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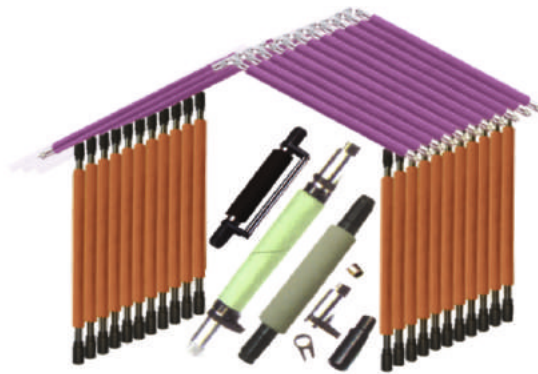
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### *A Summer Blazer might sound like an oxymoron but with season constraint*

Summer months rolled in, fashion conscious refused to let go of their layers. Enter the summer blazer. An updated takes on its warmer brother, it is lighter, colourful and with a more roomy fit. What works in the favour of blazer is the fact that it is so easy to style, it goes with everything—from dress to skirt, shorts to jeans. It is widely seen that blazer come back over the last few seasons. A summer blazer is usually in cotton, linen, light silks, crepes and even super fine wool that has a natural cooling quality.

Once a workwear staple, the blazer is more versatile now because of its design and styling in recent fashion seasons. Longer jackets can double up as evening dresses, when it is accessorised with belts. Taking cue from the runway and celebrities, the summer blazer could be gender neutral and it may be added a feminine touch of glamour by the way of a brooch or bling. The summer blazer is a polished layering piece.

Designers recommended over sized silhouettes and interesting textures in gender-neutral styles, shoulder pads and anti-fit designs are in vogue too. Blazer borrowed from brother/boyfriend/father is the trend we currently are in love with. A blazer not only help you look cool but also stay cool, summer layering is a must as thoughtful layering helps combat summer heat in a better way. Summer light weight jacket is a classic, use two-button for work and single-button for leisure wear and one can never go wrong with slim-fit blazer. Layering is great way to add an element of personal style to any outfit in any season. It is a great way to carry an outfit from indoor to outdoor or a workday to a night out. Summer blazer can take the person from zoom meetings to small get together. If you cannot be better than your competitor, just dress better. And a blazer might just be the thin line between fashion and fabulous.

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### ⇒ During the global inflation worries, China moves to soften prices

Prices are jumping in the United States and around the world, prompting growing warnings that a wave of inflation could threaten the global economy if it persists. China isn't waiting to find out. Beijing is moving swiftly to protect its factories and work-places from rising costs. It has discouraged steel makers and coal producers from raising prices. It has vowed to investigate price-gouging and hoarding. And it has allowed its currency to rise in value to a level unseen in years, giving it a more valuable and powerful tool for buying up the world's grain, meat, petroleum, minerals and other essentials. Rising prices in China, by far the world's biggest manufacturer and exporter, could be felt around the world. Annabelle New York, a Manhattan-based importer and distributor that sells down-filled parkas and other high-end apparel to department stores and other retailers, already raised prices 10% this spring. But the company's costs for merchandise from China are up 20%, said Bennett Model, the company's chief executive and president. Chemicals to make the parkas' synthetic fabric shells have become costlier as world oil prices rise. Down feathers, for which China is the world's dominant producer, have become more expensive. And trans-Pacific freight costs have tripled for some shipments as air cargo companies and shipping lines have struggled to keep up with demand. Only the fear of losing customers has prevented Mr. Model from passing along all these higher costs to American stores. He has accepted narrower profit margins instead. "If I really wanted to cover all the increases, the price would be prohibitive right now," he said. It's far from certain that the current bout of global inflation will last. Many economists believe price increases will moderate once companies clear supply bottlenecks caused by factory closings and other measures taken during the coronavirus pandemic. But China has clear reasons to fear inflation. Its breakneck economic growth over recent decades has periodically been accompanied

by surging prices that provoked anger across the country. Rising prices contributed to the demonstrations in Tiananmen Square in Beijing in 1989. The authorities have long used informal price controls and subsidies to prevent rising costs from being felt in China's supermarkets and at the family dinner table. For some goods, prices are indeed rising. Paper manufacturers have raised bulk volume prices for products like napkins and toilet paper four times this spring. Soybeans for tofu are becoming costlier. But for now, Chinese manufacturers, rather than consumers, are feeling the price increases. Wholesale prices in China were almost 7% higher in April than a year earlier, when the pandemic was holding down prices. Costlier iron ore from Australia and corn from the United States account for much of that rise. □

### ⇒ US job growth surged in May; unemployment rate falls to 5.8%

US employers boosted hiring in May as the easing pandemic, helped by vaccinations, pulled more people back into the labour force, offering assurance that the economy's recovery from the Covid-19 recession remained on track. Non-farm payrolls increased by 559,000 jobs last month, the Labor Department said in its closely watched employment report recently. Data for April was revised slightly higher to show payrolls rising by 278,000 jobs instead of 266,000 as previously reported. Economists polled by Reuters had forecast 650,000 jobs created in May. The unemployment rate fell to 5.8% from 6.1% in April. The jobless rate has been understated by people misclassifying themselves as being "employed but absent from work." April's initial employment count, which delivered roughly a quarter of the new jobs economists had forecast, led to handwringing among some economists and investors that growth was stagnating at a time when inflation was rising. The improving public health situation and massive fiscal stimulus are supporting the economy. At least half of the American population has been fully vaccinated against COVID-19, according to data from the U.S. Centers for Disease Control and Prevention. That has

allowed authorities across the country to lift virus-related restrictions on businesses, which nearly paralyzed the economy early in the pandemic. But the reopening of the economy is straining the supply chain. A worker shortage blamed on childcare complications, generous unemployment checks and lingering fears over COVID-19 sharply restrained hiring. There are a record 8.1 million job openings. Millions of workers, mostly women, remain at home as most school districts have not moved to full-time in-person learning. Despite vaccines being widely accessible, some segments of the population are reluctant to get inoculated, which labor market experts say is discouraging some people from returning to work. Government-funded benefits, including a \$300 weekly unemployment subsidy, are also constraining hiring. Republican governors in 25 states are terminating this benefit and other unemployment programs starting next shortly. These states account for more than 40% of the workforce. The expanded benefits will end in early September across the country. That, together with more people vaccinated and schools fully reopening in the fall, is expected to ease the worker scarcity by September. □

### ||| G7 nations unanimous on uniform minimum corporate tax

A group of the world's richest nations reached a landmark deal recently to close cross-border tax loopholes used by some of the world's biggest companies. The Group of Seven said it would back a minimum global corporation tax rate of at least 15%, and put in place measures to ensure that taxes were paid in the countries where businesses operate. "After years of discussion, G7 Finance Ministers have reached a historic agreement to reform the global tax system to make it fit for the global digital age," British Finance Minister Rishi Sunak told reporters. The accord, which could form the basis of a global pact in July, is aimed at ending a decades-long "race to the bottom", in which countries have competed to attract corporate giants with ultra-low tax rates and exemptions. That has, in turn, cost their public coffers hundreds of billions of

dollars—a shortfall they now need to recoup all the more urgently to pay for the huge cost of propping up economies ravaged by COVID-19. □

### ||| Global food prices rise to near decade high : UN

Global food prices extended their rally to the highest in almost a decade, heightening concerns over bulging grocery bills as economies struggle to exit the Covid-19 crisis. A United Nations gauge of world food costs climbed for a 12th straight month in May, its longest stretch in a decade. The continued advance risks accelerating broader inflation, complicating central banks efforts to provide more stimulus. Drought in key Brazilian growing regions is crippling crops from corn to coffee, and vegetable oil production growth has slowed in Southeast Asia. That's boosting costs for livestock producers and risks further straining global grain stockpiles that have been depleted by soaring Chinese demand. The surge has stirred memories of 2008 and 2011, when price spikes led to food riots in more than 30 nations. □

### ||| China's industrial production soars 6.6%

China's main indicators steadied for a second month as of June, a sign that the recovery is in a more stable phase and the economy is rebalancing slowly. The recovery from the pandemic has been led by a property-fueled construction boom and surging industrial production for export, with consumer spending remaining the weak link—and the key to more sustainable growth. The latest data released recently by the statistics bureau showed a shift toward consumption-driven demand is underway, but at a gradual pace. Industrial production rose 6.6 per cent in May on a two-year average basis — which strips out the impact of last year's pandemic — while retail sales grew 4.5 per cent, about half of its pre-pandemic rate. Investment in fixed assets such as property and land was 4.2 per cent on that basis in the five months through May, according to the National Bureau of Statistics. ■

# INDIAN ECONOMY AND TRADE TRENDS

## Lockdowns slow down economic activity in April, May : CLSA

Foreign brokerage CLSA said the initial lockdowns in Indian states due to the second wave of the coronavirus pandemic hit economic activity in April and a bigger hit was likely in May. The brokerage said nearly half of its 43 high-frequency economic indicators for April 2021 worsened and among them, only 35% were above three-month moving averages. CLSA also said half of its macro and consumption indicators deteriorated from the previous month in April and 6% of its industrial indicators worsened. The brokerage said all of its 14 early indicators point towards even weaker economic activity in May as all states went into lockdown during the month. "We believe the relaxation of lockdowns will be gradual and economic normalisation may take at least 2-3 months," said CLSA. The brokerage pointed out that the unemployment rate jumped to an 11-month high of nearly 12% in May from 8% in April. Some of the state governments have announced limited relaxation on lockdown rules from early June as India saw a 52% decline in active cases from the peak of the second wave. □

## Forex reserves touched a record \$600 b

India's foreign exchange reserves rose to a record \$600 billion, although the central bank does not plan to introduce new instruments to manage these inflows. After a risk-off period in April-May, the prospects for capital flows to India are improving again. "As of early June, the country's forex reserves touched \$598.2 billion," RBI Governor Shaktikanta Das said in his policy statement. "We are in the striking distance of achieving \$600 billion of reserves. Based on our current assessment, we feel that the reserves have already crossed \$600 billion." Analysis of historical data indicates that the last \$100 billion has taken exactly a year to be added—the fastest since the global financial crisis of 2008. There is apprehension that the rupee liquidity generated by the accumulation of dollars could impact domestic money market rates. But the central bank seems comfortable the way it is managing the flows. "At the moment, there is no necessity to deploy additional tools to sterilise the forex inflows," the governor said at the post-policy media briefing. "In

any case, at the end of the day (through our daily reverse repo window, the liquidity gets sterilised. It (need for new instruments) will depend on how the situation evolves." Such inflows help in easing external financing constraints, but

could lead to financial market and asset price volatility. In the process, there could be "undesirable and unintended fluctuations in liquidity that can vitiate the monetary policy stance," the governor said. The

Reserve Bank has been actively buying and selling dollars in various segments of the market. In FY21, the central bank bought \$68 billion from the spot market alone. "The success of these efforts is reflected in the stability and orderlines in market conditions and in the exchange rate in spite of large global spill-overs," the governor said. □

## Kitty Swells

The landmark dates India's Forex Reserves

Dec 12, 2003	100.2
Apr 06, 2007	200.3
Feb 29, 2008	301.2
Sept 08, 2017	400.7
June 05, 2020	501.7
June 04, 2021*	600.0

\*Likely. (\$ billion)

Source : RBI

## Farm sector gains 17% export growth

Sharp growth in exports of cereals, oil meals, sugar, cotton, fresh vegetables and vegetable oil boosted India's agriculture exports by 17.34 per cent in 2020-21 to \$41.25 billion after hovering around \$38 billion or lower in the last three years with the farm sector responding positively to opportunities presented by the Covid-19 pandemic, Commerce Secretary Anup Wadhawan has said. "In 2021-22 also the momentum is being sustained with growth in the first two months at 43 per cent. This is a success story we should sustain with some efforts," Wadhawan said addressing a media briefing recently. This is all because of the opportunities that Covid-19 offered that were capitalised upon by exporting a wider variety of products to a larger number of countries, the Secretary said.

### Exports grow

"The increase in exports is thanks to the ability of our agriculture sector to respond to the opportunity. It was also on account of various programmes emanating from the Agriculture Export Policy that were implemented in decentralised manner across States, districts and clusters. There are

several success stories coming out of various clusters," Wadhawan added. India's overall goods exports contracted 7.26 per cent in 2020-21, recording \$290.63 billion, but the farm sector was relatively less affected by the disruption of the Covid-19 pandemic. The steepest growth in exports in 2020-21 was seen in items such as non-basmati rice growing by 136.04 per cent to \$4.79 billion, wheat by 774.17 per cent to \$549.16 million, other cereals by 238.28 per cent \$694.14 million. Other agricultural products, which posted significant increase in exports, as compared to 2019-20, were oil meals (\$1.57 billion - growth of 90.28 per cent), sugar (\$2.78 billion - growth 41.88 per cent), raw cotton (\$1.89 billion - growth 79.43 per cent), fresh vegetables (\$721.47 million - growth 10.71 per cent) and vegetable oils (\$602.77 million - growth 254.39 per cent).

#### Exported locations

Largest markets for India's agriculture products were the US, China, Bangladesh, UAE, Veitnam, Saudi Arabia, Indonesia, Nepal, Iran and Malaysia with exports posting the sharpest growth in Indonesia (102.42 per cent), Bangladesh (95.93 per cent) and Nepal (50.49 per cent). Export of spices like ginger, papper, cinnamon, cardamom, turmeric, saffron etc., which have known therapeutic qualities, has also grown substantially during the year, the Secretary said. Export of spices touched the highest ever level of around \$4 billion during 2020-21. Organic exports posted a 50.94 per cent to \$1.04 billion as against USD 689 million in 2019-20, registering a growth of 50.94 per cent. Organic exports include oil cake/meals, oil seeds, cereals and millets, spices and condiments, tea, medicinal plant products, dry fruits, sugar, pulses and coffee. □

#### Govt. raises MSP for kharif crops

The Centre of late raised the minimum support price (MSP) for kharif crops for the 2021-22 crop season (July-June) by an average 3.7 per cent, with the maximum hike reserved for pulses and oilseeds to encourage farmers to shift from paddy. The relatively higher increase in MSP of kharif pulses and oilseeds comes at a time when their prices are rising owing to low production and a jump in international rates. The Cabinet raised the MSP of tur and urad by ₹300 per quintal in absolute terms to ₹6,300, while that for groundnut seed has been increased by ₹275 per quintal in 2020-21 to ₹5,500, and sesame

seed by ₹452 to ₹7,307. In comparison, the MSP of common grade paddy, the biggest cereal grown during the kharif season, has been raised by a modest ₹72 per quintal to ₹1,940 per quintal. While paddy is grown in high rainfall areas or in well-irrigated areas, tur and urad are grown in areas that see less rainfall, according to Pramod Kumar Joshi, former director, South-Asia, International Food Policy Research Institute. "Strategy-wise it is good to use MSP as a tool to encourage farmers to shift from water-guzzling paddy to more in-demand pulses and oilseeds, but experience shows that shift does not happen so easily as climatic conditions needed are entirely different," Joshi, who was part of the three-member panel set up by the SC on three farm Acts, told recently. Agriculture Minister Narendra Singh Tomar said that hikes once again dispel the notion that the current system of MSP will be dismantled once the new farm Acts come into force. □

#### GST collection Rs. 1 lakh in May lower than previous month

Gross Goods and Services Tax (GST) receipts came in at ₹1,02,709 crore in May, markedly lower than the record ₹1,41,384 crore mopped up in the previous month, yet a decent sum given the second Covid wave. May collections mostly pertained to the transactions conducted in April, so it reflected the lockdown's impact only marginally; the collections could be much lower in June (May transactions). The government said GST collections reported for May included the returns filed till June 4, as taxpayers were given various relief measures in the form of waiver/reduction in interest on delayed returns filing for 15 days in the wake of the second Covid wave. The actual revenues for May would be higher since all the extended dates were yet to expire, it added. In recent months, the government's GST revenue has been robust—it has crossed the ₹1 lakh crore mark for the eight straight month in May, thanks to steps taken to curb evasion and also a shift to business away from the informal sector, in addition to a nascent economic recovery that appears to have been quickly disrupted by the pandemic's second surge. For the second year in a row, the Centre will borrow under special, relatively low-cost mechanism in 2021-22 to bridge a yawning shortfall in the GST compensation cess pool and transfer the funds to states as back-to-back loans, sans any consequent fiscal cost to states. ■



## Textile industry finds hope on the robust exports for growth

With the second wave of the pandemic causing temporary disruption in manufacturing, India's apparel industry expects robust external demand to drive growth in the sector.

According to top players in the industry, a resurgence in apparel spending in the western markets has led to the recent growth in textiles and apparel exports from India. Besides, there has been a shift in demand in the US, the UK as well as European nations towards Indian cotton garments owing to a ban on cotton produced in China. While the domestic market is largely stagnant due to localised lockdowns during April-May, share of exports has grown to almost 90 per cent of Arvind's sales, Kulin Lalbhai, executive director of the company, told recently.

"While garments have always been largely exported by us, we are predominantly a fabric player wherein our fabric is converted into garments. Generally, we see 60 per cent exports and 40 per cent domestic sales in fabric but currently exports have been so strong that they are almost 90 per cent of our fabric sales," said Lalbhai.

According to him, there is a pent-up demand for textiles and apparel, which was tepid a year ago owing to Covid-induced lockdowns. "Global brands were careful while buying during the pandemic and their pipelines are empty. They now need to fill them as markets have opened up in the US, the UK and Europe. The US opened but a lot of restrictions were in place which are now going away. The online business growth is also resulting in additional volumes," Lalbhai added. Outbound shipments have been on the rise for apparels over the last few months. Exporters said that the order book is encouraging. "Exports are doing better and progress is good as compared to last year. The second wave has affected dispatch and production to a certain extent but we are slowly coming out of it, with states beginning the unlock process," said A Sakthivel, chairman of Apparel Export Promotion Council (AEPC).

"There is a ban on cotton produced in China resulting in more orders for cotton garments. This is one of the reasons for the higher demand. Demand for medical textiles such as PPE suits and masks since August (2020) has been on a rise. The world is looking for sustainable textiles, and we are good at producing that," Sakthivel said.

Western buyers are also shifting to India for cotton and this has led to hikes in cotton and cotton yarn prices in recent times.

Similarly, home textiles and made-ups are also witnessing a spurt in demand and sales. According

to a Welspun spokesperson, the US government's office of textiles and apparel (OTEXA) data in the last three years shows that India's market share in towels and bedsheets increased by four per cent and reached 42 per cent and 53 per cent, respectively.

"We have seen a massive shift towards e-commerce. With digitisation accelerating in the US markets, we hope to see an upside happening which will be contributed by our brands like Christy, Martha Stewart, Scott Living, online and offline. And, also from our D2C brands like Welspun and Welhome. We definitely see huge potential there and robust growth, moving forward. Recent US economic indicators show that the economy is on a firm footing and is expected to grow the fastest in three decades," the Welspun spokesperson stated. According to Welspun, vaccination, economic stimulus, payments, and tax refunds are providing a substantial increase in personal income and thus purchasing power in the US. The challenge has been in making most of the growing export from India, especially in garments, due to the localised lockdown. Extended lockdowns in states such as Karnataka, which house several garmenting units, including those of Arvind, have hit manufacturing. ■

### Cotton on to this

Where is cotton grown? Well, in countries like India, Pakistan, Bangladesh, China, and... in space!

No kidding, NASA is carrying out an experiment on the International Space Station, which is circling 400 km above the earth to see how cotton grows in the absence of gravity.

Cotton is an indispensable cash crop, and the world grows about 25 million tonnes of it every year. The experiment, which will be conducted by NASA's Expedition65 to the ISS, is designed to investigate to what extent the root system architecture influences stress resilience, water-use efficiency and carbon sequestration. These properties are believed to be linked to an enhanced root system that explores the soil wider and deeper for water and nutrients. Such exploration patterns are strongly linked to gravity.

Well, then, what happens if there is no gravity? Which environmental factors or genes are at play in the development of the root system? NASA will tell us after October, when Expedition65 ends.

The investigation has been sponsored by the US retail store Target. No wonder, then, that the programme is called 'Targeting Improved Cotton Through On-orbit Cultivation'. ■

## More expansion of jute production to boost jute output

India's jute production could be higher this year on favourable weather conditions, and increase in sowing area due to remunerative prices the golden fibre fetched last year. The Centre's decision to raise the minimum support price of ₹4,500 a quintal (TD-5 variety) this year from ₹4,225 last year is also expected to help the higher production.

Raw jute production, particularly in West Bengal, is likely to be higher this year by about 55 per cent at 85-90 lakh bales (of 180 kg each) in the next season starting July, against 55-58 lakh bales during the current season.

The country's jute cultivation is primarily concentrated in three States — West Bengal, Bihar and Assam. Bengal accounts for nearly 80 per cent of the area under jute and 83 per cent of its production, followed by Assam with a production share of 8 per cent, with Bihar making up the rest.

According to Raghav Gupta, Chairman, Indian Jute Mills' Association (IJMA), there has been a 20 per cent expansion in sowing area this year as jute farmers have been encouraged by the high prices the fibre fetched last season. Jute planting, which had dropped to 6.5 lakh hectares (lh) last year, is estimated to have increased to around 7.5 lh this year. "There has been a 20 per cent expansion in jute acreage and the weather has been very favourable. The crop is very healthy. So we are expecting anywhere between 85 and 90 lakh bales of jute crop this season," Gupta told recently.

There is a meagre quantity of carryover stock due to the lower production. Poor weather conditions and the migration of jute farmers to other crops such as maize dragged raw jute production to 55 lakh bales in 2020-21 against an average production of 65-70 lakh bales.

This year, growers who had shifted to maize could return to jute as they hardly get the MSP for the coarse cereals fixed by the government. This is despite maize exports rising to a six-year-high last fiscal. The Centre has raised the MSP for maize for the next season by a paltry ₹20 to ₹1,870 a quintal.

Raw jute prices, which were ruling at around ₹4,750 a quintal at the beginning of the season in July 2020, are currently ruling at around ₹9,000 a quintal, up 89 per cent. This has encouraged farmers to go in for large-scale sowing of the crop this year.

