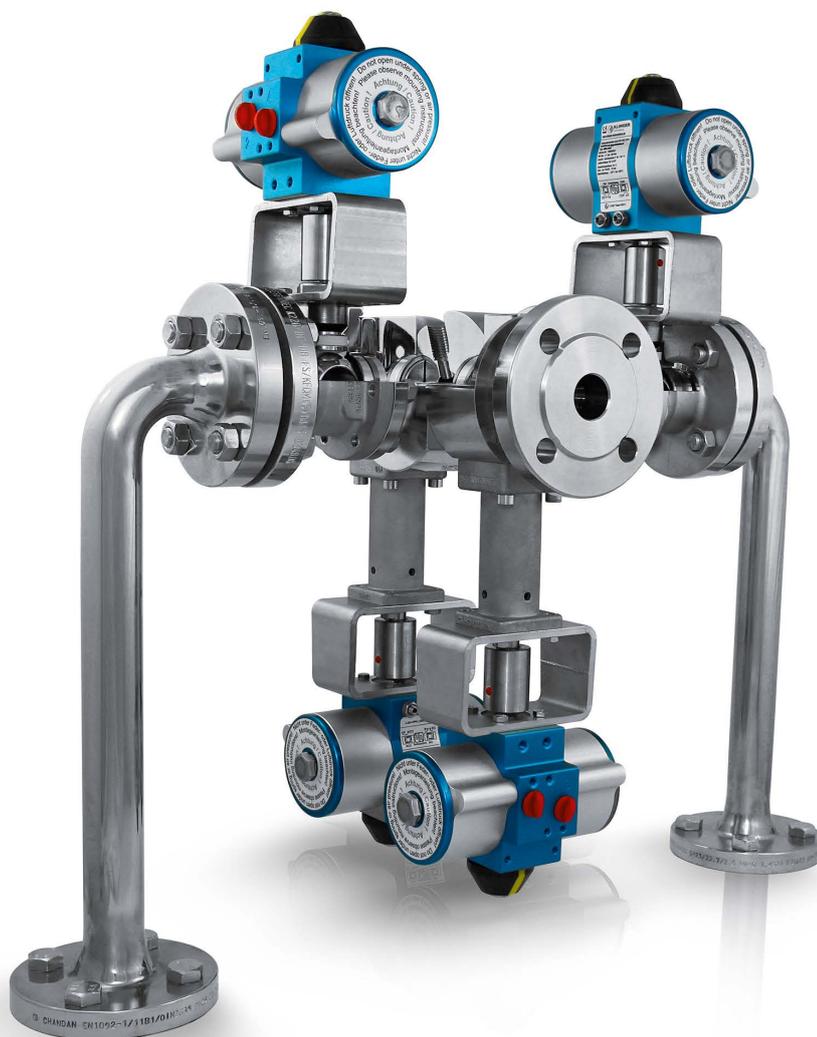




# DOUBLE BLOCK VS DOUBLE ISOLATE SYSTEMS

Crucial to work safely in the industrial sector.

Whitepaper



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## INTRODUCTION

Safety is something that's not up for discussion: all maintenance and repairs to critical pipework installations must comply with the strictest standards, and both Double Block and Bleed and Double Isolate and Bleed play a crucial role in this. These types of shut-off devices not only guarantee safety; they also optimise the production

process in terms of energy costs, sustainability and the environment.

This whitepaper allows you to explore the benefits of Double Block and Isolate systems and demonstrates exactly how KLINGER develops the right solutions for your installations.

# WHAT IS DOUBLE BLOCK AND BLEED?

## Safety upgrade

Double Block and Bleed is a type of safety system for installations. The system is designed to separate two substances that must not come into contact with one another. If one of the block elements is not properly sealed, you can immediately see that this is the case via the open bleed valve.

A Double Block and Bleed system is an indispensable safety upgrade for pipework installations, not only for the technical staff maintaining or adjusting your systems, but also for the product eventually created as part of the process, as any risk of accidental mixing of substances is prevented.

## A practical example

A brewery serves as a good example: caustic soda is often used to clean the pipework. This is a substance that clearly must never come into contact with the beer produced. The block elements in a Double Block and Bleed block the pressure from the outside in. If one of the two elements after bleed was to leak, any fluid will be discharged via the bleed valve. This guarantees that the two fluids can never mix and that a block in the other direction remains in place at all times. What's more, the bleed valve doesn't always have to be checked visually for any leaks; sensors in the shut-off device are another option to detect leaks.

# WHAT IS DOUBLE ISOLATE AND BLEED?

## Safe working

Double Isolate and Bleed is intended for safe working downstream from a valve: it can be used to isolate a pipe during a pump overhaul, for example. The Double Isolate and Bleed system creates a pressureless space before a second isolation element, making safe working possible.

