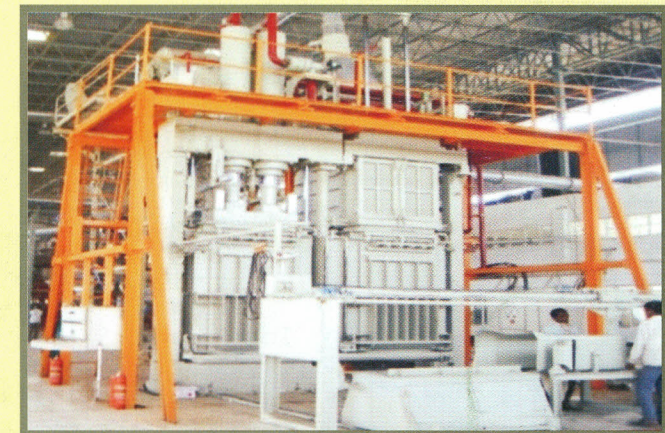
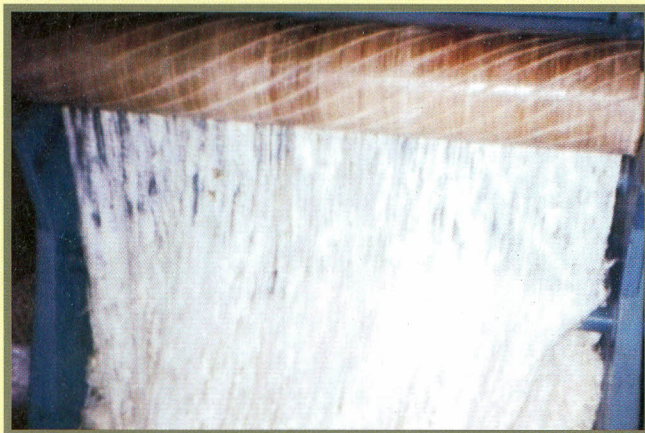




APPROPRIATE TECHNOLOGY FOR INDIAN GINNING INDUSTRY



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CIRCOT

The Central Institute for Research on Cotton Technology (CIRCOT) formerly known as Cotton Technological Research Laboratory (CTRL) was established in 1924 and a widened mandate of research and development on all aspects of post harvest technology of cotton and value addition to cotton by-products and processing wastes. Apart from this, the institute has been providing services to the trade and industry during its long journey of more than nine decades by imparting training on cotton quality evaluation and ginning technology and also by offering the quality assessment support for fibre, yarn and fabrics on commercial terms.

About Ginning Training Centre

The Ginning Training Centre, Technology Transfer Division of CIRCOT is located at Amravati Road, Nagpur (MS) on a sprawling land admeasuring 7 acres and housed in four buildings besides a trainee's hostel. In addition to an excellent infrastructure for ginning training, the centre has facilities for quality evaluation of fibres, demonstration plants for ginning and pressing, scientific processing of cottonseeds and preparation of particle boards from cotton stalks.

ZTM & BPD Unit of CIRCOT

Zonal Technology Management and Business Planning and Development (ZTM-BPD) Unit has been set up at CIRCOT, Mumbai with support from the Indian Council of Agricultural Research (ICAR) through National Agricultural Innovation Project (NAIP). This unit is catering to the needs of budding entrepreneurs, exporters, consultants, policy makers, concerned, Central and State Government personnel and ICAR institutions located in the West Zone of the country. Recently, ZTM-BPD unit at CIRCOT has been awarded with 'Best performing NAIP Business Planning and Development Unit for Technology Commercialization' at Agri-Tech Investors Meet-2013, New Delhi.



Appropriate Technology for Ginning Industry

CIRCOT with technical collaboration with Bajaj Steel Industries Limited, Nagpur has made significant improvements in roller ginning technology including cotton cleaning, material conveying equipment, baling and humidification technologies, which are presently used by cotton ginning & pressing industries not only in India but also in the world particularly African countries. Details of the Ginning Machinery are given below:

① High Efficiency Double Roller Ginning Machine

Until 2000, Double Roller (DR) Gins were of lower ginning capacity i.e. about 50-60 Kg Lint/h thereby operating cost was higher. After year 2000, high capacity Double Roller Gins were developed by increasing length of roller having a capacity of about 80-85 Kg lint/h with reduced vibrations and noise. The modifications have improved the working performance of ginning factories significantly. The research to further increase in productivity of the Double Roller Gin, to reduce the grooving cycle, roller washer technology for longevity and strengthening of machine to increase the ginning speed is going on.