Jute consumption totally is estimated to be 75-80 lakh bales, including demand from both the organised and unorganised sectors. With the drop in production, there was a "perceived shortage" which pushed up prices.

### Prices to stabilise

Prices are, however, likely to stabilise at around ₹5,500 a quintal on the back of higher production this year. "The government demand is very robust. We expect to supply the requirement during 2021-22. For kharif, they have a requirement of 21-22 lakh bales, but we may not be able to match the entire supply due to the Covid lockdown and spike in raw jute prices. We expect to supply around 15 lakh bales, but we will fully meet their rabi requirement," he said. ■

### Cotton body slashes output estimate for current season

In its latest cotton crop estimate for the season 2020-21 ending September, the trade body Cotton Association of India (CAI) has reduced the crop size by four lakh bales (each of 170 kg) to 356 lakh bales.

The reduction is attributed to the lower output expected in Gujarat and Telangana. The CAI estimates show a decrease of one lakh bales in the crop estimate for Gujarat, while cotton crop for Telangana is estimated lower by three lakh bales based on the pressing data provided by Telangana Cotton Millers & Traders Welfare Association.

The trade body has increased the consumption estimate for the current crop year by 10 lakh bales to 325 lakh bales from its previous estimate of 315 lakh bales.

"The Committee has made this revision considering the brisk demand for cotton yarn despite disruptions caused on account of the lockdown implemented to arrest the second wave of Covid-19 pandemic in the country," it said.

Cotton exports for 2020-21 is projected to increase by seven lakh bales to 72 lakh bales based on the input received from exporter-members, CAI noted. As of May 31, 2021, about 58 lakh bales are estimated to have been shipped. Imports, meanwhile, are estimated to be 10 lakh bales as against earlier estimated 11 lakh bales.

Cotton arrivals from October 2020 to May 2021 are estimated at 340.19 lakh bales.

Based on the latest production, consumption, imports and exports, the closing stock at the end of the season on September 30, 2021, is estimated at 94 lakh bales. ■

## Covid-hit formal wear segment accelerates its business

With work from home (WFH) having become the norm for corporate India for more than a year, the formalwear segment has taken a beating. During the first wave of the pandemic, revenue for lifestyle brands, mainly formalwear, declined by 81% in the first quarter of FY21, abetted by store closures during lockdowns, as per industry estimates.

As a result, the growth of casual wear options has accelerated, with formalwear brands like Raymonds, Van Heusen and Peter England launching new clothing ranges in this space. Companies are also focusing on digitising the customer experience by going D2C (direct to consumer sales, or sales through their own websites).

“Brands are expanding their online presence with the incorporation of 3D technology, and are innovating with spandex-comfort fabrics,” Prashant Agarwal, co-founder and joint managing director, Wazir Advisors, said.

For instance, Raymond has launched a virtual shopping experience through WhatsApp and Zoom video calls, with a concierge service for tailored garments from the comfort of consumers’ homes. Its readymade segment, on the other hand, is focusing on comfort and “casualisation” with the infusion of cotton-based fabrics.

“While lightweight fabrics are receiving more demand, we have introduced active formalwear with mild stretch and autofit, along with functionalities, in our bottom wear range,” Ganesh Kumar, COO, lifestyle business, Raymond said.

ABFRL’s Van Heusen recently launched a sub-brand, Denim Labs, to sell more t-shirts, denim shirts, jeans, casual jackets and casual shirts. Bombay Shirt Company, too, has launched two brands : Cityof, a casual wear shirt brand, and Korra, a denim brand. Launched in the second half of 2020, the company’s online sales have doubled this year, said Akshay Narvekar, founder and CEO, Bombay Shirt Company.

Anand Ramanathan, partner, Deloitte India, said, “Although for this category, a majority of e-commerce revenue is still coming from marketplaces like Myntra and Amazon, the D2C channels are experiencing high growth with a smaller client base.” ABFRL also witnessed a

strong e-commerce performance with double-digit growth, from 7% in FY20 to 15% in FY21, as per company data.

With the summer wedding season getting postponed to the second half of this year, brands are anticipating an early recovery in formal/ethnic wear. Raymond has also introduced Shubharambh, a wedding advisory solution service, for weddings and celebrations across the year. “The industry had reached pre-Covid sales in January and February this year, after a fillip provided by last year’s pent-up demand and Diwali sales,” Ramanathan said.

Brands see this trend of shifting from formalwear to casual/semi-casual as ‘temporary’ because the pandemic may not change buying behaviour overnight. According to Wazir Advisors, in FY19-20, the formalwear market was pegged at ₹1,400 crore and next year onwards, the segment could grow between 8-10% over the next four years. “As there are no blanket restrictions nationally this year, 2021 could prove to be more of a stabilising period for the industry,” Agarwal said.

Furthermore, brands are prioritising tier II and tier III markets for offline store expansion, by leveraging lower rentals egged on by the pandemic. ■

### Hit by Covid-19, textile NPAs rose to 16.9% in December

After witnessing a continuous improvement for eight quarters, the textile sector’s asset quality slipped as gross non-performing assets (NPAs) rose to 16.92 per cent in December 2020 from 15.92 per cent in September 2020, triggered by the Covid-induced lockdown, according to the credit bureau CRIF-SIDBI’s report.

According to the CRIF report, the total amount of credit availed by the sector as of December 2020 stood at ₹1.62 trillion, which witnessed a Y-o-Y decline of nearly 20 per cent. This is due to the suspension of manufacturing activities in the immediate aftermath of the lockdown in March 2020. ■

## Covid stress hits hard textile units in Kanpur, Chennai-Kancheepuram

India's textile clusters in Kanpur and Chennai-Kancheepuram have been worst hit by the COVID-19 pandemic, with the highest proportion of loans turning delinquent by December 2020, according to a report.

The country's textiles industry has been in trouble since the national lockdown imposed in March last year, with outstanding credit to the sector falling 20% year-on-year by December 2020 and loans to export units falling by a sharper 25%, according to a SIDBI-CRIF report on the sector released recently.

The textiles and apparel industry provides direct and indirect employment to an estimated 10.5 crore Indians and contributes 2% to GDP.

A recent short survey carried out by SIDBI of textile units in Tamil Nadu, Uttar Pradesh, Haryana and Gujarat revealed that the sector also faces several operational roadblocks at the ground level, including high fuel and raw material prices, challenging GST norms and delayed tax refunds.

Almost 82% of loans extended to textile units in Kanpur had turned delinquent by December 2020, with the Chennai-Kancheepuram belt reporting a delinquency rate of 42.6% of outstanding credit. Loans are labelled delinquent after past dues accumulate for more than 90 days.

The Pune-Kolhapur belt, and the Ludhiana-Jalandhar-Amritsar textile region reported delinquency rates of 32% and 29% in the same period. Ahmedabad and Tiruppur-Coimbatore-Madurai recorded the lowest proportion of loans going bad, at 8.24% and 8.6%, respectively, compared with the overall delinquency rate of 16.4% in the textiles sector.

Among micro, small and medium textile enterprises, the textiles cluster in Punjab reported the highest delinquencies at almost 25%, followed by Chennai-Kancheepuram (23.6%) and Hyderabad-Guntur (22.8%).

The SIDBI survey found that ongoing changes in the GST portal and filing of returns has created confusion for units, with exporters stating that getting Integrated GST refunds is a 'major challenge'. The lack of clarity on the export benefits that would accrue under the new Remission of Duties and Taxes on Export Products (RoDTEP) scheme, isn't helping.

Most units said access to working capital was a challenge and cash flows were constrained, while 'ever-increasing fuel prices' have escalated transport costs. The rise in yarn and other raw material prices, and fluctuating cotton prices, are also difficult to cope with, even as export orders have slowed down due to COVID-19, the survey found. ■

## Cotton bodies get together to extend area under cultivation, improve yields

With cotton commanding prices as high as ₹7,500 per quintal, the Cotton Corporation of India (CCI) and the Cotton Association of India (CAI) have come together to educate farmers to increase cultivation across the country and also raise yields.

Normally, around 110-120 lakh hectare area comes under cotton cultivation in India.

Atul Ganatra, president, CAI, said that the Centre has allocated ₹440 crore towards "Cotton Quality Improvement Mission" to improve quality and yields.

Although India has the highest area under cotton, the yield is among the lowest in the world, he added.

He was addressing a virtual meeting of stakeholders to improve cotton yields across the country. The 'Cotton Mission' is currently under discussion and meetings have been held by the stakeholders with the Textile Committee of India.

The Textile Committee's office has asked for a list of cotton ginners across the country so that they can become part of the project. The minimum support price (MSP) of cotton in the outgoing season was ₹5,825 per quintal. During the cotton season of 2020-21, CCI had procured 92 lakh bales under MSP operations and nearly 1 crore bales in the season of 2019-20.

Arvind Pant of the Gujarat Cotton Association said that the area under cotton in Gujarat is likely to go up by 10-12% despite oilseeds commanding high price. Government procurement plays a big role in ensuring farmers stick to cotton, he said.

Mahesh Sarda of the North India Cotton Association pointed out that price is the biggest deciding factor for the farmer who would look for better returns. The price realisations of cotton and groundnut need to be compared, he said, adding that sowing in some parts of Rajasthan and Haryana has been around 5% less this khariff.

Pradeep Jain, president, Khandesh Cotton Ginners/Pressers Association said that ginners in Maharashtra have been working on improving cotton yields for last 8-10 years and a booklet of best practices has also been distributed to farmers through the 'Ginner at Your Doorstep' initiative. The response has not been very positive he said.

Ashok Patil, a farmer from Jalgaon said that he managed to get 28 quintal per acre yield from his farm and offered his services to both the bodies. In Maharashtra, it is expected that over 40 lakh hectares will record sowing of cotton and soybean. ■

# STUDY ON THE EFFECT OF PARTICLE SIZE, FIBRE TYPE AND YARN TWIST ON THE ANTIMICROBIAL EFFICACY OF KNITTED FABRICS FINISHED WITH NANO ZnO

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## Abstract

In this paper, knitted fabrics were finished with Zinc Oxide nano particles of 30 nm & 90 nm size. To make knitted fabrics, 100% cotton and 67/33 Polyester / Cotton ring spun yarns made with varying twist factors were selected. Knitted fabrics were finished with nano ZnO particles by Exhaust – dry –cure method and the samples were evaluated for anti microbial efficacy. Test results indicate that in general, anti microbial efficacy of samples increases with increase in yarn twist and decrease in ZnO particle size. Polyester cotton blend samples show better anti microbial efficacy than cotton samples.

**Key words :** Anti microbial efficacy, Knitted fabrics, Ring spun, Particle size, Zinc Oxide nano particles.

## 1. Introduction

The application of nano particles to textile materials aimed at producing finished fabrics with a variety of functional performances. Nano finishes are processes in which nano particles of metallic origin are synthesized and then applied onto textile substrate to get the desired functional properties, to suit various end use requirements [1-5]. Nano particles have many advantages over the conventional finishing agents such as high durability, good wash fastness, etc due to their smaller size and increased surface area. The application of nano finishes enable ultra strong, durable, and specific function oriented fabrics to be effectively produced for numerous applications such as military, industrial, medical, domestic, apparel, house hold furnishing and many more [6].

Nano finishes have been effectively applied to cotton, wool, silk and polyester fabrics. Antibacterial finishes have been applied on cotton, wool, silk and polyester fabrics as well, with the twin objective of protecting the wearer and fabric too. In the case of nano finishing with synthetic textile materials, the aspects to be considered have been odor elimination, antistatic, and antibacterial properties. Nano particle dispersions have also been used in photonic applications besides textile wet processing. Zinc oxide (ZnO) nano particles

have been used for antimicrobial properties and protection against UV radiation [7-8]. Zinc oxide has been the most preferred among other types of nano particles owing to their superiority with regard to photo-catalytic, electrical, electronics, optical, dermatological and anti-bacterial properties [9-11].

Moreover, it has three unique characteristics, namely, semi conductivity, piezoelectricity, and bio safety compatibility. These special characteristics make zinc oxide the most prospective nano material for future textile research. Claudia Rode et al studied the effect of coating of Polyester fabrics with nano ZnO particles which indicates that the antibacterial efficacy and washing stability of coated polyester samples depends on the composition of the coating solution. It has been found that Particles of ZnO in the range of 50 - 300 nm demonstrate better results with regard to antibacterial efficacy after different washing cycles whereas nanoparticles with a size of 10 nm shows improved optical appearance. ZnO concentration up to 20 µg ZnO/cm<sup>2</sup> is found to exhibit suitable antibacterial effect and requires cytocompatibility [12]. Alina Popescu et al. studied the influence of various chemical auxiliaries used in finishing operations, the process temperature, pH and the treatment duration on the anti bacterial efficacy of samples of man-made fibers containing ZnO in blends with cotton and the results shown that the influence of those factors on anti bacterial efficacy is less significant [13]. Marta Fiedot-Toboła et al. studied anti bacterial properties of surface modified polyamide 6 (PA), polyethylene terephthalate (PET) and polypropylene (PP) textiles using zinc oxide. The study revealed that the amount and structure of antibacterial layer on samples is dependent on roughness and wettability of textile surfaces and rougher and more hydrophilic is the material, the more ZnO were deposited. The biggest amount of ZnO microrods was present on PA, then PET and the least on PP. Crystallite sizes and strain values were highest for PET, PA and least for PP samples. Samples show significant bactericidal activity particularly against Gram-negative bacteria [14]. Mahmoudi Alashti et al. studied the antibacterial

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effect on cotton fabrics modified with nanosized zinc oxide by in situ method using zinc acetate dihydrate as precursors and sodium hydroxide, with and without starch as a capping agent. The size and morphology of nanosized zinc oxide on cotton fabric in presence and absence of starch were investigated and the results of contact angle revealed that more hydrophobic character of treated cotton as compared with blank, will have high potential applications in various fields [15]. Hu Ruimin et al, studied the UV reflectivity and antibacterial activity of cotton samples loaded with hexagonal zinc oxide sheets and the study indicates that the samples show high UV reflectivity, better antibacterial activity against *Escherichia coli* and *Staphylococcus aureus* organisms and also better Infrared barrier results [16]. Shirin Nourbakhsh et al studied bactericidal properties of ZnO coated polyester fabric treated with sodium hydroxide. The results demonstrated that increasing of zinc oxide nano particles concentration increased bending length, water adsorption time, antibacterial and self-cleaning effect. Pre-alkaline-treated fabric had more zinc oxide nano particles; therefore more self-cleaning and bactericidal effect than simultaneous alkali treatment samples [17]. Fabrics are more susceptible to microbial growth especially natural fibers like cotton, when moisture, oxygen and suitable temperature exist than the fabrics made from synthetics.

In this work, nano ZnO particles of 30 nm & 90 nm size have been applied on knitted fabrics produced from 100% cotton and 67/33 polyester/cotton yarns of 34 Ne count. The yarns produced with varying Twist factors (TF) were used, to study the effect of twist factor on the anti microbial efficacy (AME) of fabrics. The nano particles were characterized by evaluating particle size and shape by using X-ray diffractometry and SEM microscopy. The ZnO nano particles are then applied on to the fabrics using binder, by exhaust – dry –cure technique and the samples have been evaluated for anti bacterial efficacy by standard test methods.

### 2. Materials and Methods

100% cotton yarns and Polyester / Cotton (67/33) blend yarns made from Ring spinning system with different twist factors were used for this study. The yarn samples were tested for basic parameters and the technical specifications are given in table I.

**Table I : Yarn Specifications**

Parameters	100% cotton yarn			67/33 polyester/cotton yarn		
	TF1	TF2	TF3	TF1	TF2	TF3
Count (Ne)	29.52	29.37	29.47	30.48	30.37	30.02
Count CV%	1.99	1.20	1.45	1.29	1.08	1.52
Twist Factor	3.32	3.66	3.94	3.32	3.66	3.94
TPI	17.80	19.38	21.14	18.10	19.86	21.46
CSP	2178	2390	2558	4150	4033	4049
U%	13.04	12.67	12.65	10.03	9.92	10.23
Hairiness Index	7.75	7.01	6.56	5.81	5.34	5

The yarns were made into single jersey plain knitted fabrics with constant loop length of 0.26 cm. The machine details are given in table II.

**Table II : Knitting Machine Particulars**

Type	Single Jersey
Make	Pailung
No. of Feeders	72
Dia (Inches)	24
Gauge	24
No. of needles	1800

The knitted fabrics were scoured and bleached using Caustic Soda (2 gpl), Hydrogen Peroxide (2.5 gpl) and detergent (0.7 gpl), at 98°C temperature for 30 minutes. The fabrics were then rinsed, neutralized with Acetic acid (0.8 gpl) and washed again.

### 2.1. Finishing of fabric samples with ZnO nano particles

The fabric samples were finished with Zinc Oxide nano particles of 30 nm & 90 nm by Exhaust –dry – cure method. Samples of 30 × 30 cm size were cut and immersed in the solution prepared with 2% ZnO of 30 nm size and 1% Acrylic binder at MLR of 1:20, for 15 minutes. Then the samples were taken out, squeezed in 2 bowl padding mangle at 60% expression to remove excess liquor and air dried. The samples were cured at 140°C for 2 minutes and rinsed with 2 gpl Sodium Lauryl Sulphate to remove unfixed particles. Then the samples were rinsed several times in water to remove soap solution. Similarly samples were also finished with 90 nm ZnO particles, for comparison.

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### 2.2. Testing of Anti Microbial efficacy (AME) of samples

The anti microbial efficacy of treated and untreated (control) samples were evaluated quantitatively as per AATCC 100 standard against *Staphylococcus aureus* and *Escherichia Coli*. The anti microbial efficacy (AME) was determined by comparing bacterial concentration of treated samples with that of untreated sample, expressed as percentage reduction in 24 hours time.

### 3. Results & Discussions

#### 3.1. Anti Microbial Efficacy of treated samples

The finished samples were tested for Anti Microbial Efficacy as per AATCC 100 standard. Table 3.1 shows the percentage reduction of bacterial count of treated samples for Gram Positive & Gram negative organisms after 24 hours of contact time. Bacterial reduction was calculated based on the comparison of bacterial count in treated samples and untreated samples.

From the results shown in table III, it is observed that the anti microbial efficacy of treated samples against gram positive organism (*S.Aureus*) increases with increase in yarn twist factor (TF) both 30 nm and 90 nm ZnO finished samples. In case of bacterial reduction of gram negative organ-ism (*E.Coli*), increase in yarn TF leads to increase in anti microbial efficacy for 30 nm ZnO treated samples but it decreases for the samples treated with 90 nm ZnO nano particles.

**Table III : Percentage reduction in Bacterial count after 24 hours**

Type	TF	Samples Finished with 30 nm ZnO		Samples Finished with 90 nm ZnO	
100% Cotton	3.32	74	80	68	72
	3.66	77	88	78	62
	3.94	88	74	88	42
67/33 P/C	3.32	84	82	69	74
	3.66	86	88	80	72
	3.94	92	92	91	62

#### 3.2. Influence of nano particle size on the AME

To study the influence of nano particle size on the AME of ZnO treated samples, percentage reduction in bacterial count of 30 nm ZnO treated samples was compared with 90 nm ZnO treated samples and expressed as percentage change in AME.

**Table IV : Percentage change in AME of treated samples (30 nm ZnO against 90 nm ZnO)**

Fibre Type	TF	Percentage change in anti-microbial efficacy	
		<i>S. Aureus</i>	<i>E. Coli</i>
100% cotton	3.32	8.82	11.11
	3.66	-1.28	41.94
	3.94	0	76.19
67/33 P/C	3.32	21.74	10.81
	3.66	7.5	22.21
	3.94	1.1	48.39

From the table IV, it is revealed that the ZnO particle size has an effect on antimicrobial efficacy of samples against Gram-negative organism (*E.Coli*) i.e. smaller the ZnO particle size higher is the AME. The decrease in ZnO particle size leads to maximum of 48% increase in AME of samples. But, not much increase in AME is observed against *S.Aureus* organism irrespective of yarn TF and fibre type. The AME against *S.Aureus* is almost same for 30 nm and 90 nm ZnO finished samples in most samples except for samples with TM of 3.32. This is due to the difference in susceptibility of Gram-positive and Gram-negative bacteria against ZnO nano particles. Gram-negative bacteria seemed to be more resistant to ZnO nanoparticles than gram-positive bacteria due to the differences in cell wall structure, cell physiology, metabolism or degree of contact. Gram-positive bacteria have one cytoplasmic membrane with multilayer of peptidoglycan polymer and a thicker cell wall (20-80 nm), whereas gram-negative bacteria wall is composed of two cell membranes, an outer membrane, and a plasma membrane with a thin layer of peptidoglycan with a thickness of 7-8 nm. Nano particle size within such ranges can readily pass through the peptidoglycan and hence are highly susceptible to damage.

Another reason for low AME against *E.Coli* of treated samples is that at lower concentrations, ZnO nanoparticles may not be toxic for various tested microorganisms and *E. Coli* can metabolize Zn<sup>2+</sup> as an oligo-element (Roselli et al., 2003). It is concluded that, due to higher susceptibility of gram positive organism to ZnO, higher bacterial reduction percentage is observed against *S.Aureus* both in 30 nm and 90 nm ZnO finishing. Irrespective of particle size, ZnO particles are able to destroy gram positive organism. Whereas Gram-negative organism show higher resistance against 90 nm

## STUDY ON THE EFFECT OF PARTICLE SIZE, FIBRE TYPE AND YARN TWIST ON THE ANTIMICROBIAL EFFICACY OF KNITTED FABRICS FINISHED WITH NANO ZnO

ZnO particles leading to low bacterial reduction and when the particle size decreases, ZnO particles are able to pass through peptidoglycan of organism which results in higher bacterial reduction. This is the reason for the remarkable increase in AME against E.Coli owing to the decrease in ZnO particle size from 90 nm to 30 nm. Change in bacterial reduction against E.Coli is also enhanced by the yarn twist factor. It is observed that change in bacterial reduction is higher at higher yarn TM.

