



SOCIAL RESPONSIBILITY **REPORT 2015**



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BARNES GROUP OVERVIEW

Who We Are

Founded in 1857, Barnes Group Inc. is an international industrial and aerospace manufacturer and service provider, serving a wide range of end markets and customers. The highly engineered products, differentiated industrial technologies, and innovative solutions delivered by Barnes Group are used in far-reaching applications that provide transportation, manufacturing, healthcare products, and technology to the world. Barnes Group's approximately 4,700 skilled and dedicated employees around the globe are committed to achieving consistent and sustainable profitable growth. We operate under two global business segments: Industrial and Aerospace.



SEGMENT OVERVIEW

What We Do



INDUSTRIAL

Industrial is a global manufacturer of highly-engineered, high-quality precision parts, products and systems for critical applications serving a diverse customer base in end-markets such as transportation, industrial equipment, consumer products, packaging, electronics, medical devices, and energy. Focused on innovative custom solutions, Industrial participates in the design phase of components and assemblies whereby customers receive the benefits of application and systems engineering, new product development, testing and evaluation, and the manufacturing of final products. Products are sold primarily through its direct sales force and global distribution channels. Industrial’s Molding Solutions businesses design and manufacture customized hot runner systems, advanced mold cavity sensors and process control systems, and precision high cavitation mold assemblies - collectively, the enabling technologies for many complex plastic injection molding applications. Industrial’s Engineered Components businesses manufacture and supply precision mechanical products used in transportation and industrial applications, including mechanical springs, high-precision punched and fine-blanked components, and retaining rings. Engineered Components is equipped to produce virtually every type of highly engineered precision spring, from fine hairsprings for electronics and instruments to large heavy-duty springs for machinery. Industrial’s Nitrogen Gas Products business manufactures nitrogen gas springs and manifold systems used to precisely control stamping presses.



AEROSPACE

Aerospace is a global provider of complex fabricated and precision machined components and assemblies for original equipment manufacturer (OEM) turbine engine, airframe and industrial gas turbine builders, and the military. The Aerospace aftermarket business provides jet engine component maintenance, repair and overhaul (MRO) services, including services performed under our Component Repair Programs (CRPs), for many of the world’s major turbine engine manufacturers, commercial airlines and the military. The Aerospace aftermarket activities also include the manufacture and delivery of aerospace aftermarket spare parts, including the revenue sharing programs (RSPs) under which Barnes Group has the exclusive rights to supply designated aftermarket parts over the life of certain aircraft engine programs.



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CORPORATE SOCIAL RESPONSIBILITY AT BARNES GROUP

Barnes Group is committed to preserving and protecting our natural environment, and to promoting and maintaining a safe workplace. In this regard, our operations are conducted in conformance with all applicable laws and regulations, as well as with all of our corporate policies pertaining to workplace safety and protection of the environment. In 2014, we launched Barnes Group's formal company-wide Corporate Social Responsibility (CSR) initiative with the full support of the Senior Leadership of the company and led by our Director of Health, Safety & Environmental Affairs (HSE), and established a baseline against which we can measure progress towards reducing our environmental footprint.

In 2015, we continued to invest in making our products and operations more sustainable, allocated funding for environmental projects such as energy and water conservation, and published our first CSR report.

This is our second annual CSR report, intended to update our stakeholders on our progress.



GOVERNANCE AND ETHICS



GOVERNANCE

Barnes Group is a publicly held company that trades on the New York Stock Exchange under the ticker symbol “B”. The Board of Directors is our highest governing body and, as of the issuance of this report, is comprised of nine directors, the substantial majority of whom are independent. We have a standing Audit Committee, Compensation and Management Development Committee, and Corporate Governance Committee.

At Barnes Group, our Board of Directors and senior management devote considerable time and attention to corporate governance matters and we maintain a comprehensive set of policies and procedures to enable effective corporate governance. The following documents are available on the Investor Relations section of our corporate website at www.bginc.com:

- *Corporate Governance Guidelines*
- *Audit Committee Charter*
- *Compensation and Management Development Committee Charter*
- *Corporate Governance Committee Charter*
- *Political Activity Policy*
- *Conflict Minerals Policy*
- *Code of Business Ethics and Conduct*
- *Policy Regarding Reporting of Complaints and Concerns*
- *California Transparency in Supply Chains Act Disclosure*



ETHICS AND COMPLIANCE

We strive to conduct business with the highest ethical standards. In 2015, Barnes Group enhanced its Code of Business Ethics and Conduct (the Code), which now includes new guidance on Barnes Group’s expectations on topics such as social media, workplace safety, bullying and human rights. In addition, the Compliance Office developed and launched a new Code training course for our employees that, among other things, highlighted the revisions to the Code. We were pleased to achieve a Code course completion rate of over 99% for all Barnes Group employees worldwide. Barnes Group continued its annual global anti-corruption training for employees above a certain grade level (98% completion rate) and harassment free workplace training for all new employees in the United States. Barnes Group maintains a company Alertline through which individuals may submit reports of potential or actual concerns or policy violations. The Alertline is available to individuals worldwide and is published in multiple languages. In 2016, Barnes Group will issue its executive questionnaire which prompts officers and business leaders worldwide to share yet unreported concerns or conflicts of interests.



HEALTH, SAFETY, AND ENVIRONMENTAL AFFAIRS (HSE)

Barnes Group strives to ensure that all aspects of our operations are conducted in conformance with applicable laws and regulations, as well as with all of our corporate policies pertaining to workplace safety and protection of the environment.

In certain cases, the Company or its strategic business units (SBUs) may establish more stringent requirements as policies, procedures or directives. At the corporate level, these requirements are documented as BGI HSE Standards.

The BGI HSE Standards are consistent with our commitment to worker health and safety and to environmental protection, as well as prevailing regulatory frameworks in place around the globe. All locations are required to meet the local laws and regulation, or the BGI HSE Standards, whichever are more stringent.



HEALTH, SAFETY, AND ENVIRONMENTAL AFFAIRS (HSE)



COMPLIANCE

We focus our time and resources on identifying and controlling hazards in the workplace to ensure compliance and our employees' safe return to their homes and families at the end of their work day. Across the globe in 2015, Barnes Group had one HSE non-conformance for which we paid a fine; this deficiency was remediated during the inspection and the lessons learned shared across the organization, with mandatory corrective actions tracked in a centralized system. Our goal continues to be to eliminate HSE non-compliance.

