



Research and Development Expenditure¹
(Millions of US dollars)

Research and Development

Superior technology enables James Hardie to develop and manufacture the differentiated and segment-specific products that are at the heart of our growth strategy, and produce them with increasing cost-efficiency.

Our technology, differentiated products, cost-efficient manufacturing capacity and proprietary processes are the result of our investment in research and development.

We have Research and Development Centres in Sydney, Australia and Fontana, California, where we currently employ over 110 scientists, engineers and technicians in Core Research and Product & Process Development. Over 50% of our scientists have advanced degrees and 45% have worked for James Hardie for over five years.

Our operating strength allows us to continuously re-invest in products and processes that deliver increased value to our customers, so they choose our products over alternative materials, delivering even more growth.

This investment increased 18% to US\$32.1 million in fiscal year 2006 as we looked for ways to:

- enhance our current products;
- develop new products for specific markets or applications; and
- create or improve manufacturing platforms and processes.

Our achievements over the last five years demonstrate our ability to apply our research and development capabilities to multiple levels surrounding our products or processes:

- We introduced our ColorPlus® pre-painted technology for siding, shingles, trim and soffit products in fiscal year 2002 and, in the following years, added pre-finished trim accessories, several new colours and more board profiles. With ColorPlus® pre-finished products, customers are saved the trouble or expense of finding tradesmen to finish their siding.

This year, we added a further enhancement to ColorPlus® products by fitting a laminate to all ColorPlus® pre-painted siding so it can be delivered and installed in the best possible condition.

¹ Research and development expenditure includes US GAAP research and development expenses and amounts classified as selling, general and administrative expense under US GAAP in the amounts of US\$3.4 million, US\$5.5 million, US\$3.5 million, US\$2.7 million and US\$1.9 million for the years ended 31 March 2006, 2005, 2004, 2003 and 2002 respectively.



Our US\$32.1 million investment in research and development for fiscal year 2006 was 2.2% of our net sales



- In fiscal year 2003 we successfully launched a new all-weather trim product using our new proprietary XLD® trim low-density fibre cement technology.
 - Fiscal year 2003 also saw us launch our new improved grid 1/2 inch backer board product, EZGrid® underlay.
 - During fiscal year 2006, we added Moldblock™ to our EZGrid® underlay and Hardibacker® sheets, to further enhance their performance.
 - We have also partnered with tool manufacturers to develop tools especially for cutting fibre cement products. In fiscal year 2001, we released the Hitachi Hardiblade® blade, the result of three years work with Hitachi to develop a blade that cuts more quickly and lasts longer than carbide blades typically used with wood products.
 - More generally, in the last five years we have introduced many new textures, styles and coatings to our fibre cement siding products in North America to capitalise on homeowners' and homebuilders' demands for a variety of cladding styles. At the same time, research and development has allowed us to find the optimum balance between low maintenance and appearance.
 - Our customers in Australia and New Zealand have also benefited from several new products introduced in the last five years, including EziGrid® tile underlay, Eclipsa™ eaves lining, Linea® weatherboards, ExoTec® facade panel, Hardirock® board (in Australia only) and Monotek® facade panel and ShingleSide panel (in New Zealand only).
 - In the Philippines, we developed our HardiFlex® board to compete against plywood applications in ceilings, walls and eaves; HardiFlex Senepa® boards to counter timber fascia board applications; and HardiPlank® siding to compete with exterior rendered systems.
 - Our skill in developing production processes also enables us to investigate new products and processes with relatively low-risk operations, as we did with our roofing product. In the case of roofing, which we closed in April this year, it became clear that the costs of manufacture and potential market for the roofing product made it a less attractive investment for us than other fibre cement growth opportunities.
- By investing in production technology, we aim to keep reducing our capital and operating costs:
- Over the past ten years, advances in production technology have allowed us to reduce the incremental cost of additional capacity at our existing sites.
 - We believe our plant capital cost is less than half that of our competitors and our superior economies of scale allow us to build and operate plants that are two to three times larger than our competitors'.
- Our goals are to:
- continue to lower the capital cost of each unit of production at new plants by learning from past projects, and through continuing innovation in engineering;
 - reduce operating costs at each plant by improving manufacturing processes, raw material yields, and machine productivity; and
 - use our proprietary product formulations and process technologies to create lightweight and durable products for all climates.