BOSSARD
Proven Productivity

Cam-Safe

Grounding Connection System

«Cam-Safe® grounding connector - the new industry standard for safety critical electrical grounding.»

CAM-SAFE®

Safely grounded

The Cam-Safe Grounding Conneciton is a unique system-based approach to provide electrical grounding in electro-risk applications, suitable for many industries including transportation, renewable energy and more.

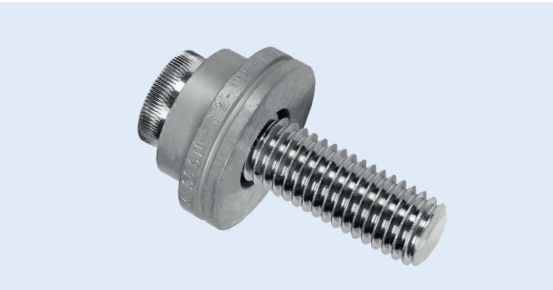
Cam-Safe® Grounding Connection *

With its system-based approach, the Cam-Safe Groudning Connection ensures quality over the entire lifecycle of a product - from comprehensive process support to minimize the risk of failure in production to archiving process data for subsequent traceability. The specially adapted intelligent tooling offers a significant improvement over the traditional installation methods currently available on the market. Cam-Safe is quick, easy and offers continuous quality control.

Designed from scratch to make all processes as simple, straightforward and safe as possible, the Cam-Safe Grounding Connection system redefines the industry standard for safety-critical electrical grounding.

THE SYSTEM COMPRISES OF

	GROUNDING STUDS/ GROUNDING NUTS
	INTELLIGENT INSTALLATION TOOLING
	INTEGRATED BARCODE READERS
	REPAIR SOLUTIONS
	PAINT PROTECTION



The Cam-Safe grounding stud is available in different variants to accommodate different current loads and materials and offers excellent performance across the board.

The Cam-Safe grounding nut enables grounding connection to be used in conjunction with conventional bolts.

*Cam-Safe is a registered trademark of Fairchild Fasteners Europe - Camloc GmbH.

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Application Overview

The Cam-Safe Grounding Connection offers studs and nuts for fastening grounding connection in various material thicknesses.

Our current supply range includes studs and nuts for fastening in various material thicknesses from 1.5 mm to 5mm and in the diameters M6, M8 and M10.

Each fastener consists of two components, a tension stud or nut and a contact-ring.

With a force-controlled installation process using our intelligent tooling, the contact ring expands within the panel hole creating a permanent joint with maximum surface contact, resistant to vibration and tampering.

There is also a repair process for correcting sub-optional installations or repairing damange ensuring continuous joint integrity and safety.

The table shows the comprehensive comparison of the Cam-Safe and the conventional grounding connection methods.

	Grip Range	
Grounding Connection	Aluminium (mm)	Steel (mm)
Grounding stud - M6	1,5 - 4,0	1,5 - 4,0
Grounding stud - M8	1,5 - 4,0	1,5 - 4,0
Grounding stud - M10	2,0 - 5,0	2,0 - 5,0
Grounding nut - M6	1,5 - 4,0	1,5 - 4,0
Grounding nut - M8	1,5 - 4,0	1,5 - 4,0

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System Features & Benefits

The Cam-Safe grounding connection system generates significant process advantages. The Cam-Safe installation tool has been equipped with specially developed functions for this purpose.

System Features

- Full process traceability
- Process management via software / intelligent tooling
- Individual installation parameter archiving
- Visual installation confirmation
- Installer / user identification
- Software management tools

Tooling Benefits

- Integrated barcode scanner
- Integrated installation software for all applications
- USB interface
- Tool management software
- Force monitoring
- Save up to 150.000 installation records
- OLED screen for visual control
- OK / not-OK display and evaluation
- Operator information

Repair Solution

As part of the Cam-Safe system, Cam-Safe offers a unique and effective repair solution to ensure that each ground connection achieves optimal joint integrity in production and at any subsequent point of repair / maintenance.

The repair solution can be used in situations where a) the installation is not implemented correctly (confirmed by visual confirmation or not-OK signal) or b) the fastener needs to be removed for repair / maintenance purposes.

Once the need for correction / repair bas been confirmed, the repair process involves three steps:

1. Punch out or press out the stud with the specially designed hand tool.
2. Adjust the contact ring to achieve alignment.
3. Install the oversized repair stud (identifiable through colour marking)

CAM-SAFE®

Applications

INSTALLATION SPEED:

The installation tool has been developed to install grounding studs and nuts quickly and effectively.

- Simple process can be carried out with minimal training
- The complete installation process takes <20 seconds per fastening element
- Automatic tool release after the installation
- Immediate OK / not-OK verification
- Audible and / or visual confirmation signals

DISPLAY SCREEN

The intallation tool is equipped with an easy to use display.

- Superior OLED display
- Visual confirmation of process steps including barcode reading, automatic product recognition and verification of correct installations.

GROUNDING STUDS

The Cam-Safe grounding studs is available in various material versions:

- Unique contact feature enables superior lifetime performance.
- Available in sizes M6, M8 and M10.
- Variants for installation in aluminum and stainless steel.
- A standard size for material thicknesses from 1.5 mm to 5 mm.
- Repair and maintenance solutions available
- Individual barcode setting for system implementation

GROUNDING NUTS

The Cam-Safe grounding nut enables a grounding connection to be used together with conventional bolts.

