

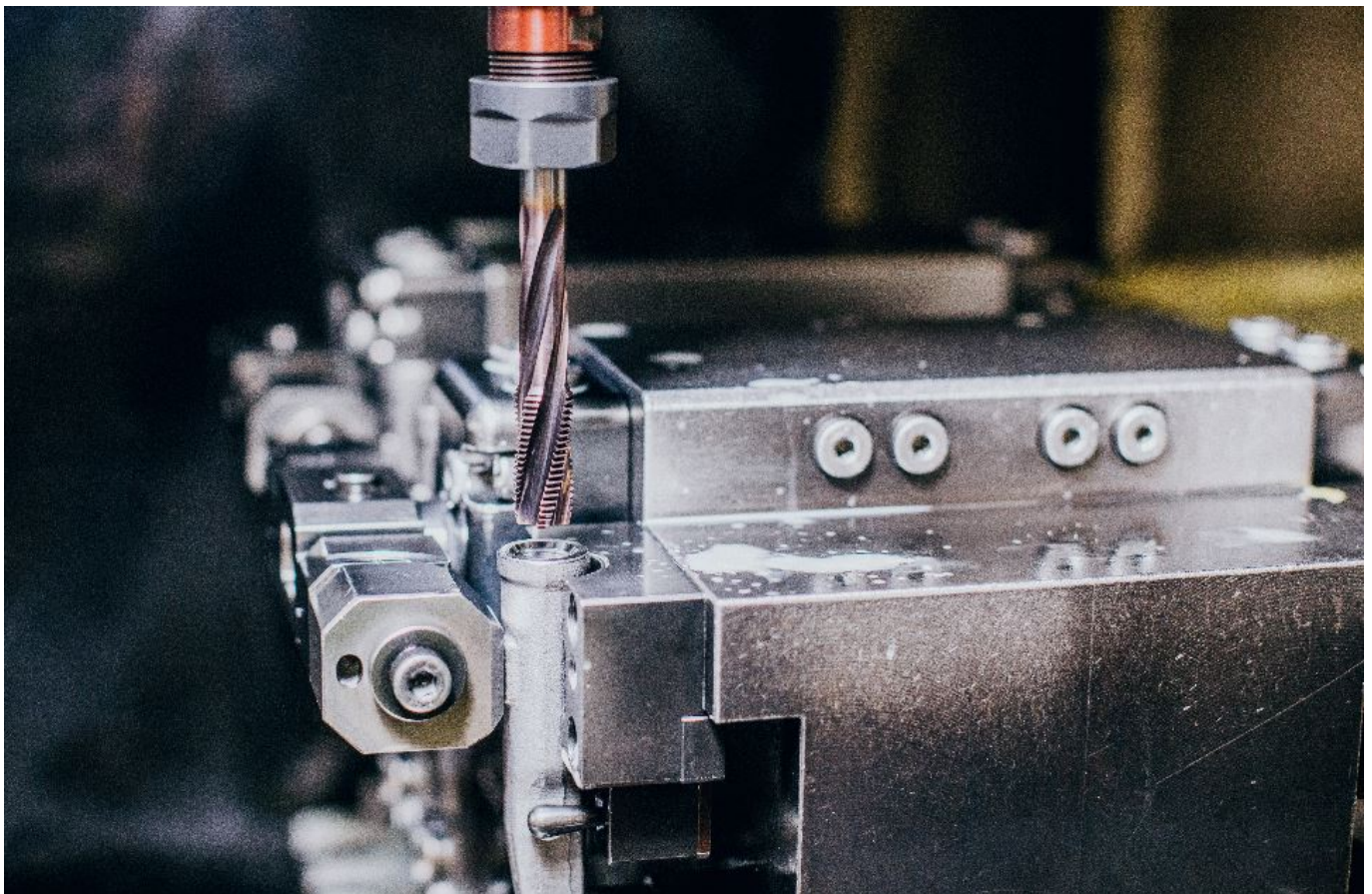
Innovate

## Tailored Solution: OSG Custom Carbide Tap Eliminates Chip Evacuation Issues in Automotive Pipe Production

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Founded in August 1958, ZF do Brasil Ltda. is an automotive company, with one of the eight facilities located in the city of Limeira, São Paulo, Brazil, with an estimated plant area of 50,000-square-meter. ZF do Brasil is a part of the ZF Group, which was established in 1915. Headquartered in Friedrichshafen, Baden-Württemberg, Germany, the ZF Group is a global technology company that supplies systems for passenger cars, commercial vehicles and industrial technology, enabling the next generation of mobility. As of today, the ZF Group is available in approximately 230 locations in 40 countries.

Recently, ZF was looking to improve tool performance on its automotive pipe production, which is used in car steering mechanisms for the automotive segment. Made of SAE 1045 forged steel, ZF produces approximately 900,000 pieces of pipe per year, and it is one of the largest productions of the company. ZF has been manufacturing this part for about four years. Eight pieces of pipe are produced per machine cycle. Each part requires vertical threading of one blind hole using an M14 tap. The hole is 46 mm in length, 38 mm in depth, and with a tap tolerance of 7H. The thread finish should be polished and without burrs.



A custom carbide tap M14 x 1.5 7HX with AlTiN coating was developed specifically for ZF's automotive pipe production to eliminate tapping issues.



ZF's machine operator prepares for the machining of automotive pipes using a Doosan MV3016LS vertical machining center.

ZF was originally using a carbide tap M14 for the application. However, the company was experiencing great difficulty with irregular chip formation, bird nesting, and elongated chips that cause chipping of the fillets. Furthermore, with cutting chips clogged up in the bottom of the hole unable to be evacuated, issues such as chipping and tool breakage were also a great headache for the company. OSG Sulamericana was an existing tooling supplier for ZF in other applications. When the opportunity arose to compete within this process, OSG entered and won the order with superior results.

Upon a detailed evaluation of the manufacturing process, OSG Sulamericana Sales Technician Bruno Dias proposed a custom carbide tap M14 x 1.5 7HX with AlTiN coating developed specifically for the application. OSG's custom carbide tap was put into a Doosan MV3016LS vertical machining center, running at a cutting speed of 30 m/min with soluble oil. ZF's previous tooling choice was able to complete 1,200 pieces. OSG's custom tool, on the other hand, was able to complete 2,880 pieces, which more than doubled the efficiency. Immediately, ZF was able to obtain an improvement in the threading process, a gain in tool life, as well as setup time.

"We cannot be more pleased with OSG's service," said ZF Engineer Guilherme Gonçalves. "Bruno is always present when help is needed. ZF looks for reliable partners to help during times of trouble, and

OSG is always there, which contributes to a long-lasting partnership."

*Previously Featured in OSG's digital Shape It magazine.*

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