**SMC Expert Article – Machinery safety**

**Why optimal machine safety leads to higher profitability**

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Although machine safety circuits serve to protect employees from harm, here at SMC we know from experience: you can achieve many more benefits by creating inherent machine safety – including higher profitability. This results largely from the potential to elevate productivity and tap into fully engineered solutions.

Safe and advanced machine design means higher productivity and enhanced control of operation. In parallel, looking at things holistically leads to several competitive value outcomes, some of which are obvious. For instance, high safety levels reduce the risk of accidents. Workplace accidents are costly for many reasons, e.g., potential insurance claims, loss of production due to absence from work, additional staff to cover those who are absent, and healthcare costs.

There are also indirect costs, such as the productive time lost related to an actual accident and the operational time lost due to the accident. Any necessary conversion measures to a machine can be an additional burden. These costs impact on your bottom-line profitability.

Furthermore, we know that correctly designed machine safety circuits reduce unplanned machine downtime – thanks to the quality of the system and components. However, this strategy also reduces short periods of planned machine downtime. Well-researched, safe work practices and safe job procedures help protect employees. Why? Because specific safety measures protect people during their work activities in different operating modes. Hence, any necessary stop for set-up operation, repairs, maintenance procedures or cleaning are clearer, shorter, and free from potential sources of danger. For example, with the optimal safety circuits in place, there is no need to cut the supply of compressed air for these short stops, reducing downtimes and thus increasing productivity by about 5-7 %.

Aside from improved machine uptime, safety functions can also improve productivity – e.g., through easier troubleshooting, reduced scrap and increased operator efficiency.

International opportunities

Another often overlooked advantage of well-implemented machine safety - International opportunities! Machine safety not only protects European markets and their machine builders, but also offers opportunities for international sales. Foreign trade strengthens the competitiveness of Europe's businesses, while harnessing sustainable development worldwide.

Forecasts estimate that 90 % of global economic growth in the next 10 to 15 years will take place outside the EU. Therefore, technologically advanced and safe machines are of competitive advantage for Europe, since safety guarantees high machine availability and, in turn, increased profitability.

Of course, the requirements for workplace safety are becoming more stringent worldwide. Beyond the clear need to prevent employees from being injured or worse, there are many reasons for this trend: not least because of higher awareness and public sensitivity regarding working conditions, as well as trade agreement demands and economic laws.

Technical partnerships

With so much to consider, increasing numbers of OEMs are turning to the service- and knowhow-based approach of our expert teams here at SMC. We know that reliable technical partnerships founded on trust are the key to successful projects. Meeting the challenges and empowering the success of our customers is what keeps us motivated.

Our experts can provide information about machine safety trends and regulations. Moreover, they offer advice and guidance in answering your questions. Functional safety is the key part of the process of designing, testing, and proving that the safety-relevant components and circuits of a machine meet the intended requirements for reliability and risk reduction.

That´s why specific safety functions related to the machine or application must be defined first. Once identified, the required safety level needs to be determined, along with the optimal components necessary to achieve acceptable risk reduction. To confirm that the minimum requirements have been met or exceeded, it is necessary to perform and document verification procedures. Here, our SMC experts and SMC tools can help you to implement functional safety.

Engineered solutions

Behind machine safety, our customers need engineered solutions. Of course, we supply suitable and highly reliable (validated) standard products. However, we also provide innovative ideas to create added values and competitive advantages.

It goes without saying: every machine is different and necessitates a specific approach. We accompany our customers through the entire lifecycle of their machine or system and, for all relevant safety issues, we have competent and professional solutions available. From individually designed machines to highly complex systems, we do not only meet all requirements for user and operational safety, but also for flexibility and productivity.

We support you with a comprehensive approach. For example, we can undertake directives and standards research, helping to answer your questions on this crucial topic. Importantly, we can also assist in defining the entire safety chain, supporting you in determining all safety functions and conceptualising their implementation in accordance with ISO 13849 (~~s~~afety-related parts of control systems) and the prevalent safety regulations.

SMC´s residual pressure release valve with direct monitoring, modular connection type, VP#46 Series

Comprehensive support

Further SMC services and expertise cover all safety-relevant data, such as MTTF (mean time to failure) and B10 (a statistical parameter that indicates the number of cycles beyond which 10% of the components under examination may suffer a failure). In addition, we offer the [SMC SISTEMA library](https://www.smc.eu/en-eu/sistema), a free-of-charge safety-integrity software tool to evaluate machine applications, provided by the IFA Institute for Occupational Safety and Health in Germany.

Naturally, SMC supports you comprehensively with conceptual design and the drafting of circuit diagrams as well as testing and analysis of the safety system. Top tip - have a look at [PneuSAFE](https://etools.smc.at/pneusafe/), SMC´s latest and free of charge online tool with various TÜV verified circuit solutions for the most common safety functions and related applications. Finally, training is also available to ensure effective knowledge.

Machine safety is an integral and important part of the development process. As a proven and competent technology partner, SMC helps you to implement safe, reliable and economic solutions – creating tangible added value and higher profitability.

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