

Most significant pipe plug technology advancement in 50 years

USA Industries, LLC

Since 1982, USA Industries has manufactured pipe isolation and testing products used in process manufacturing facilities for maintenance and repair projects, turnarounds, outages and capital projects. The company's engineered products streamline conventional process intensive isolation and testing methods during plant shutdowns, leading to significant labor, material and downtime cost savings. USA Industries' broad line of isolation and testing products includes pipe plugs, such as its standard double-block and bleed, heavy-duty industrial isolation plug, flange weld test plug, and inflatable pipe plugs among others.

Pipe plugs have been in use since the late 1890s, with the first modern plug patent having been filed in 1948. Until recently, the basic technology for gripping-type plugs had not advanced since 1952, when the first patent was granted. USA Industries' newly patented GripSafe®ST (Superior Technology) pipe isolation and high-pressure test plugs offer groundbreaking, instant security technologies that no other gripping-type pipe plugs have.



The GripSafe® ST line of isolation and test plugs.

When properly prepared and then inserted into the pipe, the wedges actively engage with the pipe ID and restrict retraction of the plug by either pressure from the backside or by the operator pulling on the plug from the frontside before the seals are even expanded. This auto-locking safety feature on the ORB and DBB models significantly reduces the risk of injury to personnel and operator equipment in the area where the pipe test is being performed. Combined with its patented high durometer Tri-Ply® seals, proprietary Gritlock® coated wedges and aviation grade aluminum bodies, GripSafe ST pipe plugs are the most technically advanced, safest and reliable isolation and test plugs in the world.

USA Industries' first generation GripSafe plugs were introduced to oil and gas refineries and chemical plants in 2017. At the time, USA Industries' independent wedge gripping system was designed for its 4-inch and larger plug sizes. With the introduction of the GripSafe ST line of plugs in 2022, they now feature the revolutionary independent wedge actuation system across all line size offerings, from ¾ inch up to 24 inch, with larger sizes available upon request.

Independent wedge actuation is the cornerstone that enables GripSafe ST plug's instant security feature. Independent actuation means that the forces transferred from the plug to the pipe remain uniform throughout all points of contact. This is due to each gripper being able to adjust independently, with respect to adjacent grippers, to the pipe's interior. Thus, the pipe is not subjected to non-uniform stresses, which can dramatically distort the pipe. Furthermore, since all pipes have irregularities in the wall surfaces and ovality, it achieves greater reliability by not counting on a fraction of the grippers to carry all the load placed onto the plug.

Competitive product technologies use a collectively driven gripping method for plug-to-pipe contact that does not offer the same level of security as GripSafe ST plugs. With their collectively driven gripping arrangement, it is necessary to apply enough force to drive the grippers' serrated edges into the pipe to attain maximum security. This leaves unwanted deep impressions in the ID of the pipe, very similar to the scarring that is left when using pipe wrenches. Traditional pipe plugs rely on this impression into the pipe to maintain their position under load. Removal of these impressions after plug usage happens by grinding out the area where they are present, effectively reducing the pipe wall thickness.

Some industry users of traditional pipe plugs choose to increase the length of the pipe needing testing to be able to place the plug in a location of the pipe that will not be needed after testing. This added length of tested pipe is then cut from the pipe after testing is completed and discarded, all to ensure no scarring or alternatively thinned pipe wall from the removal of the scarring when the system is placed into service. GripSafe ST plugs do not require this impression to operate safely and reliably. This is because GripSafe ST plugs use a proprietary grit coating, branded as Gritlock®, spring-driven wedges and the mechanical advantage of true wedges. This saves customers time from having to grind



USA Industries demonstrating GripSafe® ST onsite in Latin America.

out the imprints caused by previous designs, or saves the customer from cutting the added sacrificial length of pipe.

The clear winner

A global EPC company with locations in Latin America contacted USA Industries to assist with a cost saving strategy for testing high-pressure pipe spools after learning about GripSafe ST pipe plugs. The EPC had been awarded several pipe spool modules for a major refinery project being constructed by the country's national oil company. The project required 6,240 weld tests, was behind schedule and was incurring costly budget overruns. The EPC needed an economic solution that could be implemented quickly and safely.

USA Industries was invited to travel to the job site in Latin America, along with other pipe-plug manufacturers, to give a field demonstration of the new technology and explain its efficiency gains and cost savings. USA Industries' senior design engineers' presentation included live tests and user training to ensure the safe, efficient operation of the new GripSafe ST pipe plug, all while exhibiting the superior technology advances over competitive products. With its patented technologies and simplicity of operation, the EPC's Field Engineering Team chose GripSafe ST as their preferred plug, surpassing the competitive field of pipe-plug products with its value proposition. This resulted in USA Industries being invited to participate in economic discussions.

Based on the customer's feedback, a primary reason for selecting the GripSafe

plug was that, unlike the competitive plugs, GripSafe ST did not scar the internal wall of the pipe, thereby eliminating the need for pipe "cut offs" or "drops." This reason alone represented significant time and cost savings to the customer. With the efficiency gains engineered into the GripSafe ST pipe plug, weld-test procedures were streamlined, and times reduced by an average of 93 percent when compared to conventional testing processes involving welding on and cutting off pipe caps, then beveling the ends of the pipe.

This resulted in a much higher return on investment, based on time, labor and material, while also moving the project closer to its original timeline schedule. A second reason why USA Industries was selected was because the manufacturer/supplier sent one of its senior engineers on the design team, and a member of our commercial team, to meet with the EPC's field engineering team, installation crew, team of inspectors and management to demonstrate the plug and its benefits onsite. The two-person team also provided hands-on training to all in attendance on the proper installation, removal and safety procedures of the GripSafe plug before commencing the project.

USA Industries continues to support this project today, working with the EPC team and contractors to provide GripSafe ST technical support, training, engineering modifications to fit special testing requirements and providing additional pipe plugging products.

For more information, visit www.USAIndustries.com/GripSafe-BIC or call (888) 299-2155. ●

INSTANT SAFETY

GRIPSAFE®ST



DOUBLE BLOCK & BLEED (DBB) - 3/4" - 24"

OUTBOARD RETRACTION BLOCKING (ORB) - 3/4" - 24"

INBOARD INSERTION BLOCKING (IIB) REVERSE PRESSURE - 3/4" - 24"

SUPERIOR TECHNOLOGY

The GripSafe®ST line of isolation and test plugs are the most technically advanced, safest, and reliable plugs in the world with a patented independently actuating wedge system.



Auto-locking functionality available on ORB and DBB models.

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For the latest GripSafe®ST patent and trademark information, go to: <https://www.USAIndustries.com/gripsafe-patents-trademarks/>



*Larger sizes available upon request