AEROSPACE SOLUTIONS

PRECISION AND POWER RESISTORS / RESISTANCE AND THERMOELECTRIC ALLOYS / PRECISION MEASUREMENT TECHNOLOGY

ISABELLENHÜTTE

Innovation by Tradition

OUR PRODUCTS

Are integral to JUICE (JUpiter ICy moons Explorer) - the first large-class mission in the European Space Agency's Cosmic Vision 2015–2025 program.

LAUNCHED IN 2005

Galileo GIO VE-A satellites incorporate our measuring resistors within their navigation systems. To date, countless satellites with our resistors have been functioning successfully in outer space.

THE BATTERY MANAGEMENT SYSTEMS

Of various satellites with solar panels have also been equipped with Isabellenhütte resistors.

VOLTAGE REGULATOR

Our components have been used in the board electronics of satellites.

POWER SUPPLIES

Our qualified shunts are used in DC/DC converters for decentralized energy distribution in satellites and helicopters.

JULES VERNE

The European equivalent of the Space Shuttle relies on the precision and reliability of products within the equipment of its ATV (Automated Transfer Vehicle).

ICE PROTECTION SYSTEMS

An atomizing process makes it possible to spray our resistance alloys on the leading edges of wings or engine air intakes to create de-icing circuitry.

TURBINE EXHAUST GAS MEASUREMENT

Our thermoelectric alloys play a key role in the efficiency of aircraft turbines by continuously and accurately measuring exhaust gas temperatures in the combustion annulus.

SAFETY AND RELIABILITY ARE YOUR GOALS. AND SO THEY ARE OUR GOALS TOO.

The aerospace and defense industry is always at the forefront of innovation and technological advancements. It plays a critical role in national defense, enables safe and efficient air travel, increases communication and the dissemination of knowledge, and contributes to increased consumerism and the globalization of supply chains.

The sophistication of the electronics content in aerospace has soared in recent years. Airplanes, helicopters and satellites are becoming more and more populated with sophisticated sensors, safety features, connectivity and automation.

Because of this, we know you're dealing with a myriad of ever-evolving and increasingly complex product engineering challenges. We believe these challenges amplify important and immediate requirements you have:

SAFETY / RELIABILITY

Today's advanced electronics systems must endure extreme conditions while contributing to the overall safety and reliability of the aircraft.

SPEED TO MARKET

You need to shorten the manufacturing and design build time. We realize how important it is for you to interject the latest safety and/or connectivity features sooner rather than later.

SOPHISTICATION IN SMALLER SPACES

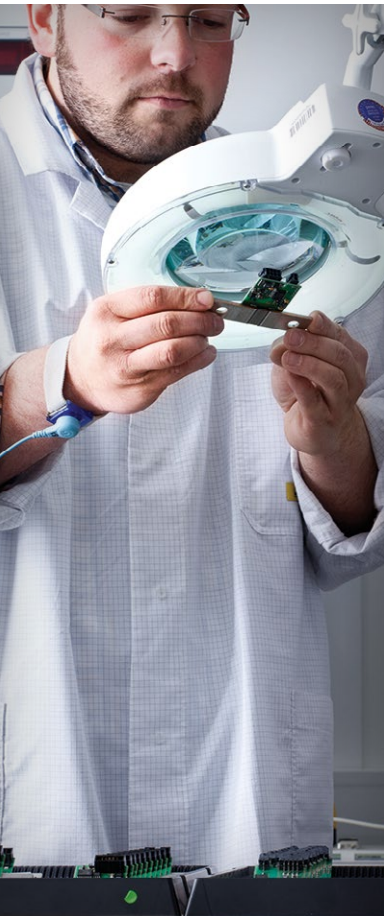
You need to continuously accommodate more technology into smaller spaces, without compromising performance.

HIGHER PRECISION

Low TCR and long-term stability are the cornerstones of our components.

These are requirements with which we can help. We've been pioneers in the aerospace market for over twenty years. Our solutions have been integral in enabling many of the advances in technology that are in the air today – all across the globe and in space.

WE ONLY DO A FEW THINGS.
BUT WE DO THEM BETTER THAN ANYONE ELSE.



Our product range may not be as comprehensive as some of your other suppliers, but there's a reason we are still a preferred partner to so many companies. Our products perform. And our support is unmatched. We offer the following:

PRECISION AND POWER RESISTORS

Modern precision resistors for current measurement have to meet many requirements, such as a small temperature coefficient, a low thermal EMF, high long-term stability, low inductance and a high load capacity. Due to the fact that these properties are influenced by the resistance material as well as by type, we offer two technology options: ISA-PLAN® and ISA-WELD®. Whether you need standard components or heavily loadable power resistors – our products meet the highest requirements.

ISA-PLAN® AND ISA-WELD® TECHNOLOGY

Both technologies are ideally suited for the manufacturing of precision resistors in the value range of 2.2 mOhm to 2 Ohm. The planar structure permits a simple realization of the 4-terminal connection technology, enabling the generation of temperature coefficients of <50 ppm/k, even with values below 10 mOhm, with a high repeatability. Due to its low-inductance structures, these components are ideally suited for use in clocked power electronics.

ISA-PLAN®

ISA-PLAN® resistors are manufactured from our unique MANGANIN® and ZERANIN® materials, using etching technology. The materials are electrically insulated and mounted on a metal substrate with good thermal conductivity. The shunts are then ideal for precision applications due to their extremely low thermal EMF and their very high long-term stability. As a result, the heat conduction into the substrate, together with its high thermal capacity, provides excellent pulse and continuous power rating.