Performing maintenance on pipework carries a high degree of risk in installations without this type of solution, especially where asphyxiant or hazardous substances are used. Generally speaking, when a ball valve or butterfly valve is closed, you can only assume that it is genuinely closed. You can never be sure, as there is no way to check from the outside. Leaks of steam, toxic gases and asphyxiant fluids or substances have more than once led to life-threatening or even fatal incidents.

## A practical example

A steam installation that controls the temperature in a production hall serves as a good example. When maintenance is required on the pipework in a specific part of the factory, a Double Isolate and Bleed system allows only that specific part to be isolated, without the temperature being affected in the other parts of the premises.

Another difference with a Double Block and Bleed system is that when a valve is not functioning properly, the pressure in the pipework element being worked on may start to rise. In this case, the flow direction in a Double Isolate and Bleed system blocks the substance at the second block element, which is something a Double Block and Bleed system doesn't do.

# WHY ARE DOUBLE BLOCK AND DOUBLE ISOLATE SYSTEMS SO IMPORTANT?

## Powerful advantages

Even though Double Block and Isolate systems have been on the rise for some time, awareness of the powerful advantages they offer remains relatively low. In fact, many industrial organisations remain unaware of what they are looking for, as the differences between the two systems are unclear. Research shows that ninety percent of industrial professionals who do not deal with safety aspects on a daily basis confuse Double Block and Bleed systems with Double Isolate and Bleed systems.

## People come first

Safety is the main argument for implementing a Double Block and Bleed or Double Isolate and Bleed system in an installation. European standards regarding employee safety are getting stricter by the day. In other words: people come first.

## Process safety

Fortunately, the number of businesses in the Netherlands who are focusing on this as a priority is growing, based on the following philosophy: if affordable solutions are available to increase process safety, we simply have to implement them. In fact, the Netherlands is well ahead of the rest of the world in this area. Another aspect to be considered is that many industrial installations in our country were built in the 1960s; an era in which operational safety was not the priority it is now. As time has passed, countless businesses in the industrial sector have decided to convert their ageing installations to guarantee that people can work safely.

But that's not all. There are plenty more factors that help make the case for Double Block and Bleed or Double Isolate and Bleed systems:

- » Maintenance can be planned more easily. With a Double Isolate or Bleed system, there is no more need to 'empty' a complete installation before cleaning or an overhaul can be started. In many cases, there is no option but to use a Double Isolate system, as there is simply no way the production process can be stopped.
- » The costs are clearer. For example, it is cheaper to install a single pumping installation that incorporates multiple block shut-off devices than it is to install three or more completely separate installations with their own shut-off devices.
- » Leaks may spell disaster for the environment. A Double Block and Bleed or Double Isolate and Bleed system significantly reduces the risk of environmental pollution as smaller sections of an installation can be taken out of service. This helps you save time and reduces production and energy losses.



# HOW ARE DOUBLE BLOCK AND BLEED AND DOUBLE ISOLATE AND BLEED INSTALLED?

The way in which a Double Block system is fitted in your installation depends entirely on the local circumstances and the nature of the process. Our KLINGER specialists do not simply stick to straightforward solutions to acute problems; they look at all aspects of the production process, and above all, at the people behind the systems and installations.

