

Environmental Protection Activities of the Textile Machinery Division



Main Business Activities: Manufacturing & Sales of Textile Machinery

Division Manager & Managing Director
Textile Machinery Division

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Environmental Approach

Just as for other types of machinery, the need is growing year by year for environment-friendly textile machinery to produce yarn and cloth while conserving energy and emitting little vibration or noise.

Our Textile Machinery Division has structured environment-friendly production processes, beginning with the selection of materials used in its products, and is exerting its fullest efforts to offer products that meet the environmental requirements of its customers.

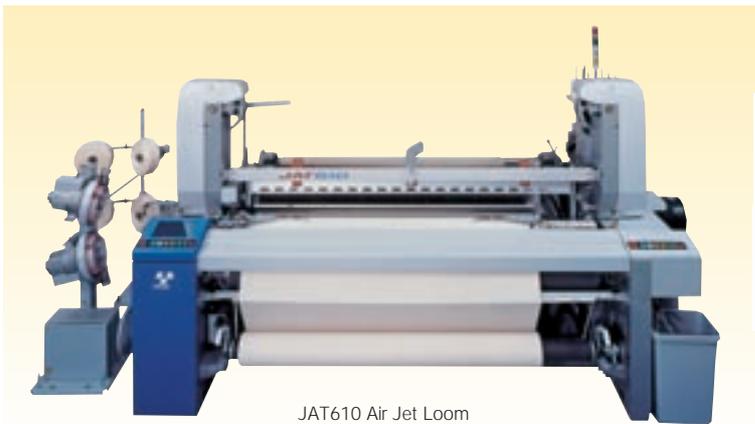
Activities

Development and Design

■Vibration Reduced with the JAT610 Air Jet Loom

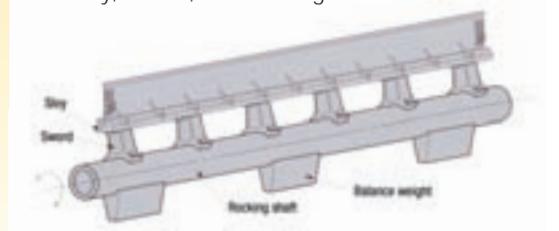
An air jet loom makes cloth using compressed air to insert the weft into the warp. The weft is inserted into the warp by the rocking motion of the sley, sword, reed, and rocking shaft. By reducing the vibration produced by the rocking motion of this non-balanced load, Toyota Industries has successfully improved the workplace environment of its customers' weaving mills. The JAT610 air jet loom was designed to optimize the cross-sectional shape of the sley, the weight of which was reduced by 20%.

In addition, the material of the sword was changed and by perfecting its placement of ribs using computer analysis, it was possible to lighten and harden the sword. By attaching the balance weight to the rocking shaft, the load was reduced. As a result, vibration was greatly decreased by reducing the dynamic load on the floor by 20%.



JAT610 Air Jet Loom

●Sley, Sword, and Rocking Shaft



■Lightening of the RX240New Ring Spinning Frame

A ring spinning machine produces thread by aligning bundles of fiber of a certain thickness and then twisting them into thread. Formerly, the weight of the spring pieces of the RX240 ring spinning frame were 49kg each, and each draft rod was 28kg. Forty of these pieces, respectively, are used for each machine, for a total weight of 3,089kg. In developing the RX240New, by reviewing the shape of the parts and changing the materials used in construction of this frame, the weight of the each spring piece was reduced to 6.5kg, and each draft rod was reduced to 18kg for a total reduction of approximately 30%, or 989kg.

As a result, resources and energy are conserved during manufacturing, CO₂ emissions are reduced during shipping, and the unit cost has been reduced.



■Lightening of Frame

Part	Material	RX240	RX240New	Weight reduction	Measures taken
Spring Piece	FC200	1,960kg	1,700kg	260kg	Review of part shapes (thinning)
Draft Rod	S48C	1,129kg	400kg	729kg	Change from solid to pipe construction
Total		3,089kg	2,100kg	989kg	

Distribution and Recycling

■Conservation of Resources through Improvements in Transport and Package Shape

To improve the transport efficiency of ring spinning frames, they are shipped overseas as partially assembled units and components packed in wooden crates and then assembled in the customer's spinning mill. As part of the division's efforts to conserve resources, an improvement of the package shape was conducted.

Transport routes, destination ports and the handling of wooden crates at the customer's factory were all carefully researched, and adjustments in crate size and improvements in the capacity and materials were reconsidered. For example, the

packaging for one of the parts of the ring spinning frame, the pneuma-duct*, was changed from a wooden crate to a pallet-type, and the packaging of the bottom roller was changed from a wooden crate to reinforced cardboard. As a result of these measures, the number of crates used was reduced by 20% and the weight of wood used was reduced by 70% to 80%, thereby conserving resources. In addition, due to the fact that reuse and recycling of crates have become easier, fewer waste products are produced. At the same time, transport efficiency was improved, and these measures helped the division conserve energy.



Pneuma-duct pallet packaging



Bottom roller reinforced cardboard packaging

*Pneuma-duct: The pipe portion of the air duct used in a ring spinning frame