

PLASTICS AROUND THE WORLD

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WHAT I SEE?

PolyOne, Global Vision 2020 team up to improve eye care in developing countries

By David Hutton
Plastics News Staff

In the United States, access to eye care often may be taken for granted, but in many developing regions of the world, access to care is sadly lacking.

Through Global Vision 2020, Kevin White, a Marine Corps veteran, has developed USee, a vision-correction kit that he says is a “dial, snap and wear” process toward vision correction. The kits offer free, stylish prescription eyeglasses to people from Mozambique to Afghanistan.

PolyOne Corp. is donating key support as well as materials to White’s efforts, helping Global Vision to create the first 3,000 production USee kits for distribution.

In the United States, there is one optometrist for every 8,000 people. In developing regions, it is one for every 1 million people. White estimates that 2.5 billion people have simple vision issues but lack access to eye care.

White’s USee kits include an eye chart, snap-in prescription lenses and frames. The patient can walk away with glasses in less than an hour for a total cost of less than \$5 per pair. The kit includes 500 frames and 500 pairs of lenses.

By following directions included in the kit, individuals such as teachers can perform a visual acuity test and deliver prescriptive eyeglasses.

White sketched out his plan for the USee device on a napkin, and that is where PolyOne came on board in an effort to bring his vision into a reality.

According to Brian Everett, global director for IQ Design at PolyOne, White developed the idea after seeing the need for improved eye care while stationed in Africa.

“He had a vision for the USee device that would help correct the vision for people in Third World areas that may not have access to an optometrist,” he said. “PolyOne initially became involved by identifying appropriate materials and a preliminary design as well as providing legal services.”

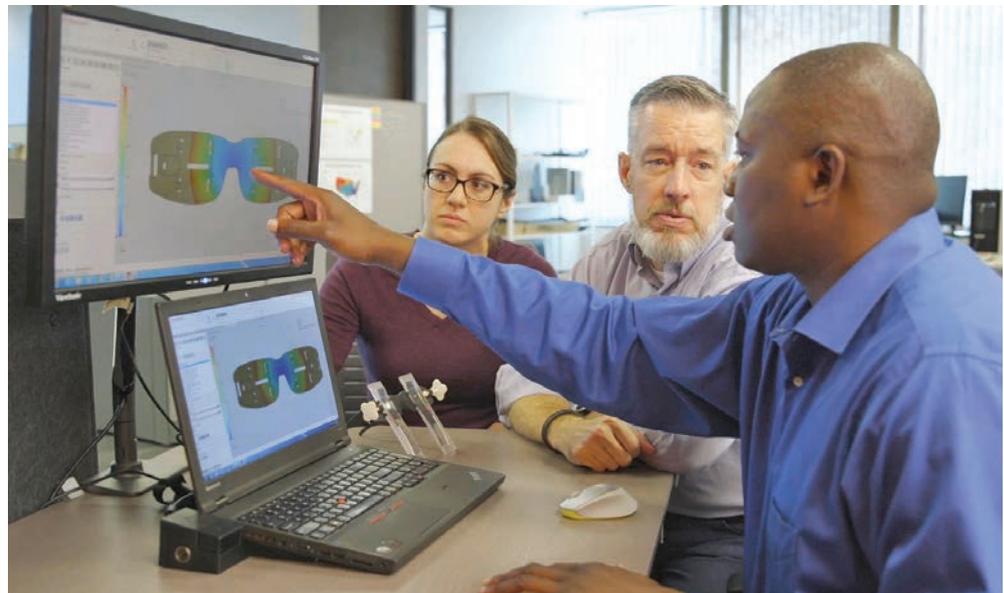
Since then, PolyOne has worked closely with Global Vision 2020 on the design, testing and production of these devices.

Everett noted that PolyOne has donated hundreds of hours of design time — including industrial design, 3D printing, prototyping, part design and tool design — along with donating the materials needed to make the first 3,000 sets of USee units.

“The goal is to reach as many people at the base of the pyramid as possible with access to eyeglasses,” White noted.

White said the dial-snap-wear process makes the USee kit simple to use.

The most technically challenging parts of the USee unit are the



Above, a customer wearing the eyewear from Global Vision 2020.

Left, Jane Spikowski, Kevin White and Ian Akoro look at eyewear.

Global Vision 2020 photos

two lenses. When moved up and down by rotating the dials on either side of the frames, they correlate to a specific lens prescription or diopter. On the side of each lens are pad-printed numbers that are color coded. Users cover one eye and rotate the dial until they can see clearly. Then they repeat with the other eye. When they’re done, the dial lines up with a spe-

cific color and number for each eye.

The person providing the test takes the correct color and number lenses out of the kit and snaps them into the eyeglass frame. All frames are the same.

Within 15 minutes, the user goes home with a new pair of glasses that allow them to see clearly.

“We want to lower the educational threshold so that teachers and community health care workers can determine who needs eyeglasses and determine the prescription and get them a pair of glasses,” White said.

While the tests are legally administered in other parts of the world, the kits cannot be used in the United States, where a prescription for eyeglasses must be written by an optometrist.

The biggest hurdle during development of the kits was selecting a polymer that would work for the lenses.

Ian Akoro, IQ Design senior design engineer at PolyOne, noted that tooling and material selection was essential in ensuring the device’s success.

“The part requires both high-quality tooling and high-quality material,” he added.

The team began working with United Kingdom physicist David Crosby on the lens system, which utilizes an unconventional molding process to ensure accurate optics in the lenses. Alpha Tool & Mold Inc. in Highland Heights,

Ohio, created the tooling, then molded and assembled the lenses into frames to create the USee devices. Alpha’s toolmakers also created a unique fixture for a machining step in the process.

In 2016, clinical trials were completed at Wilmer/Johns Hopkins, indicating that this was a valid method of diagnosing an eyeglass prescription.

“In 2016, there were field trials at four high schools in Mozambique,” White added. “We trained teachers with positive results.”

In January, Global Vision 2020 received a We Work Global \$1 million award for the program.

Teaming up with Global Vision 2020 was an easy decision for PolyOne, according to Everett.

“We have an initiative in our company to give back to our local communities as much as possible,” he said. “When this project came to us, it was very attractive. It is something that is very important. It literally is something that could change the world.”

Everett added that PolyOne will continue to support White’s efforts.

Going forward, White hopes to be able to develop 250,000 USee kits by the end of 2019, and he is seeking additional partners for those efforts. He also is hoping to have the kits approved for children under the age of 12.

“We want to get the word out that we have a solution,” he said. “We have a great tool.”



Alpha’s toolmakers also created a unique fixture for a machining step in the process. PolyOne Corp. photo