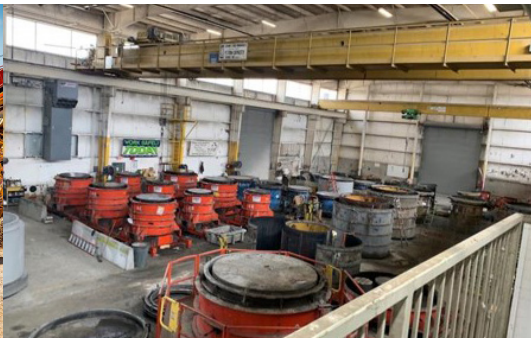


PRECAST CONCRETE INDUSTRY

Trapped Key Interlock Safety Solutions

Five Part Application Series



Electrical and Struck-by incidents are among the most DEADLIEST hazards in the construction industry per the Health and Safety Executive (HSE)!

Working in the concrete industry introduces safety hazards that place workers in danger and put their lives at risk. To ensure worker safety throughout the cement manufacturing process, several applications require power to be properly isolated and safeguarded to ensure safe access only once hazards have been eliminated.

Across the number of the fatal injuries per 100,000 workers employed, the rate of fatal injury in construction is around 4 times higher than the rate across all industries

Electrical and stuck-by hazards present themselves in the Precast Concrete Industry. A trapped key interlock solution mitigates these risks by driving a pre-determined sequence of operations that isolates power and guards against areas that may contain energised equipment and moving cranes and or product.

Eliminating the TOP FOUR would save 137 lives in the UK every year! (Top Four: Falls, Struck-by, Electrocutions, Caught-in/between)

While LOTO provides a visual warning and identifies hazards, a trapped key interlock safety solution physically prevents a specific set of actions from being performed until previous action(s) have been fully completed!

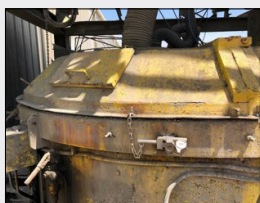
This Precast Concrete series will discuss hazards within specific applications and how trapped key interlock solutions can prevent injury and ensure...

Everyone has the right to be **SAFE** at work!

Applications:



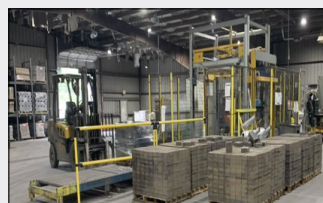
Conveyor Systems



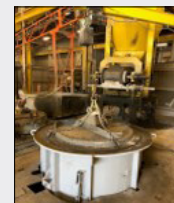
Cement Mixer



Hoppers



Block & Tile Production



Overhead Cranes



An estimated 18-20 per cent of all recorded health and safety incidents in quarry operations result from conveyors, according to Rema Tip Top Industry UK Ltd

The extraction or storing of aggregate within a gravel pit serves a variety of purposes across many industries including the concrete & cement industries.

Conveyor systems are an important method in the process of transporting materials across the mine surface, into hoppers, over grating for sorting, and into trucks for distribution to plants and manufacturing facilities.

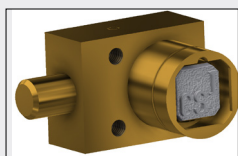
Injuries such as severed limbs can occur during the clearing of conveyor blockages and can cost an estimated £118,000 in fines according to the Health & Safety at Work Act

The continuous movement of belts, chains, and diverters place personnel working and operating the system at risk. Regular maintenance on these systems is required to ensure efficiencies. Safety processes must be followed to mitigate human error and save lives. The isolation of power prior to entry into the area is the first step in mitigating risk.

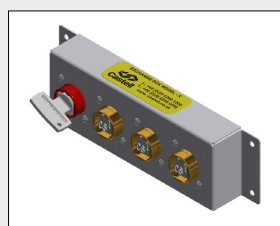
Trapped Key Interlocking conforms to UK and EU regulations for the proper isolation of electricity and equipment power so that there is no negative result in health and safety risks for personnel

Trapped key interlock safety solutions ensure a pre-determined sequence of operations each & every time. While LOTO provides a visual warning and identifies hazards, a TKI solution physically prevents a specific set of actions from being performed until previous action(s) have been fully completed!