ISA-WELD®

ISA-WELD® resistors are stamped from solid electron-beam welded composite material consisting of copper in combination with one of our special resistance alloys. The resistors can be adapted by means of stamping and bending to suit almost any shape and application. Further benefits are offered by the comparably low input resistance of the copper terminals, their high thermal conductivity respectively their heat storage capacity, and the resulting current density and heat dissipation within the shunt. ISA-WELD® shunts are particularly suitable for extremely low-ohmic values (in the range of 0.1 to 2.0 mOhm). They are available in SMD or busbar assembly configurations.

THERMOELECTRIC AND RESISTANCE ALLOYS

Isabellenhütte's alloys rank among the finest in the world and are used in many aerospace applications. During production we are always committed to specific customer requirements and can supply our alloys in different forms and types.

OUR SOLUTIONS CAN BE FOUND IN SEVERAL IMPORTANT AEROSPACE APPLICATIONS.

Whenever highest reliability, precision and longevity are required, your choice should be low-ohmic precision and power resistors from Isabellenhütte. We have been supplying measuring resistors to the aerospace industry for more than twenty years – always meeting the toughest industry-wide and customer-specific quality standards. For example, our SnPb plated contacts help prevent the forming of tin whiskering, which can lead to short circuiting in many applications.

THINGS YOU SHOULD KNOW

OUR QUALIFACTIONS

- ESCC 4001/027 and ESCC 4001/028 for space applications
- Customer-specific qualification

OUR QUALITY

- SnPb plating of the contacts
- Certified according to IATF 16949 / ISO 9001
- 100% quality control
- Clearly traceable due to the comprehensive documentation
- Date code label

QUALITY STANDARDS

- DIN EN ISO 9001:2015
- IATF 16949:2016
- DIN EN ISO 14001 / DIN EN ISO 50001
- REACH / RoHS 2011/65/EU
- AEO-F-certificate
- Calibration Laboratory Accredited DIN EN ISO/IEC 17025:2005

SOME OF THE PROBLEMS WE SOLVE.

We're the right partner for precision components when reliability is the principal requirement. Whether you require our standard commercially available resistors or screened components, which comply with ESCC 4001/027 and ESCC 4001/028, our products meet the highest requirements in terms of temperature coefficient (TC), thermal EMF, long-term stability, inductance and load capacity.

LONG-TERM STABILITY

Long-term stability is an extremely important characteristic for a sensor. Even after many years of service, it is essential that users can rely on the original calibration. Resistance materials must therefore be stable against corrosion and invulnerable to any metallurgical change in structure or state.

Our MANGANIN, ZERANIN, ISAOHM and newly developed NOVENTIN alloys have a homogenous mixed crystal structure, which makes them the ideal material for these applications. The alloys are carefully annealed and stabilized, and are therefore supplied in their thermodynamic ground state. As a result, they all have resistance stability ratings in the range of ppm per annum, which is why our alloys have proved themselves over many years under difficult conditions.

TEMPERATURE DEPENDENCE

The temperature dependence of our resistors is mainly determined by our precision resistance alloys MANGANIN, ZERANIN, ISAOHM and newly developed NOVENTIN. In many cases, however, low-ohmic resistors suffer from significant influences of the termination, which is why the sense voltage should be measured via a four-terminal measurement.

HIGH-LOAD CAPACITY

Due to the fact that the thermal conductivity of resistance materials is relatively low compared with copper and the resistor foil thickness is small (in the region of 20 to 150 µm), it is not possible to conduct the heat out of the resistor via the resistance material into the terminals.

For this reason, the resistance foil on our ISA-PLAN® resistors is bonded to a metal substrate with excellent thermal conductivity (copper or aluminium) using a thin adhesive that is also thermally conductive. This enables effective discharge of dissipated heat via the substrate and terminals. The result is a very low internal heat resistance, typically in the region of 10 to 30 K/W.

Our resistors can therefore be used at their full rated power up to a very high terminal temperature. That is, the derating point on the power derating curve is very high compared to that of other products. At the same time, the maximum temperature in the resistance material is kept low, thereby significantly improving long-term stability.

YOU CAN EXPECT MORE FROM US.

Perhaps you haven't heard of us, but Isabellenhütte is one of the most trusted partners to the aerospace industry. Because of our extensive experience and performance history, OEMs and tier-one suppliers utilize our solutions to help solve their most difficult electronics design challenges. There's a simple reason why: we engineer our components and materials not just to meet your specifications, but to expand the boundaries of what's possible and exceed traditional quality limits. What's more, they are backed by the expert technical support required to ensure successful implementation.

SOME OF THE THINGS WE CAN DO FOR YOU

- Application-oriented support
- Simulation of your application conditions
- Component optimization for critical applications
- SMD test board for the initial evaluation
- Comprehensive documentation
- Standard values can be supplied with SnPb plated contacts

WHAT DRIVES US?

We believe that imagination and innovation are the fuel for forward progress. We are intensely focused on our customers and their challenges. Always looking for new possibilities and ways to help you win. We remain undeterred by the barriers that stop others. Relentless in our effort. Aiming to continuously take technology to the next level. Supplying products that perform beyond expectations and applying our expertise to help people whenever and wherever we can. We define ourselves by our customer support as much as by our products. Trust, ultimately, is the byproduct.

ISABELLENHÜTTE.
A NAME YOU SHOULD REMEMBER.

Isabellenhütte has a 500-year history. Seems impossible, right? But it's true. There are records that take us back to 1482. The company became Isabellenhütte in 1728 and has been owned since 1827 by the Heusler family. This exceptional history makes Isabellenhütte one of the oldest family-run industrial companies in the world. But at the same time, we're one of the most modern – by always keeping ahead of customer needs. What began over 500 years ago with the smelting of copper has developed into a high-tech provider of international importance.

ISABELLENHÜTTE

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