

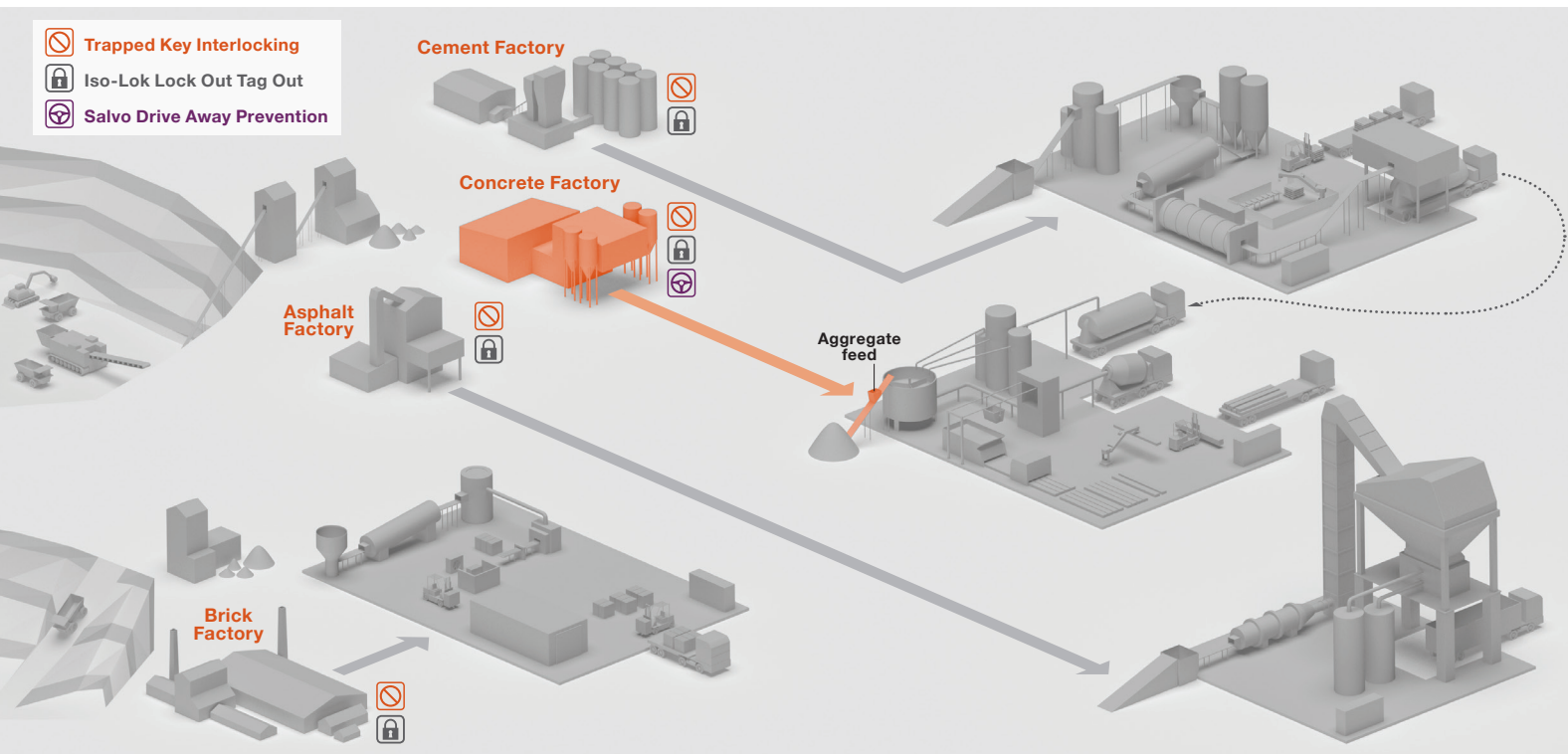
### The Risk

The bucket lifts aggregate from a stockpile into the mixer. The bucket is a large moving part and the tipping of the aggregate also presents a risk. The bucket and the lift must be isolated before access to the area is allowed.



Trapped Key Interlocking

### Aggregates Industry



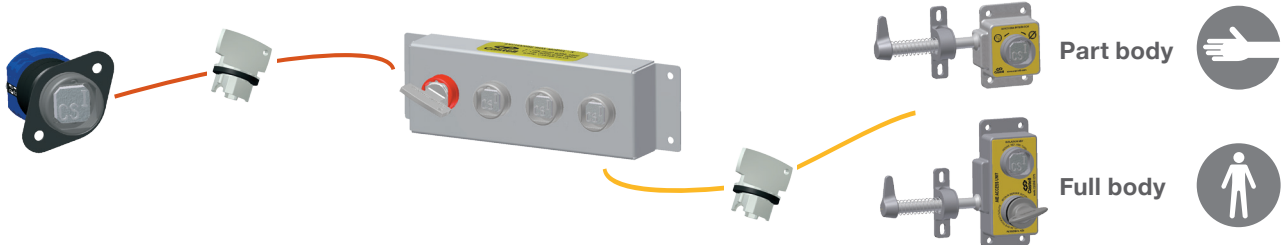
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## Castell Solution

### 1 Isolation

### 2 Key Exchange







### 3 Access Control

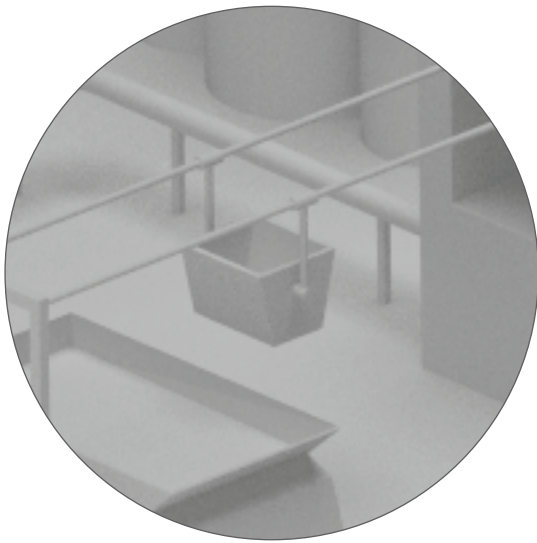


## Benefits

- 1) Extended system life, due to the stainless steel construction of housings and mechanisms, Castell interlock systems offer many years of trouble free operation.
- 2) High level of risk control, as control is in the hands of the operator when in the dangerous area through the personnel key.
- 3) Downtime is reduced as access is mechanical.
- 4) By implementing a process rather than a procedure, efficiency is increased. The system is not dependent on verbal communication. The transfer of the key enables operators to know the status.

## Products

Isolation		Exchange	Access	
Isolation of the aggregate feed can require that the equipment reaches a home position before safe entry can be gained. If this is the situation then a solenoid controlled KSS unit is required. The device waits for a home signal before the key used to gain access is released.		Where there are multiple points of entry and / or multiple points of isolation required an exchange box will be needed to enable multiple keys to be inserted prior to access keys being released.	The product used to control access has to be based on the access that can be gained, this will be either a part body or full body access lock.	
KS 	KSS 	X 	AI-HD 	AIE-HD 
KSSE 				