SAFETY

Barnes Group is committed to promoting and maintaining a safe workplace for our employees. Through initiatives such as the Critical Risk Mitigation Program, behavior-based safety, and other injury prevention activities, Barnes Group reduced recordable incidents by 23% since 2013. Although our lost time incident rate remained flat overall, once again in 2015, half of our manufacturing facilities worked the entire year without a lost time injury. We are proud of our safety accomplishments, especially in light of our diverse manufacturing processes. We believe this is a testament of our commitment to our employees and our culture of empowering teams to identify and report potential safety issues through HSE Audits and Inspections, Gemba Walks, and Near Miss programs.



Nitrogen Gas Products' (NGP) Strömsholmen, Sweden division surpassed 1.1 million hours worked without a lost time injury in 2015.



WATER

With all Barnes Group operations now tracking water usage data, we are pleased to report that our divisions successfully implemented several conservation projects in 2015 to reduce consumption. Some of the water conservation initiatives implemented in 2015 include:

- Our Associated Spring Singapore division ceased operation of their plating line in February 2015. Discontinuation of this process eliminated all water usage for make up of plating solutions and parts rinsing.
- Our Männer Bahlingen, Germany facility installed a new heating and cooling system for Plant II in 2014 to reduce its dependency on groundwater. In 2015 after a full year in operation, the facility experimented with operating the new system without using any groundwater. The trial was successful and the groundwater usage was reduced significantly in the second half of the year. Therefore, the groundwater permit for Plant II will not need to be renewed, and groundwater usage in Plant II will be eliminated completely in 2016 and beyond.
- Our Associated Spring facility in Corry, Pennsylvania installed electric shut off valves in January 2015 on its rolling mills to reduce water consumption during non-production periods.



Water Usage is defined at Barnes Group as the total amount of water measured in gallons consumed by a facility including municipal water (supplied to a facility from a public distribution system), well water, and water withdrawn from surface water and groundwater resources, including non-conventional anthropogenic water sources such as water produced at desalination plants.

HEALTH, SAFETY, AND ENVIRONMENTAL AFFAIRS (HSE)



WASTE

Barnes Group operations report waste generation data using a common online system according to the framework established in our corporate environmental standards. Centralized reporting of both non-recycled and recycled industrial process wastes began in 2014 and enabled us to identify pollution prevention and waste minimization opportunities, as well as to drive towards recycling a greater percentage of our industrial waste streams.

HIGHLIGHT - OIL RECYCLING AT ASSOCIATED SPRING BRAZIL

Associated Spring Campinas, Brazil division identified that the oil consumption in its spring manufacturing process was high and its effectiveness for corrosion protection was degrading over time. The team researched alternatives and identified a supplier that could filter and purify the oil to allow reuse in the system. The new system removes solid and liquid particles dissolved in the oil and minimizes deterioration over time. As a result, the division is using less virgin product, generating 30% less oil waste requiring offsite disposal, and the associated costs have also been reduced by 30%.

HIGHLIGHT - METAL POWDER RECYCLING AT BARNES AEROSPACE WEST CHESTER

Barnes Aerospace West Chester, Ohio division started working with a recycling firm that processes metal powder waste from our grit blasting and grinding operations. The firm reclaims metals such as chromium and nickel for reuse in its other operations, preventing the material from being disposed of as waste in landfills. The division successfully diverted 26 tons of material from landfill in favor of recycling in 2015.



HIGHLIGHT - ACID RECLAMATION AT BARNES AEROSPACE

Barnes Aerospace Lansing, Michigan and Ogden, Utah divisions implemented acid reclamation and dosing systems in 2015. These innovations minimize process chemistry variations, thus improving process control, and increase consistency of surface quality for processed hardware. This system required infrastructure modifications to each facility to provide the specified utilities to the system, and to free up space for each system's placement for appropriate maintenance and operator access. The HSE benefits of the new acid reclamation and dosing systems for both facilities include:

- 30-50% reduction in hydrofluoric and nitric acid consumption
- Elimination of tank dumps due to off spec chemistry
- Reduction in waste generation and waste disposal costs
- Minimized manual chemical handling of acids by employees



Consistent with our efforts to minimize the environmental impacts of our operations, 10 of our Barnes Group facilities' environmental management systems have been registered under ISO 14001.

HEALTH, SAFETY, AND ENVIRONMENTAL AFFAIRS (HSE)



ENERGY

After establishing our Company baseline in 2014, our operations were asked to identify and implement energy conservation projects for 2015. Some of the projects completed in 2015 include:

- Several additional facilities implemented energy-efficient LED lighting and motion-sensors
- Associated Spring Bristol, Connecticut division installed demand-based, variable speed compressors, which contributed to an overall reduction in energy usage at the facility of over 850,000 kilowatt hours in the first year alone
- Barnes Aerospace Windsor, Connecticut division commissioned a detailed energy audit with the local utility, and subsequently completed a repair of its compressed air system that eliminated a significant leak of which they were previously unaware
- Barnes Aerospace Singapore division reduced the number of air compressors and air conditioning units used to support operations
- Associated Spring Singapore division consolidated its offices, resulting in a reduced physical and energy footprint



HIGHLIGHT - ENERGY CONSERVATION IN MOLDING SOLUTIONS

In 2015, our Männer facility in Bahlingen, Germany focused on developing and certifying its Energy Management System under ISO 50001. The operation recently replaced its Plant II office lighting with new, LED lighting. Through this solution, the Bahlingen, Germany facility is expected to reduce energy usage attributable to office lighting in Plant II by 83%.

HIGHLIGHT - ENERGY MANAGEMENT AT SEEGER-ORBIS

Seeger-Orbis, located in Königstein, Germany, also implemented a new energy management system program according to ISO 50001. This was a major undertaking for the Seeger team as they integrated this new program into their existing environmental and health and safety management systems (ISO 14001 and ISO 18001). Seeger's new energy saving program includes annual reduction targets and TÜV audits to independently verify the progress made. The key performance indicator (KPI) Seeger will use is kilowatts per kilogram of processed material (kwh/kg). Seeger has set targets to reduce this quotient in 2016.



In 2015, purchased electricity consumption at Barnes Group was reduced by 1.8 million kilowatt hours or 1.5% versus the prior year.