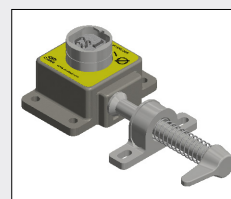
Common trapped key interlock solution interlocking conveyor system with multiple access points and access doors:



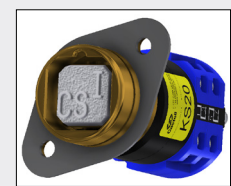
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Step 1: Power Isolation K Bolt Interlock installed on main breaker for conveyor

Step 2: Multiple Entry Points Castell X key exchange box for access to multiple hopper access doors

Step 3: Safe Access AI single key access interlock installed on hopper doors

Step 4: Controlled Power Castell KS power electrical switch installed on control switch for hopper doors

PROTECT your employees, **PREVENT** accidents, and **PROVIDE** risk control and peace of mind by implementing a trapped key interlock solution that will ensure that...

Everyone has the right to be **SAFE** at work!



Accidents in confined spaces continue to be one of the most common causes of work related fatalities in the UK accounting for 5 to 7 per cent of all workplace fatalities

The storage of aggregate for various usage can lead to the potential risk to personnel involving engulfment within hoppers (confined space) and loss of materials due to incorrect materials loading. Protecting workers from confined space hazards that can occur during maintenance, cleaning, filling, and unloading of hoppers is critical within a gravel pit.

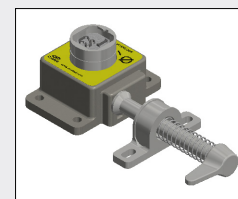
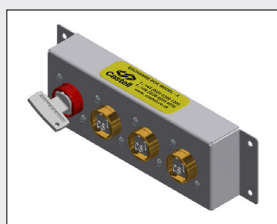
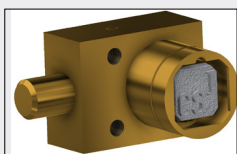
Confined spaces claim the lives of as many as 30 people in the UK each year

Interlocking access doors/gates around conveyor systems and hoppers will ensure that entry can only be gained after the power has been isolated and residual energy has ceased. Understanding the access points, partial or full body, will help determine the best interlocking solution to safely manage access to the hoppers and surrounding areas that could pose a confined space hazard.

60% of confined space fatalities are rescuers – Let's change the statistics and enhance your safety!

Trapped key interlock safety solutions ensure a pre-determined sequence of operations each & every time. While LOTO provides a visual warning and identifies hazards, a TKI solution physically prevents a specific set of actions from being performed until previous action(s) have been fully completed!

Common trapped key interlock solution interlocking conveyor system with multiple access points and hopper doors to mitigate confined space hazards:



Step 1: Power Isolation K Bolt Interlock installed on main breaker for conveyor

Step 2: Multiple Entry Points Castell X key exchange box for access to multiple hopper access doors

Step 3: Safe Access AI single key access interlock installed on hopper doors

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The most common cement mixer hazards: caught-in/between * electric shock * struck by moving elements

Concrete is the most common used man-made material on earth. The uses of concrete range from structural applications to piping, drains, and pavers. Buildings, bridges, roads, and more could not be constructed without this important material.

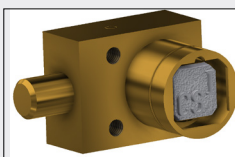
Assessing and maximising machine guarding on your cement mixer will mitigate hazards and prevent injuries & fatalities

Concrete mixing plants must perform regular maintenance on mixers to ensure proper working conditions and efficiencies. Maintenance can involve accessing the mixer's entry points for cleaning and servicing of paddles or blades. To ensure work safety, power must be isolated prior to entry of the mixer and at no time during maintenance can power be inadvertently re-energised.

Don't allow an oversight to become a reportable! Let's change the statistics and enhance your safety!

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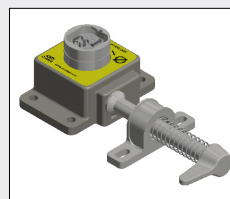
Common trapped key interlock solution for isolating power and accessing mixer:



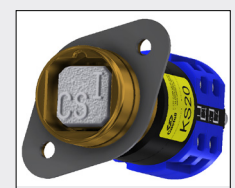
Step 1: Power Isolation K Bolt Interlock installed on main breaker for mixer



Step 2: Residual Energy Castell DAE mechanical time delay unit pre-set to allow for mixer run-down time



Step 3: Safe Access AI single key access interlock installed on mixer lid



Step 4: Controlled Power Castell KS power electrical switch installed on control switch for mixer lid winch