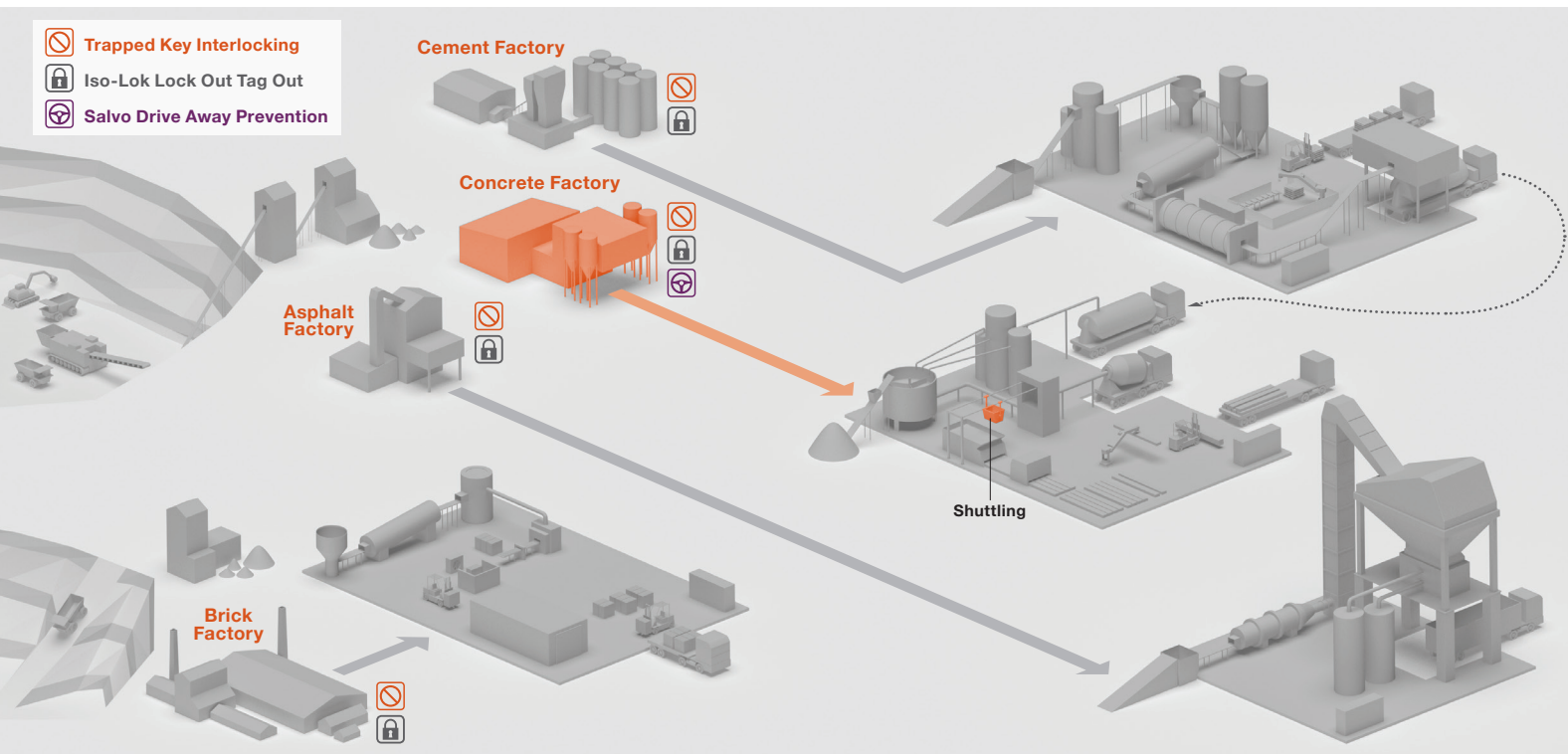
### The Risk

The shuttle mechanism is used to carry loads of wet cement from the mixers to the production floor in a precast works. The shuttles are large, heavy moving parts and provide a significant danger to operators.



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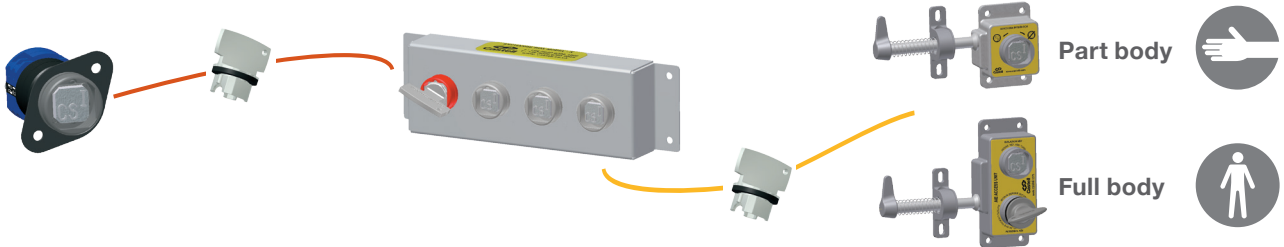
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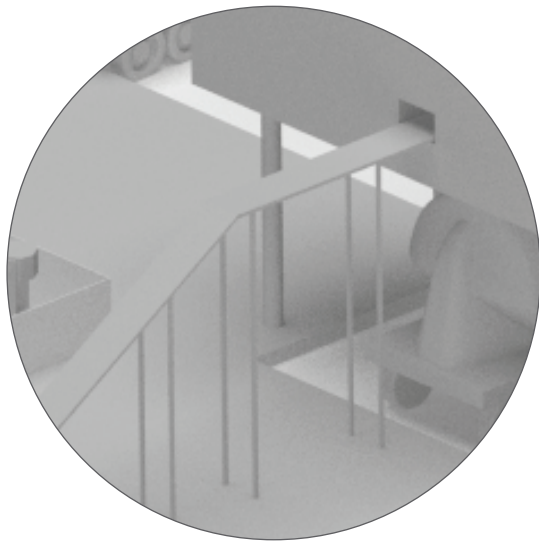


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### Products

Isolation		Exchange	Access	
<p>Isolation of the shuttle mechanism can require that the equipment reaches a home position before safe entry can be gained. If this is the situation then a solenoid controlled KSS unit is required. The device waits for a home signal before the key used to gain access is released.</p>				
KS	KSS	X	AI-HD	AIE-HD
				
KSSE				
				



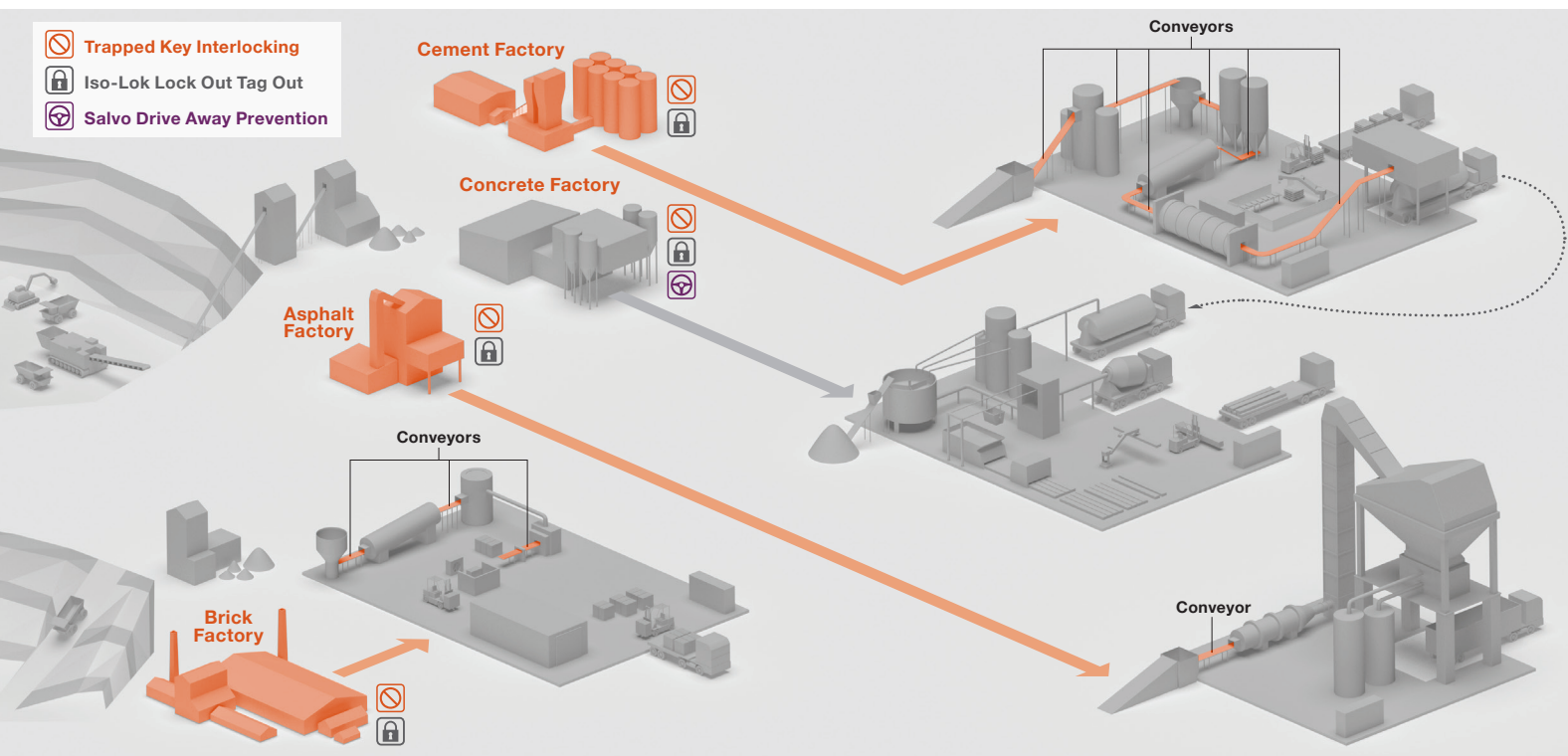
## The Risk

The conveyor is an automated process machine which provides a risk due to moving parts on the chain drive at the directional change point. Access can be gained into the area whilst the conveyor is in an unsafe state. The conveyor needs to be isolated and put in a safe state before entry to the area can be granted.