Samples treated with 30 nm ZnO nano particles show higher bacterial reduction percentage than those samples treated with 90 nm ZnO nano particles due to the fact that 30nm sized nano particles have relatively higher surface area to volume than 90nm particles. The antibacterial efficacy increases with decreasing particle size which is due to enhanced bioactivity of smaller particles probably attributed to the higher surface area to volume ratio.

### 3.3. Influence of yarn TM on the AME

From the table V, it is observed that antimicrobial efficacy against Gram-positive organism (*S.Aureus*) increases with increase in TF, for both 30 nm and 90 nm ZnO finished samples of 100% cotton and 67/33 P/C samples. But against Gram-negative organism (*E.Coli*), AME generally decreases with increase in yarn TF, except for 67/33 P/C samples finished with 30nm ZnO.

The increase in AME of samples against *S.Aureus* due to increase in yarn TM may be attributed to the influence of fabric constructional parameters. Fabric weight and thickness increases owing to the increase in yarn TM. In order to study the association between yarn TM and fabric constructional parameters such as weight, thickness & TF, correlation coefficient values are calculated and shown in table V.

**Table V : Correlation coefficient values between yarn TM and fabric parameters**

Finished with ZnO particle size of	Weight	Thickness	Tightness factor
30nm	0.99	0.99	0.99
90 nm	0.99	0.89	0.99

From the table 3.3, it is evident that increase in yarn TM positively influences fabric weight, thickness and TF. It is seen that the most significant influence of yarn TM is on the fabric weight. Hence due to increase in weight of the fabric samples due to increase in yarn TM, more nano particles maybe bound onto fabric surface per given area, which

might be the reason for their increased antimicrobial efficacy.

### 3.4. Influence of fibre type on the AME

In order to study the influence of fibre type on the AME of ZnO treated samples, percentage reduction in bacterial count of fabrics made from 100% cotton and 67/33 P/C yarns are compared and the percentage change in AME is calculated.

**Table VI : Percentage change in bacterial reduction of 67/33 P/C samples compared with 100% cotton samples**

TF	30 nm ZnO		90 nm ZnO	
	<i>S.Aureus</i>	<i>E.Coli</i>	<i>S.Aureus</i>	<i>E.Coli</i>
3.32	13.51	2.50	1.47	2.78
3.66	11.69	0	2.56	16.13
3.94	4.60	24.32	3.41	47.62

Positive values in the table VI indicate that microbial reduction for 67/33 P/C samples are higher than 100% cotton samples at all the three twist level. It is due to the fact that cotton fibres naturally are more susceptible to microbial growth than polyester fibre. This agrees with earlier findings that P/C samples show better bacterial reduction than the 100% cotton samples because of better bacterial resistance of polyester component (Parthasarathi V et al, 2009). Higher difference in AME is observed against for *S.Aureus* in samples finished with 30 nm ZnO and against *E.Coli* in samples finished with 30 nm ZnO particles.

### 4. Conclusions

It is observed that samples finished with 30 nm ZnO particles show higher bacterial reduction percentage than the samples finished with 90 nm ZnO particles against both Gram-positive and Gram-negative organisms. This is due to the fact that 30nm sized nano particles have relatively higher surface area to volume than 90nm particles. This agrees with earlier findings that smaller particle size have larger surface area and thus increased contact with micro organisms leading to improved bactericidal and fungicidal effectiveness (Wong Y W H et al.2006).

It is evident that increase in yarn TM leads to increase in AME in all samples. This is due to the increase in fabric weight owing to the increase in yarn TM which results in increased antimicrobial efficacy. Increase in yarn TM and increase fabric weight leads to more nano particle adhesion onto the fabric surface. More ZnO nano particle on the



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fabric surface leads to better antimicrobial activity. But against E.Coli, different trend is observed that AME decreases with increase in TM for the samples finished with 90 nm ZnO.

Samples made from 67/33 P/C yarn show better AME than the samples made from 100% cotton yarn which is due to the fact that polyester blend samples are less susceptible to microbial growth than 100% cotton samples.

### REFERENCES

- Hoon Joo L, (2005). Bacteriostatic and skin innocuousness of nano size colloids on fabrics. *Textile Research Journal* 75 (7), 551-556.
- Gokarneshan N, Gopalakrishnan.P.P and Jeyanthi B, (2012). Influence of Nano Finishes on the Functional Properties of Textile Materials, *International Journal of Basic and Applied Chemical Sciences* ISSN : 2277-2073 (Online) An Online International Journal Available at <http://www.cibtech.org/jcs.htm>, 2 (2) , 8-24.
- Gokarneshan N, Gopalakrishnan.P.P and Jeyanthi B, (2012), Influence of nano finishes on the anti microbial properties of fabrics, *International Scholarly Research Network, ISRN Nanomaterials*, 8, Art. ID 193836.
- Sawhney APS, Condon B, Singh KV, Pang SS, Li G and Hui D, (2008). Modern Applications of Nanotechnology in Textiles. *Textile Research Journal* 78(8), 731-739.
- Baglioni P, Dei L, Fratoni L, Lo Nostro P and Moroni M, (2003). Preparation of nano and micro particles of group II and transition metal oxides and hydroxides and their use in the ceramic, textile and paper industries. *WO Patent* 2, 82-742.
- Pan ZW, Dai ZR and Wang ZL, (2001). Nano belts of semiconducting oxides. *Science*, 291 1947-1949.
- Vigneshwaran N, Kumar S, Kathe AA, Varatharajan PV and Prasad V, (2006), Functional finishing of cotton fabrics by using Zinc-oxide soluble starch nanocomposites, *Journal of Nano Technology*, 5087-5095.
- Yadav A, Virendra Prasad, Kathe AA, Sheelaraj Deepti Yadav, Sundaramurthy C and Vigneshwaran N, (2006), Functional finishing in cotton fabrics using zinc oxide nano particles, *Bulletin of Material Science*, 29(6) , 641-645.
- Parthasarathy.V, Thilagavathi.G, (2009), Synthesis and characterization of Titanium Dioxide nano particles and their applications to textiles for microbe resistance, *Journal of Textile and Apparel, Technology and Management*, 6, Iss.2, 1-8.
- Parthasarathy.V, Thilagavathi.G, (2011), Synthesis and characterization of Zinc oxide nano particles and its applications on fabrics for microbe resistant defence clothing, *International Journal of Pharmacy and Pharmaceutical Sciences*, 3, Iss.4 , 392-398.
- Rajendran.R, Balakumar, Hasabo.C, Mohammed Ahammed.A, Jayakumar.S, Vaideki.K, (2010), *International Journal of Engineering, Science and Technology*, .2, 202-208.
- Claudia Rode, Michael Zieger, Ralf Wyrwa, Susanne Thein, Cornelia Wiegand, Monika Weiser, Andreas Ludwig, Dirk Wehner, Uta-Christina Hipler, (2015), Antibacterial Zinc Oxide Nanoparticle Coating of Polyester Fabrics, *Journal of Textile Science and Technology*, 1, 65-74.
- Popescu A, Rascov M, x Chirila L, Chirila C, Toma & Dinca L C, (2018), The behavior in finishing of textile materials made of man-made fibers containing ZnO in blends with cotton, *Industria Textila*, 69(3), pp.212-218.
- Marta Fiedot-Toboła, Magdalena Ciesielska, Irena Malis-zewska, Olga Rac- Rumijowska, Patrycja Suchors-ka-Wozniak, Helena Teterycz and Marek Bryjak,( 2018), Deposition of Zinc Oxide on Different Polymer Textiles and Their Antibacterial Properties, *Materials*, 11, 707; doi:10.3390/ma11050707.
- Mahmoudi Alashti, Taherh, Negar Motakef-Kazemi, & Seyed Abbas Shojaosadati, (2020), In situ production and deposition of nanosized zinc oxide on cotton fabric, *Iranian Journal of Chemistry and Chemical Engineering (IJCCE)*.
- Ruimin Hu, Jinlong Yang, Pu Yang, Ziqin Wu, Hang Xiao, Yiping Liu & Ming Lu, (2020), Fabrication of ZnO @ Cotton fabric with antibacterial and radiation barrier properties using an economical and environmentally friendly method." *Cellulose*, 27, pp. 2901-2911.
- Shirin Nourbakhsh, Majid Montazer & Zoha khandaghabadi, (2016), Zinc oxide nano particles coating on polyester fabric

## STUDY ON THE EFFECT OF PARTICLE SIZE, FIBRE TYPE AND YARN TWIST ON THE ANTIMICROBIAL EFFICACY OF KNITTED FABRICS FINISHED WITH NANO ZnO

- functionalized through alkali treatment, *Journal of Industrial Textiles*, <https://doi.org/10.1177/1528083716657819>.
18. Gopalakrishnan.P.P & Dr.K.Thangamani, (2016), Finishing of Knitted fabrics using ZnO nano particles for antibacterial and ultraviolet protection, *Journal of Textile Association*, 4, 243-247.
  19. Kathirvelu.S, Louis D'Souza & Bhaarathi Dhurai, (2009), UV protection finishing of textiles using ZnO nano particles, *Indian Journal of Fibre & Textile Research*, 34, 267-273.
  20. El-Molla M.M, El-Khatib E.M, El-Gammal M.S & Ab-del-Fattah S.H, (2011), Nanotechnology to improve coloration and anti microbial properties of silk fabrics, *Indian Journal of Fibre & Textile Research*, 36, 266-271.
  21. Chattopadhyay D.P & Patel B.H, (2009), Improvement in physical and dyeing properties of natural fibres through pre treatment with silver nano particles, *Indian Journal of Fibre & Textile Research*, 34, 368-373.
  22. Matyjas-Zgondek E, Bacciarelli A, Rybicki E, Szykowska M.I & Kolodziejczyk M, (2008), Anti microbial properties of silver finished textiles, *Fibres & Textiles in Eastern Europe*, 16, No.5, 101-107.
  23. Kathirvelu S Louis D'Souza & Bhaarathi Dhurai, (2010), Study of stain eliminating textiles using ZnO nano particles, *The Journal of the Textile Institute*, 101, No.6, 520-526.
  24. Tang E, Cheng G, Ma X, Pang X and Zhao Q, (2006), Surface modification of zinc oxide nano particle by PMMA and its dispersion in aqueous system. *Applied Surface Science* 252 5227-5232.
  25. Tang E, Cheng G and Ma X, (2006), Preparation of nano ZnO/PMMA composite particles via grafting of the copolymer onto the surface of zinc oxide nanoparticles. *Powder Technology* 161, 201-214.
  26. Almetwally, AA & Salem, MM (2010), Comparison between mechanical properties of fabrics woven from compact and ring spun yarns', *AUTEX Research Journal*, 10, 35-40.
  27. Chellamani, KP, Panneerselvam, G & Krishnasamy, J, Breathability of woven surgical gowns treated with nano finishes, *Asian Textile Journal*, 20, 45-51. ■

## A contribution to sustainability of Maratona dles Dolomites

### Carvico and RadiciGroup have joined competencies while respecting the environment

A contribution to the sustainability of the 2021 Maratona dles Dolomites, the iconic cycling event scheduled for July 4, 2021 that takes place along some of the most beautiful passes in the Dolomites, comes from Carvico and RadiciGroup, two Italian textile manufacturers that have joined competencies to develop and produce 10,000 sustainable vests. They were created by using its "special edition Maratona 2021" fabric made of 100% recycled polyester from PET plastic bottles and will be given to all participants in the competition.

Repetable® was used to create the fabric for the gilets, an innovative polyester yarn obtained through a post-consumer recycling process of plastic bottles and produced by RadiciGroup. Compared to virgin polyester, Repetable® reduces CO2 emissions (-45%) and reduces water (-90%) and energy (-60%) consumption, while ensuring high

technical performance. To package the 10,000 vests for the participants of the Maratona dles Dolomites-Enel, more than 102,000 bottles were recovered, avoiding the emission of 6,516 kg of CO2 into the atmosphere.

"We have had a long-term partnership with Carvico – claimed Angelo Radici, President of the RadiciGroup – aimed at launching on the market various high performance solutions which are also eco-sustainable and eco-friendly. We have teamed up with several strategic partners to expand our range of products made of recycled products coming from a local, transparent and traceable supply chain, giving a concrete evidence of the fact that circular economy and sustainability are actually feasible".

**For further information, please contact :**  
**RadiciGroup**  
**newsradicigroup.com** ■

# THE CAUSES AND REMEDIES OF THE LOOP FORMATION IN FDY

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## [1] Introduction

One of the professionally managed group of companies situated at Silvassa who manufactures and bulk continuous filament (BCF) yarns, such as air twisted, power heat set/Superb heat set, cabled/twisted, and air entangled yarns etc., conventional dyed and textile yarns, including partially oriented, fully drawn, draw textured, highly oriented, mono, mother FDY, and air textured yarns having turn over more than 2800 CR, faced the problems of Loom formation in their FDY Product. Hence this Small Project work was assigned to us and was solved with proper studies with suggestions.

Loops are always harmful for any industrial product such as POY, FDY, PTY and Twisted yarns as it causes obstacles in the next process especially at loom stage. It created end breakages, fabric defects and production loss at final stages.

## [2] Aim of the Project

Now a day the end use of FDY is increasing at every stage of twisting, weaving (warp & Weft) knitting (Warp & Circular) and also being used at apparel, Technical Textile, Industrial Textile etc because of its several positive points. Loop formation is very common in POY, FDY .DTY because of the several reasons and of course it is very much harmful. It creates obstacles in warp, weft, knitting process that go for uneven tension creation, yarn breakages and fabric defects. This paper is specially discussing about the loop formation in FDY and suggested the preventive measures and how to minimise the same. Our client organisation was facing this problem mainly in bright FDY and this study was taken. We have checked the production processes, Process control activities and after studying at Length, we derived some conclusions.

## [3] What is Fully Drawn Yarn? (FDY)

Fully Drawn Yarn (FDY) is produced by spinning the yarn at higher speeds coupled with intermediate drawing integrated in the process itself. This allows stabilization through orientation and crystallization.

Fully Dawn Yarn is used as weft or warp during weaving. It can also be knitted or woven with any other filament yarn in order to produce different varieties of fabrics such as home furnishing fabrics, fashion fabrics, terry towels etc.

FDY is available in 3 lustres, Semi-dull, Bright having circular section & Trilobe Bright having triangular cross-sections. Instead of making the fabric with FDY Raw-white first & then dyeing it, Dope Dyed Fully Drawn Yarn can be used to make the coloured fabric directly.

Fully Drawn Yarns are produced by a continuous polymerisation process. All critical yarn properties such as tenacity, elongation, Uster variation and boiling water shrinkage, intermingling are closely monitored and controlled. Controlled interlace enables the yarns to be twisted or sized in subsequent operations.

FDY has the following properties

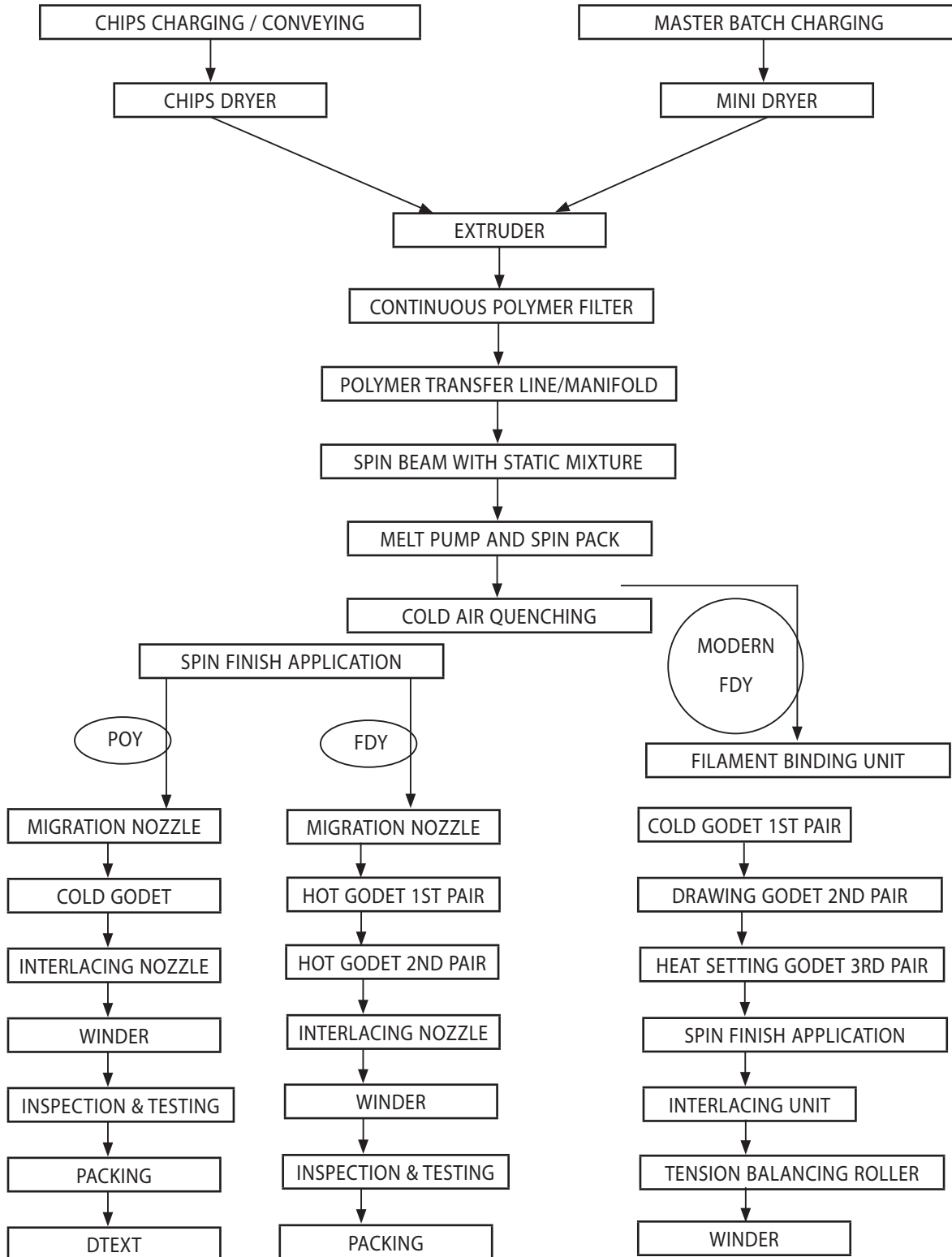
1. Intermingled FDY yarns are suitable for direct twisting, warping and weaving.
2. The fabric made from these yarns have a feel and drape similar to fabrics produced from pure silk resulting in high realization of product quality.
3. These yarns eliminate draw-twisting and sizing process reducing the cost of products for light and medium range of fabrics.
4. There is high efficiency and low breakages in subsequent processes.
5. Having excellent dyeing consistency.

## [4] Manufacturing Process FDY

The Raw material i.e. PET Chips are dried, melted, filtered and then distributed to spinning manifolds followed by spinning position to get fully drawn yarn. To manufacture FDY, PET chips are fed into dryer where the moisture is reduced from 0.30% to 0.0020%. After this, chips are melted, filtered through polymer filter and extruded through the spinnerets. Extruder is electrically heated microprocessor temperature controlled and screw speed is controlled and monitored very precisely to ensure uniform quality. The extruded filaments are cooled by filtered air in the quench chamber with precise temperature control. Air having no turbulence is used to ensure perfect evenness. High quality antistatic lubricating oil is applied to avoid static charges in the yarn. The yarn is taken through heated godets to maintain residual elongation. Air punching is done at regular intervals by intermingling nozzles and finally wound on automatic winder in the take up. (Please see Flow chart at next page). The FDY so made is

**THE CAUSES AND REMEDIES OF THE LOOP FORMATION IN FDY**

**FLOW DIAGRAM OF EXTRUDER SPINNING SYSTEM**



## THE CAUSES AND REMEDIES OF THE LOOP FORMATION IN FDY

capable of running in high speed warping, sizing, knitting, circular knitting and looms.

### [4.1] Spinning Speeds

The type of yarn produced during melt spinning is decided by the spinning speed. Low oriented yarn (LOY) is produced at speeds below 1500 m/min. Medium oriented yarns (MOY) are spun between 1500-2200 m/min. partially oriented yarn (POY) is spun at speeds between 2800 to 3600 m/min., where the yarn is more oriented with a little crystallinity. This gives POY better stability, and therefore, POY is preferred as commercial intermediate for drawn or textured yarns. The take up speed of FDY is kept 4000 – 5200 mpm. The take up speed of PA-6 and that of PA-66 is maintained 4000 – 4300 mpm. Yarn made at speeds of 4000-6000 m/min is called highly oriented yarn (HOY). It is not fully oriented and has elongation-to-break values of between 40 and 60%. In order to obtain fully oriented yarn (FoY) by a One-step process, with elongation-to-break values of 20-30%, spinning speeds of well over 6000m/min would be needed.

HOY & FOY are manufactured for the Industrial purpose such as High tenacity Yarn, Tyre Cords, Seat belts, Geo Fabrics etc.

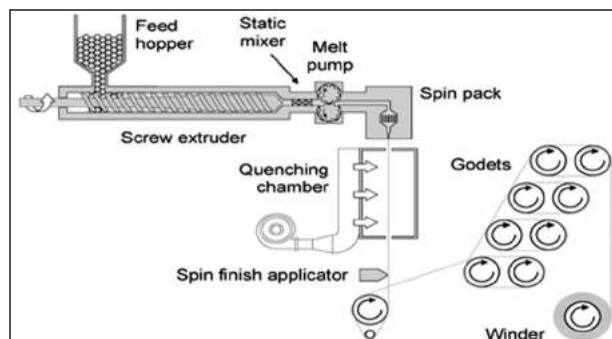
Normal Partially Oriented Yarn (POY) needs to be necessarily texturised before being used for making fabric whereas FDY is drawn fully during the process of spinning itself and therefore does away with the requirement of texturising and can use directly for making fabric.

FDY is generally used for better quality fabric as the process of texturising is avoided where the bulk yarn is produced.

