

Turning a Medical Crisis into a New Lease on Life

by Bryon Ater

There are probably hundreds of Shot Peener readers that have experienced something similar to my story. Your day starts out as it usually does. You go to the same job that you have taken for granted for many years and then something happens that changes the course of your life.

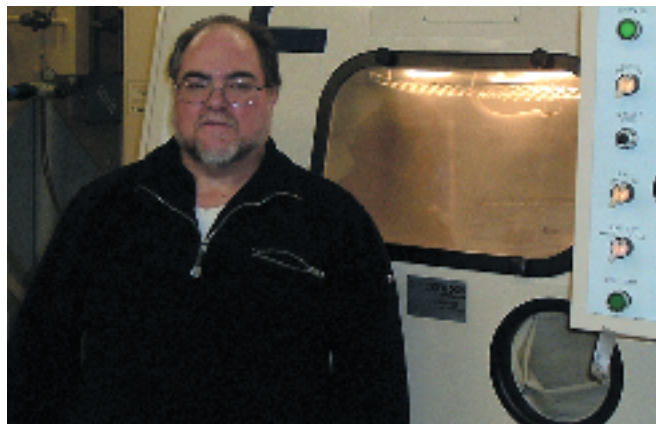
It happened to me. In January of 2001, I was running an overhaul facility for a major airline. I went into work one day and by the end of the day I was in the hospital. Six weeks after that I was unemployed.

While recovering from major surgery, I began to wonder who would want to hire me at this point in my life with my medical condition. What will happen to my family and me?

I had an idea about starting my own business but what would that be? I had been an automotive mechanic for years so I thought about that. I had worked as a mechanic for the Air Force and a national airline carrier so I thought about that. Then it came to me. I had been shot peening at my job with the airline for several years. I could use my experience in the aviation and automotive industry to educate on how shot peening could increase product life. That's where I headed.

I did a marketing study and began to develop BG&S Peening and Consulting LLC. What a great feeling to answer to no one but myself. It didn't take long to find out about the "Big Gorillas" that can get in the way. However, I proceeded to cut a niche into the road of progress.

I was making progress building the business and then all of a sudden I had to have major surgery again because of the same medical condition. I was down again. Who was going to run the business and was I going to lose everything that I had worked for? Those are some of the thoughts that went through my head while I was lying there in bed doing nothing. As I watched the hospital staff do their job cleaning the furniture and wiping down the rails on the beds and the floors, I asked a staff member what she was using to clean these areas. The young lady looked at me and said "a bacteria cleaner". As I lay there and watched her spray the cleaner on and then wipe it off, I remembered a TV program on diseases



Bryon Ater in his shot peening facility at BG&S Peening and Consulting.

in the hospital. The program had acknowledged a number of cases where people have gotten sick as a result of being hospitalized. I started kicking around some ideas in my head related to shot peening.

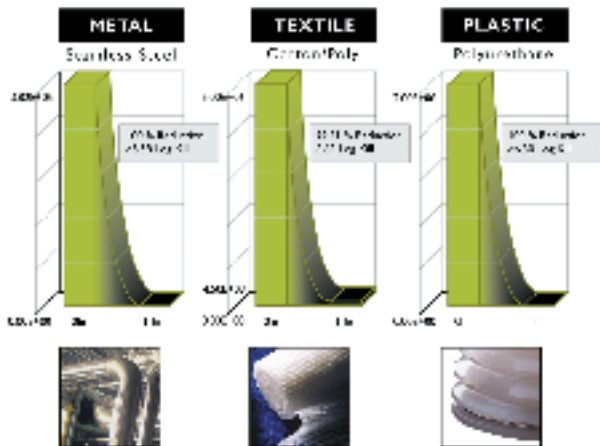
While I recovered from surgery, I began pursuing the notion of using shot peening to help cure hospitals' bacteria problems and, at the same time, eliminate fatigue and stress corrosion problems. I consulted with Matco labs, a testing lab with which I worked, and the metallurgist on my company's advisory board to see if they thought this was a possibility. They shot me down. I was told that this could not be done because I would create more problems by shot peening than I would ever be able to cure—the shot peening process could trap bacteria in the metal.