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Aggregates Industry



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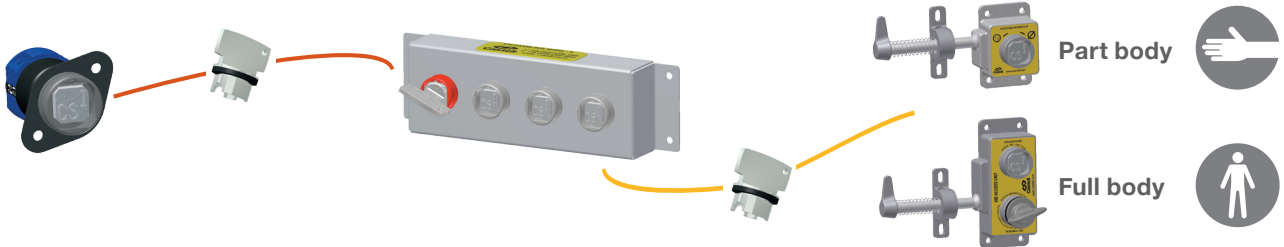


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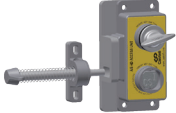


#### 3 Access Control

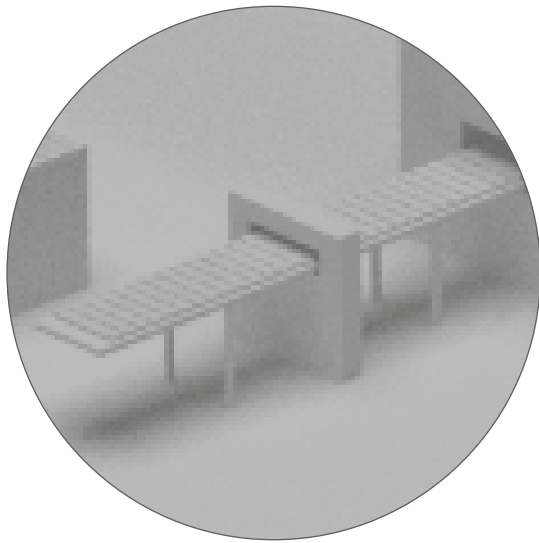


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### Products

Isolation		Exchange		Access	
Isolation of the conveyor must cause a sequenced shut down of all belts on a particular line to prevent a pile-up of produce.		A conveyor system often covers a large distance, so there may be several access points. In this case, the exchange box must release several access keys.		The product used to control access has to be based on the access that can be gained, this will be either a part body or full body access lock. Full body access to the underside of the conveyor may be required for cleaning and maintenance purposes.	
KSD 	KS 	X 	Y 	AI-HD 	AIE-HD 
K 		Z 			



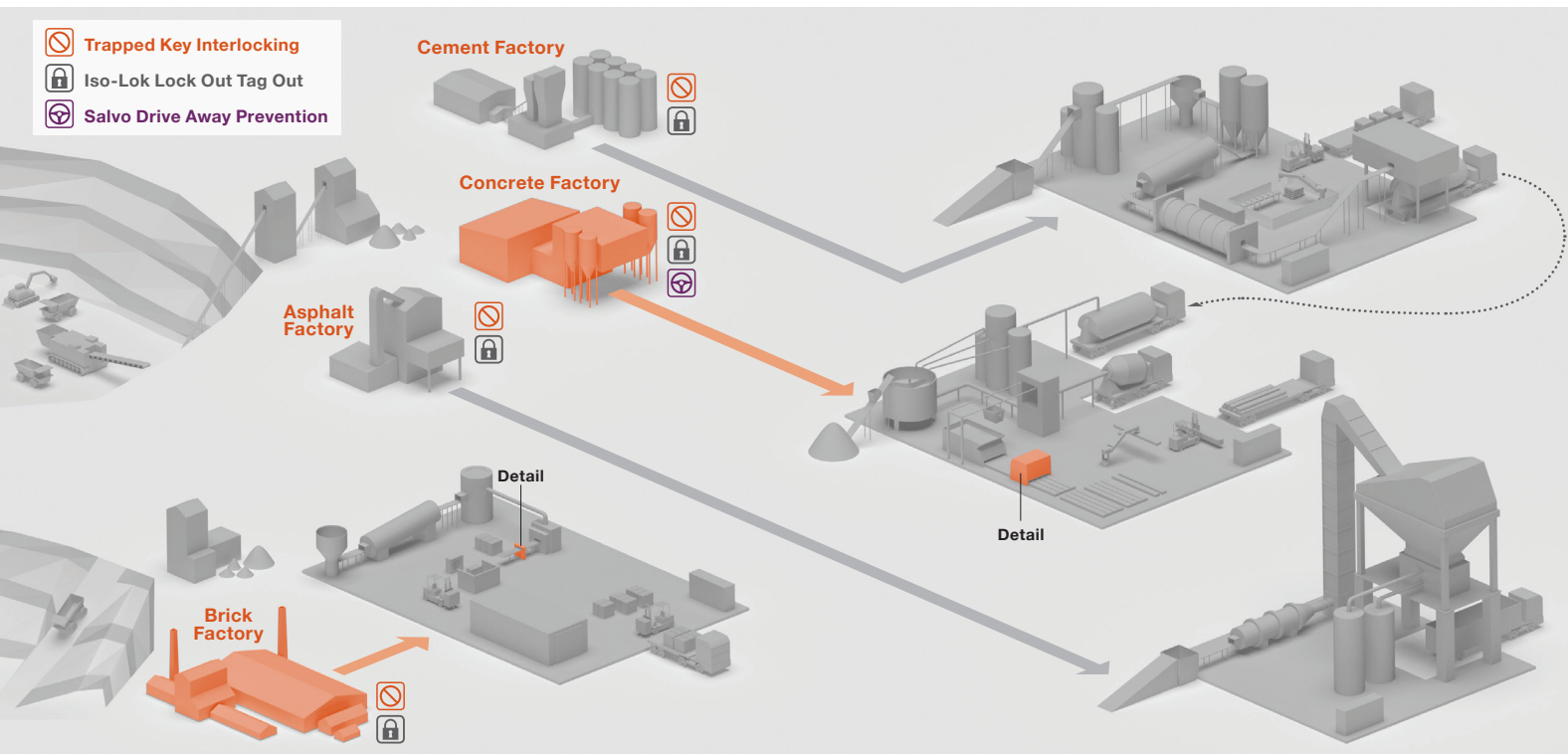
### The Risk

Machinery such as saws and sanders remove sections and add texture to brick and precast concrete structures. Proximity with fast-moving parts, saw blades and sanding surfaces present a high risk to operators.



Trapped Key Interlocking

### Aggregates Industry



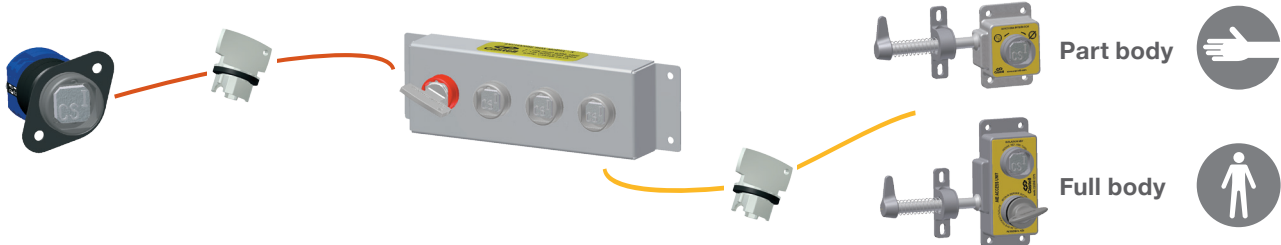
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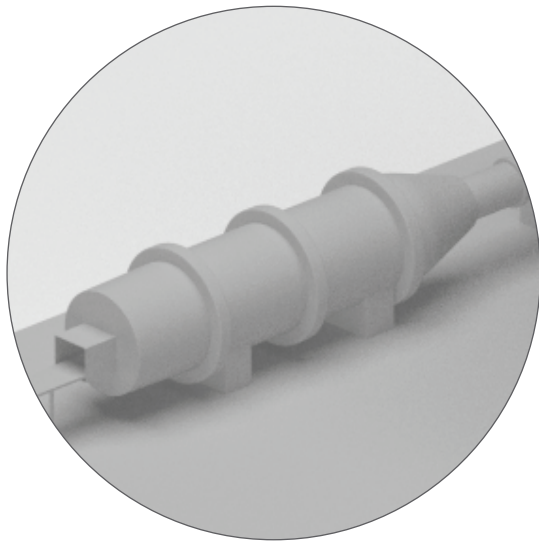
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## Products

Isolation		Exchange	Access	
Detail machinery often uses high velocity parts. In this case, time delay or motor sensing equipment may be required, to allow for sufficient run down of the moving parts before access is allowed.		Where there are multiple points of entry and / or multiple points of isolation required an exchange box will be needed to enable multiple keys to be inserted prior to access keys being released.	The product used to control access has to be based on the access that can be gained, this will be either a part body or full body access lock.	
KS 	TDI 	X 	AI-HD 	AIE-HD 
DAE 	BEMF 			