In the Next Page, the flow diagram of Extruder spinning system is shown for the POY, FDY and Modern FDY. The difference between POY & that of FDY lines are that in FDY there are two additional Godets to draw the yarn, (Please see picture 2 next page).

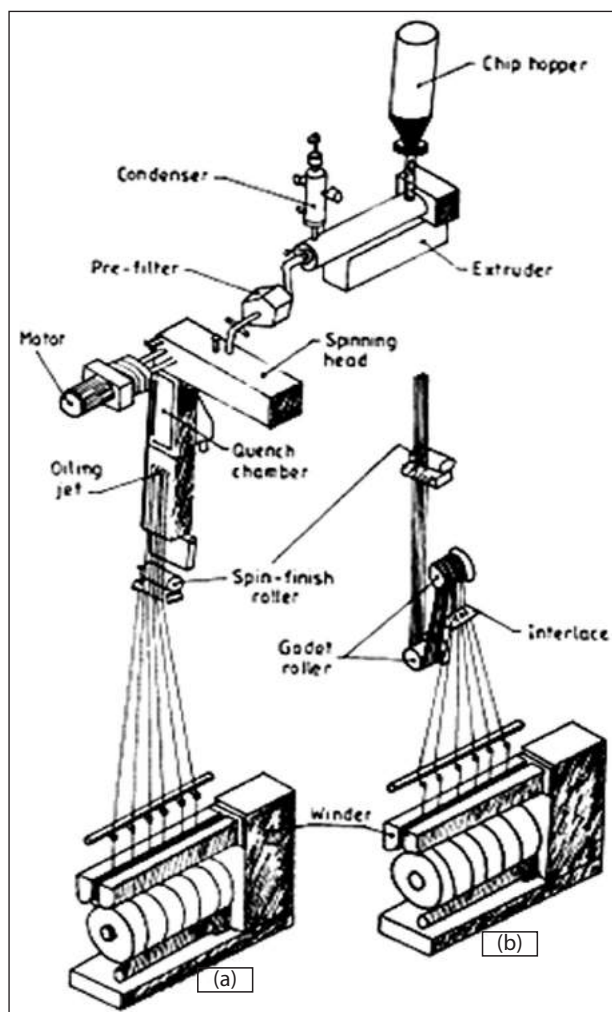
In case of Semi Dull, Bright yarn or super bright yarn, the Master Batch Charging will be eliminated. Master batch is attached only when the Dope Dyed Yarn is produced.

For the CP Line (Continuous polymerisation, without batch Process), the Flow of the melted polymer will be started from Manifold / Polymer Transfer Line and thereafter till take up zone.



Pic – 2 is showing one typical picture of the FDY Manufacturing Process with multiple Godets from a Batch Processing System.

Pic – 3 is showing the spinning process without Godet (POY) and with two pair of Godets for the FDY Manufacturing process.



An industrial melt-spinning unit :  
(a) without godets, (b) with godets

**THE CAUSES AND REMEDIES OF THE LOOP FORMATION IN FDY**

**[5] What is LOOP?**

When bunch of filaments running together and if one filament gets switched or slacked it forms a loop. Loop is bubble like structure that forms on yarn structure due to the lack in MELT SPINNING process which results in a faulty package and further will result into a faulty fabric formation.

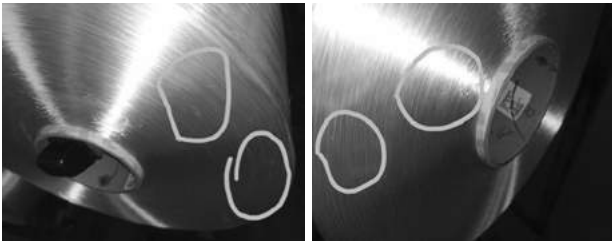
When a yarn is twisted and then woven it will disturb the neighbouring yarn and when the shed is open it will affect the neighbouring yarns and will cause an uneven surface or a faulty fabric. Hence it is not at all desirable. It hampers the quality of product as well as its aesthetic properties.

It is a chronic problem in Nylon POY.

It differs from 0.5mm, 1mm etc.

However during the production process of FDY due to any lacuna in technical or human process there are chances of loop formation on the surface of the yarn causing irregularities on the surface and stated as a yarn defect.

This paper helps in identifying some certain reasons of loop formation and its prevention.



Loops in the FDY Packages

**[5.1] Causes of Loop formation**

1. Due to variation in air pressure or if jet is not regular -  
eg - Air with angle 90° will have more loops that of 80° (chances will be more if the flow is from up to down) or if in the quenching chamber the air flow is from a single direction only.  
If there is choke up in the jet application.
2. Loops can come from Spinneret - Due to irregularities in the holes caused by the accumulation of particles. And if the holes are not as per the yarn denier.
3. Loops can also be generated due to irregularities of Spin Finish application as lesser the Spins higher will be the loop.
4. Difference in yarn diameter to that of nozzle diameter also results in loop formation.

5. Loops generate if zone temperature is not set properly, or quench air flow is not set according to yarn denier & individual filament denier.
6. Variation in process parameters (like variation in speed or jerk in yarn) also results in loop formation.
7. Loops can come from guides in take up area, or from air nozzle & intermingling, and from winder during the traverse motion.
8. In Trilobal Spinning there is a higher chance of getting a loop due to the irregularity in the arrangement of filaments.
9. It could be due to grooved drum, spinneret, and traverse guide.



SPINNING AREA



GEAR PUMP MOTOR



GUIDES IN TAKE-UP AREA (GODET)



Extruder



SPINNERET



Dryer

**[5.2] Precautions to prevent LOOP formation**

1. Nozzle Air pressure and its angle should be maintained properly and as per requirement.  
Air should not contain any moisture i.e. it should be dry and should be neutral in behaviour that it should not affect the yarn quality.  
Nowadays companies are using machines in which air comes from all the peripheral directions of the quenching chamber.

## THE CAUSES AND REMEDIES OF THE LOOP FORMATION IN FDY

2. SPINNERET should be inspected on a regular basis and before passage of yarn air with high pressure should be passed through it so that particles accumulated at its holes get passed away.

The Spinneret holes should use according to the yarn denier to be processed.

Spinneret should be arranged in such a way that all the filaments should touch each other equally.

3. Arrangements of Spins should be regular and it should be inspected on a regular basis as if it get loosen it will result in formation on bigger loops.
4. Ratio of Yarn dia. to Nozzle dia. should be as per measures as it may also result in deterioration of yarn surface and behaviour.
5. Zone temperature should be maintained properly and it should not fluctuate and quench air flow should be set according to yarn denier & individual filament denier generally the zone temperature is maintained on 19°C - 22°C.
6. There should not be variation in speed or jerk in yarn due to machine vibration or human error.
7. Guides in take up area, or air nozzle & intermingling, and winder should be inspected on a regular basis and should be kept dirt free and also if there will be any crack or irregularity on the surface it should be immediately replaced.
8. There should be a proper arrangement of filaments in the Trilobal Spinning i.e. filament should be adjusted in such a way that there should not be any slippage between them and they should hold each other properly.
9. The arrangement should be in opposite direction to each other like top portion of one triangular filament should touch the bottom portion of another one so that the inter cohesion property increases and the arrangement will be regular.
10. To avoid loops in the packages, check the groves of the drum, fix TG properly, change pack etc.

**Hence there should be Proper Process control to prevent the occurrence of any Loop Formation.**

### [6] What is Process Control?

1. A process Control means that a Process has minimum amount of variation and to meet the target value without loss of any material and manpower.
2. Increasing Transparency and Confidence through Real-Time Data Sharing
3. Process Control Systems (PCS), sometimes called Industrial Control Systems (ICS), function as pieces of equipment along the production line during manufacturing that test the process in a variety of ways, and return data for monitoring and troubleshooting. Many types of process control systems exist, including Supervisory Control and Data Acquisition (SCADA), Programmable Logic Controllers (PLC), or Distributed Control Systems (DCS), and they work to gather and transmit data obtained during the manufacturing process.
4. A process being in control and meeting customer satisfaction.  
As stated a process is in control if it is between the UCL and LCL lines. This just means that the process is working well without much noise.
5. To meet customer satisfaction we need to check the "process capability." Process capability checks to see if the process meets some target value (i.e. customer satisfaction line).
6. It starts from the incoming of Raw materials to outgoing of finished goods.

### [6.1] The Process Control System in a FDY Plant

1. To check all the parameters as decided to achieve the desired quality and to see that there is no down gradation.

The parameters are

- (i) Take up Speed which are for a Barmag Winder 4500 mpm, and for coloured yarn it is 4100. The speed is also decided as per the yarn denier. It is checked every day and no variation is allowed. For any nonconformities, the winder is rectified.
  - (ii) For the China made winders, the take up speed is decided 4200 mpm.
2. Godet, Zone Temp and Special Beam temperature to be checked at desired frequency. No variation is permitted. The Godet Temp is kept 160 – 175 degree depending on Den & Filaments.
  3. Air flow, moisture contents are to be checked and frequent intervals.
  4. Doff weight is checked and that should be uniform as it is auto doffing.
  5. Spinnerets are checked at any Change over of the product.

## THE CAUSES AND REMEDIES OF THE LOOP FORMATION IN FDY

6. Cross sections are checked with filament counting of the FDY of the first doff after change over.
7. Take Down is done for the fresh doff and the subsequent doffs at regular interval. For any non-confirmation the material is downgraded and the actions are taken so that the next doff is produced with uniform dye uptake.
8. The Mergability checking is done for the product of new Pack vs Old pack.
9. The Spin Finish / OPU application is checked every day by the Instrument and for any variation, it is rectified then & there. The measurement of Spin Finish% application is done in Computerised way and the results are displayed after taking the print out. The target spin Finish% (0.95%-1.0%) kept as per the lustre of the FDY.
10. The Physical properties (Den, tena, E%, nips per mtr, SH%) are checked at regular interval say position no 1, 2, 3 at 1st shift, 4, 5, 6 and 2nd Shift, 7, 8, 9 at 1st Shift Next day and 10, 11, 12 at 2nd shift and so on. For any abnormalities at any position, all the positions right from 1 to 12 are checked and rectified.
11. B.F and Loops are checked after focussing light on the spools after doffing and the immediate actions are taken by stopping the winder.
12. All the guides are checked on the machine during running condition every day and also during mc. stoppage. Any non-conformation is rectified immediately.
13. Yarn path, thread to guide, yarn contact paths are checked every day with focussing on the mc. and steps are taken.
14. BF Formations can be due to capillary break, Spinnerets not clean, bad yarn to metal contact, POY self-life expired, broken/old guides etc.
15. Loops can be formed because of any uneven spin finish application( it is much sensitive in bright yarns), yarns getting any uneven pull during processing, any smallest scratching on any metal surface, guide not set properly, old guide with rough surface, Disturbance in the Air flow process, pack life is more etc.

**Table-1 : FDY Product Range as on April '21**

Den	Fil	Lusture	Den	Fil	Lusture	Den	Fil	Lusture
40	24	SD	75	36	SD	150	144	SBT
49	48	SD	75	36	SBT	151	48	SD
49	48	SD LBS	75	72	SD	155	96	SBT
50	24	SD	80	12	SBRT MCX	160	24	SBT MCX
30	12	SD	80	48	SDBSY	180	96	BSP Jari Gold
30	18	SBT	95	72	RND BLK	180	96	BSP LC MANGO
40	18	SBT	100	36	RND BRT	180	96	SBT
40	24	R. SUPER DYE	100	36	SD	210	96	BSP Jari Gold
47	36	SBT	100	48	SBT	210	96	BSP LC MANGO
50	24	R. SUPER DYE	100	72	RND BLACK	300	96	Deep Champagne
50	36	R. SUPER DYE, TL	100	72	SBT	300	96	LT Champagne
50	36	SBT	100	96	SD	300	96	SD
68	72	SD	110	36	Cataonic TL	300	96	SD
69	36	SD LBS	121	48	SBT	300	96	SBT
70	36	SD	135	108	BSP BSY	500	192	SBT
70	36	SBT	150	48	SBT	600	192	SBT
70	72	SD LBS	150	48	SBT LBS			

SD- Semi Sull, LBS- Low Boiling Shrinkage, SBT- Super Bright Trilobal, R.Super Dye- Recron Super Dye, TL- Trilobal, SBRT MCX- Super Bright Mix Cross Section, BSY- Bi Shrinkage, BSP BSY- Bright Bi Shrinkage, BSP - Bi Shrinkage



## THE CAUSES AND REMEDIES OF THE LOOP FORMATION IN FDY

### [7] The Range of FDY Production available as on today ( April '21)

The Product range of FDY is increasing day by day as per the demand in the market . It had got more demands for the furnishing and Industrial uses. There are high tenacity FDY produced for the sewing thread, Fishing nets, Conveyor belts etc. Below table no 1 is explaining the details. Table-1.

**Summary :** The Denier Range: 30 to 600, Filament Range: 12 to 192. Lustre : SD, Bright, Super bright, Dope Dyed, Mix Cross Section etc.

**End Usage of the FDY Products as on today :** (i) The lighter den 49, 50, 47 are used for Warp knitting to produce Net Fabrics, Maharani, CanCan fabrics etc. (ii) The lighter deniers below 80 are used for Saree, Dress materials, Garments, Taffeta Etc (iii) Tafetta is also manufactured by 100 den. (iv) 100 + deniers are used for manufacturing Blankets, Furnishing Fabrics, seat Belts etc. (v) 150 -200 deniers are used for Home Décor, embroidery, etc (vi) coarser deniers i.e. 300+ are used for Industrial products i.e. Fishing nets, road constructions, Built Tech , etc.

The chances of loop formation are in SBT, high no. of Filaments, cationic.

#### [7.1] Physical Properties of the FDY

Tenacity : 4.0 to 4.5 g/den , High Tenacity : 5.5 – 6 g/den , Elongation % : For knitting – 22-23%, Weft use high speed 23 -24% , Warp use : 24-26% , Good for twisting – 26-28% , Intermingling – 6-7 per mtr for knitting, 12-14 per mtr for weft use. 20- 22 per mtr for warp use. Oil Pick Up – 1%, for Dope dyed / CD – 0.7 – 0.8%. SH% - 5.0 – 7.0%

### [8] Quality Check Procedures

#### Raw Material Inspection

Incoming polymers and chemicals are tested for critical properties before approval - the FIFO system also traces back suppliers' batches and processing performance.

#### 100% Physical Inspection

A robust product clearance system at each inspection stage allows only approved packages to move ahead for delivery.

#### Online Monitoring

Process parameters are passed through a Supervisory Control & Data Acquisition System (SCADA) for immediate rectification of deviations, strengthening of quality, controlling generation of non-standard products and online trend analysis.

### Process Control

This streamlines processes, ensures a proactive work system using control charts and statistical tools, counters deviations from ideal norms, and eliminates repetition and non-conformation to parameters during manufacturing of yarn packages.

### Final QC Approval

Conforming to Acceptable Quality Limits (AQL), this improves quality measures to meet customer expectations - in service, product and experience.

### [9] Action Plan

1. Proper process control at every stage right from POY to Take-up is to be followed vigorously.
2. At every stage proper observation, supervision, visualises are to be there.
3. Periodic maintenance of each and every guide, yarn to metal contact, surface applicants are to be supervised strictly.
4. After doffing of FDY spools, each and every spool has to be checked and inspected thoroughly with the help of power (more focusing on them).  
Positions are to be noted and actions are to be taken immediately.
5. Every day, with the help of 'STROBOSCOPE' all the winder speed are to be checked as well as the surface and speed of winder is to be inspected for any abnormalities i.e. loop formation, b.f's (broken filament) etc.
6. Operators are to be kept vigilant to make sure that no abnormalities are to be carried in the process.
7. Pack pressure, pack life are to be controlled as per the schedule.  
Any expired pack life should not be entertained.
8. Pack formula is to be strictly as per the denier, number of filaments and shade of the POY.  
In case of coloured yarn (dope dyed), pack formula should be more vigorous.
9. Humidification in the hall/working area is to be adhered to as per the humidification norms.
10. The quenching, airflow, airflow temperature is to be maintained as per the denier, number of filaments and shade of POY.
11. Temperature monitoring at every stage especially in Godets are to be done at every shift of 8 hours.

## THE CAUSES AND REMEDIES OF THE LOOP FORMATION IN FDY

### [10] Fish Bone Analysis

(i) The fishbone diagram is a tool that is used to conduct a cause and effect analysis for a particular problem that needs a solution. (ii) Overall, fishbone analysis entails brainstorming to identify various causes of a problem instead of settling with the obvious ones. (iii) Moreover, the fishbone analysis helps to educate the entire team in problem resolution. (iv) Also, they can use it to have their focus on the current issue.

The fact that it uses visuals makes it easier to brainstorm and makes it an essential tool in achieving corrective actions.

### [11] Conclusion

By the end of this paper we can now depict the preventive measures for loop formation. This paper highlights most of the process lacks which

cause loops in the yarn. This paper also contains the Process Control Systems in FDY plant and the Quality Check Procedure for FDY yarn. Although it's difficult to maintain the quality of a product over a period of time as the machine parts also get wear and tear and it's not necessary that the quality at starting of the process will remain same over a longer period.

So it is required and suggested to follow a proper inspection rules with a certain specified guidelines so that there should not be any diversity in the required specifications.

It will not enhance the product cost but the quality of the product will be maintained and the rise in price of the process can be maintained by the measure decrease in formation of faulty yarn packages. ■

## PLI : Textile Ministry looks back at eligible products

The Textile Ministry is re-considering the products shortlisted so far for qualification under the production-linked incentive (PLI) scheme for the sector and is looking at including inputs such as fabrics and filaments in both the man-made fibre (MMF) and technical textiles categories to incentivise more value-addition in the country.

“So far mostly end products have been considered for the PLI scheme both for the MMF and technical textiles categories. These include items such as garments, sweaters, diapers and sanitary napkins. However, it has been pointed out by the industry and experts that just including end products may not optimally encourage manufacturing and investments. It is also important to include inputs such as fabrics and filaments used for making the end product to give a boost to investments and production,” a person tracking the matter told recently.

Textiles is one of the 13 sectors for which the Centre has announced the PLI scheme to enhance India's manufacturing capabilities and exports. The textiles sector has been allocated ₹10,683 crore under the scheme which, as per initial plans of the Ministry, will be offered for incremental production in 40 identified MMF fibre items and 10 technical textiles products over five years.

“The Textile Ministry is now taking a re-look at the scheme to finalise the list of items that would be eligible and is considering the option of including fabrics, fibres and filaments in the revised list,” the official added.

There is also demand from the industry to lower the turnover threshold for eligibility under the scheme to include smaller players as well. As per the initial plans, for brownfield companies (companies already in operation), the incentive rates were reportedly proposed to be fixed at 9 per cent of turnover in the first year for companies with a turnover of ₹100-500 crore (for 50 per cent incremental turnover) and 7 per cent for those above that. In the subsequent four years, it would keep decreasing.

### Greenfield projects

For greenfield projects (new set-ups) a minimum investment of ₹500 crore was reportedly proposed with incentives at 11 per cent to start with the source said.

However, the industry has pointed out that it may be difficult for most companies to meet the ₹500 crore criteria as most companies in India do not invest in the entire value chain such as from yarn to garments and, therefore, the threshold needed to be lowered.

The Textile Ministry is also re-looking at the condition of achieving 50 per cent growth on a year-to-year basis, as the industry pointed out that it is ambitious and difficult to achieve.

“The PLI scheme has to fit in with what the needs of the industry and the market conditions are. It is better for the government to take some time and get it exactly right,” the official said. ■

# EFFECT OF CHITOSAN CONCENTRATION ON 100% COTTON FABRIC TO STUDY ANTIMICROBIAL PROPERTY

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## Abstract

In recent years, several technologies have been developed for modifying cotton and cotton blends as multi-functional textiles. Surface modification of cotton fabrics can impart wrinkle free finishes, self-cleaning properties, anti-microbial activity, UV protection, and flame retardancy. Self-cleaning features include Chitosan finish.

Chitosan is polysaccharide polymer containing more than 5,000 glucosamine and acetylglucosamine units, respectively. And their molecular weights are over one million Dalton's. Chitin is found in fungi, arthropods and marine invertebrates. Commercially, chitin is derived from the exoskeletons of crustaceans (shrimp, crab and other shellfish) Chitosan is obtained from chitin by a deacetylation process.

Chitin, the polysaccharide polymer from which chitosan is derived, is a cellulose-like polymer consisting mainly of unbranched chains of N-acetyl-D-glucosamine. Commercial chitosan is derived from the shells of shrimp deacetylated chitin, chitosan, is comprised of chains of D-glucosamine.

Chitosan can also be used in water processing as a part of a filtration process. Chitosan causes the fine sediment particles to bind together and is subsequently removed with the sediment during sand filtration. Chitosan also removes phosphorous, heavy minerals, and oils from the water. Chitosan is an important additive in the filtration process. Sand filtration apparently can remove up to 50% of the turbidity alone while the Chitosan with sand filtration removes up to 99% turbidity.

**Keywords :** Chitosan, E. coli, S. aureus, antimicrobial.

## 1. Introduction

Cotton is most important cellulose fiber in textile. But natural cotton contains some impurities. Many finishes are applied on these cotton and cotton blends. Special finishes like stain repellency finish is also applied on cotton to make it Antimicrobial finish. Textiles need to be regularly upgraded and improved to meet the requirements of the industry and reflect the concerns of the society regarding health and environment. This includes knowledge of latest research and innovations covering the entire range from fibre to fabric manufacturing techniques and then fabric to three dimensional finished garments.

The inherent properties of the textile fibres provide room for the growth of micro-organisms. Besides, the structure of the substrates and the chemical processes may induce the growth of microbes. Humid and warm environment still aggravate the problem. Infestation by microbes cause cross infection by pathogens and develop odour where the fabric is worn next to skin. In addition, the staining and loss of the performance properties of textile substrates are the results of microbial attack. Basically, with a view to protect the wearer and the textile substrate itself antimicrobial finish is applied to the textile materials.

