

## Compressed Air: A key utility in textile industry

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### Economical weaving through air jet looms

Compressed Air is more or less required at every stage of the textile manufacturing. Particularly large volume of air is required for integrated cotton textile industries having air-jet looms as well in the polyester yarn industries. Compressed air is a very critical requirement in the PFY (Polyester Filament Yarn) value added segment such as texturing.

Compressed Air is one of the most expensive utilities, but more often than not, this fact is not understood. Unlike the other utilities, many users find it difficult to measure their cost per CFM (Cubic Feet per Minute). Primarily, it should be understood that the compressed air frictional drag of compressed air jet coming from a main nozzle. Sub-nozzles are provided along the profiled reed to support the weft yarn during its insertion.

For the weft insertion mechanisms of air jet looms, the profile reeds with sub-nozzle systems are the most advantageous in terms of improving high speed weaving and wider cloth width. Not only the airflow from the main nozzle and sub-nozzles but also the airflow in the weft passage is closely related to the flying state of the yarn at the time of weft insertion in this system. In order to manufacture high quality textiles with air jet looms, it is necessary to establish



optimum weaving conditions. These conditions include the supply air pressure and air injection timing for the main nozzle and sub-nozzles according to the kind of well yarn. Energy saving is the most important of the technical subjects, related to air jet looms today. Research about the improvement in performance of main nozzles, which plays an important role for weft insertion, has been performed by various researchers.

Although some effort has been made to improve the efficiency of compressed air usage, the effort has not been uniform. There is still a critical need to understand the energy loss or consumption in filtration, distribution and machine usage in the textile industry. Due to technical barriers, reducing energy consumption by compressed air systems has been viewed as a complicated task.

Most textile companies rely on compressed air in their production, and improving the usage of compressed air will have significant economic benefit to the textile industry. Eliminating leakage and reducing the operating pressure is two of the most cost-effective steps in energy conservation. By proper selection

and effective management of compressed air system, which include compressors, air treatment and filtration device, distribution network, and end usage, different processes like spinning, weaving and processing holds great potential for cost savings in the textile industry without any broad impact on the productivity and product quality of the plant.

In Pakistan, while managements spend a lot of time on selection and negotiating compressor purchases, little attention is paid to life time costs of the equipment and plumbing grade pipe is used for transmission of compressed air. This results in loss in airflow, clogging of filters owing to rust and reduced life of line filters. All these impact quality and cost of the end product. New materials and technologies have emerged on the market for compressed air pipe work together with measuring and monitoring devices for flow and quality of air. Progressive textile managements need to study these and adapt, concluded the author of this special report contributed specially for Pakistan Textile Journal. ♦