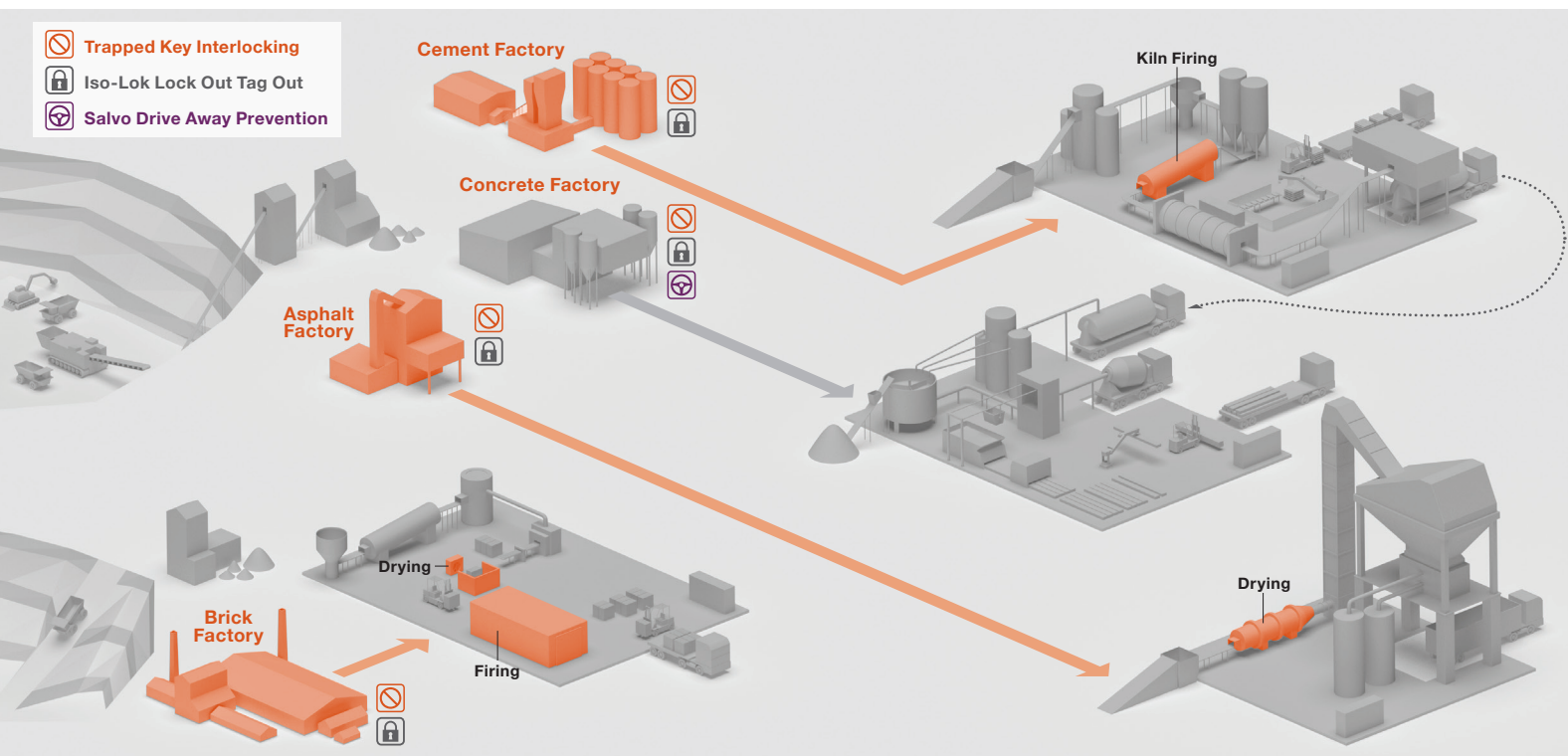
## The Risk

Very high temperatures are used to dry aggregates, fire bricks and produce cement. The firing can take place over an extended period of time. Access to these areas must be prevented when the firing is underway.



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## Aggregates Industry



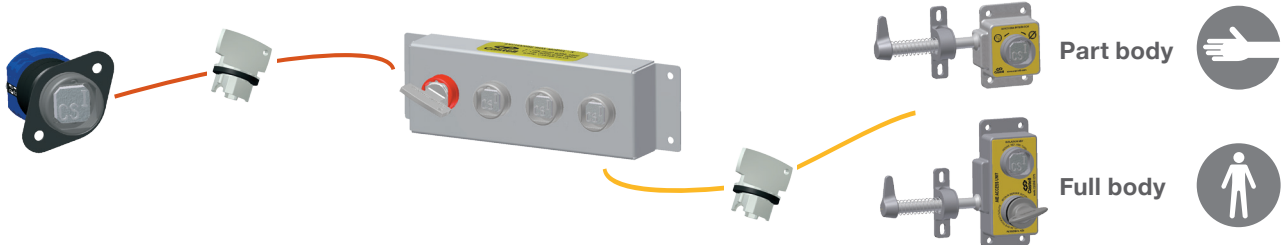
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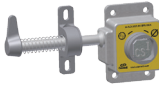




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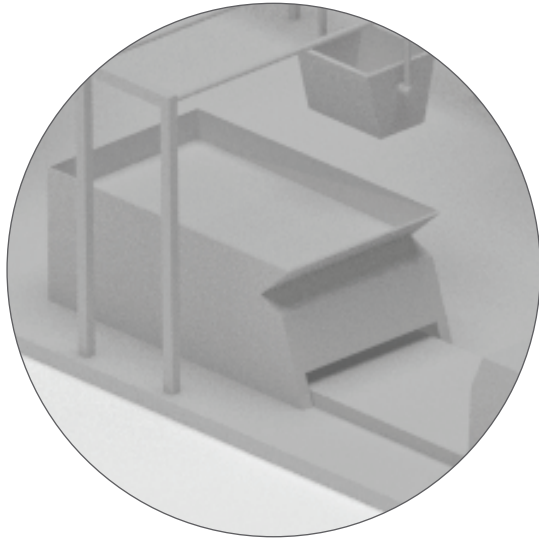


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## Products

Isolation		Exchange	Access	
Isolation will cut power to the burners. There must be a long time delay between initially powering off and allowing access, as the area will remain very hot for some time.		Where there are multiple points of entry and / or multiple points of isolation required an exchange box will be needed to enable multiple keys to be inserted prior to access keys being released.	The product used to control access has to be based on the access that can be gained, this will be either a part body or full body access lock.	
KSD 	KS 	X 	AI 	AIE 
K 	TDI 			
DAE 				



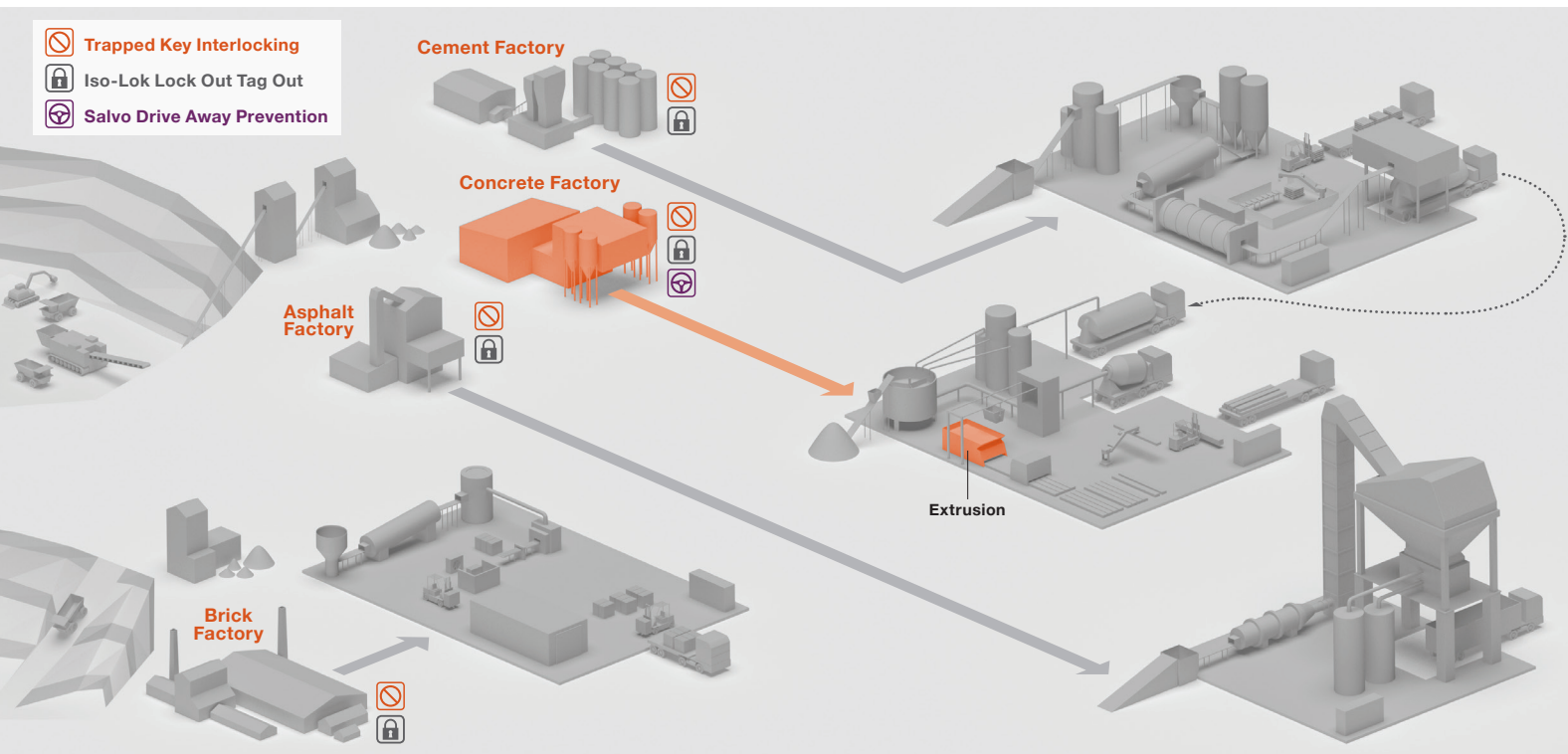
### The Risk

The extruding machine is used to create concrete structures with a regular cross-section. The risk comes from the large gears and the weight of the moving platform.