## A thorough analysis

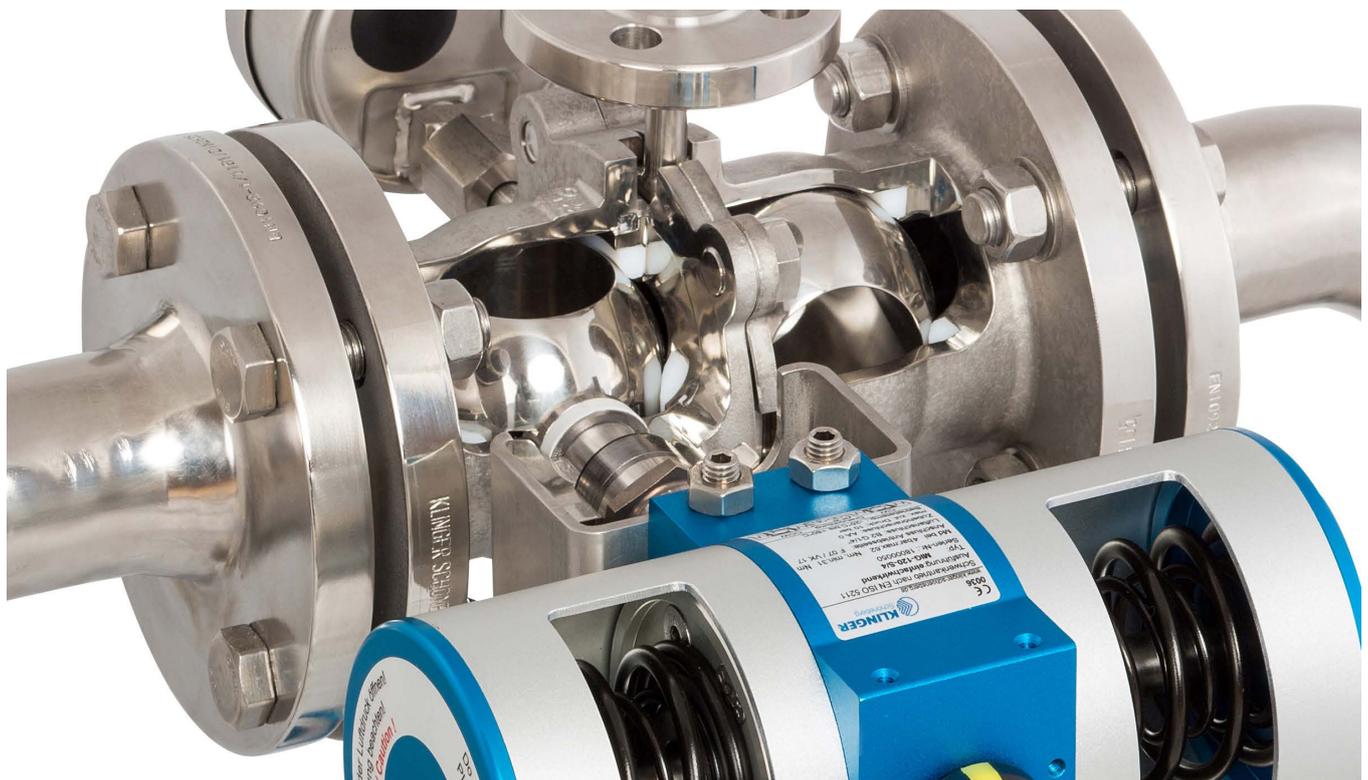
In many cases, Double Block and Bleed and Double Isolate and Bleed systems will require made-to-measure installation, but KLINGER has developed a number of standard solutions for this purpose. As a result, Double Block and Isolate system solutions are always fitted on the basis of a thorough analysis of all peripheral elements: is there enough space, how often does the installation need to be maintained, how old is the existing pipework, or how pressing is the need to be able to automate blocks in the installations?

## A practical example

A prominent Dutch steel manufacturer provides the perfect example to clarify this further. To roll its steel, the company

uses a large number of special rolls. Each of these rolls requires regular grinding, but stopping the entire production process to do so is not ideal. As a solution, one roll at a time is automatically isolated using a specially designed Double Isolate and Bleed system to remove the pressure from that part of the installation. This allows the technicians to safely remove the roll to be maintained from the system, while the rest of the rolling plant continues to operate. The greatest strength of this system KLINGER developed in consultation with the client is that not every roll is fitted with its own hydraulic pump (in fact, a single pumping system operates all of the rolls), so that every part of the installation can be isolated using a shut-off device.

The application of a Double Isolate and Bleed system at a tank storage business provides another example. When a pump on a tank containing thousands of litres of a substance needs to be replaced, it is handy and practical to be able to only isolate a small section of the pipework using a Double Isolate system, so that there is no need to empty the entire tank before any replacement work can be started.





## » INSIGHT INTO THE INNOVATIVE APPROACH OF A DOUBLE BLOCK AND BLEED OR DOUBLE ISOLATE AND BLEED SOLUTION «

# DOUBLE BLOCK AND BLEED AND DOUBLE ISOLATE AND BLEED IN THE INDUSTRIAL MARKET

### Prevent costly interventions

One aspect that typifies the current situation is that the industrial market has little insight into the opportunities Double Block and Bleed and Double Isolate and Bleed systems offer. On site visits, our KLINGER specialists regularly notice that businesses often opt for two or three separate shut-off devices in their installations, even though they barely have the space for them. This results in expensive interventions in pipework sections with lots of different risks and unsafe situations, all while a perfect solution is available in the form of a Double Block system that requires only a single shut-off device to be fitted.

This unawareness of the opportunities offered by Double Block and Bleed or Double Isolate and Bleed systems often

also means that management teams dither for too long on whether to invest or not. As a result, ageing installations that cannot be or can barely be adjusted according to the traditional way of thinking remain inefficient and even unsafe for way longer than they need to.