Antimicrobial textile products continue to increase in popularity demand for fresh smelling, skin friendly, and high-performance fabrics. Modern performance fabrics are required in much specialist application, sports textile is one example. This need to exhibit high degrees of performance in terms of longevity and durability by imparting antimicrobial properties to the fabrics. These properties can be improved as well as increase the comforts as hygiene factor making them more pleasant to wear. Odour can be neutralized and skin problems caused by microbial growth reduced thus emphasizing the 'hygienic' nature of the treated product.

Microbes are the tiniest creatures not seen by the naked eye. They include a variety of micro-organisms like Bacteria, Fungi, Algae and viruses. Bacteria are unicellular organisms which grow very rapidly under warmth and moisture. Further, sub divisions in the bacteria family are Gram positive (Staphylococcus aureus), Gram negative (E-Coli), spore bearing or non-spore bearing type. Some specific types of bacteria are pathogenic and cause cross infection. Fungi, molds or mildew are complex organisms with slow growth rate. They stain the fabric and deteriorate the performance properties of the fabrics.

Growing awareness towards health and hygiene has increased the demand of bioactive textiles. A durable finish is potentially effective means of controlling micro-organism on to textiles. In last few decades, wide varieties of antimicrobial agents have been used for the protection of textile as well as wearer. The major class of antimicrobial agent for textiles includes triclosan, metal and their salts, organo metallics, phenols, quaternary ammonium

compounds, organometallics, phenols, quaternary ammonium compounds and organosilicons. One prime consideration related to the end use and function of an antimicrobial finish on textiles is the low toxicity of the finishing agent and such chemical finishes applied to textiles should meet environmental and low toxicity criteria. The use of natural antimicrobial agents on textiles dates back to antiquity, when the ancient Egyptians used species and herbs to preserve mummy wraps. Chitosan are the richest source of antimicrobial compounds.

## 2. Materials and Methods

### 2.1 MATERIALS

The plain-woven 100% cotton fabric will used for the study.

**Table 2.1 : Fabric particular**

Sr. No	Particular	100 % Cotton
1	Material	100% cotton fabric
2	Weave	Plane
3	GSM	150
4	EPI	70
5	PPI	70
6	Warp count	22
7	Weft count	22

### 2.2 Chemical

**Table 2.2 : Chemicals Used for Study**

Sr. No	Name of Chemicals	Purpose
1	Enzyme Amylase	Desizing Agent
2	Sodium Bicarbonate	To adjust pH
3	Sodium Hydroxide	Scouring Agent
4	Turkish Red Oil	Wetting agent
5	Hydrogen Peroxide (30%)	Bleaching Agent
6	Sodium meta Silicate	Stabilizer
7	Sodium Hexa Meta Phosphate	Sequestering Agent
8	Chitosan	Antimicrobial Agent
9	Citric Acid	Auxiliaries
10	Acetic Acid	To Adjust pH

### 2.3 Experimental Method

#### 2.3.1 Desizing

100% cotton fabric treated with 3-5 gpl cellulase enzyme desizing to remove size paste. Desizing of cotton fiber was carried as follows :

**Table 2.3 : Chemicals used for desizing**

Sr. No	Chemical	Quantity
1	Cellulase	3-5 gpl
2	Wetting agent	1 gpl
3	Sequestering agent	1 gpl
4	Temperature	60-70°C
5	Time	90 minutes

#### 2.3.2 Combine Scouring and Bleaching

In combined scouring and bleaching of cotton, the scouring process is accelerated in presence of  $H_2O_2$  and less time is required to achieve good absorbency of the material. The process of combined scouring and bleaching was carried using Hydrogen peroxide ( $H_2O_2$ ) and Sodium Hydroxide (NaOH). After Completion of this process washing and draining of fabric was carried out. The process of combine scouring and bleaching is carried out in alkaline pH which is maintained by Sodium Carbonate ( $Na_2CO_3$ ). pH of combine scouring and bleaching is 9-11. The combine scouring and bleaching was carried out as follows :

**Table 2.4 : Chemicals used for Combine scouring and bleaching**

Sr. No	Chemical	Quantity
1	$H_2O_2$	3-5% {owf}
2	Sodium hydroxide	3% {owf}
3	Sodium Carbonate	1 gpl
4	Sodium Silicate	1 gpl
5	Sequestering Agent	1 gpl
6	Wetting Agent	1 gpl
7	pH	9-11
8	Temperature	85°C
9	Time	90 minutes

#### 2.3.3 Preparation of chitosan chemical and application

Chitosan was dissolved in 2% aqueous acetic acid solution. The fabric was first immersed in the pad bath for 10 min. padded up to  $80 \pm 5\%$  wet pickup on weight of fiber [O.W.F.], dried on pin frames at  $100^\circ C$  for 5 minutes. Cured at  $180^\circ C$  for 2 minutes.washed and dried. Samples were cured at  $180^\circ$  for a period of 2 minutes.

#### 2.3.4 Treatment of Chitosan on Fabric

The pre-scoured and bleached cotton fabric will pad-dry-cure with different concentrations of solution. Were prepared by dissolving chitosan

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overnight at Room Temperature. Containing various concentration of Chitosan (3gpl, 4gpl, 5gpl, 6gpl, 7gpl, 8gpl, 9gpl, 10gpl, 11gpl, 12gpl, 13gpl, 14gpl, 15gpl) keeping 65% expression. The padded fabric samples were then dried at 80-85°C to maintain the residual moisture content 8-10%. The dried fabric

**Table 2.5 : Concentration of chitosan**

Sr. No	Concentrations in GPL	Temperature in °C
1	3	180°C
2	4	180°C
3	5	180°C
4	6	180°C
5	7	180°C
6	8	180°C
7	9	180°C
8	10	180°C
9	11	180°C
10	12	180°C
11	13	180°C
12	14	180°C
13	15	180°C

### 2.4 Testing and Analysis

#### 2.4.1 Antimicrobial Activity

Anti-microbial testing was done by AATCC test method 100:2004 for the quantitative assessment of the antibacterial effectiveness of the antimicrobial agents against Gram positive bacteria (*Staphylococcus aureus*) and Gram-negative bacteria (*Escherichia coli*). Circular swatches of 4.8 ± 0.1 cm in diameter were cut from the test fabric. The cut pieces were stacked in 250 ml wide mouth glass jar with a screw cap followed by sterilization at 121°C for 15 min. 0.5 ml of the bacterial solution was added to the swatches so that whole of it is absorbed by one swatch. The jar was kept for 24 h in the incubator at 37°C. After 24 h 50 ml of sterilized saline water was added to each jar followed by 15 min shaking in the shaker. Further three serial dilutions were done by taking 100 ml in 900 ml of saline water in eppendorf micro test tubes. Nutrient agar plates were made and 100 ml of this diluted bacterial solution was inoculated into the agar plate and left for 24 h in incubator at 37°C. After 24 h the number of bacterial CFU of the bacteria formed on the agar plate were counted. Untreated cotton sample was used as the control sample every time.

#### 2.4.2 Tensile Strength (ASTM D 5035)

Prior to the test specimens were conditioned to moisture equilibrium in the standard atmosphere of 65% relative humidity, 27 ± 2°C temperature. Samples (fabric strip) were cut by using the given template. Cut threads were removed from both side of the sample (raveling) to get strip of exactly 5 cm width. Clamp was set on testing machine at distance of 20 cm. and strength indicating pointer to zero position. Sample was clamped between two jaws, with some length of fabric extending beyond the jaws at each end. Sample was elongated at a constant rate of 300mm/min till a rupture. Breaking load in Kgf was noted. Same procedure were repeated for all samples.

#### 2.4.3 Measurement of Bending Length

Prior to the test specimens were conditioned to moisture equilibrium in the standard atmosphere of 65% relative humidity, 27 ± 2°C temperature. Samples (fabric strip) were cut by using the given template. Cut threads were removed from both side of the sample (raveling) to get strip of exactly 1-inch × 6-inch width. Put the sample on bending length track. Slide sample in forward direction till incline angle become 41.50. When fabric reach angle 41.50 than measure the length on scale which is nothing but bending length.

### 3. Result & Discussion

#### 3.1 Antimicrobial activity

**Table 3.1 : Antimicrobial activity**

Sr. no	Concentration of Chitosan	Antimicrobial Activity (Percentage reduction in CFU)	
		E.coli	S.aureus
1	3	40.00	55.50
2	4	55.20	68.30
3	5	69.70	79.45
4	6	72.90	81.60
5	7	75.50	86.00
6	8	79.30	88.50
7	9	81.30	90.70
8	10	84.80	91.50
9	11	85.30	91.80
10	12	85.90	92.00
11	13	86.10	92.80
12	14	86.80	93.80
13	15	87.20	94.50

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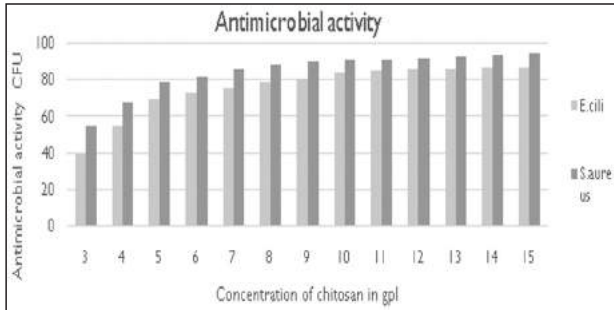


Fig .3.1: Antimicrobial activity

As shown in Fig. 3.1, chitosan gives good anti-microbial activity when concentration increases from 3 to 10 gpl. With increase in concentration of chitosan antimicrobial activity increases. After 10 gpl there is no any remarkable improvement in antimicrobial activity. The maximum antimicrobial activity is archived at 15 gpl concentration which is 87.20% for E. coli and 94.50 for s. aureus. The effect may increase with increase in concentration of chitosan but increase in concentration decrease the penetration of chitosan. With increase in concentration of solution and temperature of curing antimicrobial Activity increases. This is due to chitosan quantity increase.

**3.2 Tensile strength**

**Table 3.2 : Tensile strength of given Treated fabric (in kg/f)**

Sr. no	Concentration	Tensile strength (E. Coli)		Tensile strength (S. aureus)	
		Warp	Weft	Warp	Weft
1	Untreated	22.30	22.25	22.30	22.25
2	3	21.95	21.90	22.00	21.95
3	4	21.95	21.90	22.00	21.95
4	5	21.80	21.85	21.90	21.80
5	6	21.80	21.80	21.85	21.80
6	7	21.80	21.75	21.80	21.80
7	8	21.75	21.65	21.75	21.70
8	9	21.75	21.55	21.70	21.60
9	10	21.65	21.45	21.65	21.50
10	11	21.60	21.35	21.60	21.40
11	12	21.50	21.30	21.60	21.40
12	13	21.50	21.30	21.50	21.30
13	14	21.45	21.25	21.50	21.30
14	15	21.45	21.20	21.50	21.25

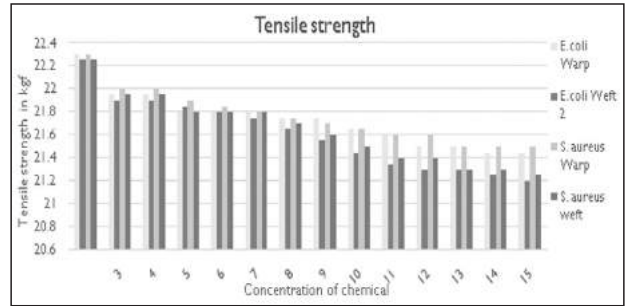


Fig 3.2 : Tensile Strength

As shown fig 3.2, With increasing concentration of Chitosan, tensile strength decreases. But decrease in tensile strength is not remarkable. 2 – 3 % tensile strength decreases in both warp and weft direction. This is due to breaking of hydrogen bonds and decrease in air permeability of fabric.

**3.3 Bending Length of given Treated fabric**

**Table 3.3 : Blending length after application of chitosan**

Sr. no	Concentration	Tensile strength E. coli		Tensile strength (S. aureus)	
		Warp	Weft	Warp	Weft
1	Untreated	2.50	2.50	2.50	2.50
2	3	2.80	2.85	2.85	2.85
3	4	2.80	2.85	2.85	2.90
4	5	2.95	2.90	2.98	2.95
5	6	2.95	2.95	2.98	2.95
6	7	2.95	3.00	3.00	3.10
7	8	3.00	3.00	3.10	3.10
8	9	3.05	3.05	3.10	3.10
9	10	3.10	3.05	3.20	3.25
10	11	3.20	3.05	3.30	3.25
11	12	3.20	3.10	3.30	3.30
12	13	3.25	3.10	3.40	3.30
13	14	3.25	3.15	3.40	3.40
14	15	3.20	3.15	3.50	3.40

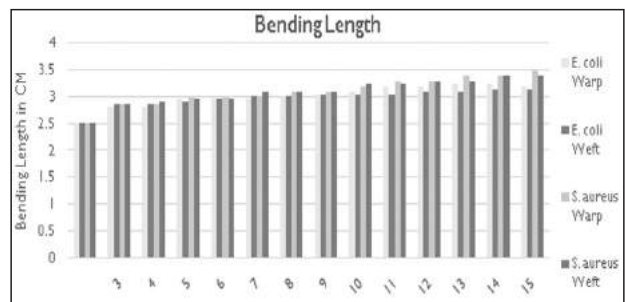


Fig 3.3 : Blending length after application of chitosan

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As shown in fig 3.3, With increasing concentration of Chitosan, bending length also increases. 2-3% increase in bending length observed in all concentration of chitosan. The increase in bending length is due to increase in stiffness of fabric.

### 4. Conclusion

In this study different concentration of antimicrobial agents were applied by pad-dry-cure technique and antimicrobial activity was evaluated against two bacteria i.e. *S. aureus* (Gram positive bacteria) and *E. coli* (Gram negative bacteria). The anti-microbial activity increases with increase in concentration of chitosan. When concentration increases from 3 to 10 gpl. With increase in concentration of chitosan antimicrobial activity increases. After 10 gpl there is no any remarkable improvement in antimicrobial activity. The maximum antimicrobial activity is achieved at 15 gpl concentration which is 87.20% for *E. coli* and 94.50 for *S. aureus*. There is no any remarkable change observed in physical properties of cotton fabric.

### 5. Reference

- Zitao Zhang, Liang Chen, Jinmin Ji, Yanliu Huang and Donghui Chen "Antibacterial Properties of Cotton Fabrics Treated with Chitosan" *Textile Research Journal* 2003 73: 1103
- Md Ibrahim H Mondal, Firoz Ahmed, Md Roknuzzaman, Md Nazmul Huda, Md Ahsan Habib "Antimicrobial activity of chitosan and its derivatives exhausted cotton fabrics as ecofriendly antimicrobial agents" *Journal of Textile Eng Fashion Technol.* 2020;6(3):77-80.
- Guneet Dhiman and J. N. Chakraborty "Antimicrobial performance of cotton finished with triclosan, silver and chitosan" *Dhiman and Chakraborty Fashion and Textiles* (2015) 2:13.
- SEUNGSIN LEE, JEONG-SOOK CHO, AND GILSOO CHO "Antimicrobial and Blood Repellent Finishes for Cotton and Nonwoven Fabrics Based on Chitosan and Fluoropolymers" *Textile Research Journal* 1999 69 : 104.
- Mr. M. Parthiban, Dr. S. Gunasekaran & Silambarasan, Sakthi Srinivasan, Seetharaman, Karthika "Effect of nanosilver application on antimicrobial finishing".
- G.Thlagavathi, T.Kannaian, "Dual Antimicrobial and blood repellent finishes for cotton hospital fabrics", *IJFTR*, vol. 33, 2008, 23-29.
- DANIELA ENESCU "Use of Chitosan in Surface Modification of Textile Materials" *Vol. 13, No. 6, 2008*, pp. 4037-4048.
- Allan, C. and Hadwiger, L.A. 1979 "The fungicidal effect of chitosan on fungi of varying cell wall composition". *Exp. Mycol.*, 3: 285-287. [Crossref], [Google Scholar].
- Boguslawski, S., Bunzeit, M. and Knorr, D. 1990. "Effects of chitosan treatment on clarity and microbial counts of apple juice". *ZFL, Int. J. Food Technol. Food Proc. Eng.*, 41: EFS55 [Google Scholar].
- Castellanos Perez, N., Maldonado Vega, M., FernandezVillagomezGand Cafferall Mendez, S. 1988. "An evaluation of the coagulating ability of chitosans from different crustacea species and fungi". In *Chitin and Chitosan*, Edited by: Skjak Braek, G., Anthonsen, T. and Sandford, P. 567-576. London: Elsevier Applied Science.
- El-tahlawy, K.F., El-bendary, M.A., Elhendawy, A.G. & Hudson, S.M. (2005) "The antimicrobial activity of cotton fabrics treated with different crosslinking agents and chitosan" *Carbohydrate Polymers*, 60(4), 421-430. ■

## US economy well on way to strong post-Covid recovery : Janet Yellen

Treasury Secretary Janet Yellen said the US is "well on the way" to a strong recovery from the Covid-19 pandemic, and urged law-makers to turn to addressing long-run problems ailing the economy.

Yellen said in testimony she's scheduled to deliver before the Senate Finance Committee of late that she came into her job in January hoping to help Americans "make it to the other side of the crisis."

"Thanks to this Congress - and its passage of the American Rescue Plan — I believe we are well on our way towards that goal," she said, referring to the \$1.9 trillion pandemic-relief bill enacted in March.

Still, the country faces challenges in wage inequality, declining labor force participation, racial gaps and climate change, she said. Facing those issues requires substantial public investment, she said, urging lawmakers to back President Joe Biden's proposals for a multi-year \$4 trillion spending plan on child care, infrastructure and green investments.

The hearing comes amid an effort by a bipartisan group of senators to hash out a compromise infrastructure plan that would deliver on a portion of Biden's proposals. Democratic lawmakers in the meantime are also preparing for a fast-track bill that would forgo the need for Republican support by wrapping in spending and revenue proposals that cannot win cross-party backing. ■

### Exports grew 80% to \$7 bn in May 1st week

Continuing a positive growth, India's exports grew by 80 per cent to \$7.04 billion during the first week of May, according to preliminary data of the commerce ministry.

Exports during May 1-7 last year stood at \$3.91 billion and \$6.48 billion in the same week of May 2019, the data showed. Imports too rose by 80.7 per cent to \$8.86 billion during May 1-7, 2021 as against \$4.91 billion in the same period last year and \$10.39 billion in 2019.

India's exports in April jumped nearly threefold to \$30.21 billion from \$10.17 billion in the same month last year.

Major export commodities which are recording healthy growth include gems and jewellery, jute, carpet, handicrafts, leather, electronic goods, oil meals, cashew, engineering, petroleum products, marine products and chemicals.

Federation of Indian Export Organisations (FIEO) President S K Saraf said that the exports growth is encouraging and order books of exporters are healthy.

"I will urge the government to look into the issues of MEIS (merchandise export from India scheme). RoDTEP (remission of duties and taxes on export products) rates should also be announced immediately to further push the shipments as profitability of exporters are getting impacted," he said. □

### Textile exports declines in FY21 on Covid-19 impact

Textile and apparel exports in 2020-2021 are almost 13% less (in dollar terms) than the previous year, provisional data available with the Cotton Textiles Export Promotion Council shows.

The exports were worth \$29 billion last year as against \$34 billion in 2019-2020.

Exports of ready-made garments declined 20.78% last financial year compared with the previous year, while exports of man-made textile items fell 21.20%.

Siddhartha Rajagopal, the executive director of the council, said exports of cotton textiles had declined to 12%. This was mainly because of the COVID spread made its impact on exports last April and May. However, all textile and clothing segments, including carpet, jute, apparel, and MMF

products, showed significant growth in March this year and this trend is said to have continued in April too, Mr. Rajagopal said.

The final data, expected later this month, may be better even for overall textile exports in 2020-2021. Textile and clothing exports are expected to do well at least till June since countries such as the U.S. and U.K. are looking up and China has also started buying. "We expect this year to be better than last year," he added. □

### Cotton export touches new high, more than last season's shipment

Building up on lower domestic cotton prices, Indian exporters have so far shipped over 75 per cent of the 65 lakh bales (each of 170 kg) of cotton exports projected for the whole year 2020-21.

Cotton Association of India's (CAI) latest data showed shipments as on April 30 at 50 lakh bales. This means, India by April has shipped out what was exported during the whole of last season. The trade body, in its revised export projections, has estimated India's cotton exports for the year at 65 lakh bales.

"Indian cotton was the cheapest in the world. Therefore, we could take advantage of being competitive in the international market," said Atul Ganatra, President, CAI.

The season 2020-21 had started with lower cotton prices at around ₹40,000 a candy (each of 356 kg of processed ginned cotton) during October-November 2020. The international prices ruled at around 68 cents per pound.

With brightened international price prospects, India's cotton shipments gained momentum, thereby lifting the domestic prices to ₹40,800 on December 10, 2020 and ₹46,200 on May 10, 2021. Meanwhile, international cotton, too, had inched up to 96 cents on February 26, 2021, Global prices softened to 86-87 cents a pound.

"However, now the export parity has reduced as the international prices have dropped from 96 cents to 88 cents so it gets less attractive to export with reduced parity. Also, we are facing challenges of availability of containers, higher freight costs and competition from US and Brazil. The export prospects are not as attractive now as it was about three months ago," also Indian exporters are facing getting good quality for export is a problem, he added.

Ganatra noted that of the total estimated production of 360 lakh bales for 2020-21, so far



## EXPORT PROSPECTS AND MARKETS

336.37 lakh bales or over 93 per cent of the crop has arrived in the market.

“The CAI has reduced its consumption estimate for the current crop year by 15 lakh bales to 315 lakh bales. Consumption this year is likely to take a hit because of the ongoing Covid-19 pandemic and lockdown in most of the States,” said Ganatra in a statement. □

### Exports surge 69% to \$32b in May; Trade Deficit at \$6.2b

India’s merchandise exports rose 69.35% in May from a year earlier to \$32.27 billion, driven by engineering, petroleum products and gems and jewellery, revised trade data released by the commerce and industry ministry recently showed. Trade deficit in goods stood at \$6.28 billion in the month, lowest in eight months.