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PEOPLE, TRAINING, WELLNESS

At Barnes Group, we believe it is never too late to improve your lifestyle and to make the most of your health and well-being. Our wellness programs have been designed with this goal in mind – to provide tools, resources and support for employees and their family members to adopt healthier lifestyles and create meaningful and lasting change towards their personal well-being and to ensure a stable workforce for the Company. We also support professional well-being by offering a diverse set of professional training and development programs.



PEOPLE, TRAINING, WELLNESS



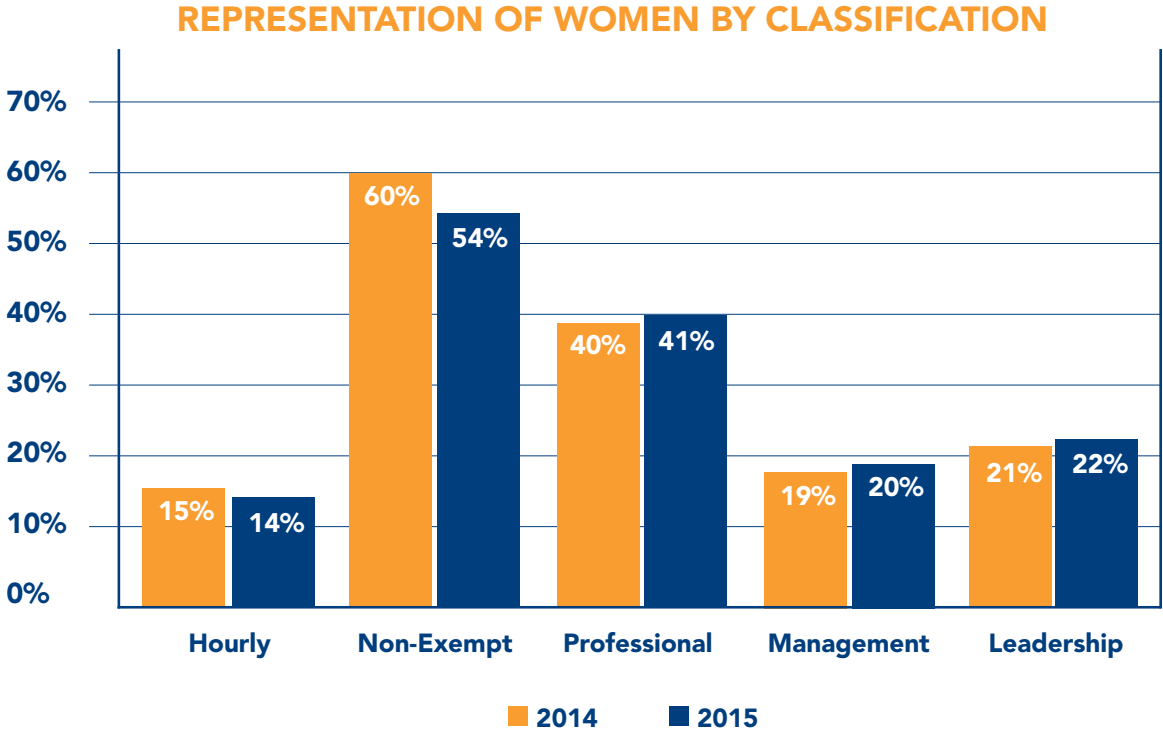
DIVERSITY AND INCLUSION

At Barnes Group, success begins with having a passionate and energized workforce. Barnes Group employs approximately 4,700 of these passionate and energized employees around the globe.



To help us maintain this energized and engaged workforce Barnes Group strives for diversity at all levels of the organization. Additionally, we look to increase women in hourly, management and salaried leadership positions. The recruitment process is an important element in achieving a more diverse population throughout our businesses.

U.S. ETHNIC MINORITIES BY CATEGORY	2015
American Indian / Alaskan Native	Less than 1%
Asian	5%
Black / Not Hispanic Origin	5%
Hispanic	5%
Native Hawaiian or Other Pacific Islander	Less than 1%
Two or More Races	Less than 1%
White / Not Hispanic Origin	84%



PEOPLE, TRAINING, WELLNESS



TRAINING AND DEVELOPMENT

Training and Development at Barnes Group provides a means to achieving a wealth of opportunities for employee development at all levels of the organization, including conferences, formal leadership and skills training programs, tuition reimbursement, and online learning through our e-learning portal, Barnes University.

We have several leadership development programs here at Barnes Group -- Barnes Leadership Development Program (BLDP), Barnes Emerging Leaders Program (BELP) and Barnes Enterprise System Leadership Program (BESLP). During 2015 we initiated a major redesign of our BLDP and BELP programs as a result of our new competency model, rolled out as part of our Integrated Talent Management System. We expect to have these ready for early 2017.

Our Barnes Enterprise System Leadership Program (BESLP) has continued to help staff our business with experienced “practitioners” in our BES operating system. In 2015, another 13 associates graduated from this rigorous program bringing the total number to 54.

The BESLP, created in 2010, is an intensive three-week training program that provides practical skills and competency building to enable participants to effectively, efficiently, and reliably develop organizational cultures at their businesses that create value for stakeholders in complex and rapidly changing environments. The program also enables participants to better manage all aspects of the Barnes Enterprise System’s (BES) continuous improvement strategies, and increase their teams’ performance through utilization of effective communication skills.



Our leadership development programs are aligned with our eight Corporate Values and our new Core Competencies, and are designed to expose our high performing depth and breadth leaders to key and critical development opportunities that will further enhance their leadership skills and capabilities.

Other skill building training in areas such as project management, employee assessment, presentation skills and general supervisory skills are also available to employees as needed. Lastly, we also provide formal and informal coaching and mentoring programs designed to help guide employee career path decisions and help our employees make the most of the career opportunities available at Barnes Group worldwide.

PEOPLE, TRAINING, WELLNESS



WELLNESS

Our mission is to support and provide wellness opportunities for Barnes Group employees and their families through health awareness activities and initiatives that foster a balance between work and a healthy lifestyle. Our Healthy Directions program provides tools, information and guidance to promote healthier living and incentives for participation and outcomes making our Company a stronger and healthier place to work.

HIGHLIGHT - WELLNESS NOTABLE ACHIEVEMENTS

GLOBAL EMPLOYEE ASSISTANCE

In 2015, we completed implementation of our Global Employee Assistance and Work/Life Program to 38 locations around the globe, in 19 countries. The Employee Assistance and Life Management Program is a professional, confidential and free service, designed to support employees and their families with their personal and work-related issues in order to promote overall well-being and enhanced performance and productivity.