### An innovative approach

The innovative approach of a Double Block and Bleed or Double Isolate and Bleed solution was first used in the United States, where industrial businesses started improving safety aspects much earlier due to the bias within the legal system towards preventing claims. However, across the rest of the globe too, large listed companies are now pioneering the implementation of safe solutions using Double Block or Isolate systems.

# WHICH TYPES OF DOUBLE BLOCK AND BLEED ARE AVAILABLE?

Countless types of Double Block and Isolate systems are available, depending on the physical situation and requirements:

## **SINGLE DOUBLE BLOCK AND BLEED SYSTEM**

- » Ball valve with two spring-loaded seats and a bleed shut-off device.
- » Lift plug shut-off device with bleed shut-off device.

## **THE BENEFITS OF A SINGLE SYSTEM**

- » Simple to operate; both shut-off elements are closed simultaneously.
- » Compact construction; ideal for installation in systems that offer limited space.
- » The valves have a full-sized passage with an uninterrupted flow opening and negligible pressure drop in the unit.
- » Quick to lock.
- » Easy to determine whether the system is securely isolated.
- » Cost-effective.

## **THE DOWNSIDES OF A SINGLE SYSTEM**

- » Small bleed connection.
- » Shut-off elements cannot be operated independently.
- » The system cannot be depressurised via the bleed shut-off device.

## **DOUBLE DOUBLE BLOCK AND BLEED SYSTEM**

- » Two ball valves and a bleed shut-off device in a single casing.
- » Two butterfly valves and a bleed shut-off device in a single casing.
- » Combination of three shut-off devices.

## **THE BENEFITS OF A DOUBLE SYSTEM**

- » Allows for large(r) bleed shut-off device passage.
- » The shut-off elements can be operated independently.
- » The system can be depressurised, tapped or flushed via the bleed shut-off device.
- » Fewer leak points due to single construction.

## **THE DOWNSIDES OF A DOUBLE SYSTEM**

- » More actions required to operate.
- » The system may take up more space.

# CAN DOUBLE BLOCK AND ISOLATE SYSTEMS BE AUTOMATED?

## Simple and safe

Of course, manually disengaging a valve using a Double Block or Isolate system is already a lot easier and safer than completely dismantling an installation or installing a blank or blind flange. In principle, a single employee can render an installation secure using a Double Block system, while the disassembly of a pipework section usually requires multiple technicians, let alone the time needed for the extensive preparations required to be able to do so.

## Automation

In addition, Double Block and Isolate systems can also easily be automated. The shut-off devices can be electronically secured and measured using sensors. These can measure the pressure before, between and after the space that is to be isolated and provide a signal if pressure drops to 0 bars. As a result, this automation can take care of the entire shut-off process in spaces that are not safe for human access. Everything can be done remotely with automatic controls and signalling, so that no employees are put at risk when a certain section of the installation needs to be rendered secure.



# HOW DOES KLINGER IMPLEMENT A DOUBLE BLOCK SYSTEM?

To KLINGER, not everything is all about the Double Block and Isolate systems themselves; instead, we look to optimise the entire process in your installation, and Double Block and Bleed or Double Isolate and Bleed play a major role in this. Using our tried-and-tested Installation Scan, we map the condition of your process installation to identify any uncertainties and potential risks.

## **THE INSTALLATION SCAN ALWAYS SEEKS TO:**

- » Raise awareness of potentially unsafe situations in production systems
- » Reduce the number of faults
- » Reduce emissions and other hazardous substances
- » Reduce energy costs
- » Improve service life
- » Improve safety

## **1. DEFINE**

- » The principle behind this first step is: where do we recommend improvements? Where do we see opportunities to optimise your production process? Are better solutions available than initially thought?

## **2. MEASURE**

- » We map the existing situation: what is the extent of the 'problem', and which impact is this having on your operations, safety and efficiency?

## **3. ANALYSE**

- » We break down the suggested improvements into categories and sit down with you to identify priorities.

## **4. IMPROVE**

- » We manage the implementation process and realise the improvements in practice.

## **5. MONITOR**

- » Even after implementation, KLINGER's specialists keep their fingers on the pulse: the improvements are carefully monitored and adjusted where necessary.

# CONCLUSION

Double Block and Isolate systems are not a luxury in industrial installations; on the contrary, they are essential. The following elements play a major role in the step towards process optimisation using Double Block and Bleed or Double Isolate and Bleed solutions:

- » Production process operational safety
- » Reduction of emissions
- » Cost reduction
- » Improving sustainability

The use of these systems is not just an interesting option for ageing installations: the Double Block or Isolate principle helps industrial processes of all shapes and sizes function more optimally — and KLINGER can deliver the custom solutions you need to lift your production processes to the next level.



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