Trade deficit was \$15.10 billion in April and \$3.15 billion in May, 2020. Imports were up 73.64% year-on-year to \$38.55 billion in May, data showed.

“The widening state level restrictions shrunk the imports of crude oil and gold, narrowing the merchandise trade deficit to an eight month low in May 2021,” said Aditi Nayar, chief economist, ICRA.

Exports to the US, UAE and Singapore witnessed the highest increase, according to the data. Exports of engineering, petroleum products and gems and jewellery in May were \$8.64 billion, \$5.33 billion and \$2.96 billion, respectively.

“The order booking position of our exporters is not only extremely good but also the gradual opening up of major global markets and improvement of situation in the country is expected to push exports growth further,” said Sharad Kumar Saraf, president, Federation of Indian Export Organisations.

Engineering Export Promotion Council said that while the export outlook has been projected to be positive in the current fiscal, there were downside risks too given that public health experts have predicted a possible third wave of the pandemic and sought targeted policy intervention.

“The efforts must be made now to minimise the impact of pandemic on trade and business as protecting livelihood is no less important than

lives. The plans should be in place to ensure goods movement, especially export consignments, are not affected by lockdowns, night curfews or any other restrictions imposed by states to prevent the spread of virus,” said EEPCC chairman Mahesh Desai.

Desai hoped that the rates for the export promotion scheme RoD-TEP would be announced shortly and provide more targeted support as suggested by the Reserve Bank in the last monetary policy review.

Gold imports increased 790% to \$679 million during the month under review from \$76.31 million in May 2020, data showed. Oil imports grew 171% to \$9.45 billion, as compared to \$3.49 billion in the same period last year.

Non-oil and non-gold imports, an estimate of the strength of domestic demand-rose 52.48% in May.

Taken together with services, India registered an overall trade surplus of \$1.6 billion in May.

Exports during April-May this year jumped to \$62.89 billion, as against \$29.41 billion in the same period last year.

Nayar said the steady exports over April-May 2021, despite the second covid surge and associated lockdowns, are heartening, suggesting that India may be well poised to benefit from recovering demand in the advanced economies. □

### China now emerges as second-largest export destination, behind only US

China overtook the UAE to emerge as India’s second-largest export destination in FY21, behind only the US, for the first time in recent memory, despite the onslaught of the Covid-19 pandemic and a deadly border clash.

Official data showed exports to China jumped an impressive 28% in FY21 from a year before to over \$21 billion, while those to the UAE plunged by 42% to nearly \$17 billion. While China’s massive infrastructure push prompted it to import iron ore and steel in large volumes from India, the UAE, hurt by a plunge in oil prices, cut back purchases in a pandemic year. India’s total merchandise exports shrank by just over 7% last fiscal to \$291 billion.

Nevertheless, the exports to China were still less than a half of those to the US (\$21 billion vs \$52 billion in FY21) even though the outbound

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## EXPORT PROSPECTS AND MARKETS

shipment to the world's largest economy faltered by almost 3%.

More importantly, India's exports to China would need to grow at a rapid pace on a sustained basis for years before the massive trade imbalance is somewhat corrected.

Including Hong Kong, considered a close proxy for Beijing, India's effective trade deficit with China dropped to \$49 billion in FY21 from almost \$55 billion in the previous year. With China alone, the trade deficit declined to \$44 billion last fiscal from nearly \$49 billion in FY20.

Despite this obvious drop in absolute term, China's share in India's total goods trade deficit still zoomed to 43% in FY21 from 30% a year before. This is because the country's imports from China were in excess of \$65 billion last fiscal, almost the same as in FY20, even though its total inbound shipments faltered by 17% from a year earlier. □

## Exports grew 197%, imports 166% in April

Riding on a sharp growth in exports of gems and jewellery, engineering goods and petroleum products, India's goods exports in April 2021 shot up 197.03 per cent to \$30.21 billion compared to April 2020 when shipments had plunged due to the national lockdown and halt in manufacturing to check the Covid-19 pandemic.

Goods imports in April 2021 increased 165.99 per cent to \$45.45 billion, widening the trade deficit to \$15.24 billion during the month which was 120.34 per cent higher than the deficit in the same period 1st year, as per early estimates released by the Commerce & Industry Ministry recently.

Exports and imports in April 2021 posted a growth of 16.03 per cent and 7.2 per cent respectively compared to April 2019 (a normal month with no lockdown).

Exporters said that they felt reassured by the rise in exports during the pandemic. Exporters' body FIEO pointed out while the impressive growth reinforced the assessment that their order booking position was extremely good, the government needed to bring clarity on incentive and input tax refund schemes, such as the Remission of Duties and Taxes on Export Products and Services Export Incentive Scheme, to create a more certain environment for exports.

Growth in labour-intensive sectors like gems & jewellery, handicrafts and carpets augurs well for the job scenario, said SK Saraf, President, FIEO.

While a sharp jump in engineering shipments is primarily on account of low-base effect, it has also been supported by robust demand, said EEPC India Chairman, Mahesh Desai.

"The recent surge in Covid-19 cases has posed risks to growth but we remain hopeful of continued recovery during the year. The WTO has also revised its projection upward and expects the global trade volume to increase by 8 per cent in 2021," he said.

In April 2021, non-petroleum exports posted a sharp increase doubling to \$26.85 billion compared to April 2020 and 19.44 per cent over \$22.48 billion in April 2019. □

## Exports grow 46.4% in 2 weeks; US, UAE Top Mkts

India's outbound shipments rose 46.43% to \$14.06 billion in the first fortnight of June, led by healthy growth in the exports of engineering, gems and jewellery and petroleum products.

Exports grew 52.39% to \$7.71 billion during the first week of June but the rate slowed to around 40% to \$6.35 billion in the second week, a government source said. Non-petroleum exports increased 43.8% in the same period.

Imports grew 98.33% to \$19.59 billion during June 1-14, led by petroleum, pearls, precious stones and vegetable oil. Non-oil, non-gems and jewellery imports, an indicator of the strength of domestic demand, expanded almost 70%.

The UAE, US and Italy were the markets which witnessed the steepest increases in exports at 184.7%, 40.4% and 171% respectively. Imports rose the most from Iraq (342%), Saudi Arabia (356%) and China (47.6%).

Driven by engineering, petroleum products and gems and jewellery, India's merchandise exports rose 69.35% in May from a year earlier to \$32.27 billion, resulting in an eight-month low trade deficit of \$6.3 billion. However, compared to May 2020, the trade deficit in goods widened from \$3.15 billion, revised trade data released by the commerce and industry ministry recently.

The government expects to post \$400 billion of merchandise exports in the ongoing fiscal 2022. India's goods exports in FY21 contracted 7.3% from the year before to \$290.6 billion.

The value of imports was \$10.5 billion during the second week of June against \$9.1 billion in the first week of June. ■

## Profile of Office Bearers of ITAMMA for the year 2021-22

### Mr. Dhijen R. Mehta, President

#### Proprietor, Ashton Green & Company

Dhijen Mehta, Owner of M/s. Ashton Green & Company manufacturer and exporters of equipment of Effluent Treatment Plant and Sewage Treatment Plant and other power transmission products related to Textile, Cement, Paper and Food Industries.



Mr. Dhijen R. Mehta, President

Ashton Green & Company established in the year 1964 and was pioneer in manufacturing of Transmission product

specialize in PIV Gear Boxes and transmission drives related to textile Industries.

Since last one year Ashton Green & Company has started designing and manufacturing of fine and coarse bar screen in standard and step type used in ETP and STP systems.

Mr. Mehta is also an Associate of the concern M/s. Transport Engineering, the manufacturers of power transmission product, dealers and stockiest of worm reduction gear boxes and their spares.

Mr. Mehta is also an Associate of the concern M/s. Medh the manufacturers of special purpose food cutting machinery.

Having the Core competency in Accounts & Finance, he has been serving ITAMMA in this field since last few years and had handled ably the very responsible post of Chairman of Finance Sub-Committee. Considering Finance being the back bone of any Association for its sustainability, Mr Mehta wish to continue his services in this field in future also to strengthen the Secretariat of ITAMMA financially so that we can serve our Members very effectively.

Mr. Mehta also guide and help the Directorate in the management of ITAMMA's Building activities leading to delivery of quality maintenance Projects at competitive cost, including state-of-the-art renovation of M C Ghia Hall.

### Mr. Purvik Panchal, Vice-President

#### Technical & Sales Head, Shree Ram Textile

» Technical & Sales Head of (SRT) Shree Ram Textile who Manufacturers a wide range of Warp Stop Motion for all types of Weaving Machines (Looms). SR Group is established since year 1957.

» Partner of (SRE) Shree Ram Enterprise who are the Authorised Distributor and Importer of CNC Metal Cutting Machine, Cutting Tools, Oils & Adhesives.

» He has wide experience in Textile & Metal Cutting Industries for almost more than 15 years.

» He is actively associated with ITAMMA since 2014 and in the managing committee since \$ 2017.

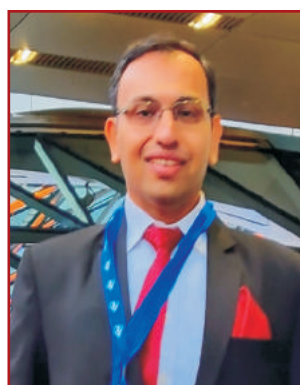


Mr. Purvik Panchal  
Vice-President

### Mr. Nimesh J Shah, Hon'Treasure

#### Partner, Britex Industries

Young and enthusiastic, Nimesh is currently partner at Britex Industries ( which is part of the Wiperdrive Group) which is into selling of Textile spare product and accessories, he is Director at Transtec Overseas Pvt Ltd which manufactures Aviation Ground support Equipments and also Director of Oilgear India Pvt Ltd which manufacture and supply Hydraulic and Automation products and solutions. He holds an MBA in International Marketing from Cardiff University, UK along with a B.E. in Production Engineering from Bombay University, India. He has Twenty five-years of rich experience and exposure



Mr. Nimesh J Shah, Hon'Treasure

to the finer side of running all business successfully. Dealt with customers such as Air India and Indian Airlines and executed sales up to the tune of Euro 20 million for Ground support Equipment. At a

**Profile of Office Bearers of ITAMMA for the year 2021-22**

young age of 45 he has played a key role in honing the operation of the group and has demonstrated considerable Financial and Marketing skills. During all these year, in a short period of time, he has initiated a significant thrust on the group export operations to Europe and Middle East companies. He also played a substantial role in getting all Group companies ISO 9001: 2008 certified and participating in international trade fair with thrust on exports. Nimesh is fully geared to spearhead his all Group companies in the area of world class product and service to exceed customer expectation.

**Mr. Chandresh H. Shah,  
Immediate Past-President**

**Executive Director, KRSNA Engimech (P) Ltd.**

- » Executive Director of KRSNA ENGIMECH P. LIMITED - One of the leading & pioneer manufacturer of soft / over flow fabric dyeing machine for all type of fabric in India.
- » Sales head of KRSNA engineering works manufacturer & exporter of all type washing range

/ bleaching range & finishing machinery he has been in to business of textile industry for last more than two decade & member of Indian Textile Accessories & Machinery Manufacturers Association [ITAMMA] for more than decade.



Mr. Chandresh H. Shah,  
Immediate Past-President

- » His main motto to serve ITAMMA & its member for better business environment & help other small member to get maximum advantage from government scheme & subsidy.
- » Apart from above KRSNA group awarded twice by government of India for Environment friendly - energy saving machines for textile Industry also we are import substitute.

**For further information, please contact :  
N. D. Mhatre, Director General (Tech), ITAMMA  
+91-9820292245** ■

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### **Mayer & Cie's strategy on Product Lifecycle Management (PLM) narrated by Sebastian Mayer**

Sebastian Mayer, Chief Digital Officer at circular knitting machine manufacturer Mayer & Cie. (MCT), gave a keynote speech at SAP's virtual PLM Info Days on May 18 and 19, 2021. He was invited to speak about Mayer & Cie.'s strategy on Product Lifecycle Management (PLM), which is rated exemplary in both scope and progress of implementation. The premium manufacturer sees the benefits for their customers as the main incentive for its PLM strategy.



Sebastian Mayer

### **Claim to leadership extends beyond machine technology**

"We see ourselves as a technology leader and innovation driver above and beyond the technology of our machines," says Sebastian Mayer, Chief Digital Officer at Mayer & Cie. "That includes an efficient and modern product origination process. The high-grade technological infrastructure is a precondition for the ability to provide adequately for the requirements of the future and our customers."

Sebastian Mayer has been in charge of digitisation at the long-established company since 2017. Together with his team, he has identified four focus areas for Mayer & Cie.'s digitisation journey: digital manufacturing or a state-of-the-art production process, followed by digital processes and a digital organisation or, in short, user- and customer-friendly processes. Along with the framework conditions in respect of the legal position and security, the company attaches the greatest importance to a digital product and new, digital customer experiences. "PLM lays for us foundations on which we can respond to customer needs faster, more individually and thereby better," Sebastian Mayer says, adding that "knitters around the world can continue to rely on our claim to leadership."

### **PLM as the "Digital Backbone"**

At a mechanical engineering company, the development department plays a key role. It is

interwoven and connected with nearly all the other departments, and that is certainly the case at Mayer & Cie. "Whenever there is a change of supplier, a service case or a special machine configuration the development department is always involved," Sebastian Mayer says. Enquiries our performance for your profit used to make their way to Development on all channels: by telephone, by e-mail or in person. Tasks were hard to channel, let alone to prioritise.

That is why the central PLM strategy approach in relation to the product was and still is to map an end-to-end digital process – from the first steps in machine development via product information of each and every kind, configuration options and production information to the service case. Every department does, after all, have a different perspective on the product that must be put to use meaningfully and holistically.

Due to central data organisation and process automation, development and production have above all moved significantly closer to each other. Customers must benefit from the reliable data flow in the web shop for spare parts, for example, by being able to find the right parts more easily.

For all the success that has been achieved so far, Sebastian Mayer concludes, there is still some way to go. "The foundation stone has been laid but the target of the philosophy of a digital twin for every machine that our customers have in use is still some way off. But with our PLM strategy we have created the digital backbone, and that is the prerequisite for better customer experiences and lean, innovative and modern processes."

### **About Mayer & Cie.**

Mayer & Cie. (MCT) is a leading international manufacturer of circular knitting machines. The company offers the entire range of machines required for making modern textiles. Fabrics for home textiles, sportswear, nightwear and swimwear, seat covers, underwear and technical uses are made on MCT knitting machines. Furthermore, Mayer & Cie. regularly develops new approaches underlining its leadership in technology.

Since 2019, Mayer & Cie. has augmented its portfolio by braiding machines which produce sheathings for hydraulic tubes used in aviation, automotive industry as well as in further, very specific fields of applications.

Founded in 1905, Mayer & Cie. generated sales of EUR 72 million in 2020 with about 400 employees worldwide, according to preliminary figures. In addition to its headquarters in Albstadt, Germany, where around 300 people work, and subsidiaries in China and the Czech Republic, sales partners for circular knitting and braiding machines in around 80 countries represent Mayer & Cie.

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**www.mayerandcie.com** □

## Spykar expanding on portfolio

Established in 1992, Spykar has come a long way and has certainly defined the rules of the fashion arena. From what started as solely a men's denim brand sold at multi-brand outlets, Spykar has expanded its portfolio to become a one stop shop for casual wear ensemble for both men and women available pan India across 193 exclusive outlets, 1000+ multi-brand outlets, all key large format stores and e-commerce portals, Besides online Spykar has over 2000 points of sales across 350 towns and cities of the country.

Progressive and at the helm of all industry updates, Spykar is also the signatory to the S.U.R.E. Memorandum, India's biggest sustainability pledge committed towards improvement in sustainable practices, by 2025.

People are an important part of our success story. The core team at Spykar has grown with the business, and continues to be a part of the journey for the last 20 years. Stability coupled with new gen enthusiasm and energy are the vital ingredients of our future.

### Spykar has also won 8 honorary awards like :

1. MAPIC INDIA AWARD 2021 - MOST ADMIRER RETAILER OF THE YEAR - FASHION AND LIFESTYLE.
2. NIELSEN 2019 - Second most Preferred Denim brand.
3. IMRB 2016 - First choice of jeans brand.
4. TRA 2015 - Most attractive denim brand.
5. TRA 2014 - Most trusted Denim brand.
6. Brand Equity 2014 - Most Excited Denim brand.

7. CMAI APEX AWARDS 2008 - The best casual wear brand of the year and product innovation.
8. CMAI APEX AWARDS 2007 - The best casual wear brand of the year and product innovation.
9. CMAI APEX AWARDS 2006 - The best casual wear brand of the year and product innovation.

Basis the talk points below wanted to understand if we can explore an interaction with our spokesperson as per your interest.

### Talk points :

1. How are fashion retailers minimizing impact of second wave



2. Which Indian markets are showing steady demand
3. Menswear fashion segment growth analysis
4. Key initiatives taken by Fashion retailers to capitalize the market
5. Will consumer spending on textile industry rise again?

Do let me know how we can take this forward.

### About Spykar

Spykar is synonymous with the 'Young & Restless' generation of today. Keeping up with the ever-changing dynamics of the global fashion industry, our collection exudes an individualistic and contemporary style. Spykar is a part of the Lord Bagri promoted Metdist Group, a diversified portfolio of companies. Spykar is known for its superlative product quality and great fits. Young & Restless at heart, we always aim to deliver emerging hi-street denim trends and fashion staples that resonate with the growing Indian consuming class. Our range of denims consist of styles which include Purist for the classic lovers to YnR for the

## CORPORATE NEWS

contemporary souls. The top-wear collections are season highlights and compliment the vast range of denims for the season.

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## Strong and healthy first-quarter performance. On track for full year. INglass acquisition positions Polymer Processing Solutions for growth

- ❖ Group Q1 order intake +34.6%, sales +7.2% and operational EBITDA +46% year-over-year.
- ❖ Surface Solutions operational EBITDA margin improved to 17.7%, driven by structural cost-out actions and a better business mix. Sales recovery in automotive, tooling and general industries continues, while aerospace remains slow.
- ❖ Polymer Processing Solutions first-quarter results are on track with full-year guidance. Recently announced acquisition of INglass is expected to be immediately margin and cash accretive on completion and positions the Division for growth.
- ❖ 2021 guidance confirmed.

Key Figures of the Oerlikon Group as of March 31, 2021 (in CHF million)

	Q1 2021	Q1 2020	Δ
Order intake	643	477	34.6%
Order backlog	678	545	24.5%
Sales	568	529	7.2%
Operational EBITDA <sup>1</sup>	88	60	46.2%
Operational EBITDA margin <sup>1</sup>	15.6%	11.4%	420 bps
Operational EBIT <sup>1</sup>	39	9	>100%
Operational EBIT margin <sup>1</sup>	6.9%	1.7%	520 bps

<sup>1</sup> For the reconciliation of operational and unadjusted figures, please see tables I and II on page 2 of this media release.

“We delivered a robust Group performance in the first quarter, which was driven by our structural cost-out actions and the recovery in the global automotive and tooling markets,” said Dr. Roland Fischer, CEO Oerlikon Group. “Assuming markets continue to pick up, and there are no further significant disruptions from COVID-19, we confirm our guidance for 2021.”

“Our strategic move in Polymer Processing Solutions with the recently signed agreement to acquire INglass positions the Division to diversify beyond filaments into the larger and more profitable polymer market. We expect the Division to be an important growth driver for the Group,” added Dr. Fischer.

### Robust First-Quarter Performance

Group orders increased globally by 34.6% to CHF 643 million. Group sales improved by 7.2% to CHF 568 million, which is attributed to an increase in demand in the filament equipment, automotive and tooling industries in China and India. At constant exchange rates, Group sales increased year-over-year by 7.5% to CHF 569 million.

Operational first-quarter EBITDA was CHF 88 million, or 15.6% of sales, representing a year-over-year improvement of 420 basis points (bps). First-quarter operational EBIT was CHF 39 million, or 6.9% of sales (Q1 2020: CHF 9 million; 1.7%). The margin improvements were driven by benefits from structural cost actions, positive operating leverage and a better business mix in Surface Solutions.

Group first-quarter EBITDA was CHF 88 million, or 15.4% of sales (Q1 2020: CHF 58 million, 11.0%), and EBIT was CHF 38 million, or 6.7% of sales (Q1 2020: CHF 6 million, 1.1%). The reconciliation of the operational and unadjusted figures can be seen in the tables below.

**Table I : Reconciliation of Q1 2021 Operational EBITDA and EBITDA<sup>1</sup>**

In CHF million	Q1 2021	Q1 2020
<b>EBITDA</b>	<b>88</b>	<b>58</b>
Expenses related to restructuring	-1	-1
Expenses related to discontinued activities	-	-2
<b>Operational EBITDA</b>	<b>88</b>	<b>60</b>

**Table II : Reconciliation of Q1 2021  
Operational EBIT and EBIT<sup>1</sup>**

In CHF million	Q1 2021	Q1 2020
<b>EBIT</b>	<b>38</b>	<b>6</b>
Expenses related to restructuring	-1	-1
Expenses related to discontinued activities	-	-2
Impairment charges	0	0
<b>Operational EBIT</b>	<b>39</b>	<b>9</b>

<sup>1</sup> All amounts (including totals and subtotals) have been rounded according to normal commercial practice. Thus, adding together the figures presented can result in rounding differences.

### New Growth Pillar for Polymer Processing Solutions Division

The agreement to acquire INglass, as announced on April 23, 2021, marks a strategic step for Polymer Processing Solutions, which was previously named Manmade Fibers. This move is in line with the Division's growth strategy to reposition itself and gain a strong foothold in the polymer processing market.

The increasing demand for sustainable, lightweight and durable solutions is driving the usage of polymers across industries such as automotive, construction and packaging. For example, in new vehicles, including electric and hybrid vehicles, weight reduction is very important to reduce energy consumption. This strategic acquisition will accelerate and enhance the Division's organic initiatives to grow its polymer processing capabilities and products, as it further diversifies into new growth areas.