On October 1, 2015, Health Advocacy services were introduced in the United States. Health Advocacy provides a personalized service to help employees and their family members navigate complex healthcare and insurance-related issues. In addition, beginning January 1, 2016, Health Advocacy will assume administration of our domestic EAP and Work/Life programs to provide continuity and a holistic approach to managing employee health and wellness.



WELLNESS IN THE UNITED STATES

Our comprehensive wellness program provides a number of ways for employees to assess their current health and wellness, and offers options for those looking to improve including: self-directed workshops, online instructor-led classes, and team-based wellness challenges. Financial incentives are provided for participation and achieving health outcomes.

2015 demonstrated strong employee engagement and produced positive results:

- 75% of our facilities hosted an on-site Metabolic Syndrome Screening event, with 77% of participants achieving healthy outcomes
- Employee participation in our health screening programs increased 21% from the prior year

Approximately 30% of our employees participate in our quarterly wellness challenges, collectively achieving impressive results:

- 234,418,323 steps were logged
- 12,444 hours of exercise were recorded
- 252 pounds were lost



BARNES IN THE COMMUNITY

At Barnes Group, we believe that being a good corporate citizen begins with being a great community leader, which is why we encourage philanthropy, compassion and change through our Barnes Group Foundation. Founded in 1945 and supported by Barnes Group, the Barnes Group Foundation is committed to the support of education, the arts, civic and youth activities, and health-related charities in the communities in which the Company operates. Since 2000, the Foundation has supported more than 400 schools, cultural centers and health-related charities, helping to ensure a legacy of community support for the future.



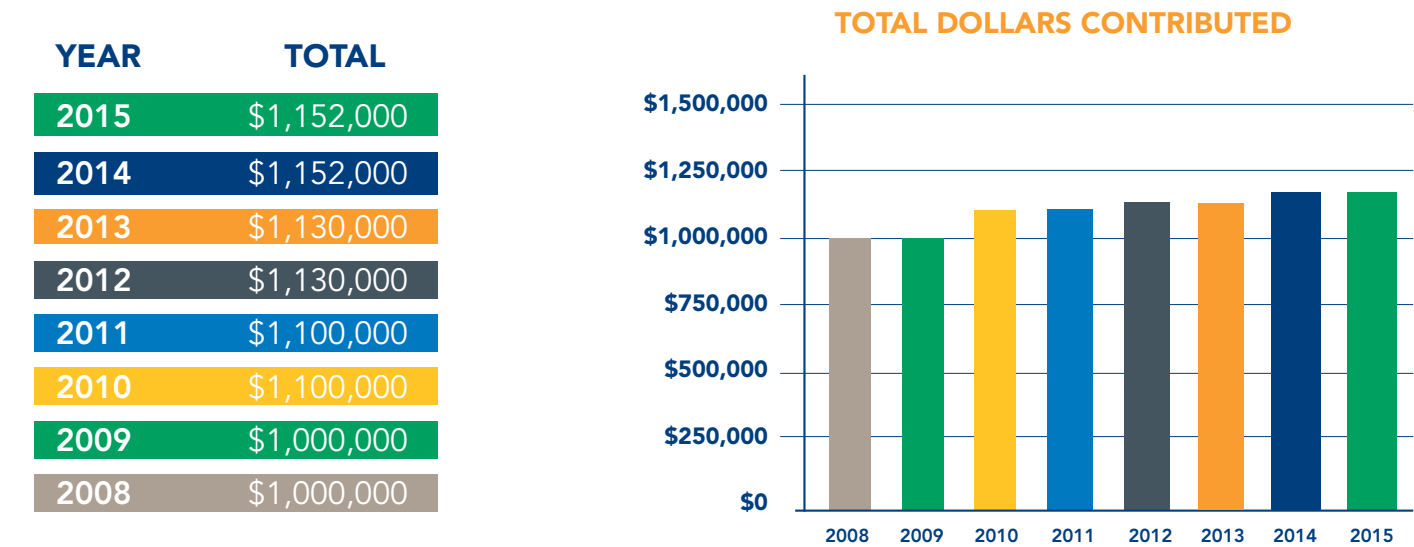
BARNES IN THE COMMUNITY



BARNES GROUP FOUNDATION

The Barnes Group Foundation is a private grant-making organization supported by Barnes Group as a vehicle for providing a balanced contribution program to accomplish the Company’s objective of good corporate citizenship.

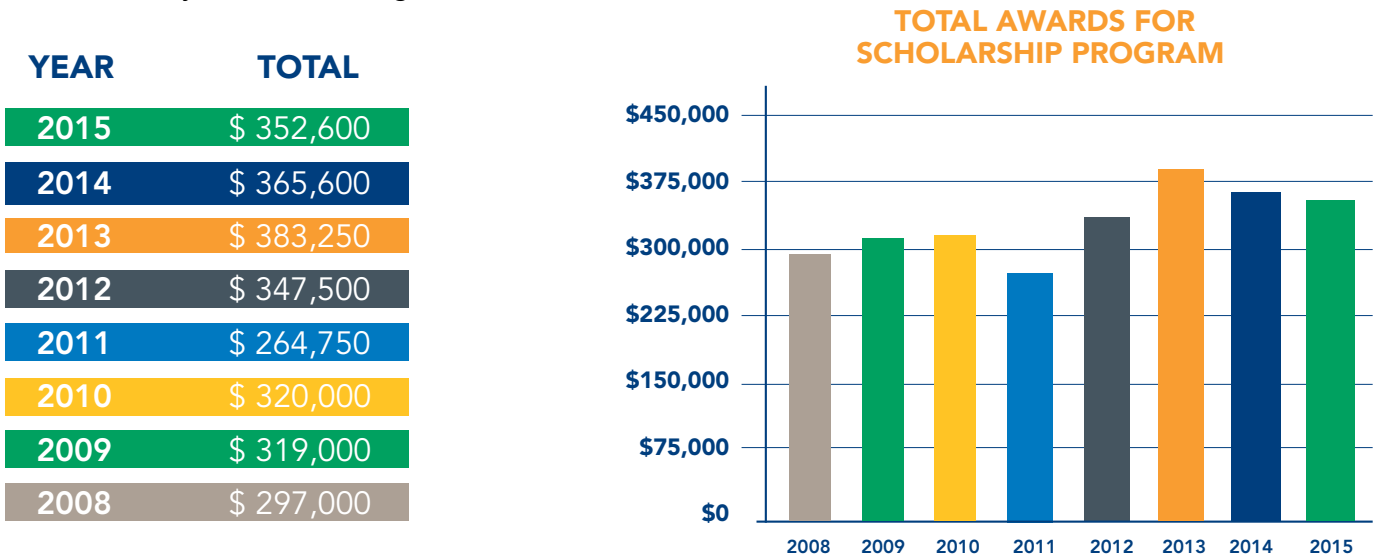
The Foundation’s highest priority is to support organizations and projects in communities where the Company has offices and other facilities. The Foundation also makes a limited number of contributions to organizations with programs that have broad impact on the community and exhibit an innovative and resourceful approach to the solution of difficult local, national and international problems.