I was determined to find a way to use shot peening to eliminate bacteria from living in the surface of metals. I decided to search for other companies that were looking for a solution to the same problem when I came across BIOSAFE™ INC. BIOSAFE manufactures a permanent antimicrobial that is used for a broad range of disease control. (An antimicrobial is a substance that kills or inhibits the growth of microbes such as bacteria, fungi, viruses, or parasites.) I shared my idea with Don Wagner, Vice President Business Development at BIOSAFE, only to discover that they were interested in applying their product onto metal surfaces. Their idea was to mix the antimicrobial into paint.

As the chart on the next page shows, BIOSAFE's antimicrobial is an extremely effective product on numerous surfaces, including stainless steel. An interesting aspect of the substance is that it causes the physical destruction of the bacteria's cell wall, thereby rendering it incapable of mutating into a "superbug". Superbug infections are practically immune to most antibiotics, making them tough to treat.

Don and I discussed the possibility of the benefits of shot peening metals with media treated with BIOSAFE antimicrobial. If we could deliver the antimicrobial to the metal through shot peening, would the treated surface retain the chemical and prevent bacteria growth? We performed tests combining his product with several different types of shot peening media. We processed the media with blue-tinted antimicrobial before placing it into the hopper. We shot peened three 1 mil x 1 mil squares each of Almen strips, aluminum and stainless steel at specified pressure, distance and time and then removed the samples. As evidenced by the residual blue tint, the antimicrobial adhered to the media and transferred to all three metal surfaces.

These tests were a career highlight for me and I felt great about this accomplishment. However, since the initial testing, we have returned to reality because this was only the first step. We know that we need to accomplish a great deal more. We are working on a list of self-imposed hurdles. As we have success with each hurdle, we know that there are great possibilities for this process. Despite all of today's advances in



Test results from the application of BIOSAFE's antimicrobial on *Escherichia coli* (*E. coli*) infected metal, textile and plastic.

health care and food processing, we are more susceptible than ever to bacteria infections, as evidenced by recent coverage in the news of e.coli outbreaks in our food supply.

In health care, just a few prospects include cleaner, stronger metal surfaces throughout the hospital. Remember how I watched the hospital staff clean my hospital bed with an anti-bacteria spray? I've since learned that patients were more likely to be infected with drug-resistant germs when they stayed in a bed previously occupied by a patient infected with the germs. I'm glad I didn't know that at the time.

Since shot peening eliminates the porosity of metals, it can reduce the corrosion problem inherent in sterilizing surgical tools. Plus, embedding an antimicrobial into the tools would greatly reduce the infection risk from surgery. However, surgeons expect their surgical instruments to be extremely shiny—an education process would be necessary to get them to accept the dull finish of a shot peened knife.

One of the common problems in joint replacements is infections. The reason infections are such a significant problem is that bacteria cannot be easily eliminated from a joint replacement implant. Despite antibiotics and preventative treatments, patients with a joint replacement infection often will require removal of the implanted joint in order to cure the infection. A shot peened and antimicrobial-treated implant would be infection-resistant, lighter, stronger and more durable.

The food industry could be revolutionized by metals embedded with antimicrobial. Stainless steel meat hooks and the splash boards in meat processing plants are breeding grounds for bacteria and leave our food supply vulnerable to e.coli outbreaks.

We're very excited about the markets for this technology and BG&S has a patent pending for the application of the antimicrobial. We are in the process of applying for grants so that we can continue our research. We will also be partnering with the University of Pittsburgh to conduct more testing.

In the meantime, we continue to grow our conventional shot peening services at BG&S Peening and Consulting. We were approved by the FAA as a 145 repair station for shot peening. We just received ISO AS 9003 and are working on our Nadcap accreditation. BG&S Peening has obtained several government contracts and we are on the Hill AFB Landing gear commodity council. The company also train mechanics in shot peening and offers consulting and testing services

from our Beaver Falls, Pennsylvania facilities. We have expanded our services to the automotive, medical, transportation, mining, defense and construction industries. Future plans of expansion will be in areas of composite repair and phosphate coating.

While I can't say that I'm grateful for my health problems that landed me in the hospital, I am grateful for my ability to see possibilities and have hope during difficult times. And if my experiences are key to the development of life-saving products (and an expanded market for shot peening!), I've been given a real gift indeed. ●

Contact information:

Bryon Ater
1-724-846-0357
bryon_ater@peeningconsultants.com
www.peeningconsultants.com

Donald Wagner
BIOSAFE Inc.
dwagner@biosafeinc.com
1-412-770-1302
www.biosafeinc.com

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