INglass is a market leader in providing hot runner systems under the brand HRS flow. These systems are used to enable effective and energy-saving plastic injection molding. In 2020, INglass had sales of approximately CHF 135 million and a global workforce of around 1000 employees. Pending the customary merger control approvals, the acquisition is expected to be completed in the second quarter of 2021. Once completed, INglass will be integrated with the existing polymer flow control business into the new Business Unit Flow Control Solutions, which will become a pillar of growth for the Division.

### Oerlikon Confirms 2021 Guidance

As vaccinations progress globally, it is expected that pent up demand will drive an increase in consumptions and consequently boost business. Assuming that the COVID-19 pandemic does not cause further major disruptions and markets continue to improve, Oerlikon expects sales of CHF 2.35 billion to CHF 2.45 billion and an operational EBITDA margin of 15.5% to 16.0% in 2021.

## Division Overview

### Surface Solutions Division

Key Figures of the Surface Solutions Division as of March 31, 2021 (in CHF million)

	Q1 2021	Q1 2020	Δ
Order intake	327	333	-1.9%
Order backlog	150	185	-18.9%
Sales (to third parties)	304	325	-6.3%
Operational EBITDA	54	41	32.0%
Operational EBITDA margin	17.7%	12.5%	520 bps

The order intake of CHF 327 million was slightly lower than in the previous year. The book-to-bill ratio is higher than 1, reflecting an increase in demand in the longer-cycle equipment business. Division sales were CHF 304 million, a decline of 6.3% year-over-year, due to a comparatively strong aerospace in Q1 2020 and the lower longer-cycle equipment business as indicated in March. The Division saw sales recover in the shorter-cycle automotive, tooling and general industries markets. At constant exchange rates, Division sales decreased year-over-year by 4.7% to CHF 309 million.

Operational EBITDA was CHF 54 million, or 17.7% of sales, compared to CHF 41 million, or 12.5% of sales in Q1 2020. The improvement in operating profitability is attributed to the structural components of the 2020 cost actions and a better business mix. Unadjusted first-quarter EBITDA was CHF 53 million, or 17.5% of sales, compared to CHF 39 million, or 11.9% of sales in the previous year. Q1 Operational EBIT was CHF 15 million, or 4.8% of sales (Q1 2020: CHF -2 million, or -0.6% of sales), and unadjusted EBIT was CHF 14 million, or 4.6% of sales (Q1 2020: CHF -5 million, or -1.4% of sales).

### Polymer Processing Solutions Division

Key Figures of the Polymer Processing Solutions Division as of March 31, 2021 (in CHF million)

	Q1 2021	Q1 2020	Δ
Order intake	315	144	>100%
Order backlog	528	360	46.8%
Sales (to third parties)	263	205	28.7%
Operational EBITDA	33	18	76.9%
Operational EBITDA margin	12.4%	9.0%	340 bps

The Division delivered a very strong year-over-year increase due to a robust first-quarter performance and the comparison with a pandemic-impacted Q1 2020. Order intake increased significantly by 119.0% to CHF 315 million, compared to CHF 144 million in 2020. Sales increased by 28.7% to CHF 263 million



## CORPORATE NEWS

year-over-year, driven mainly by India and China. At constant exchange rates, sales increased by 27.0% to CHF 260 million.

Operational EBITDA improved year-over-year to CHF 33 million, or 12.4% of sales, compared to CHF 18 million, or 9.0% of sales, in Q1 2020, due to improved operating leverage. Unadjusted EBITDA was CHF 33 million, or 12.4% of sales (Q1 2020: CHF 18 million, 8.9%). Operational EBIT was CHF 24 million, or 9.3% of sales (Q1 2020: CHF 11 million, or 5.6% of sales). Unadjusted EBIT was CHF 24 million, or 9.3% of sales (Q1 2020: CHF 11 million, or 5.5% of sales).

#### Additional Information

Oerlikon will present its results in English during its conference call today beginning at 14:00 CEST. To participate, please click on this link to join the webcast.

To ask questions in the Q&A session, please dial in.

Country	Local toll call numbers
Switzerland	+41 (0) 58 310 50 00
UK	+44 (0) 207 107 06 13
USA	+1 631 570 56 13

Please find the media release including a full set of tables at [www.oerlikon.com/pressreleases](http://www.oerlikon.com/pressreleases) and [www.oerlikon.com/ir](http://www.oerlikon.com/ir).

#### About Oerlikon

Oerlikon (SIX: OERL) is a global innovation powerhouse for surface engineering, polymer processing and additive manufacturing. The Group's solutions and comprehensive services, together with its advanced materials, improve and maximize the performance, function, design and sustainability of its customer's products and manufacturing processes in key industries. Pioneering technology for decades, everything Oerlikon invents and does is guided by its passion to support customers' goals and foster a sustainable world. Headquartered in Pfäffikon, Switzerland, the Group operates its business in two Divisions – Surface Solutions and Polymer Processing Solutions. It has a global footprint of more than 10 600 employees at 179 locations in 37 countries and generated sales of CHF 2.3 billion in 2020.

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## Lenzing launching a nonwoven industry premiere with introduction of E-branding service

- » The first online licensing platform for the nonwovens industry streamlines certification and licensing for VEOCEL™ brand partners.
- » Online registration, application and approval enhances workflow efficiency.
- » The Lenzing E-Branding Service creates greater value and transparency by showcasing the use of sustainable, high-quality and ethically sourced materials.

Lenzing is launching a nonwoven industry premiere with the introduction of E-branding service for certification and licensing service to the VEOCEL™ brand in an industry first move to elevate supply chain transparency for nonwoven fibers. The Lenzing E-Branding Service provides the VEOCEL™ brand's expanding network of partners with a platform designed to increase the value of products by showcasing the use of sustainable, high-quality and ethically sourced materials. Designed from the ground up to make the VEOCEL™ certification process simple, the Lenzing E-Branding Service creates peace of mind for all VEOCEL™ brand partners, allowing producers, retailers and brand owners from hygiene, beauty and home care products, to certify their use of VEOCEL™ branded fibers and develop co-branding campaigns that improve the value of their products. Lenzing E-Branding Service elevates VEOCEL™'s industry-leading reputation.

First launched in 2018 for the textile industry, the Lenzing E-Branding Service unifies registration, application and approval in a state-of-the-art online system designed to eliminate the use of paper and reduce response times, with the aim to enhance efficiency by digitizing workflow. The system's early success and positive feedback made the expansion to the VEOCEL™ brand a natural next step for the industry-leading platform.

As a digital hub for VEOCEL™ brand partners, the platform includes features to apply for new

licenses, monitor application status, and manage existing licenses. Simultaneously, the platform will act as a support portal, showcasing the latest branding guidelines and support for VEOCEL™ brand certified products.

“We are excited to expand our industry-leading Lenzing E-Branding Service to VEOCEL™ brand customers and partners. The expansion showcases Lenzing’s unwavering commitment to sustainability for nonwoven applications, accelerates the digitalization of the industry and sets new standards for driving greater transparency”, says Jürgen Eizinger, Vice President of Global Nonwovens Business, Lenzing AG.

The VEOCEL™ brand continues to push for greater sustainability boundaries. The expansion of the Lenzing E-Branding Service comes nearly two years after the VEOCEL™ brand introduced its pioneering certification requirements mandating nonwoven products use 100% cellulosic and biodegradable materials before qualifying to feature the VEOCEL™ brand logo. Alongside the industry-first requirements, the Lenzing E-Branding Service creates an unparalleled guarantee for consumers that products featuring the VEOCEL™ brand logo are genuinely sourced and produced.

“The VEOCEL™ brand is rapidly becoming an industry-leading credential for hygiene and personal care brands and end-users who are serious about increasing their environmental responsibility. The new E-branding Service will truly complement our VEOCEL™ certification criteria to ensure trustworthy supply chain transparency for our partners, customers and end-users,” adds Eizinger.

“We have observed an overwhelmingly positive shift in consumer preferences as they seek greater sustainability from the nonwoven brands they trust. During this exciting time of transition toward the greater use of environmentally responsible materials, we are thrilled to provide our brand partners and end-users with the peace of mind that products containing VEOCEL™ branded fibers help to better protect the environment and safeguard the future of our planet,” says Harold Weghorst, Vice President of Global Marketing & Branding, Lenzing AG.

VEOCEL™ brand partners can now register for the Lenzing E-Branding Service for VEOCEL™ HERE.

Images related to the announcement can be downloaded HERE.

### About the Lenzing Group

The Lenzing Group stands for ecologically responsible production of specialty fibers made from the renewable raw material wood. As an innovation leader, Lenzing is a partner of global textile and nonwoven manufacturers and drives many new technological developments.

The Lenzing Group’s high-quality fibers form the basis for a variety of textile applications ranging from elegant ladies clothing to versatile denims and high-performance sports clothing. Due to their consistent high quality, their biodegradability and compostability Lenzing fibers are also highly suitable for hygiene products and agricultural applications.

The business model of the Lenzing Group goes far beyond that of a traditional fiber producer. Together with its customers and partners, Lenzing develops innovative products along the value chain, creating added value for consumers. The Lenzing Group strives for the efficient utilization and processing of all raw materials and offers solutions to help redirect the textile sector towards a closed-loop economy. In order to reduce the speed of global warming and to accomplish the targets of the Paris Climate Agreement and the “Green Deal” of the EU Commission, Lenzing has a clear vision: namely to make a zero-carbon future come true.

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### Moda Biella organised 2-day programme on technology, future designing and colour

**Moda Biella announces Winners for SS22 Contest, in collaboration with National Institute of Fashion Technology**

Italian Luxury brand Moda Biella, collaborated with the prestigious, National Institute of Fashion Technology (NIFT), where Mr Malcolm Campbell imparted a wealth of industry experience and knowledge with the students. The 'Moda Biella Master Class' webinar was conducted for 14 NIFT centres across India for students in Textile Design course.

During the 2-day technical, design and colour workshop, Moda Biella announced a contest for the

## CORPORATE NEWS

NIFT students to coin their very own Hero product and stand a chance to feature their designs in the upcoming Moda Biella Collection. The winners of this contest were, Anwasha Mohapatra from NIFT Mumbai, Pearl Bansal from NIFT Chennai and Aaliya Khan from NIFT Jodhpur.

Anwasha Mohapatra from NIFT Mumbai, shared a stylish and sophisticated textile design, nailing the brand ethos with an excellent focus on colour selection and shade names. There were very clever yarns featuring intricate compositions in nice weights of cloth for Spring 2022, woven in classic weaves, accompanied with some great graphics and illustrations of both herringbone weaves and checks as featured in the trendy outfits.

Pearl Bansal's mood board had an incredible Italian influence, accompanied with a wonderful choice of end use for work wear in Busybee, and Smarter Office Space.

A palette of pleasant colours in earthy tones and pleasant illustrations of both cloths and styles was presented, along with the use of The Blazer and the 3B jacket. Furthermore, the structure and texture with the honeycomb weave, and a topical feature of 'eco friendliness' made it a wholesome approach to the art of textile design.

Aaliya Khan from NIFT Jodhpur, emphasised on Honey-Maize colour and how it progresses seasonally, with a clever transition into 'butter' colours.

The nice flowy garment styles, worked extremely well with recycled materials, making it a pleasant combination between nature and comfort.

Mr Vikram Mahaldar (MD & CEO, OCM Private Limited) said, "We were delighted to help train and inspire the future fabric and garment designers within our industry, and are overwhelmed by the response we received for the Moda Biella SS22 Contest.

We are elated to share that with the enormous number of entries we received, each of them were unique in their own way, it was pretty tough to choose the winners. We congratulate Anwasha Mohapatra (NIFT Mumbai) for capturing the mood and style with such sophistication, Pearl Bansal (NIFT Chennai) for focussing on nature and Planet Earth, and Aaliya Khan (NIFT Jodhpur) for her focus on recycled materials to reduce waste, and can proudly say that the future of the textile industry is very bright."

Mr Malcolm Campbell (European Advisor) adds, "It was a pleasure to share my knowledge, my experience and my energy with the young textile design students in India. It is commendable, how the students captured the brand ethos & that reflected in their designs. It was an amazing experience to impart my learnings and also interact

with some of the bright minds. I was impressed with the enthusiasm shown by the students and by the questions that they asked me about raw materials, weaving, tailoring, and the emotion of colour. I am confident that with these type of Master Class seminars to be held over the coming months and years, that the future of Textile Design in India is very positive, and very bright indeed."

Moda Biella, Teaching our Students well to lead the way in The Future of Fashion!

**About MODA BIELLA**

MODA BIELLA has been a revered brand in Italy for many years. The fabrics are truly top notch-with superfine exotic fibers to produce a remarkable array of superfine cloths. With a line-up of finely designed fabrics, this brand is not only deep-rooted to its heritage of making world class fabrics but also excels in technical innovation, and outstanding colour and design features.

**About OCM**

OCM, one of India's largest fabric manufacturers, forays into the Indian market with the launch of Italy's luxurious heritage fashion brand – "MODA BIELLA".

The Company has an extensive 37 acre complex that houses a new-age plant with an annual capacity of 8 million meters of fabric and an employee base of 1,900. The company's ownership lies with the promoters of the Donear Group.

The product design function is at the forefront of global styling. Today, the Company has an extensive product range of high quality all-wool and wool-blended worsted fabrics.

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## **Lenzing hails clear positioning of the EU Commission in the fight against plastic waste**

» Guidelines of the EU Commission to implement the Single-Use Plastics Directive have been published.

- » Uniform labelling obligation for wipes and feminine hygiene products containing plastics as of July 03, 2021.
- » Lenzing's wood-based, biodegradable VEOCEL™ branded fibers as a sustainable alternative to plastic.

The Lenzing Group, the globally leading supplier of sustainably produced specialty fibers, welcomes the issuance of the guidelines for the implementation of the Single-Use Plastics Directive (EU) 2019/904, which took effect on June 05, 2019. In these guidelines, the EU Commission specifies which products fall within the scope of the directive, thus providing clarity in the joint fight of the EU member states against environmental pollution from plastic waste. Lenzing's wood-based, biodegradable cellulosic fibers such as those of the VEOCEL™ brand comprise a sustainable and innovative solution to this man-made problem.

"Pollution of the environment – especially marine pollution – is one of the biggest problems of our time. For this reason, we welcome the measures taken by the EU to reduce certain single-use plastic products and the transition to closed-loop models", says Robert van de Kerkhof, Member of the Managing Board of the Lenzing Group. "Lenzing has been investing in the development of sustainable and innovative solutions for the textile and nonwovens industry for many years and will also continue in the future to intensively work on achieving systemic change towards a circular economy", van de Kerkhof adds.

Lenzing's ambitious sustainability targets make it a trailblazer in manufacturing industry, especially the fiber segment. Lenzing's considerable investments in developing sustainable innovations and implementing climate objectives focusing on carbon neutrality not only strengthen the company's market position and increase shareholder value but also continuously create new jobs.

#### **Uniform labelling rules for some single-use plastic products**

The Commission implementing regulation (EU) 2020/2151 applying to the Single-Use Plastics Directive stipulate uniform labelling requirements for some of the single-use plastic products on the packaging or the product itself starting on July 03, 2021. They encompass feminine hygiene products and wet wipes for personal and household care containing plastic.

"The issue of hygiene is becoming increasingly important and is especially the order of the day in the light of the prevailing epidemic conditions", states Jürgen Eizinger, Vice President Global Nonwovens Business at Lenzing. "The Single-Use

Plastics Directive enables consumers to make a more informed purchase decision. That is why we welcome these implementation guidelines which now provide enhanced clarity. Lenzing's VEOCEL™ fibers already offer a natural solution today for the problem of global plastic waste, and the company is continually expanding its capacities for wood-based specialty fibers as a means of promoting the development of sustainable wipes and hygiene products", Jürgen Eizinger adds.

#### **Consumers want sustainable hygiene products**

Even before the implementation of the Single-Use Plastics Directive, Lenzing already gives consumers clear guidance in their purchasing decisions. Products bearing the VEOCEL™ brand logo on their packaging are produced in line with stringent certification criteria. As a consequence, consumers can be assured that the products contain biodegradable, cellulosic materials.

A Marketagent survey carried out in German-speaking Europe in October 2019 concluded that nine out of ten consumers would immediately change their purchasing behavior for wipes if they found out that their current product contains plastic. This would seem to imply that new market dynamics will emerge once the labelling rules for single-use plastic products takes effect. According to a Smithers Report, about 500,000 tons of petroleum-based fibers are used each year for the production of wipes.

#### **#ItsInOurHands – the initiative for enhanced awareness and transparency**

On the basis of its environmental initiative #ItsInOurHands, Lenzing has been supporting a movement since the end of 2019 in collaboration with its partners to create enhanced awareness and transparency for materials used in wipes. An online platform as well as a dedicated community strive to increase awareness on the part of producers and consumers and thus push ahead with the development of sustainable alternatives (more information at [www.itsinourhands.com](http://www.itsinourhands.com)).

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### **International Nonwovens Symposium, held from 9-10 June 2021**

The two-day programme explored the latest challenges and innovations by experts from leading institutions including the European Commission, STFI, the Nonwovens Innovation & Research Institute, the Technische Universität Kaiserslautern, DKTE and the Indian Institute of Technology.

A broad range of presentations from thought leaders and market influencers including DuPont, ANDRITZ Laroche, Johns Manville, Sabic, Beaulieu, Covestro, Sandler, Freudenberg, Hassan and Walki, explored topical themes including:

- » New opportunities and technologies for meltblown nonwovens
- » Innovations in automotive nonwovens
- » New processes for the manufacturing of medical nonwovens
- » Recycling and sustainability considerations in nonwoven design and production

Further detail on costs and sponsorship opportunities can be found on the dedicated event webpage.

#### **About EDANA**

EDANA helps its members to design their future, serving more than 310 companies in the nonwovens and related industries, across over 40 countries. Its mission is to create the foundation for sustainable growth of the nonwovens and related industries through active promotion, education and dialogue.

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### **Tehtextil India : First hybrid edition Postponed to 25-27 November 2021**

India's leading trade fair in technical textiles, nonwovens and composites, originally scheduled in September 2021, has now been postponed to 25 – 27 November 2021. On account of the developments around the current Covid-19 situation and its relative impact on the safety, well-being and continuance of business, Messe Frankfurt India has taken this decision in consultation with industry stakeholders.

Even as companies look forward to economic revival, the continued difficulties posed by the pandemic makes it necessary for industries to recover, plan and prepare before they can get down to business. The organisers feel that moving the

show ahead will allow this additional time and is a necessary step that will in-turn create a healthy business environment when the industry can finally come together.

Mr Raj Manek, Executive Director and Board Member, Messe Frankfurt Asia Holdings Ltd said: "We are glad to have the support from the industry and our exhibitors whose interests are at the centre of this decision. Exhibitors, just like organisers, are working around undefined parameters which require adequate planning flexibility. We are all committed to putting up a great show!" Elaborating on working together with venue and service providers to align safety measures, he further added: "Right now, our focus is on the well-being of our exhibitors, visitors, employees and all stakeholders and we pray for everyone to be safe and in good health. In the coming months, our efforts will be strongly focused on meeting the safety imperatives and working in co-operation with venue authorities and service providers to implement a comprehensive safety concept, aligned with government guidelines."



#### **Technical Textile sector remains future focused**

Proving its growing importance in these critical times, technical textiles emerged as a power sector with advanced solutions in protective textiles, antiviral and air-purifying furnishing fabrics and home textile products, anti-microbial coating among others.

During the critical stages of lockdown when global trade came to a grinding halt, the medical textile industry proved its resilience in meeting demand for protective textiles while also providing a much-needed boost to the economy. From being a primary importer of PPE kits to becoming its "second largest producer" in just two months, India had exported over 20 million PPE kits and more than 40 million N-95 respirators around the globe including countries such as the US, the UK, the UAE, Slovenia and Senegal, by the end of 2020. Even in these challenging times, the industry

remains future-focused and prepared to meet vital demand for med-tech, agri-tech, geo-tech, sports-tech, and infra-tech, home tech among others.



A key exhibition in the business calendar, Techtextil India will continue its critical role in highlighting solutions and innovations that are need of the hour across twelve key application areas. With a comprehensive safety concept under the 'MFISafeConnect' standards, Techtextil India will open its doors from 25 – 27 November 2021 at the Bombay Exhibition Centre Mumbai. This will be the first-ever hybrid edition as the trade fair will be held as a physical expo in conjunction with its online event on the same dates.

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## Techtextil North America returns to Raleigh, North Carolina USA in August 2021

North America's only dedicated show for technical textiles and nonwovens

Following the postponement of the 2020 edition, we are very excited to be moving forward and planning for the return of live events! The upcoming edition of Techtextil North America will take place in-person August 23-25, 2021 at the Raleigh Convention Center in Raleigh, North Carolina.

The last edition of Techtextil North America 2019 was a HUGE success and we received tremendous feedback from both visitors and exhibitors praising the activity on the show floor and location. Raleigh, NC is at the heart of textile manufacturing and innovation in the U.S. textiles industry, making it easy for many visitors and nearby companies to attend and participate with reduced expenses.

## What to expect at Techtextil North America 2021?

**INNOVATION** : Utilizing partnerships with academic programs, research institutions and industry associations, Techtextil North America has cultivated an environment that encourages innovation through the sharing of ideas and collaboration among industry leaders.

**DIVERSE PRODUCT GROUPS** : The product groups at Techtextil North America represent the entire value-added chain in the technical textiles and nonwovens sectors.

**NEW BUSINESS** : With hundreds of exhibiting companies, international media outlets and pavilions representing top contributors to the global textile industry, both visitors and exhibitors alike gain unparalleled exposure to new business opportunities and potential partnerships

**EDUCATION** : Expand your expertise and gain a competitive edge through educational sessions led by industry experts.

### Product Categories

The product categories represent the entire value-added chain in the technical textiles and nonwoven sectors

- » Fibers & Yarns
- » Functional Apparel Textiles
- » Woven Fabrics, Laid Webs, Braiding, Knitted Fabrics
- » Nonwovens
- » Coated Textiles, Canvas Products
- » Research, Development, Planning, Consulting
- » Technology, Machinery, Accessories
- » Composites
- » Bondtec

### Show features

#### Tech Talks

Attend Tech Talks complimentary educational sessions on the show floor.