STUDENT SCHOLARSHIP PROGRAM

The Barnes Group Foundation has established a scholarship program to assist an employee’s child who plans to pursue post-secondary education in college and vocational programs. Renewable scholarships are offered each year for full-time study at any accredited post-secondary institution of the student’s choice.

The scholarship is administered by Scholarship Management Service, a department of Citizens’ Scholarship Foundation of America, Inc. (CSFA). CSFA is a national nonprofit educational support and student aid service organization that seeks to involve and assist the private sector in expanding educational opportunities and encouraging educational achievement. Awards are granted without regard to race, color, creed, religion, gender, disability, or national origin.



BARNES IN THE COMMUNITY



MATCHING GIFTS PROGRAM

Barnes Group provides a 2-to-1 matching gifts program for employee donations made to qualified nonprofit organizations, up to a yearly cumulative maximum of \$4,000 per employee/spouse. Qualifying organizations must be recognized as tax-exempt under Section 501(c)(3) or Section 170(c)(1) of the Internal Revenue Service Code and fit into one or more of the following categories:

- Education
- Cultural and Arts
- Civic and Youth
- Health and Welfare

VOLUNTEER ACTION AWARDS

The Foundation believes it is vital to the health of every community that citizens be active in local organizations. Employees who volunteer a minimum of 30 hours to assist a local charitable organization during the year are eligible to apply for a Volunteer Action Award. Volunteer Action Awards are grants of up to \$2,000 presented to the charitable organization at which the employee has donated his/her time.

YEAR	TOTAL
2015	\$174,857
2014	\$183,841
2013	\$188,512
2012	\$214,345
2011	\$236,986
2010	\$253,727
2009	\$195,891

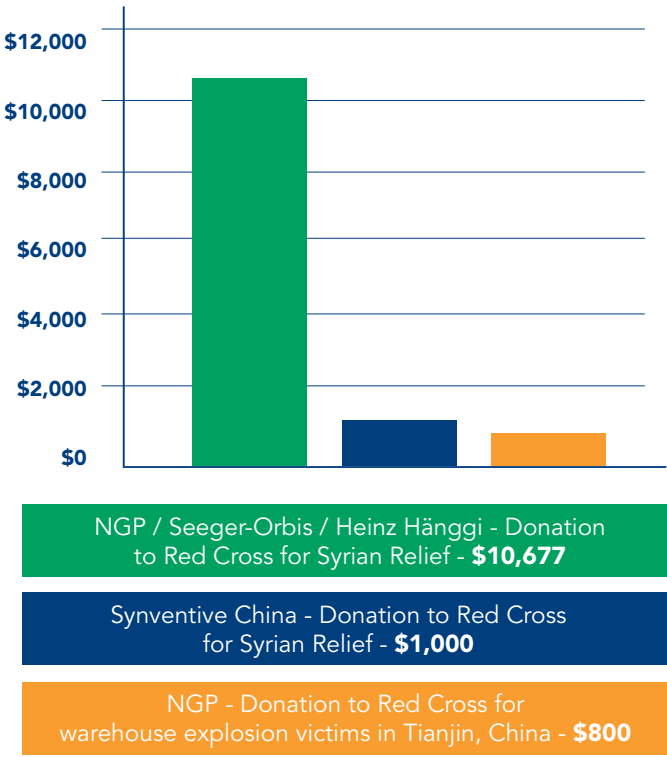
YEAR	TOTAL
2015	\$2,500
2014	\$6,000
2013	\$4,000
2012	\$5,500
2011	\$5,000
2010	\$8,500
2009	\$13,500
2008	\$13,000



CHARITABLE GIVING PROGRAM

Barnes Group also supports charitable giving at our international locations through our 1-to-1 matching program. All locations are eligible for the matching gift given in support of employee projects that involve the entire location and support a charitable organization or project that has a positive impact on the community.

CHARITABLE GIVING PROGRAM





Barnes Group global employees once again showed their outstanding generosity and commitment to community during the 2015 Barnes Group United Way Campaign. Employees across the United States raised \$229,531 for the campaign, for a grand total of \$459,062 with the corporate match! In addition, Barnes Aerospace, Singapore raised \$12,720, for a total of \$25,440; and Associated Spring's international divisions in, Singapore, Mexico and Brazil raised \$3,902, for a total of \$7,804.

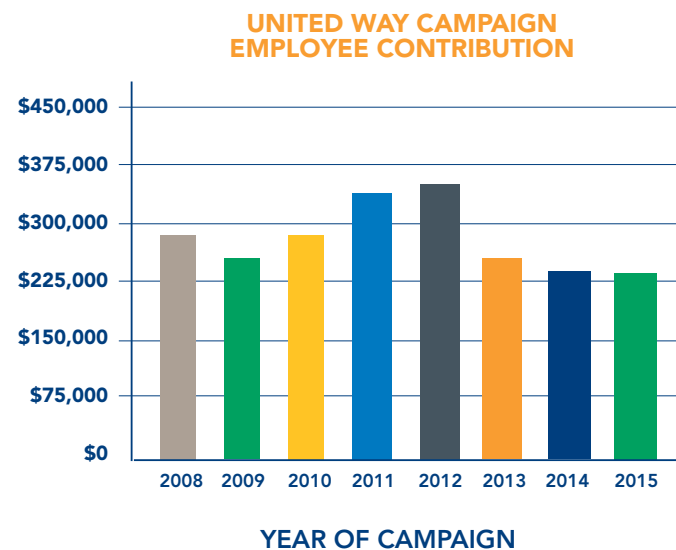


UNITED WAY CAMPAIGN

Barnes Group has a long and proud tradition of supporting the United Way through local campaigns held annually at each of our United States locations. We have earned our reputation as a great community leader, helping our neighbors in need. Through the Barnes Group Foundation, all donations made to the United Way are matched 1-to-1, increasing our total contribution.

