

# Unsafe Chromium from Cotton Ginneries and Development of A Rubberized Cotton Fabric Roller for Cotton Roller Gins

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*Abstract* :- This paper realizes the hazards of chromium contamination and pollution caused in the use of chrome composite leather-clad (CCLC) rollers commonly used in cotton roller ginning industries and attempts to eliminate the chromium contamination and pollution during the complete process. The cotton roller ginning process is the mechanical separation of cotton fibres from their seeds by means of one or more rollers to which fibres adhere while the seeds are impeded and struck off or pulled loose. Most of the cotton ginning operations are done using roller gins. The CCLC roller coverings contain about 18 000 to 30 000 mg/kg (ppm) as total chromium of trivalent and hexavalent forms which are toxic to human health. When the seed-cotton is ginned, due to the persistent rubbing of CCLC rollers over the fixed knives, the cotton and its products get contaminated with the total chromium of trivalent and hexavalent forms. Gin and mill workers are exposed to this chromium pollution and are susceptible to health hazards since toxic effects are produced by prolonged contact with airborne or solid or liquid chromium compounds even in small quantities. The three pollutants namely cotton dust, chromium and leather powder and/or other foreign matter, under favorable conditions of sunlight (photo energy), humidity, temperature and air movement interact and produce chrome specific dust (CSD) which is a serious pollutant due to synergistic interacting function. To offset this problem, pollution-free rubberized cotton fabric (RCF) eco-friendly rollers for both the laboratory and commercial studies have been designed, fabricated and used in experiments in rollers gins. This nullifies chromium contamination and pollution during the complete process. Cotton technological parameters are well proven for commercial acceptance.