#### Symposium

Learn about today's hot topics and industry trends from academic and industry leaders.

#### The Lab

Experience textile texting first hand and review the latest in industry standards.

#### Quick Links

- » TTNA21 Factsheet
- » TTNA21 Brochure
- » TTNA21 Application form

### From the Desk of Priyanka Videsh

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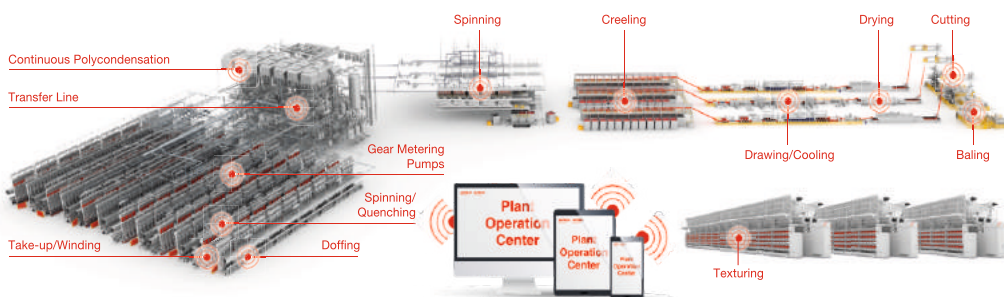
# Clean Technology. Smart Factory.



## From Melt to Yarn, Fibers and Nonwovens

Oerlikon Polymer Processing Solutions Division with the competence brands Oerlikon Barmag, Oerlikon Neumag and Oerlikon Nonwoven is one of the leading provider for filament spinning systems, texturing machines and BCF carpet yarn, staple fiber spinning as well as nonwovens solutions.

For further information visit us at [www.oerlikon.com/polymer-processing](http://www.oerlikon.com/polymer-processing)



**oerlikon**  
barmag

**oerlikon**  
neumag

**oerlikon**  
nonwoven



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# SCIENCE IN INDUSTRY

## Oerlikon

**Largest staple fiber plant order in the company's history at ITMA ASIA + CITME mega event in Shanghai**

**Xinfengming Group invests in innovative staple fiber technology from Oerlikon Neumag**

In the context of the ITMA ASIA + CITME currently taking place in Shanghai, Oerlikon has now announced that it has concluded the largest staple fiber plant order in the history of Oerlikon Neumag with the major Chinese group Xinfengming in the run-up to the trade fair. This involves eight complete staple fiber lines with a total of 320 spinning positions for the production of synthetic staple fibers. Oerlikon will not only supply the technology, but will also take over the engineering of the lines. Delivery is scheduled for 2022.

With a total capacity of 1,800 t/d, the project is Oerlikon Neumag's largest staple fiber plant order to date. The eight two-step lines will produce cotton-type staple fibers in a titer range



Shen Jianyu, Chief Executive Officer of Xinfengming Group Co. together with Oerlikon Manmade Fibers Solutions Sales Director Felix Chau and Sales Manager Wang Xiaoxin at the signing of the contract for eight new staple fiber lines from Oerlikon Neumag.

of 1.0 - 1.4 denier. With this investment, the Xinfengming Group is expanding its product portfolio. As one of the world's leading FDY and POY polyester filament yarn producers, the Chinese company has relied on Oerlikon Barmag technologies for decades and now also on those of Oerlikon Neumag.

**VDMA media conference held on May 31, 2021: Oerlikon at ITMA + CITME**

**Clean Technology. Smart Factory**

During the VDMA press conference on 31.5.2021 on the occasion of the upcoming ITMA ASIA+ CITME 2021, André Wissenberg, Head of Marketing, Corporate Communications and Public Affairs at Oerlikon Polymer Processing Solutions Division, reported on the following topics (the spoken word counts):

"Dear Ladies and Gentlemen, dear media representatives, dear friends,

First of all, I hope that you and your families are all well under the circumstances of the corona pandemic. I am very much looking forward to seeing you all back in good health soon again.

As Chairman of the VDMA's Trade Fair and Marketing Committee, I would like to start today's VDMA media conference by expressing my thanks to Boris Abadjieff, Nicolai Strauch, Barbara Clobes and, last but not least, Thomas Waldmann on behalf of all member companies for VDMA's commitment and engagement to this years ITMA Asia 2021.



### What's new at Oerlikon?

You've probably already heard about it. We are continuing to grow!

Oerlikon, a leading provider of surface engineering, polymer processing and additive manufacturing, just recently announced that we have signed an agreement to acquire Italy-headquartered INglass S.p.A. and its innovative hot runner systems technology operating under its market-leading HRS flow business. The strategic acquisition is a significant step in expanding our current manmade fibers business into the larger polymer processing market.

Looking ahead to ITMA Asia 2021, we are looking forward to welcoming our long-standing customers at our booth in Hall 7, A54, and of course very much hope to make new contacts as well.



André Wissenberg, Head of Marketing, Corporate Communications and Public Affairs at Oerlikon Polymer Processing Solutions Division, looking forward to an exciting exhibition at ITMA ASIA + CITME 2020 in Shanghai from June 12-16, 2021

Due to the Corona pandemic, we have decided to concentrate with our Chinese sales and service teams on guests primarily from China and greater Asia. However, some experts from Germany, who are working in China at our locations anyway, will be live on site at the booth. Other experts from Germany, India and US will be available online for the entire 5 days of the trade fair and will simply be connected by video conference to the discussion with the visitors on site if there is a need for.

As you all know, our product portfolio ranges from melt to yarn, fibers and nonwovens. We offer sustainable, energy-efficient technology solutions for the production of polyester, polypropylene, nylon and other materials. Today, this also includes spinning in-house recycling solutions and biopolymer plant solutions.

In addition to the melt flow, digital data handling plays an increasingly important role

today. Here, too, we always have the tailor-made solution for our customers with our software and hardware offerings. Meanwhile have successfully installed over 300 of our digital Plant Operations Solutions worldwide.

Following the ITMA Barcelona, where we presented the new eAFK Evo, our engineers have been working intensively on the development of this texturing machine. At ITMA Asia 2021, we will present the next generation of this automatic texturing solution with up to 25% energy saving and up to 30% higher production speed, easy maintenance and best yarn quality. The core of this machine, the so-called EvoCooler, will be shown as an exhibit in combination with digital solutions like AIM4DTY. We will also invite all our guests to our Open House at our Oerlikon plant in Suzhou. Its just one hour drive from the NECC exhibition center.

In the field of high-precision flow control solutions components, we will present two new gear metering pumps developments for the production of aramid and spandex.

You will find out everything else on site and accompanied to this with the start of the trade fair on our website and in the corresponding social media. Thank you very much for your attention."

### About Oerlikon

Oerlikon (SIX: OERL) is a global innovation powerhouse for surface engineering, polymer processing and additive manufacturing. Its solutions and comprehensive services, together with its advanced materials, improve and maximize performance, function, design and sustainability of its customers' products and manufacturing processes in key industries. Pioneering technology for decades, everything the company invents and does is guided by its passion to support its customers' goals and foster a sustainable world. Headquartered in Pfäffikon, Switzerland, the Group operates its business in two divisions – Surface Solutions and Polymer Processing Solutions. It has a global footprint of more than 10 600 employees at 179 locations in 37 countries and generated sales of CHF 2.3 billion in 2020.

For more information: [www.oerlikon.com](http://www.oerlikon.com)

### About the Oerlikon Polymer Processing Solutions Division

With its Oerlikon Barmag, Oerlikon Neumag, Oerlikon Nonwoven and Oerlikon HRS flow brands, the Oerlikon Polymer Processing Solutions Division is focusing on manmade fibers plant

## SCIENCE IN INDUSTRY

engineering and flow control equipment solutions. Oerlikon is one of the leading providers of manmade fiber filament spinning systems, texturing machines, BCF systems, staple fiber systems and solutions for the production of nonwovens and – as a service provider – offers engineering solutions for the entire textile value added chain. Furthermore, Oerlikon has a high precision flow control components business that offers a large selection of gear metering pumps for the textile and other industries, including the automotive, chemical and paint markets. With Oerlikon HRS flow the division develops innovative hot runner systems for the polymer processing industry. In cooperation with Oerlikon Balzers, highly efficient and effective coating solutions are offered here from a single source.

As a future-oriented company, the research and development at this division of the Oerlikon Group is driven by energy-efficiency and sustainable technologies (e-save). With its range of polycondensation and extrusion systems and their key components, the company caters to the entire manufacturing process – from the monomer all the way through to the textured yarn and other innovative polymer processed materials and applications. The product portfolio is rounded off with automation and Industry 4.0 solutions.

The primary markets for the product portfolio of Oerlikon Barmag are in Asia, especially in China, India and Turkey, and – for those of Oerlikon Neumag and Oerlikon Nonwoven – in the USA, Asia, Turkey and Europe. Oerlikon HRS flow is particularly at home in the core automotive markets. These include Germany, China, Korea and Brazil. Worldwide, the division – with more than 4,500 employees – has a presence in 120 countries with production, sales and distribution and service organizations. At the Research and Development centers in Remscheid, Neumünster (Germany), San Polo di Piave, Treviso (Italy) and Suzhou (China), highly qualified engineers, technologists and technicians develop innovative and technologically leading products for tomorrow's world.

For more information: [www.oerlikon.com/polymer-processing](http://www.oerlikon.com/polymer-processing)

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Screen-O-Tex is a preferred supplier of rotary nickel screens across India with a range of well-proven, precision nickel screens for textile and non-textile rotary printing applications.

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to produce high-quality screens which are known for consistency in open area, thickness, and repeat size. Screen-O-Tex's screens are made from high quality, ductile nickel which can be stripped more times than other screens available in the market. Thus, Screen-O-Tex's screens can be used by textile printers for longer print runs and for more designs. Every individual screen passes through stringent quality tests and each box of screens carries a quality test report.



For sharper, half-tone, and geometric gradation designs, Screen-O-Tex offers Vega Screens that range from 135-195 mesh. Screen-O-Tex also supplies an XT (extra thickness) version of the Vega screen that has an even longer life.

Screen-O-Tex's screens are exclusively marketed by A.T.E. Enterprises in South India and Bangladesh.

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## S. K. Associates

### Information about Poly Chain Drive Conversion

S. K. Associates is an India based Industrial group with activities in all regions.

S. K. Associates trading & supplying many products like, SKA Spring Loading for Top Arms, Bobbin Holders, Compact spares for spinning & Conversion of LR Ring Frames Rotary filter to Stationary filter, LR & KTTM Ring Frame Main drive motor pulley conversion to Poly chain drive conversion & include Smart Slub.

More information about conversion of LR & KTTM Ring Frame Main drive motor pulley

conversion to Poly chain drive conversion is attached herewith.



Poly Chain Carbon synchronous belts have a renowned industry reputation for high performance and huge cost savings in a range of applications, designed to handle longer centre distances at high load-carrying capacities.

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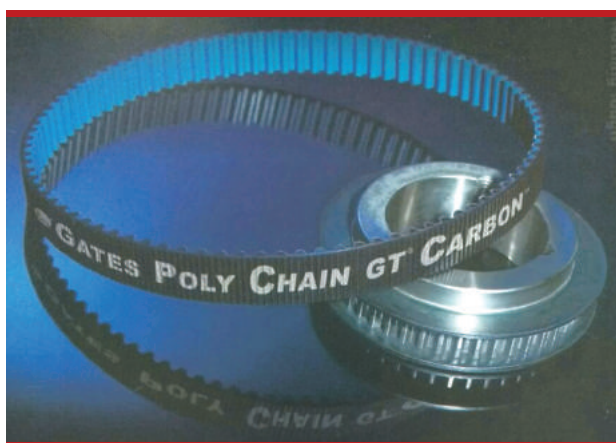
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3. 100% power transmission.
4. Life of polychain belt leads up to 10 years.
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9. Weight of timing pulleys used is very less compared to the existing pulleys in machine.

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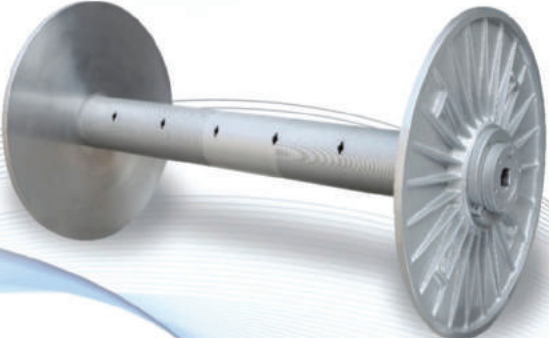
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If you are interested in finding out more about the many performance advantage of Gates Poly Chain® GT Carbon™ belt drive systems, Please visit [www.Gates.com/India](http://www.Gates.com/India) or contact your local Gates representative.

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## **Mimaki Europe BV**

### **Mimaki Launched New Product Innovations and Engage Visitors with High-Performance, High-Value 100 Series at virtual drupa**

Mimaki Europe, a leading manufacturer of inkjet printers and cutting systems, announced on April 7, 2021 that it would exhibit its broad portfolio of cutting-edge digital print technologies at first ever virtual drupa (20-23 April 2021). The company's brand-new "100 series" took centre stage on its interactive virtual booth alongside brand-new additions to its powerful product portfolio, unveiled at the event. In addition to that, Mimaki launched a special promotion at virtual drupa for selected products, making its product portfolio even more appealing to those companies looking to diversify their business during these challenging times.

In line with virtual drupa's goal to help the industry keep in contact, grow their networks and generate leads in today's challenging times,

Mimaki had used the event to demonstrate its latest business-enhancing digital printing solutions and to highlight numerous application opportunities. "Faced with the current circumstances of the Covid-19 pandemic, we all need to adapt and come together to come through this challenging situation," said Danna Drion, Marketing Manager, Mimaki EMEA. "For the last 12 months, Mimaki has been at the forefront, supporting customers and prospects with virtual events, networking and educational opportunities to overcome the impact and challenges created by the Covid-19 pandemic. Online events remain central to our strategy and virtual drupa represented a key opportunity for us to share our expertise and encourage print service providers to join us and find new ways to drive their business forward."

The company's latest "100 series" portfolio was one of the highlight technologies showcased at virtual drupa. Designed to enable users to drive success amid the current market uncertainty, the new printer series offers high productivity and reliability, extreme flexibility to diversify the application range, as well as a highly competitive price-performance ratio. The Mimaki's 100 series consists of three models, each equipped with a variety of renowned Mimaki features, including NCU (Nozzle Check Unit), NRS (Nozzle Recovery System), and DAS (Dot Adjustment System).

» **Mimaki JV100-160** : a roll-to-roll eco-solvent printer, the JV100-160 enables users to achieve high quality solvent printing at an entry-level price. The printer adopts the recently developed, fast drying eco solvent ink "AS5", available in both a dual CMYK 4 colour mode and 8 colour mode (CMYK Lc LmOrLk). Besides reducing graininess and allowing for fine details even when printing images with high volumes of ink, the new AS5 ink has superior scratch resistance and outdoor durability which allows printers to create a multitude of applications, whether they are for indoor or outdoor use.



Part of the 100 Series, the Mimaki UJV100-160 a roll-to-roll UV-curable inkjet printer designed for high quality printing and maximum productivity

» **Mimaki UJV100-160** : a roll-to-roll UV printer, the UJV100-160 combines high productivity, extreme versatility, and superior print speed. The printer uses a low-cost UV ink "LUS-190" which cures immediately after being exposed to UV light, enabling a faster turnaround without the need for a degassing period after printing. The LUS-190 ink can be printed onto not only

## SCIENCE IN INDUSTRY

PVC, but also uncoated substrates such as PET film and paper. This system is the ideal solution for print businesses introducing UV printing technology to their production line.

- » **Mimaki TS100-1600** : a dye-sublimation textile printer, the TS100-1600 offers an affordable, high-quality solution to those printers looking to explore digital sublimation printing and expand their production capacity. Featuring a print width of 1,600 mm and speed of 70 m<sup>2</sup>/h in the fastest mode, the TS100-1600 uses a 1 litre ink bottle which helps reduce the running cost and enables stable, continuous operation due to the reduced need for ink replacement. The TS100-1600 is ideal for a diverse range of applications in fashion, soft signage, home and interior, sportswear, and personalised items.



The newest addition in the 100 Series, the TS100-1600 is a dye-sublimation textile printer designed for a diverse range of applications in fashion, soft signage, home & interior, sportswear, and personalised items.

The TS100-1600 is ideal for a diverse range of applications in fashion, soft signage, home and interior, sportswear, and personalised items.

As part of the company's long-term commitment to drive innovation in the digital printing space, Mimaki also introduced two brand-new printing platforms at virtual drupa. Featuring cutting-edge capabilities to print special formats and onto special substrates, the new cutting-edge additions are designed to open new application opportunities in the large format and fashion industries. Mimaki's experts would also be on hand to provide an insight into the company's full colour 3D printing technology and relevant application opportunities.

"By showing our extensive portfolio of cutting-edge technologies at virtual drupa, we aim to demonstrate our clear commitment to the industry. Leveraging our flexibility, forward-thinking approach, and R&D expertise, we are able to adapt quickly to market changes and address new customer opportunities to deliver constant system improvements or brand-new innovations," comments Drion. "The '100 Series' excels when it comes to efficiency and high-quality, while also offering flexibility to produce a wide array of applications, from vibrant wallpapers to high-quality signboards. Further to that, the new additions to be unveiled at the show will break new boundaries in their market segments."

For more information about products and services from Mimaki, visit [www.mimakieurope.com](http://www.mimakieurope.com).

### About Mimaki

Mimaki is a leading manufacturer of wide-format inkjet printers and cutting machines for the sign/

graphics, industrial and textile/apparel markets. Mimaki develops the complete product range for each group; hardware, software and the associated consumable items, such as inks and cutting blades. Mimaki excels in offering innovative, high quality and high reliability products, based upon its aqueous, latex, solvent and UV-curable inkjet technology. In order to meet a wide range of applications in the market, Mimaki pursues the development of advanced on-demand digital printing solutions. Mimaki Engineering Co. Ltd., (President: Kazuaki Ikeda) Nagano (Japan), is publicly listed on the Tokyo Stock Exchange, Inc.

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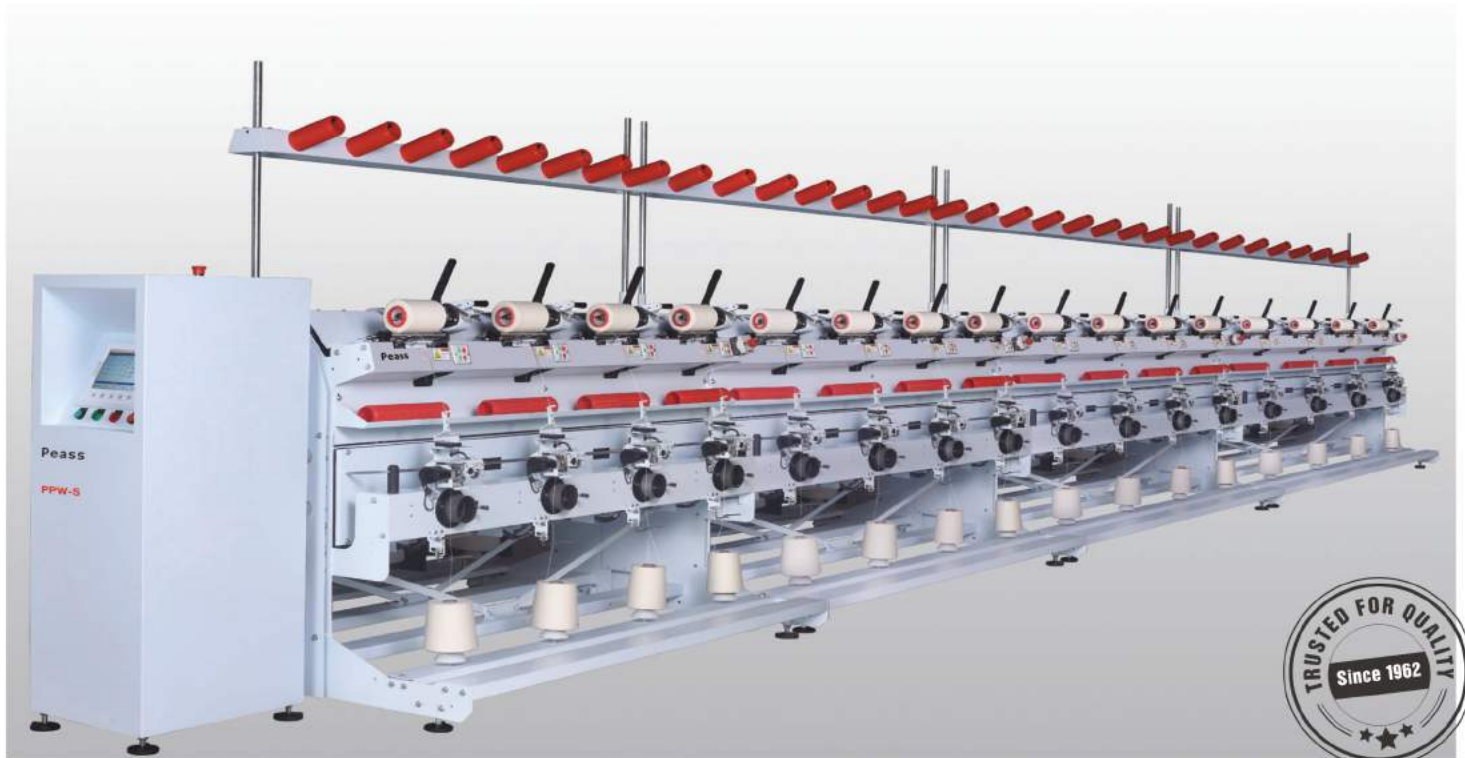
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