Together, the Company and its employees have contributed over \$2 million to the United Way over the past eight years, assisting the United Way's more than 1,300 member organizations. For the 2014-2015 campaign, employees were encouraged to LIVE UNITED and support their local campaigns. Living United means being a part of the change. It takes everyone in the community working together to create a brighter future.

YEAR	TOTAL
2015	\$229,531
2014	\$229,997
2013	\$234,258
2012	\$357,212
2011	\$342,561
2010	\$286,335
2009	\$254,718
2008	\$282,000



HIGHLIGHT - ASSOCIATED SPRING, BRAZIL SUPPORTS ENRICHMENT & EXPANDED ENROLLMENT AT CHILDREN'S SCHOOL IN CAMPINAS

Since 2010, employees of Associated Spring, Brazil have donated their time and money to Creche Bento Quirino, a children's school located in Campinas, Brazil dedicated to helping kids in need. The school provides numerous services to underprivileged students ages 3-14 years old, including transportation to and from school, daily meals, introductory computer instruction, and social assistance for students' families.

During 2015, employees contributed around 3.5 tons of food and clothing, and a total of R\$37,535 (US\$9,850) to the school for additional food, clothing, school supplies, and other much needed items. Donations also supported numerous programs and activities for the children throughout the year, including Ride the Buffet Jambo Kids, Project Horta II, June Festival, Children's Day, Easter and Christmas parties, as well as field trips to the theater, Itatiba Zoo, circus and the AS facility. The 1-to-1 matching gift from Barnes Group helped fund the expansion of classrooms; installation of a municipal drinking water supply and new drinking fountains; a kitchen refurbishment; and the purchase of new computers, uniforms for the children, and synthetic grass for the recreation area. Thanks to the generosity of AS Brazil employees and Barnes Group, Creche Bento Quirino will now be qualified to support 140 children, up from 110 when the partnership started. Associated Spring Brazil will continue to partner with Creche Bento Quirino in their efforts to help children in need in their community.



Pictured: Tom Barnes, Chairman of the Board, and Scott Mayo, President Barnes Industrial visited Creche Bento Quirino

BARNES IN THE COMMUNITY



HIGHLIGHT - BARNES AEROSPACE CELEBRATES ANOTHER "SUMMER OF COMMUNITY" SERVICE



In the summer of 2015, Barnes Aerospace (BA) rolled out its third annual "Summer of Community," a series of community service initiatives involving BA employees across all eight locations worldwide. Barnes Aerospace created the Summer of Community in 2013 to provide opportunities for its employees to volunteer in ways that would directly benefit their local communities.

In 2015, the Summer of Community activities focused on helping families, schools, and the environment. Each location reached out to the local organizations of their choice and lent a helping hand, participating and supporting the following events:

- Barnes Aerospace Headquarters (BAHQ), Windsor and East Granby supported Food Share, a local charity designed to end hunger and alleviate poverty in the Greater Hartford, Connecticut area, as well as the Windsor, Connecticut Food Bank. The teams collectively donated \$610, over 50 non-perishable food items, and 344 pounds of fresh produce. 310 pounds of the produce were donated by John Boyko, BA Windsor employee, from his personal farm!
- Lansing, Michigan stuffed 1,400 bags for handouts at Ele's Race, in support of Ele's Place, a local Michigan healing center for grieving children and their families. The volunteers also worked to implement beautification improvements to the outside of the center. Lastly, Lansing supported Habitat for Humanity by helping to build a home - completing soffits, interior trusses and bracing, and installing doors and siding - all in one day's work!

- Ogden, Utah held several charitable drives by way of volunteer activities and non-perishable food and back-to-school donations. These efforts supported local schools, the Catholic Community Services, and Bridging the Gap, a mobile distribution program that feeds local, low-income elementary students.
- Phoenix, Arizona employees supported P.L. Julian School, whose student population is largely underprivileged children. The division collected several hundred dollars in back-to-school supplies which were donated to the students.
- West Chester, Ohio employees assisted with a community clean-up day sponsored by Spring in Our Steps, a local organization that helps clean and repair downtrodden areas of Cincinnati. The team also served breakfast to guests of the Ronald McDonald House.
- Singapore supported Pulau Ubin, a small natural reserve island where people enjoy cycling, fishing, trekking and other outdoor activities. Volunteers cleaned up trash along the designated forest trail and sea side coast.

