensing of stock and finally two quality

controllers ensure that the product has no defect and pass it on to the five delivery personnel.

The first stage in the manufacturing process is cutting. Fabric is pulled from the warehouse (fabric inventory records will be updated at that time) and laid out on a table; paper patterns are positioned on top of the fabric and cutters using high-powered cutting machines follow the patterns to create the various pieces that will then be sewn together. As you can imagine, the patterns are designed to minimise fabric wastage. Ujwal Khanna summarises the process at Golden Hosiery: "Cutting is done completely by hand, there are about five cutters in our unit who cut through five layers of fabric at a time when the fabric is fine and two layers when it is thicker."

The cut pieces are then gathered together to form the batches. The batches will go from one sewing work station to the next in a pre-ordained sequence. Different types of product will require different types of stitches and will therefore go through different stitching-machine workstations. A very basic panty will require only a half-dozen operations. A more complicated item such as a bra will call for a dozen, or more,

operations. Among these are the attaching and stitching of the cups, sewing of elastics and straps, attachment of hooks and all of the accessories (see charts for panty and bra operations). A more sophisticated item, think sleepwear, can require several dozen operations.

There is nothing demure or romantic about a lingerie factory. There are dozens of machines whose operation composes a deafening racket. Here is how Ujwal Khanna describes the inventory of machines at Golden Hosiery: "The ones used for cutting are the band knife, straight knife and round blade cutting machines. We use Italian moulding machines. For sewing there is the lock stitch-single needle/double needle, zigzag single-and three-steps and the edge cutter. There is also the chain stitch, over lock, flat steaming stitch, and bar tuck. Steam irons are used for the finishing process."

While high-end lingerie brands like Enamor import their machinery from abroad, the mass-market brands believe in keeping their costs down. "We buy our machinery in India, all metropolitans in India have shops that sell good quality machinery. The popular companies are Brother, Yo Motto (a Japanese firm). A few Chinese companies have entered the market and are selling machinery at reasonable prices," explains Khanna.

Machinery to manufacture lingerie can cost anywhere between Rs 3,000 to Rs 80,000. It just depends on where you purchase it and what type of machine you are buying. Buying from abroad would obviously

mean it'd be more expensive; buying locally would cut cost. A sewing machine for Rs 3,000 would have only one style of stitch but the imported machine for Rs 80,000 can manage different types of stitches at a higher quality level.

As for the workers running all this machinery, the labour is paid according to the wage structure in India. Minimum wages in India are about Rs 3850 a month. But most workers are paid according to experience. An employee who has no prior experience will obviously be hired at the going minimum. "Most of our employees are talented and able workers hence we pay an average of Rs 5500 a month," says Khanna. In Groversons workers are paid per piece (rather than by time worked) and for skilled workers pay comes up to Rs 5500 per month.

As in other businesses, quality is of key concern in lingerie. Being a popular brand in India, Enamor has to ever keep it in mind. "There is a quality checker assigned to every major step of the manufacturing process. During the process of cutting, it is checked by a cutting supervisor. The process of stitching is supervised on the line and each production line has a supervisor with responsibility for quality. Once the production is completed the product goes through quality control. Once past it, it moves into the finishing process consisting of attaching hangtags, etc. and then it is packed. As soon as the final product is ready it is checked again on a random basis by a quality checker," explains Nidha Adheni, Brand Manager

CANADA'S GIFT TO HUMANITY

Here is a quick peek at the Wonderbra, this planet's most famous lingerie item

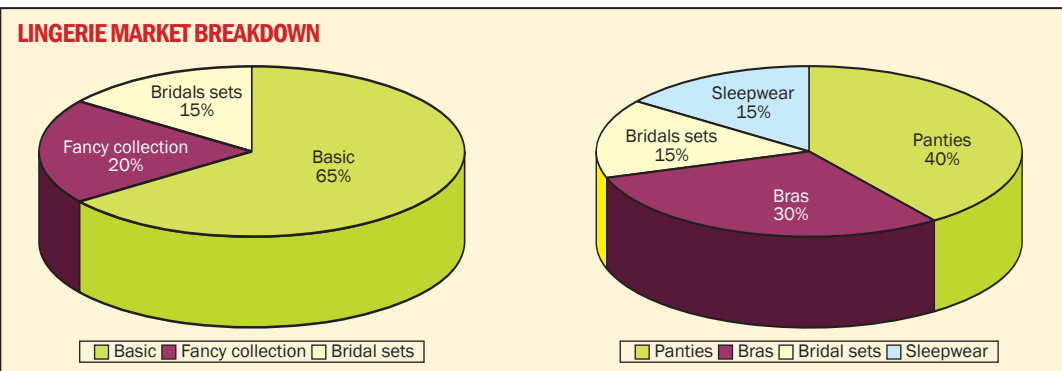
A Canadian by the name of Moe Nadler is responsible for the development of the Wonderbra brand. He licensed the trademark in 1939 (from the American patent holder, Israel Pilot) and built it up, so to speak, for the next thirty years. In 1960 he developed a lacy, half push-up bra called the pigeonant (meaning "pigeon-breasted" in French). A few years later his company came out with a deeply plunged, laced push-up design, known as the model 1300. It was this model that took off in the UK in the 1990s (by that time Nadler had sold his company to Sara Lee).