Trapped Key Interlocking

### Aggregates Industry



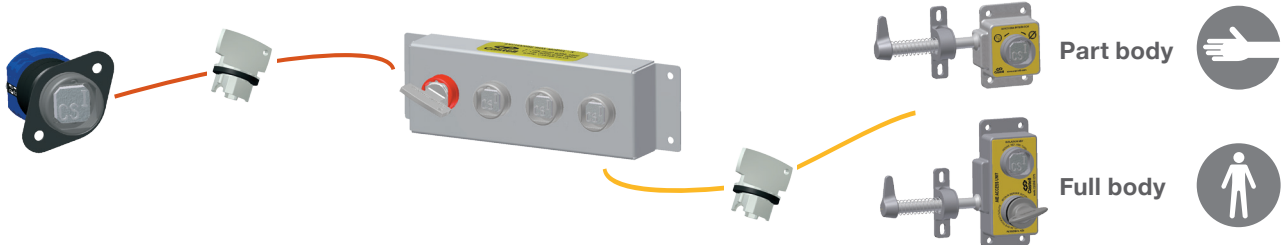
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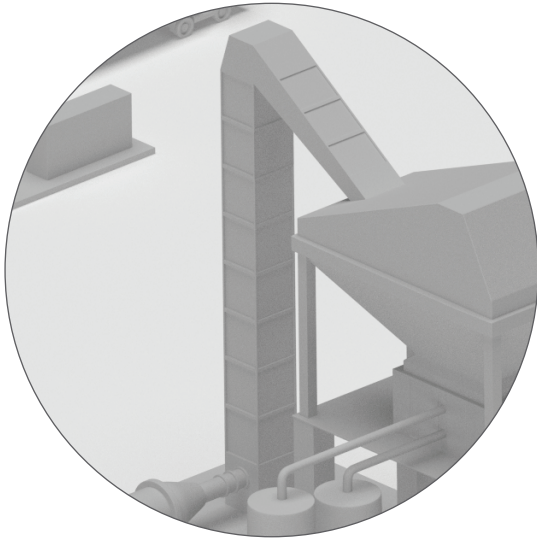


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## Products

Isolation		Exchange		Access	
Isolation of the extruder can require that the equipment reaches a home position before safe entry can be gained. If this is the situation then a solenoid controlled KSS unit is required. The device waits for a home signal before the key used to gain access is released.		Where there are multiple points of entry and / or multiple points of isolation required an exchange box will be needed to enable multiple keys to be inserted prior to access keys being released.		The product used to control access has to be based on the access that can be gained. A full body access lock may be required, particularly if access is allowed to the underside of the extrusion platform.	
KS 	KSS 	X 		AI-HD 	AIE-HD 
KSSE 		Y 	Z 		



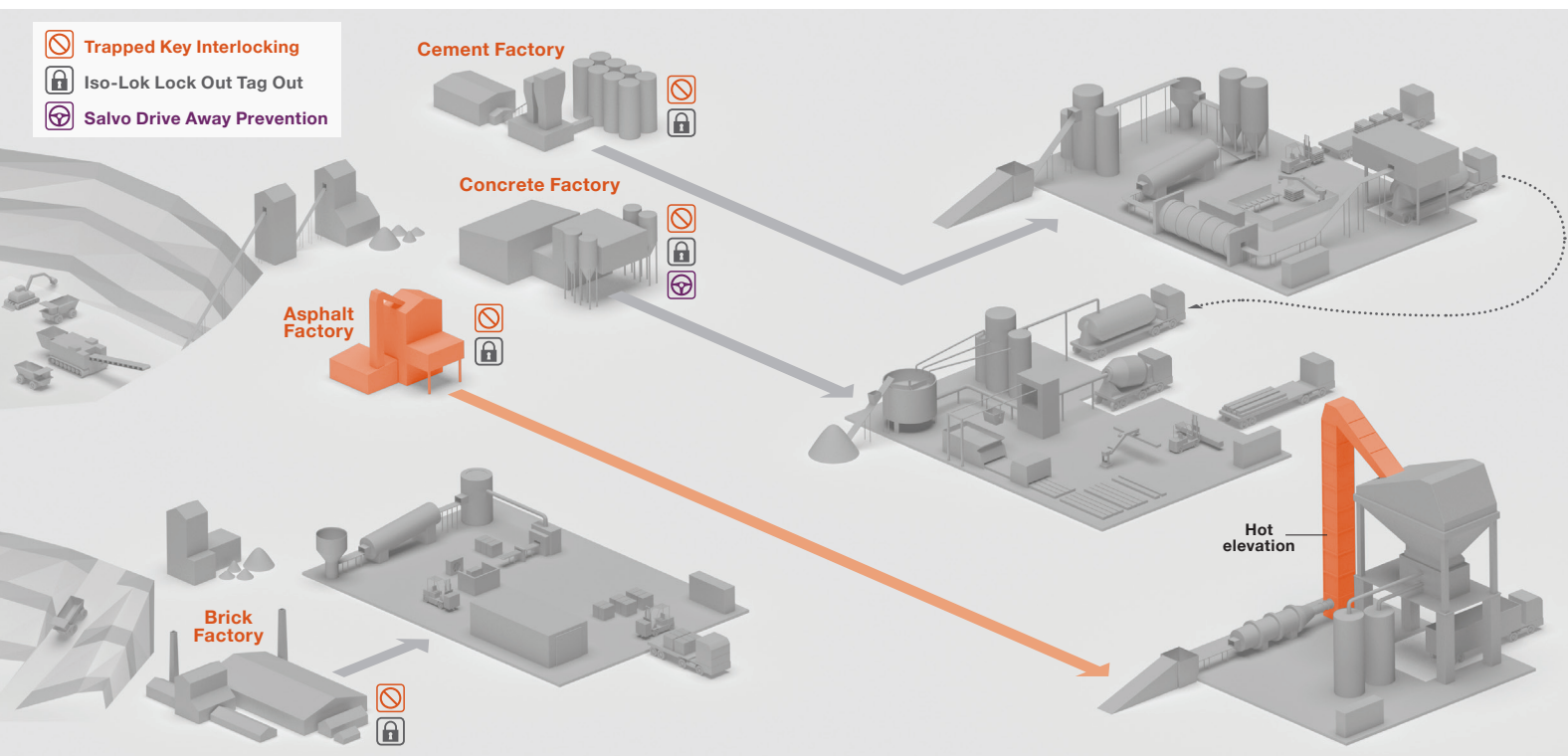
### The Risk

Aggregates used in the production of asphalt are lifted up an elevation shaft after being dried in a kiln. This presents a risk as the lift platforms are heavy moving parts, aggregate may fall down the shaft, and the temperatures will be high.



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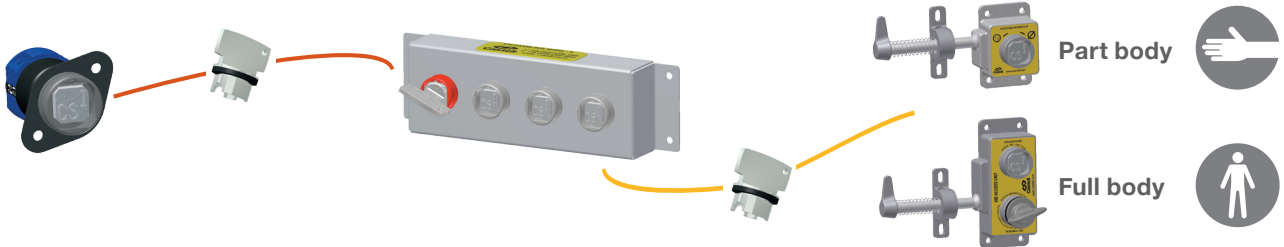


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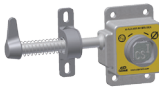