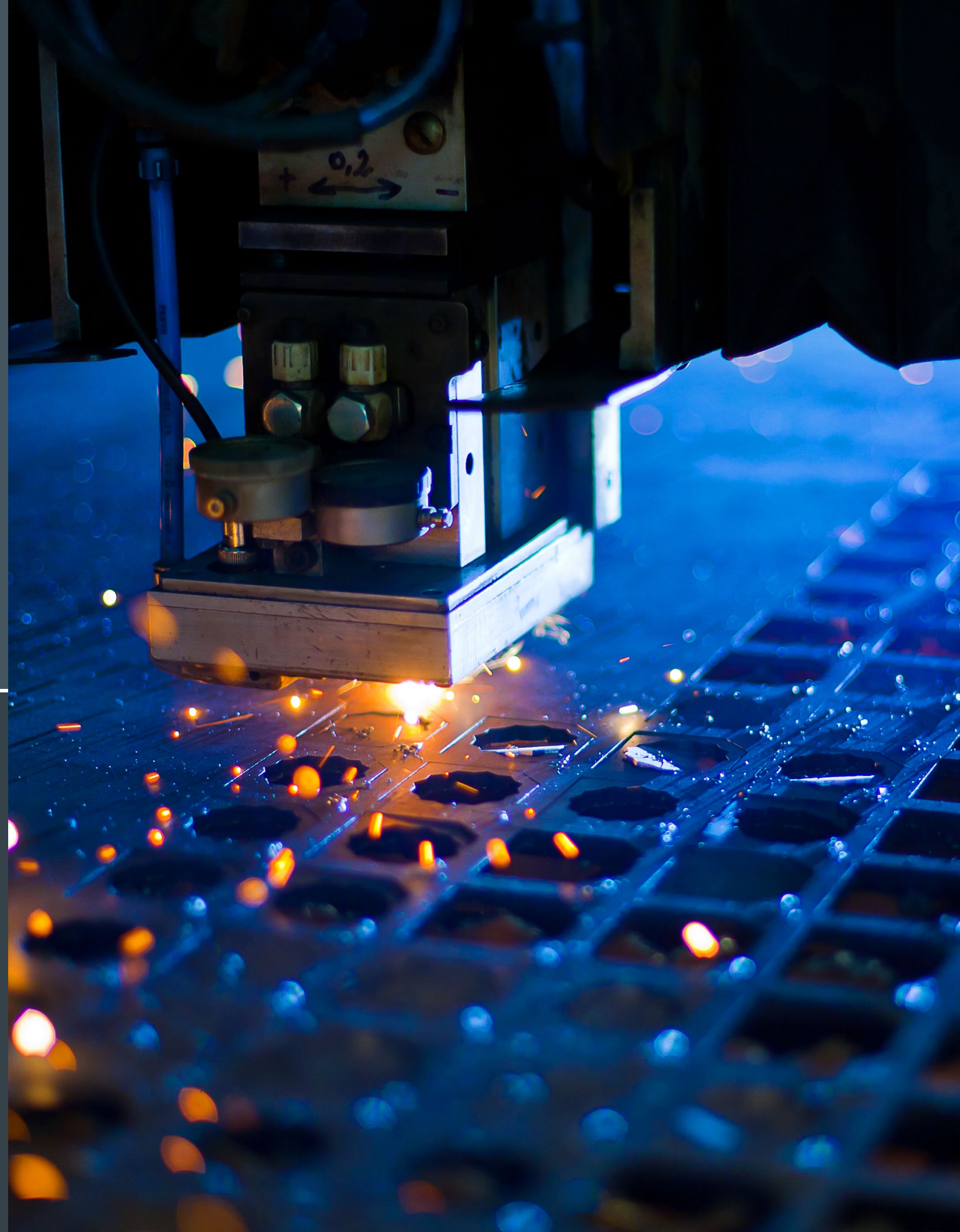
The Summer of Community volunteers were proud to be part of this coordinated team effort to "give back" across the globe, to live our Corporate Values, and to recognize our communities as key stakeholders of our business.





PRODUCTS

At Barnes Group, we are committed to making sustainability an integral part of product and process innovation. We strive to ensure that newly designed products and processes are as resource-efficient as possible. The intention is to develop new product concepts that solve customer problems and create customer value, based on sustainable solutions and processes.



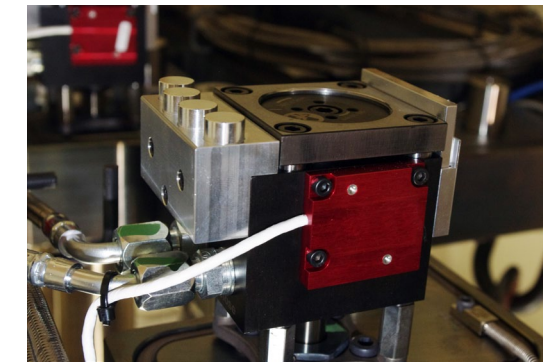
PRODUCTS



SUSTAINABLE PRODUCTS AND PROCESSES

In 2015, Barnes Group developed sustainable cutting-edge technology products for our customers in the transportation and plastics industries. These include:

- Development of Servo and Precision Force Controlled Metal Forming Systems for production of complex parts and advanced high-strength materials, resulting in lighter weight, safer and more fuel efficient vehicles.
- Development of m-Struts® for automotive racking/dunnage – an industry first employing a mechanical strut solution to eliminate consumable gas struts. The m-Struts® offer ergonomic and safety enhancements versus gas struts and cover the life cycle of the automotive model production at lower total cost of ownership.
- Development of m-Struts® for portable equipment – an industry first using a mechanical strut solution in place of torsion bars on folding cafeteria tables. The m-Struts® meet all ergonomic and safety requirements with no deterioration in performance over the 20-year life cycle of the application, while providing an enhanced user experience and premium value.



- ISTAR Hardening Process With Polymer Quenching – this eliminates the generation of smoke in the manufacturing environment, providing better health for employees, and eliminating the need to dispose of or recycle hardening quench oil.
- Further development and refinement of patented GDI (Gas Direct Injection) process technology to improve mileage and fuel efficiency of vehicles.
- Expansion of hot runner system flow control technology for the plastics injection molding industry that reduces waste by eliminating blemishes or discoloration of plastic molded parts. Plastic components for automobiles also help make the vehicles lighter, thereby creating more fuel efficiency and lower emissions.

PRODUCTS



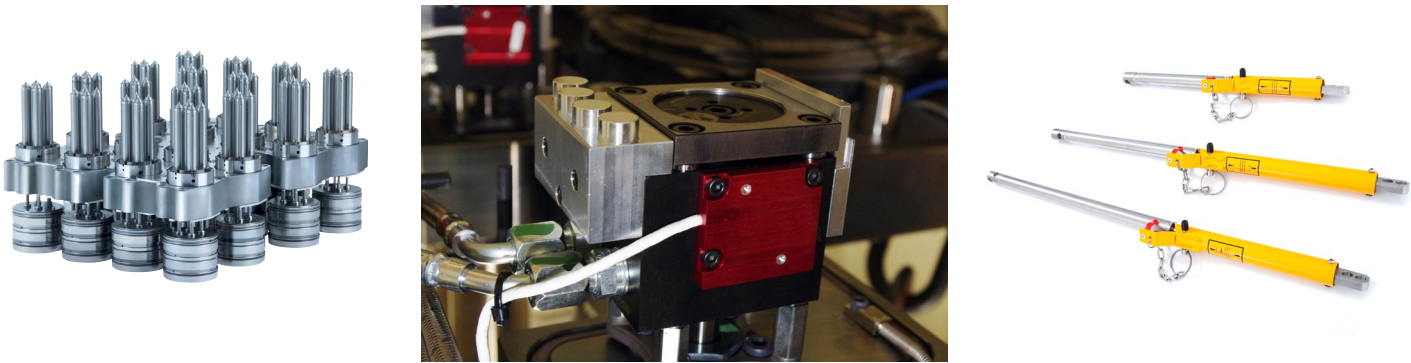
HIGHLIGHT - NGP BRECKSVILLE DEVELOPS TECHNOLOGY FOR SERVO-CONTROLLED PULSE FORMING™ SYSTEM

NGP, a business of Barnes Group, provides engineered products, differentiated technologies and innovative solutions to die builders, steel makers and metal stampers around the globe. NGP specializes in precision force control products for metal forming applications and enables companies to be more efficient and produce safer, lighter weight products and complex shapes.

