Niagara College research team develops efficient dispensing solution for PaperNuts

BY CAROLYN MULLIN
NIAGARA RESEARCH

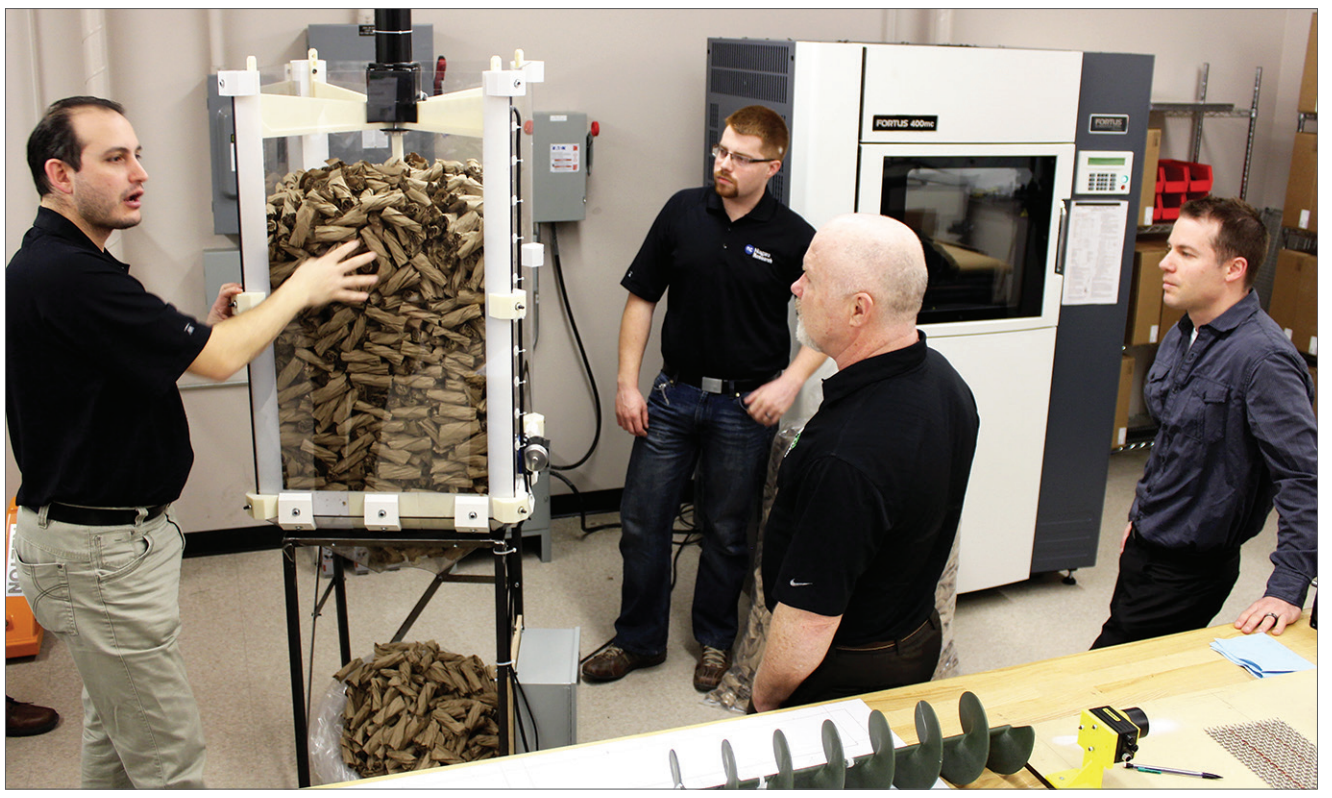
Who knew one little paper "nut" could revolutionize the way we pack and send packages around the corner and around the world?

The innovative minds behind PaperNuts, that's who.

PaperNuts are an environmentally responsible and consumer-friendly material used to fill the empty space inside shipping boxes. Unlike the traditional polystyrene and corn-based products, which can shift during shipping, PaperNuts expand slightly, offering a protective matrix around the item. What's more, PaperNuts can be recycled or disposed of in landfills without harm to the environment.

But PaperNuts' greatest asset of staying in place actually provides a challenge for the company doing the shipping, when it comes to dispensing the nuts into the containers. Traditional materials can be dispensed from gravity-fed hoppers, but that doesn't work for PaperNuts.

To create an efficient dispensing system – a free-standing unit that can be used by high-volume customers nationally and internationally – the St. Catharines-based company turned to the experts at the Industry Innovation Centre at Niagara (IIC@N), the advanced manufacturing centre operated by Niagara College's Niagara Research. Through IIC@N, Niagara Research works with small- and medium-sized businesses to meet their innovation goals, and to keep them competitive. With funding from various provincial and federal agencies, current students and recent graduates are hired to work alongside expert faculty to help industry partners leap forward in the marketplace.



From left, Costa Aza, researcher and industry liaison, Bryan Mewhiney, researcher and industry liaison, Scott MacRae, PaperNuts company owner, and Ben Laurence, mechanical engineering student and research associate, discuss the workings of a prototype for dispensing the environmentally friendly packing material. /PHOTO NIAGARA RESEARCH

The research team drew concept sketches, created basic computer-aided design (CAD) drawings, and the built and tested several concepts, using basic materials such as foam board, and components created using the college's 3D printing machines.

Once the best prototype was identified – using an auger to relieve the pressure and an agitator to keep the nuts moving – the team went back to refining the CAD drawings and building a refined prototype.

"About 40 per cent of the materials were designed and built in-house, while the rest were sourced from local companies," notes Ben Laurence, third-year mechanical engineering student and research associate on this project. "We will be able to provide PaperNuts with a prototype that allows an efficient dispensing unit, so that the operator can make clean stops and starts."

"This is our second project working with Niagara College. Not only have they been very professional, they also bring a fresh new perspective to some of the issues that we've been having as we develop new and improved machines for the manufacturing and distribution of PaperNuts," notes Scott MacRae, company owner.

This project was made possible with funding from the Colleges Ontario Network for Industry Innovation, and Federal Economic Development Agency for Southern Ontario's Prosperity Initiative.

Niagara College will continue to support collaborative research projects in various disciplines that may involve product and process applied research, engineering design, technology development, product testing, proof of concept, commercialization solutions, and piloting and problem solving. Nearby small- and medium-sized businesses can benefit from gaining access to the College's adept faculty, students, and recent graduates and exploring opportunities for innovation.

To learn more about partnership opportunities with Niagara Research, contact research@niagaracollege.ca or visit www.NiagaraCollege.ca/Research.