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Coloring * Molding * Curing * Tumbling * Cubing * Palletising

A production cell for precast concrete block & tile presents many hazards for workers and equipment. Energised equipment, rotating machinery, industrial saws and cutters, pinch points and partial and or full body access points all present opportunity for extremity injuries. Ensuring the proper sequence of safety operations is followed will mitigate the risk of injury

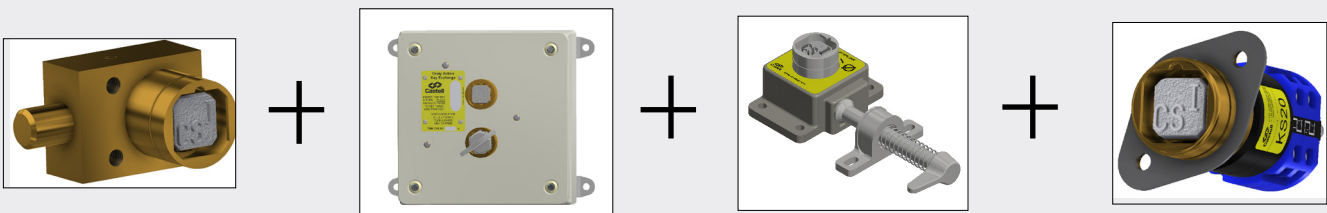
Extremity injuries are prevalent, accounting for approximately ¾ of all reportable OSHA incidents within this industry

Regular maintenance on the equipment within the production cell is required to ensure efficiencies. Safety processes must be followed to mitigate human error, eliminate risk, prevent injuries to extremities.

Hand injuries account for 23% of all workplace injuries and compensation costs can be as high as £189,110 per incident

Trapped key interlock safety solutions ensure a pre-determined sequence of operations each & every time. While LOTO provides a visual warning and identifies hazards, a TKI solution physically prevents a specific set of actions from being performed until previous action(s) have been fully completed!

Common trapped key interlock solution for a block/tile production cell:



Step 1: Power Isolation K Bolt Interlock installed on control panel for block/tile production cell

Step 2: Residual Energy Castell DAE mechanical time delay unit pre-set to allow for run-down time on equipment

Step 3: Safe Access AI single key access interlock installed on mixer lid

Step 4: Controlled Power Castell KS power electrical switch installed on control switch for mixer lid winch

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According to the HSE, there have been 61 accidents, 25 serious injuries and 9 fatalities between 2001-2014 as a result of incidents involving cranes

Overhead and gantry cranes are essential for the movement of heavy materials to be efficient, effective, and without harm to personnel. During cement production, heavy pieces of equipment as well as finished precast product requires transportation into holding areas and on trucks for distribution.

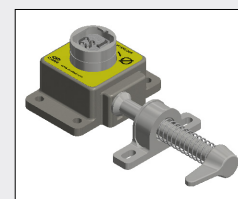
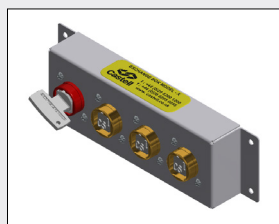
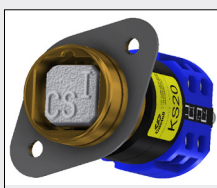
The main crane-related hazards include: Falling Loads, Electrical Hazards (50% of accidents involving overhead cranes), Crane Overload

Risks such as caught-in/between, struck-by/against, and/or overloaded or falling materials from a crane can bring serious harm to personnel, product, and equipment. To ensure safety within the area, controlled access points interlocked with crane controls mitigate accidental entry while crane is in operation.

In the construction industry, around 4.2 million working days were lost each between 2017-2020 due to workplace injury (25%) and work-related illness (75%) costing an estimated £3 billion

Trapped key interlock safety solutions ensure a pre-determined sequence of operations each & every time. While LOTO provides a visual warning and identifies hazards, a TKI solution physically prevents a specific set of actions from being performed until previous action(s) have been fully completed!

Common trapped key interlock solution implementation for overhead cranes:



Step 1: Controlled Power Castell KS power electrical switch installed on control switch overhead/gantry crane

Step 2: Multiple Entry Points Castell X key exchange box for sequence control of access keys only after all access points have been locked closed and ready to safely energise overhead/gantry crane

Step 3: Safe Access Castell AI single key access interlock on any and all access points safeguarding overhead crane perimeter

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