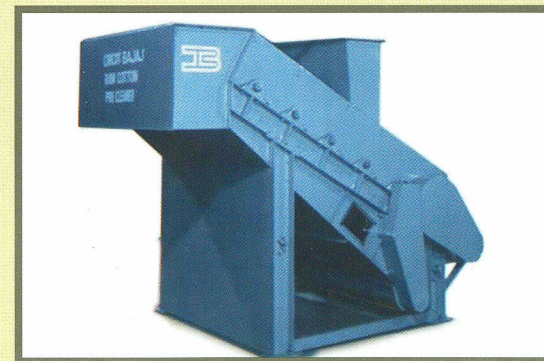
Major breakthrough is the introduction of Golden jubilee DR Gin having lint production capacity of 95 to 135 kg per hour. This DR is engineered for less machine vibrations during operation and well accepted by the ginning industry.



Pneumatic conveying system
for seed cotton



Seed cotton dispensing system
with tractor mounted attachments



CIRCOT- Bajaj Pre-cleaner



② High Efficiency pre-cleaners

Absence of proper pre-cleaning machines were an impediment in obtaining cotton with lower trash and contamination. CIRCOT-Bajaj pre-cleaners were designed in different sizes and capacities which are now used by the cotton ginning & pressing industry to obtain clean cotton. Further improvements are made in grid, spike, speed and optimized machine for good fibre parameters and improved efficiency. Further, trash collection conveyor is added to improve the trash removal system.

③ Pneumatic / Mechanical Cotton Conveying Systems

The manual conveying of seed cotton up to the ginning hall was replaced by well designed, suitable capacity, electrical power efficient, pneumatic suction system to pull the cotton from as long as 750 feet with multiple points. This has resulted in reduction of substantial number of manpower and dependent inefficiencies due to erratic working / non-availability of manpower. Moreover, regular supply of seed cotton has resulted in uniform and sufficient feeding to Double Roller Gins thereby increasing productivity. This has also helped in reducing the contamination and trash.

④ Automatic Individual Gin Feeding System

Sensor based individual Gin feeding auto regulators and Electro-mechanical Overhead Distribution Conveyors over a series of Double Roller Gins in one row and also in parallel rows have ensured continuous and controlled feeding to gins as per requirement of gin which has helped in realizing higher production per machine.



DR Gin with Autofeeder and Lint collection system



Close view of Lint blanket discharged from DR gin



Automatic Individual Seed Cotton Feeding System to Gins (4 rows)



View of pre-cleaner, feeding & dropping system



5 Improved Auto Feeder on Double Roller Gin

Earlier each gin was required to be continuously fed and cotton was to be stirred to avoid choking of beater area. Now improved Auto Feeder / Lattice Feeder provides a reservoir for about 10 minutes feeding to each gin and level sensor signals re-feeding as soon as cotton level in the feeder goes below a minimum level. Hence continuous feeding of cotton is ensured. Use of auto feeder leads to an average increase in ginning output of about 7%.

6 Automatic Lint Suction System from each DR Gin

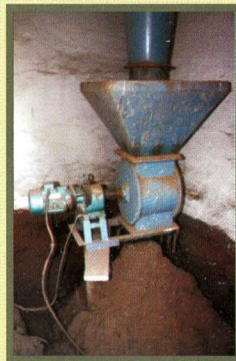
A well designed Lint collection chutes, Lint collection Boxes and incremental lint suction ducting have automated collection up to lint cleaner. This has eliminated total requirement of manpower for lint collection from each Gin and its carrying up to Lint Cleaner. Further improvements in respect of central suction pipe connections and improvement in lint collection hopper have enhanced the efficiency greatly with reduction in trash and contamination.

7 Fibre Friendly Lint Cleaners

Use of fibre friendly lint cleaners with improved grid and spike systems has helped to remove trash from lint without damaging the fibre. Further trash removal systems introduced recently have greatly facilitated the trash removal efficiency.