- Quick and easy installation.
- Available in sizes M6, M8 and M10.
- Unique contact function enables superior lifetime performance.
- Individual barcode setting for system implementation

BARCODE FUNCTIONALITY

The Cam-Safe grounding connection installation tool has a barcode reader which enables the installation parameters to be set safely and quickly.

- Fast and easy barcode reading function.
- Each fastener has a unique barcode on the box
- Reader enables automated product identification within the tool
- Tool setting automatically adjust to the scanned barcode

COMPARISON

Cam-Safe® Grounding Studs in comparison

With its system-based approach, the Cam-Safe Grounding Connection ensures consistent quality.

The system offers future-oriented options for process integration into the customer's MRP systems.

- Corresponding to specified electrical connection with required ampacity
- Efficient installation
- Setting process control
- Repair / maintenance solution

The table shows a comprehensive comparison of Cam-Safe and conventional grounding connection methods.

	Cam-Safe®	Traditional grounding connection	Welding
Healthy & safe installation	No danger	No danger	Extensive safety regulations needed
Installation time	1 minute	3 minutes	15 minutes
Preparation	None	None	8 minutes
Investment	Medium tooling investment	Low tooling investment	High tooling investment
Reliability	Permanent solution	Permanent solution	Non-permanent solution
Tooling	Excellent	Poor	Very poor
Quality documentation: Adjustment process - force	Recording of every installation (real-time measurement with ERP via Wifi possible)	None	None
Operator skill	Minimal training needed	High effort but minor training needed	Welding training needed
Quality	Part and batch number	Part and batch number	N/A
Tests	All required tests	all required tests	N/A
Approvals	Customer-defined	Permanent solution	N/A
Repaid solution	Yes	No	No
Paint protection	Yes	No	No

CAM-SAFE®

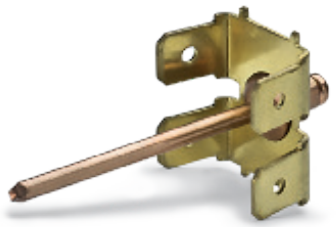
Further possible applications in the groudning connection

POP® GROUNDING RIVET

Rivet mandrel and shank made of copper for good electrical conductivity.

Features:

- Wedge design for grounding connection on prepainted sheets.
- Available with one or more connection lugs.



INSERTION LUG PEM®

Compared to the conventional use of welding and riveting lugs, the press-in technique offers the advantage that the lugs can be precisely positioned. Reworking is not necessary, since impurities such as weld spatter do not occur. There are also no openings and gaps as with punched sheet metal.

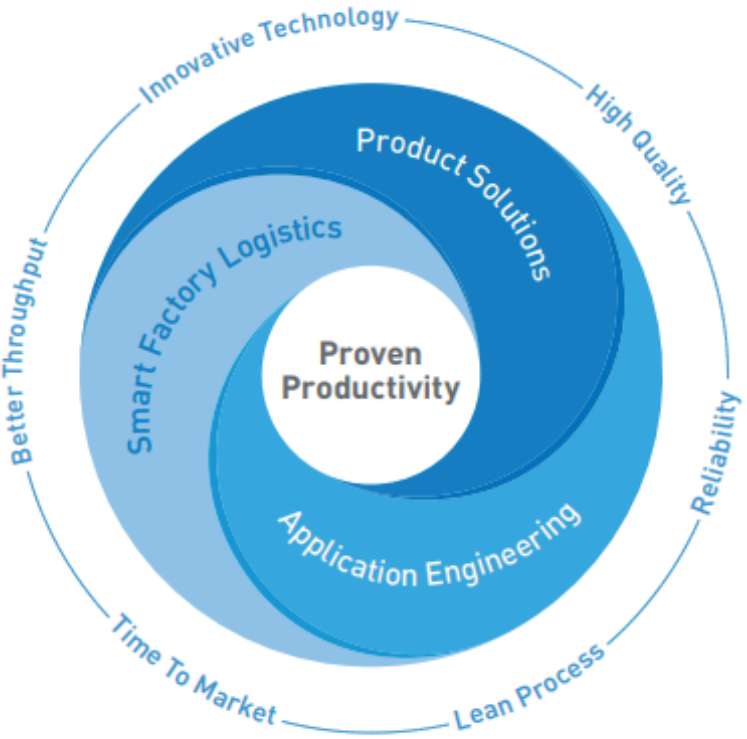
GROUNDING CAGE NUTS

- Ensuring electrical conductivity in housings.
- High security against stripping of the thread in thin sheets.
- Compensation of positioning errors.
- Integrated upturned lugs that penetrate the surface for grounding.

«Involve our engineers in your team right from the concept phase. Your idea and our know-how about the advanced functions of modern fasteners will ensure the success of your project»

PROVEN PRODUCTIVITY – A PROMISE TO OUR CUSTOMERS

The strategy for success



From years of cooperation with our customers we know what achieves proven and sustainable impact. We have identified what it takes to strengthen the competitiveness of our customers. Therefore we support our customers in three strategic core areas.

Firstly, when finding optimal **product solutions**, that is in the evaluation and use of the best fastening part for the particular function intended in our customers' products.

Secondly, from the moment in which our customers begin to develop a new product, our **application engineering** delivers the smartest solutions for all possible fastening challenges.

And thirdly, optimising our clients' productions in a smart and lean way with **Smart Factory Logistics**, our methodology, with intelligent logistics systems and tailor-made solutions.

Understood as a promise to our customers, "Proven Productivity" contains two elements: Firstly, that it demonstrably works. And secondly, that it sustainably and measurably improves the productivity and competitiveness of our customers.

And this for us is a philosophy which motivates us every day to always be one step ahead.

www.bossard.com