While there is no consensus on the cause for the take-off, one line of retro-reasoning attributes it to the impetus given by the French designer Jean-Pierre Gaultier, who began promoting underwear as outerwear. In any case, by 1994 Wonderbra had grown into a full-range lingerie fashion label.

The science-minded will be served by the fact that a state of the art bra has 54 design features that make for lift at the peak and support at the base of the mammaries, while also creating a curvaceous and gorgeous concavity. The fuselage, as it were, of Wonderbra has five main construction elements. Starting with a three-part cup construction, where each cup is made of three separate pieces, it proceeds to precision-angled back and underwire cups (the key to Wonderbra's unique, persuasive cleavage). Then there are the removable contoured pads for lift and mass (Wonderbra gives maximum uplift and lateral control; its gate back and full power netting keeps the bra cups in place-much as the skeleton frame of a Zeppelin supports and keeps in place its hull). Finally the adjustable non-stretch straps keep the construct in place, much like a Zeppelin's mooring lines.

Rakesh Grover, Managing Director of Grovesnors, summarises the odyssey as follows: "Thanks to Wonderbra, bras went on to become an aspirational, luxurious beauty product rather than just a utility product. This development has completely changed the contour of the brassiere world by providing a vast range of designs, colours, and styles." ■



CASE STUDY OPERATIONS



Another aspect of quality control occurs up front, at the time of fabric ordering. Ujiwal Khanna of Golden Hosiery explains: "We have a long procedure in testing the fabric. We employ a manual process of tumble-drying the cloth, dip drying and then sun drying, to assess for shrinkage, quality of the cloth, and other parameters. Many a time, vendors selling fabric claim that the fabric has five per cent elasticity. But after we test the fabric it turns out that it was only one per cent," says Khanna.

Despite all this testing, it sometimes happens that the customer is not satisfied. "Even after all the care we take to

manufacture a quality product, there are occasions when the retailer rejects it. This happens purely due to poor quality of the fabric, but we have to incur the loss. We then take the product back and wheedle a place in our production schedules to produce a replacement lot," adds Khanna.

Another, more pleasant, case of unplanned production is the rush reorder. To handle such situations, "we normally keep back-ups of raw material and stitching, and put in extra work shifts at the factory," explains Rakesh Grover of Groversons.

And so, after having spent the first part of its life in the humming, buzzing and frenetic confines of the factory floor,

DAINTY BUT HARROWING

The life of a lingerie plant manager is made of lots of styles and sizes, lots of work orders and lots of glitches

Since product quality is the first concern of a plant manager, the first requirement is thorough knowledge of the raw materials (fabrics, elastics, accessories) and of industrial sewing. The plant manager functions as a virtual chief quality inspector and must be fluent in the product and process to foster a quality mindset and deal with all the raw material and mechanical glitches as they arise. "It is an extremely challenging job. To be a manufacturing manager in a lingerie plant not only do you need to have the managerial skills that one can learn in school but you also need sufficient know how about the specific product and process," says Rakesh Grover, Managing Director, Groversons.

Lingerie is a batch manufacturing process and the fancier the product, the more styles there are and the smaller the batches. The mind of a lingerie manager therefore needs to have many compartments for all the different products he has to master and all the requirements of the different in-process work orders he has to remember.

Master scheduling, the art of scheduling work orders to meet delivery dates under the constraints of machine capacity and worker skills, can never be perfect. When there are insufficient lead-times, management cool needs to come into play. "Insufficient lead-times result in high pressure. This makes it even more difficult to be able to manage and maintain the quality of production. Hence it is essential for us to be calm and see the production through," says Vineet Nagpal, GM Productions, Groversons.

Machine breakdowns are a major concern as without proper working machines it is impossible to produce quality garments and maintain high productivity. Some factories have the machine equivalent of safety stock, one or two spare machines which can be used in case of a breakdown. But if extra machines aren't available, the manager may need to juggle work order flow so that workers do not remain idle. Or he may need to organize overtime to make up the lost time. It is all these glitches combined with the daunting number of work orders that make the plant manager's job such a pressure-laden one.

The fact that workstations are typically cramped together and that the machines are noisy makes for an enervating environment no matter what. Think of a lingerie plant as the antithesis of a sterilised and humming chip plant. Given the numerous small glitches, mechanical or human, that necessarily happen, plant managers need to be zen masters. ■

the bra, panty, slip, or negligee makes it to the subdued and elegant shelves and racks of the lingerie store--and thence to madame's boudoir. Hopefully from there the industry's labour of love proceeds to some

place rendering merely human pleasure. Happy Valentine's Day! ■

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