Intermittent four point Lint cleaner trash waste collection system



Rotary Lock & Fine dust collected in the chamber



Primary and secondary filters in compactor in dust control equipment



8 Use of Scanners for Contamination Removal

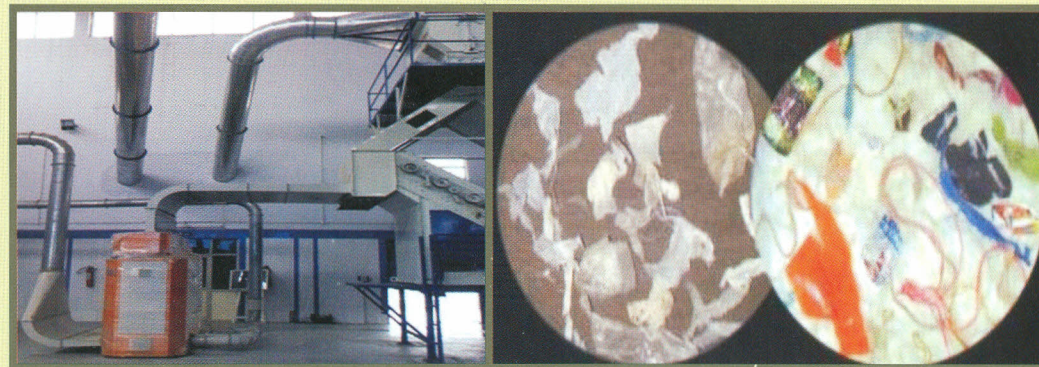
Camera and Sensor based contamination removal system has been introduced after the lint cleaner to remove the coloured contaminants thereby providing contamination free cotton to spinning industry.

9 Multipoint Suction System to connect to the Bale Press

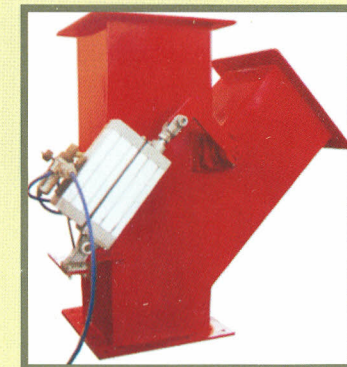
Multipoint suction system or single point suction system from the end of lint collection conveyors fitted below series of lint cleaners for each module of ginning machines, has facilitated the high volume lint conveying. Ginning plants having a capacity of about 2700 bales per day using multiple bale presses of 35 bales/h each, being setup in India making them world's highest capacity ginning & pressing factories which was simply a dream before 2000.

10 Use of Humidification System

Warm air Humidification system is specially designed and developed to suit Double Roller Ginned lint which is delivered in blanket form and warm & humid air have been incorporated in the lint feeding slide or lint feeding belts. This can add moisture to lint in a controlled manner thereby providing all the benefits of humidification like retention of fibre properties, savings in electrical units in packing etc.



Camera and Scanner to remove coloured contamination before baling

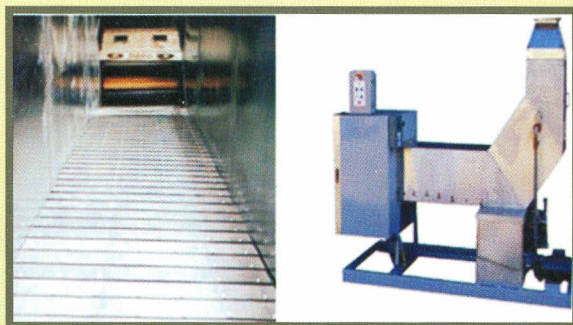


Fire detection and Diversion system in Lint suction system



11 Use of door-less Down Packing Automatic Baling Presses with online Bagging Arrangement

Earlier i.e. prior to 1999, Double Roller based ginning & pressing factories used to have up packing old fashioned manual cotton baling presses requiring a pit of about 40 feet, below the ground level and employing a large number of manpower with lot of dustful surrounding. Now fully automatic, door-less down packing baling presses with online bagging arrangements are being installed in most of the new factories. This has resulted in full covering of the bales which finally protects it from contaminants and manpower requirement has come down drastically. To provide baling solutions to smaller ginneries so that they can operate as composite units, a small capacity single box fully automatic press has also been introduced in the Indian market.



Online Moist Air humidification set up



Mechanical Bale handling system



Fully automatic cotton bale press

Further CIRCOT has designed and developed Laboratory Model Gins and axial flow precleaner for benefit of farmers, ginners and traders.



Axial flow cottonseed pre-cleaner
for farmers & ginners



Lab-Model Gin for
ginners, farmers & breeders





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