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News

Bionic suits make light of hard work

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In the comic and film series *Iron Man* the inventor Tony Stark builds a bodysuit to free himself from the clutches of kidnappers and goes on to save the planet from the forces of evil. In real life futuristic exoskeletons are being built with a different aim: to rescue Britain's construction industry before its ageing bricklayers keel over.

An American manufacturer of exoskeletons is bringing a series of inventions to the UK for the first time early next year to revolutionise a trade beset by industrial injuries and a recruitment crisis.

Ekso Bionics, which is based in California and has already invented devices for the US military and health sectors, told *The Times* that it had attracted interest from "safety groups, distributors and wholesale buyers" for its construction products and would introduce its first devices to the UK in March.

The British construction industry is urgently in need of a superhero to rescue it. About 30 per cent of bricklayers are over the age of 50 and 700,000 are expected to retire over the next decade. Unions are also braced for a Brexit-related exodus of workers, with 15 per cent of British building sites relying on bricklayers from eastern Europe.

The first device due to arrive is designed to make tools feel weightless. The Ekso ZeroG, which has already been on hundreds of American building sites for 16 months, has a "gravity balancing arm" that can hold industrial drills that weigh up to 16kg to stop builders from straining their hands.

The futuristic Ekso Vest is a spring-loaded upper-body exoskeleton designed to stop injuries to shoulders by making heavy items weightless in builders' arms as they lift them.

It was recently tested by BMW in South Carolina and will also come to Britain.

By the end of 2019 the company says that it will be in a position to export a full robotically powered Ekso Works suit, which is now in development, that will allow users to carry heavy materials freely around building sites while on the move. "Exoskeletons will allow staff to work for longer and more safely and help to solve a demographic crisis in the construction industry," Tom Mastaler, the company's senior vice-president for industrial business development, said from its headquarters in Richmond, California.

"They'll also change forever the kind of body types that can work in heavy-duty construction. In future women will be able to do the jobs that men now do because of the support that exoskeletons can provide their bodies to handle great weights.

"Future generations will also look forward to not suffering the kind of damaging body problems today's construction workers face." Such industrial injuries cause significant damage to the British economy each year. According to figures from the Health and Safety Executive 30.4 million working days were lost to workplace illness or injury in 2015-16, costing the economy £14.1 billion.

Ashley Perry, a robotics expert for the property consultancy JLL, said that automation in the UK construction industry was inevitable as its workforce aged. "I would expect to see full body exoskeletons for construction workers on larger building sites in the early 2020s," he said. "Technological advances in this sector could be a game-changer."

Experts suggest that each Ekso Vest was likely to cost companies about $5,000 (£3,858) and bodysuits, when completed, were likely to cost upwards of $10,000 each, although these rates are yet to be negotiated.

Exoskeletons were once the preserve of fantasy movies such as *Iron Man, Aliens* or *RoboCop*. At the start of the century, however, real-life weapon suits were developed by Ekso Bionics for the US military and to help hospital patients with spinal injuries to walk again.

Now the industry is expanding rapidly into manual labour and construction as these sectors belatedly embrace automation.

There are as many as 36 companies now working on exoskeleton technology, mainly in the United States, and the sector as a whole is expected to be worth $2.1billion by 2021, up from $36.5 million in 2015.

According to Fionnuala Costello, at the agency Innovate UK, Britain is on the cusp of an exoskeleton revolution. "Once exoskeletons have been proven for early wins in rehabilitation and industrial manufacturing they can quickly be applied to lifting heavy loads where a flexible response to a changing environment is needed, in sectors as diverse as logistics, aviation baggage handling and care homes," she said in a paper published this year.

The Times reported this year that fully fledged robo-brickies had started replacing humans on a handful of sites in America. Each robot still requires several real-life builders to operate them.

The Unite union, which represents most construction workers, has called on the government to increase the number of apprenticeships available to solve the industry's recruitment crisis. A spokesman said that he was not aware of any British construction sites having finalised a deal to buy exoskeletons.

EKSO BIONICS

The Zero G support makes holding a drill easy and would revolutionise other building tasks such as hod carrying