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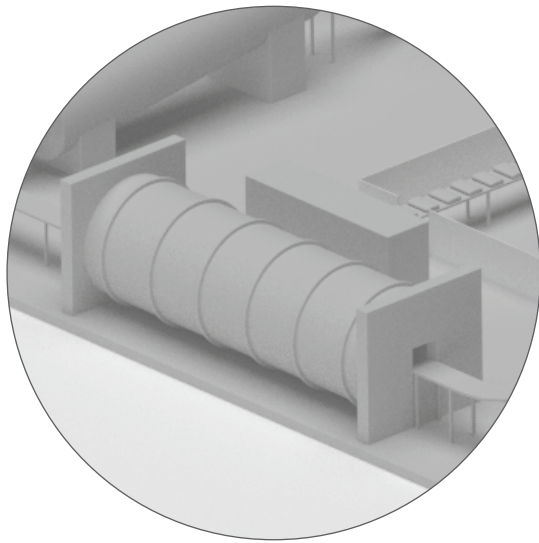


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### Products

Isolation		Exchange		Access	
Turning and releasing the primary key will cut the power to the drivers in the elevator shaft. The lift platforms must be isolated and stationary before access is permitted.		Where there are multiple points of entry and / or multiple points of isolation required an exchange box will be needed to enable multiple keys to be inserted prior to access keys being released.		The product used to control access has to be based on the access that can be gained. A full body access lock may be required,	
KSD 	KS 	X 	Y 	AI 	AIE 
K 		Z 			



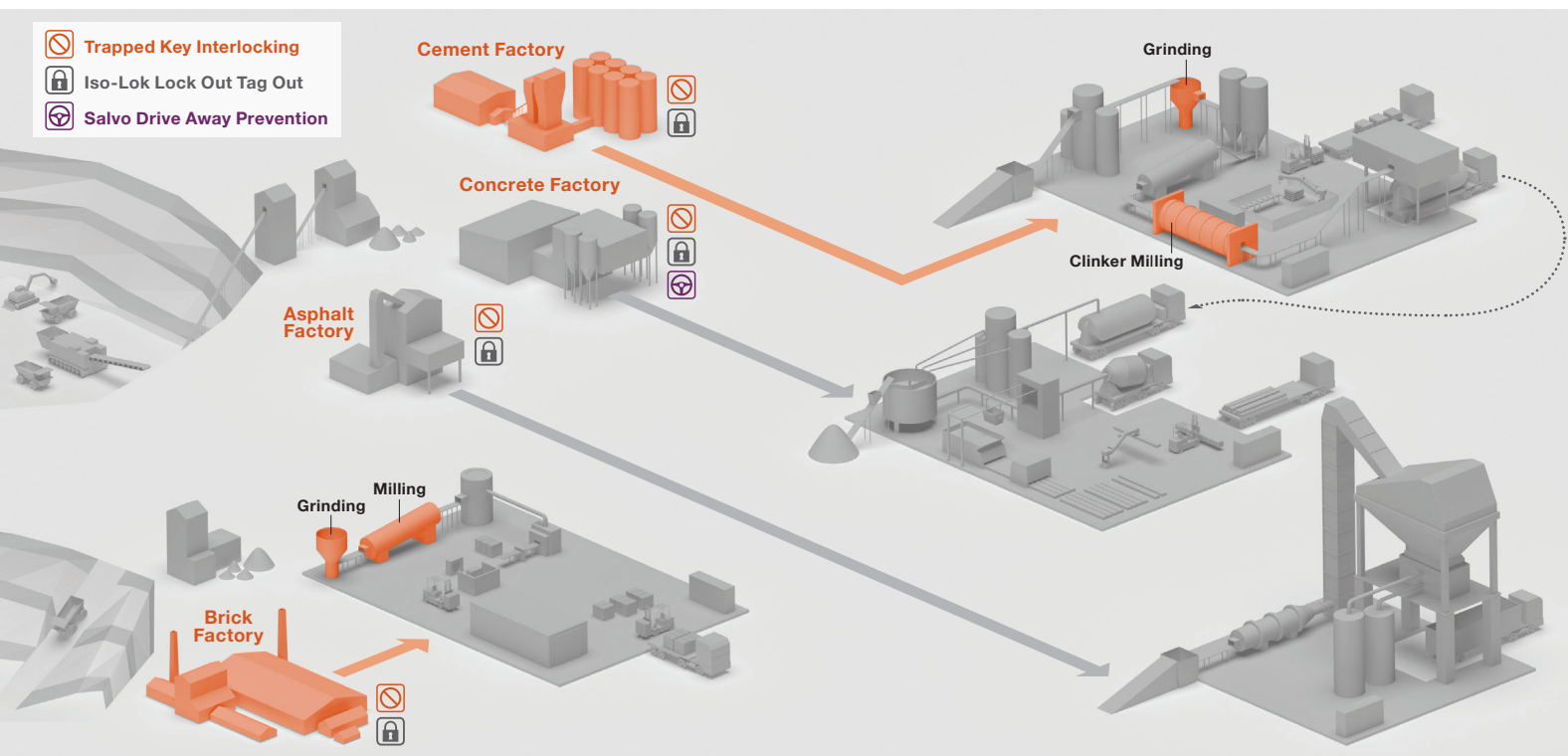
## The Risk

This process involves breaking down of raw material using large rollers or rotating drums. The mechanical action presents a serious danger to operators, and access to the area must be prevented when the machines are active.



Trapped Key Interlocking

Aggregates Industry



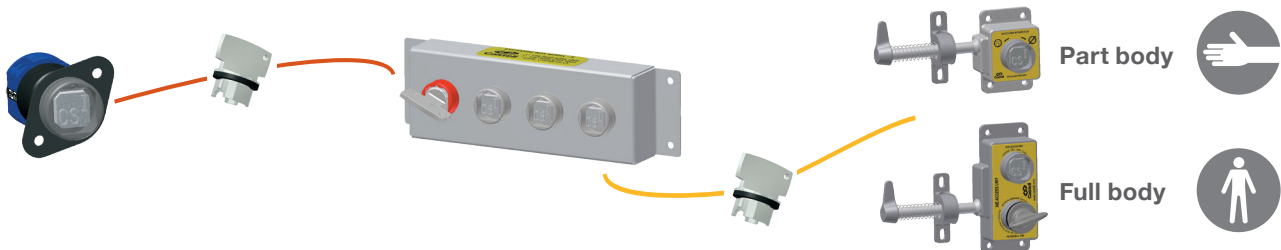
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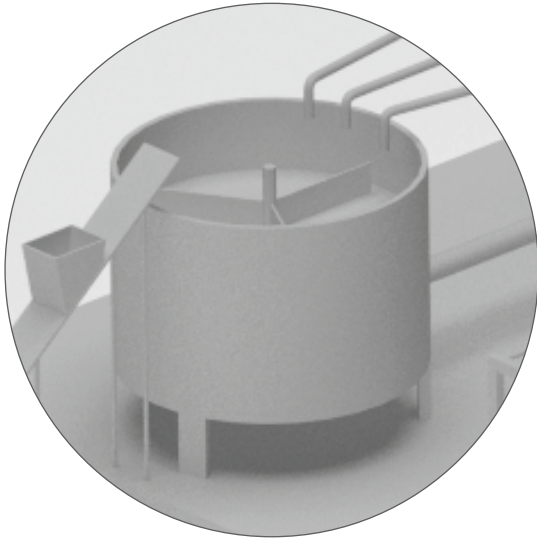


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## Products

Isolation		Exchange	Earthing	
Turning and releasing the primary key will isolate the rotating parts of the machinery. There must be a time delay or a motor sensing isolation mechanism to make sure the machines have fully run down and stopped moving before access is permitted.		Where there are multiple points of entry and / or multiple points of isolation required an exchange box will be needed to enable multiple keys to be inserted prior to access keys being released.	The product used to control access has to be based on the access that can be gained, this will be either a part body or full body access lock.	
KS 	TDI 	X 	AI-HD 	AIE-HD 
DAE 	BEMF 			



