



# FINAL REPORT EXECUTIVE SUMMARY

For Public Release

## Part 1 - Summary Details

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**CRDC ID:** DU1601

**Project Title:** Breathable Cotton for Compression Garment

**Project Start Date:** 1/7/2015

**Project Completion Date:** 30/12/2017

**Research Program:** 5 (ES2) Driving RD&E impact

## Part 2 – Contact Details

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## Part 4 – Final Report Executive Summary

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*Provide a one-page summary of your research that is not commercial in confidence, and that can be published on the internet. Explain the main outcomes of the research and provide contact details for more information. It is important that the Executive Summary highlights concisely the key outputs from the project and, when they are adopted, what this will mean to the cotton industry.*

While only 30% of athletic apparel containing cotton is marketed as offering performance features versus 92% of synthetic garments, data from Cotton Incorporated suggests 97% of consumers would prefer a cotton alternative with the same performance features as synthetic active wear. Compression athletic wear (CAW), has become increasingly popular for delivering better fit and enhanced performance. However, Cotton Incorporated's 2014 Sports Apparel Survey suggests that over 90% of consumers wear athletic wear for activities other than exercise and 77% of these consumers believe that comfort is a very important factor in their decision to purchase athletic apparel.

Compression athletic wear is usually made from synthetic fibres, often by coating an elastomer band on the fabric surface. There are currently no methods of creating compression athletic wear containing predominantly cotton. This project used an innovative approach to develop fabrics suitable for compression garments from Australian Long Staple cotton to favourably compete with currently available synthetic compression athletic wear. Through this project the comfort advantage of the developed fabric over the existing synthetic products was demonstrated. It was shown that predominantly cotton knit fabrics have excellent stretch and recovery properties with higher power than synthetic compression wear fabrics. The maximum force required to extend knitted cotton fabrics was almost 1.5 times greater than that of the commercial compression garments. If designed well, the higher power of cotton knitted fabrics can be used to make a suitable compression garments and provide sufficient pressure on different parts of the body. Moisture management of knitted cotton fabrics was superior to commercial single jersey fabrics with faster wicking times, 2.5 mm/sec compared to 0.5 mm/sec, and greater moisture spread in the fabrics, 16 mm compared to 5 mm. Cotton fabrics showed they are able to efficiently transfer liquid moisture from next to skin side to the outer side of the fabric. The developed cotton fabric, while thicker and heavier than commercial fabrics demonstrated similar heat transfer properties (including heat resistance and water vapour resistance) to the single jersey commercial compression garment. This research led to developing a fabric with improved breathability and heat and moisture transfer for people who prefer to get the ultimate benefits of cotton in their garments for sports and outdoor activities in all climates. This project will open up a new opportunity to develop an innovative manufacturing technology and new market for Australian cotton, which could be used in other application outside of active wear, such as medical textiles.