NGP’s Servo-Controlled Pulse Forming™ system helps metal stampers master the complexity between material, tool and press by providing real time force control and the programmability needed to advance the metal forming process.

To assist meeting more stringent automotive fuel efficiency standards while maintaining crash safety, the industry is pushing the envelope for new lighter and higher strength materials. Although these new materials can provide the lighter weight and strength to help in the fuel efficiency challenge, these materials become less ductile and brittle, which can pose many challenges to the designers and companies tasked with forming them. Using new and innovative equipment such as the Servo-Controlled Pulse Forming™ system allows the stronger, less ductile materials to not only be formed into complex shapes, but in many cases more efficiently than with previous technologies.

NGP takes great pride in being able to contribute to the environment by creating innovative solutions that are sustainable. By developing a technology that will help achieve the industry goal of doubling global fuel efficiency standards by the year 2025, NGP will have a significant positive impact on the natural resources, emissions, and overall industry environmental footprint.



HIGHLIGHT - HEINZ HÄNGGI DEVELOPS SUSTAINABLE TECHNOLOGY FOR AUTOMOTIVE INDUSTRY

Heinz Hänggi, a business of Barnes Group’s Engineered Components strategic business unit (SBU), is a world leader in Gasoline Direct Injection (GDI) technology, which is a key innovation being hailed as an enabler of next-generation traditional fuel-powered engines supporting sustainability in advanced powertrains. GDI (Figure 1 to the right) achieves increased combustion efficiency because of the optimized high-pressure fuel injection mechanism, and due to the homogeneous chemical reaction that ultimately reduces harmful emissions. One important potential benefit is the ability to downsize the engine while maintaining the same horsepower. Our Hänggi GDI solution’s superior fuel delivery performance is achieved using our innovative processes for optimized flow hole characteristics, meeting critical tolerances with throughput and cost advantages over laser drilling/EDM and other alternative processes.

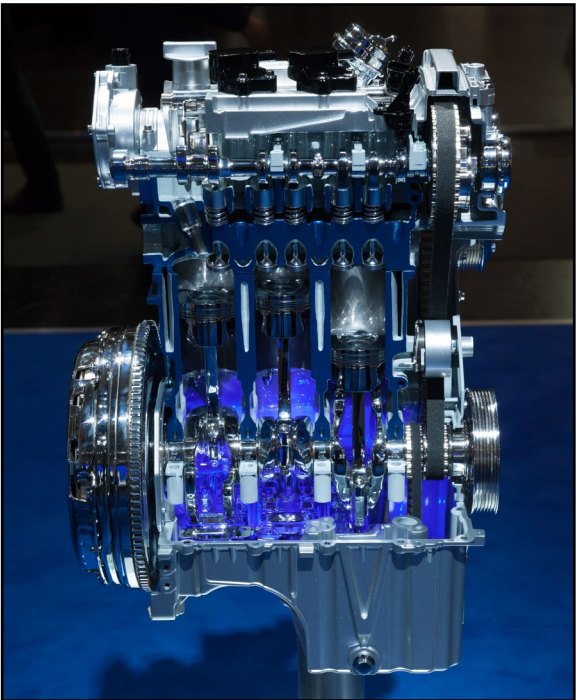


Figure 1: Example engine with GDI
Courtesy of © Typhoonski | Dreamstime.com
Ford Ecoboost Three Cylinder Engine Photo

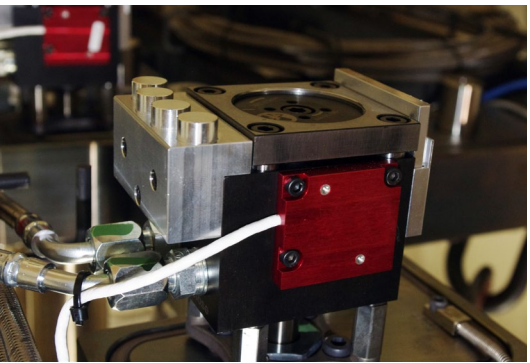
PRODUCTS



HIGHLIGHT - MOLDING SOLUTIONS DEVELOPS SUSTAINABLE TECHNOLOGY FOR MEDICAL & PLASTICS INDUSTRIES

Männer, a business of Barnes Group’s Molding Solutions SBU, specializes in the development and manufacture of high-precision molds, hot runner systems, and micro injection molding systems. In 2015, Männer introduced sustainable breakthrough technology products for the medical and plastics industries. With the advancement of state of the art valve gate technology for side injection molding applications, Männer launched its new EDGELINE™ technology. With the ever changing needs of the pharmaceutical and medical manufacturers, the EDGELINE™ technology is critical to the production of several medical device components such as syringes, insulin pens, pumps, medical connectors and more. Such new technology allows for perfect mold flow through advance gating technology to ensure quality and elimination of dangerous particulates that improves functionality and reliability for some of the most critical medical diagnostic and treatment needs around the world. Complimentary to the direct benefits to advancing health care technology, it also increases manufacturing production rates resulting in reduced energy usage and elimination of resin waste by optimizing the distribution and placement of component materials.

Synventive, also part of our Molding Solutions SBU, is a leading manufacturer of high quality hot runner systems for the plastics injection molding industry. In 2015, Synventive developed sustainable breakthrough technology relative to its new SynCool3 (passively cooled actuator) plastic molding solution. With the development and commercialization of this patent pending technology, the industry now has access to valve gated hot runner systems without risk of decomposing hydraulic oils or damaging actuator seals, while providing long-term stable performance by eliminating issues associated with clogged cooling circuits. With major benefits associated with energy consumption, SynCool3 eliminates cooling circuit requirements for many applications while improving manifold thermal uniformity, resulting in reduced power consumption and gained energy efficiency.



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