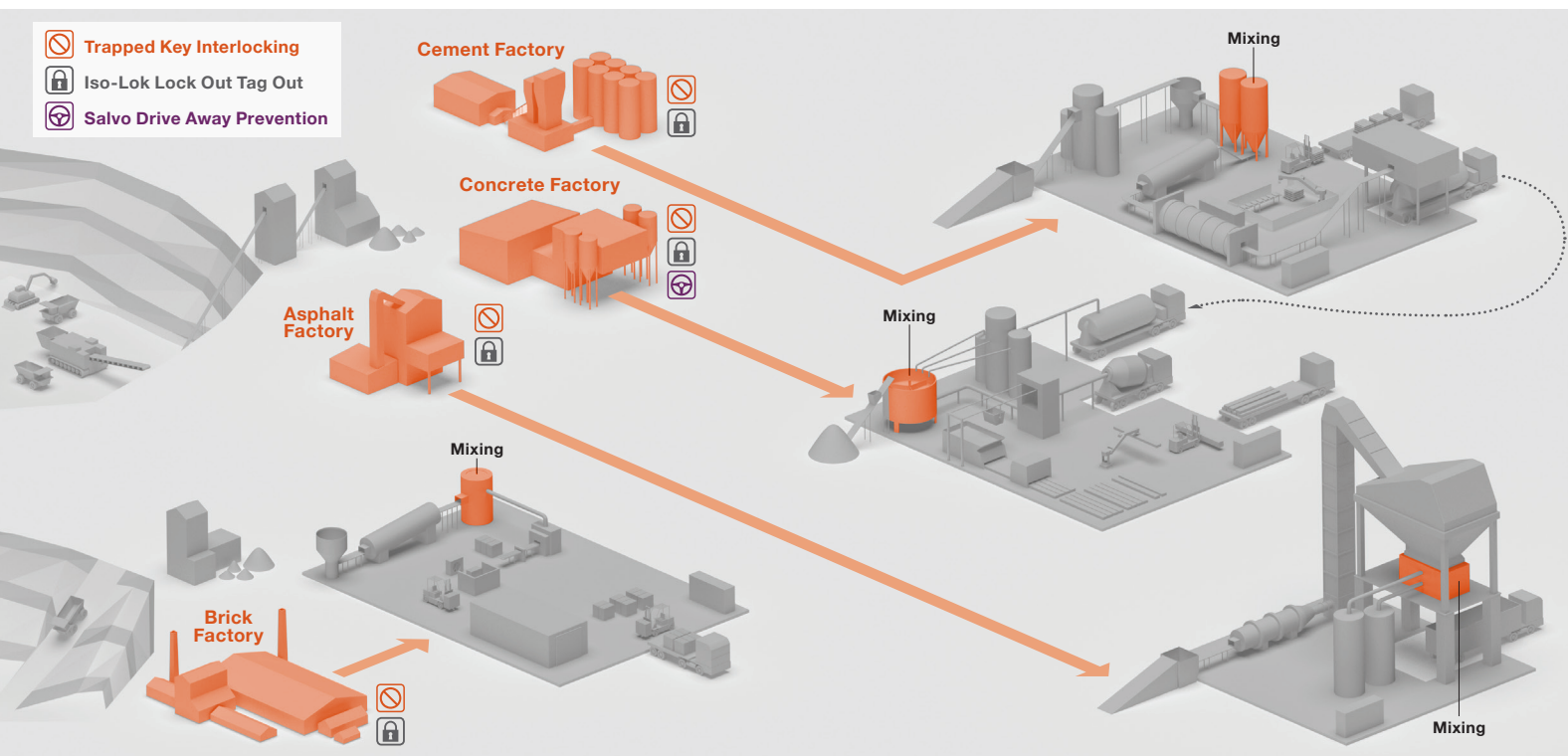
### The Risk

Rotating blades mix the raw materials to create a homogeneous blend. This often takes place within an enclosed drum. Access to the moving parts must be prevented while the machine is in operation.



Trapped Key Interlocking

### Aggregates Industry



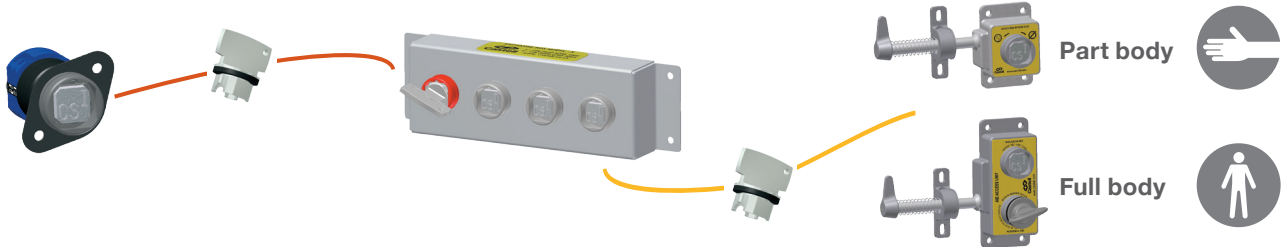
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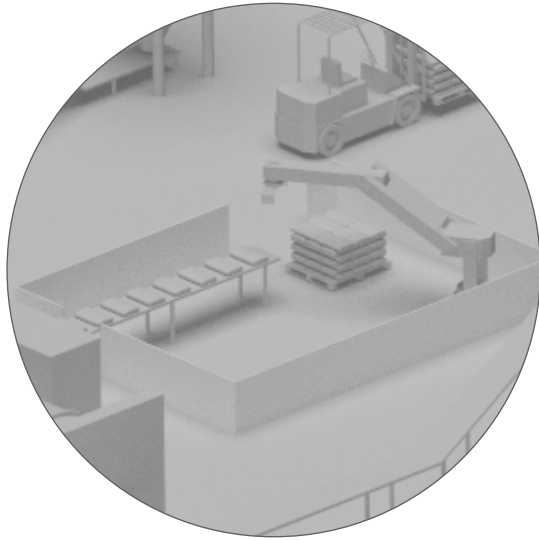
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### Products

Isolation		Exchange	Access	
Turning and releasing of the primary key isolates the mixer blades. A time delayed or motor sensing system of isolation allows sufficient run down for mixer blades to stop moving.		Where there are multiple points of entry and / or multiple points of isolation required an exchange box will be needed to enable multiple keys to be inserted prior to access keys being released.	The product used to control access has to be based on the access that can be gained, this will be either a part body or full body access lock.	
KS 	TDI 	X 	AI-HD 	AIE-HD 
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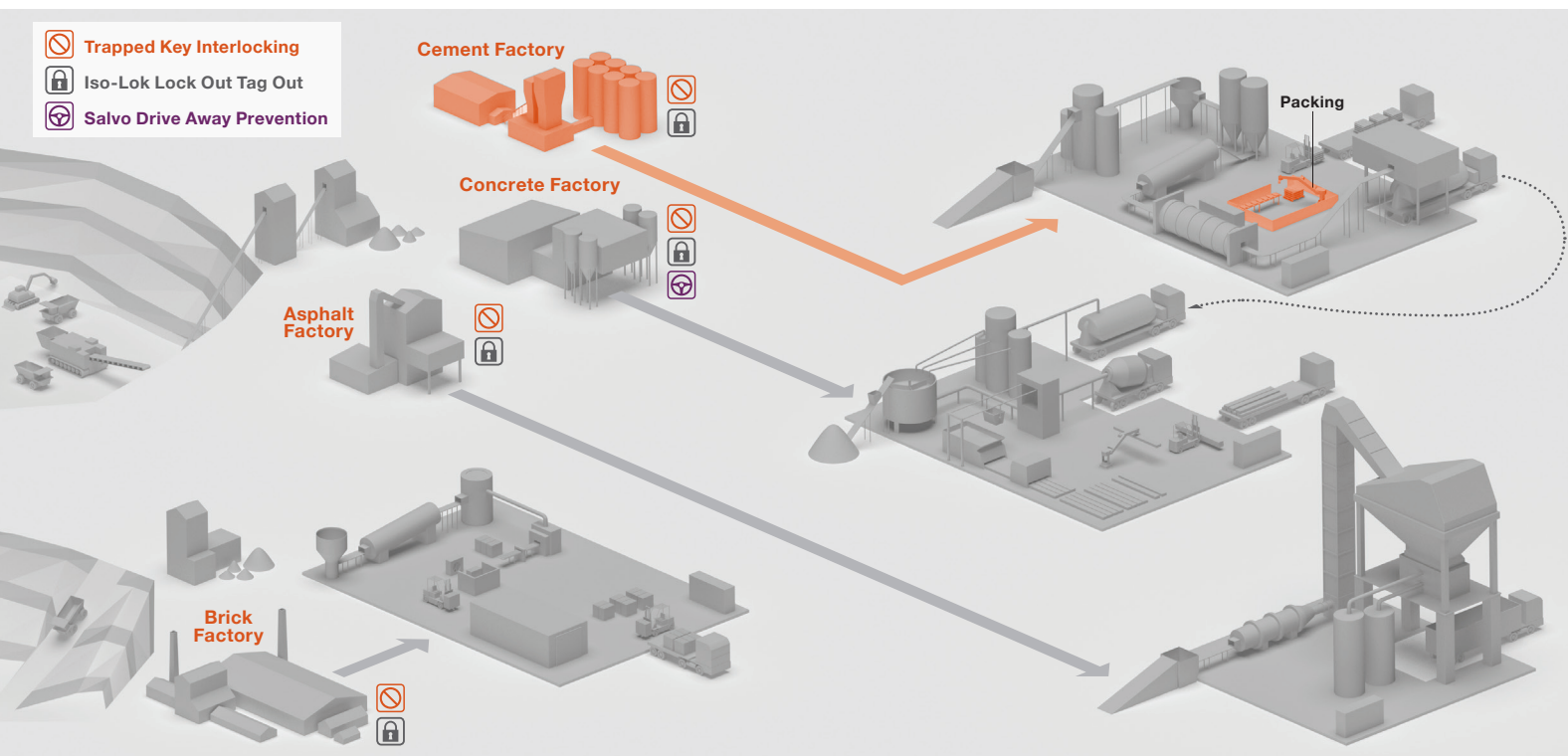
### The Risk

Large volumes of material are bagged, often very rapidly on automated machines. Access to the bagging area must not be permitted while the machine is in an unsafe mode.



