MiSUMi

WSR POSITIONING PINS

The reliable alternative for body-in-white construction

A joint development by MISUMI, FEF-Aachen and RWTH Aachen University

WSR/EN/V01/2026

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What are WSR positioning pins?

MISUMI offers a steel pin with an optimised surface and an aluminium chromium nitride (AlCrN) coating. “WSR” stands for “Weld Spatter Resistant”.
Accordingly, the new WSR positioning pins are extremely resistant to weld spatter and wear, making them ideal for the requirements of resistance welding on steel sheets in body shell construction and the ideal solution for areas subject to high wear due to the positioning of steel components. The result is process reliability and cost reduction.

What is special about WSR positioning pins?

The new positioning pins from MISUMI are the first steel pins that can achieve at least the same results in body-in-white productionas ceramic pins.

Robin Christ
Business Development Manager
at MISUMI Europa GmbH

Our project manager says:

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After more than two years of development, we have created a combination of optimised positioning pins and coating that offers a more reliable alternative to the products previously available on the market. ceramic pins. Our WSR positioning pins offer all the advantages of a steel pin and also have outstanding properties in terms of weld spatter and wear resistance. As a mechanical engineer with several years of professional experience in the body-in-white production of two OEMs, I am convinced of our innovative solution both technically and economically. After seven years, we have now further developed our coating to achieve even better performance.

The most important advantages of WSR positioning pins at a glance

- Extremely resistant to welding spatter and wear
- Solid steel pin = no ceramic sleeve that can break or come loose
- Process reliability and cost reduction through durability
- No disadvantages in terms of performance compared to ceramic sleeves and also in the same price segment
- Excellent results in practical tests at various OEMs

Are you interested in our WSR positioning pins?
We would be happy to advise you in a personal consultation!

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The requirement in the application area

With ceramic pins, the solution commonly used to date for resistance welding on steel sheets in body shell construction, the sleeves can become detached from the steel core or break due to damage from welding spatter, wear or transverse forces during use. As a result, numerous car bodies often become unusable. Due to this weakness of ceramic pins, a major European car manufacturer approached MISUMI with a request for a more reliable alternative.

The origin

For the development of a coated steel positioning pin with optimised properties, MISUMI was able to enlist the help of two renowned partners from the scientific community: the Institute for Welding Technology at RWTH Aachen University and the Research and Development Association for Joining Technology (FEF). The scientists analysed coatings from 18 of the most important manufacturers;

According to the manufacturer, the most suitable for the specific application. This ensured that no coating variant was overlooked. At the same time, MISUMI optimised the surface of its positioning pins and minimised their roughness. Ultimately, a positioning pin with aluminium chromium nitride (AlCrN) coating showed by far the best performance in laboratory tests.

Excellent results in series production

Since 2018, WSR positioning pins have been used in series production by various well-known car manufacturers and their suppliers. After all this time, we can confirm that positioning pins with the WSR coating contribute to a significant extension of the service life and thus an improvement in process reliability.
The pins are characterised by barely noticeable wear or weld spatter adhesion compared to previous solutions. Users therefore assume that the positioning pins can achieve more than one million cycles.
This is convincing: **many users have decided to replace their ceramic pins or uncoated pins with WSR positioning pins.** This **applies** both to welding spatter and to highly stressed positioning pins with high wear.

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Overview of the properties of the WSR coating

PROPERTIES	WSR
Colour	Anthracite
Hardness (HV)	~ 3,200
Thickness [µm]	0,2 - 1,0
Coefficient of friction against steel, dry	0,15 - 2
SURFACE ROUGHNESS RZ [µm]	< 1
Coating process	PVD (Physical Vapor Deposition; physical gas phase deposition, e.g. by evaporation or sputtering)
Use for	e.g. resistance welding of steel sheets, positioningof steel sheets

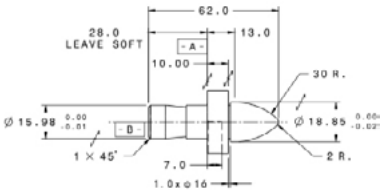
// MISUMI products with WSR coating

Positioning pins according to BMW standard

Positioning pins according to VW standard

Positioning pins according to NAAMS standard

Special pins (on request)



About MISUMI

MISUMI is a global manufacturer and leading supplier of more than 20 million mechanical components and indirect materials for special machine construction and assembly automation. A large number of MISUMI products can be individually configured. Founded in Tokyo in 1963, the company has sales offices worldwide and employs more than 10,000 people. The European headquarters has been located in Frankfurt am Main, Germany, for more than 20 years. Here, components are designed that are precisely tailored to the requirements of large European machine builders. The MISUMI business model is based on the highest quality, low costs and short delivery times, and has won over more than 220,000 customers around the world.

Further information is available at www.misumi-europe.com