Trapped Key Interlocking

### Aggregates Industry



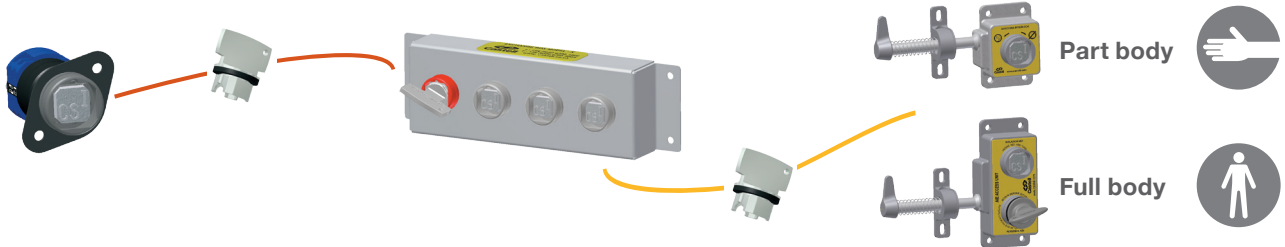
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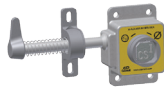



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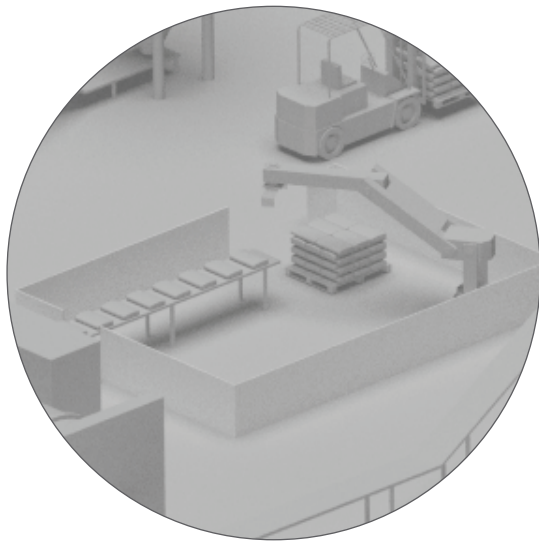


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## Products

Isolation		Exchange	Access	
Isolation must incorporate motor sensing equipment or a time delay to ensure that the moving parts of the bagging machine are no longer active when access is permitted.		Where there are multiple points of entry and / or multiple points of isolation required an exchange box will be needed to enable multiple keys to be inserted prior to access keys being released.	The product used to control access has to be based on the access that can be gained, this will be either a part body or full body access lock. Full body access may be permitted if there is a perimeter guard in place.	
KS 	TDI 	X 	AI 	AIE 
DAE 	BEMF 			



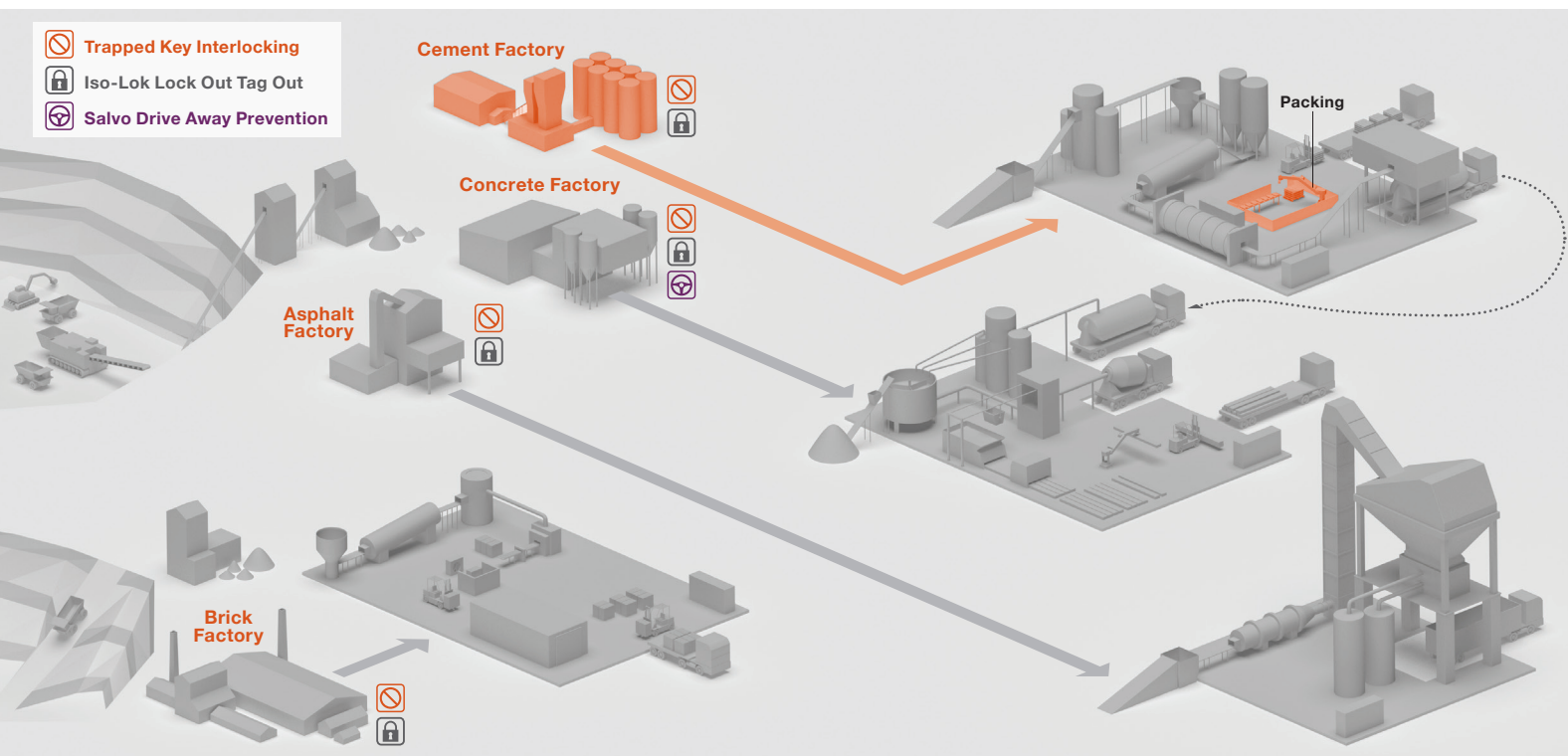
### The Risk

The palletiser is an automated machine that arranges bags onto a pallet. When stacked with bags, a full pallet is extremely heavy. There are also mechanical arms which manoeuvre the bags into place. Both of these things present a danger to the operators.



Trapped Key Interlocking

Aggregates Industry

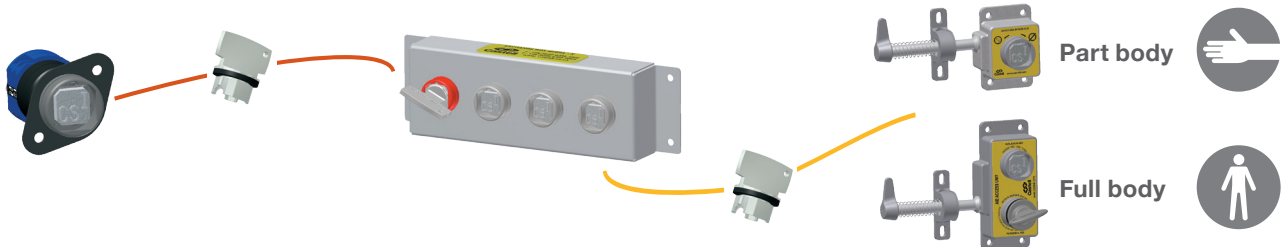


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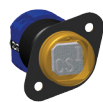






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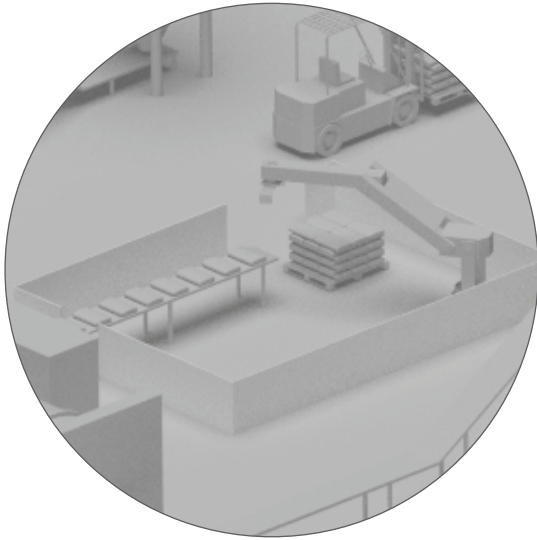


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### Products

Isolation		Exchange		Access	
Isolation will cause the simultaneous disabling of the mechanical arms that arrange the bags on the pallet, and the mechanism which feeds bags into the machine.		Where there are multiple points of entry and / or multiple points of isolation required an exchange box will be needed to enable multiple keys to be inserted prior to access keys being released.		The product used to control access has to be based on the access that can be gained, this will be either a part body or full body access lock.	
KSD 	KS 	X 	Y 	AI 	AIE 
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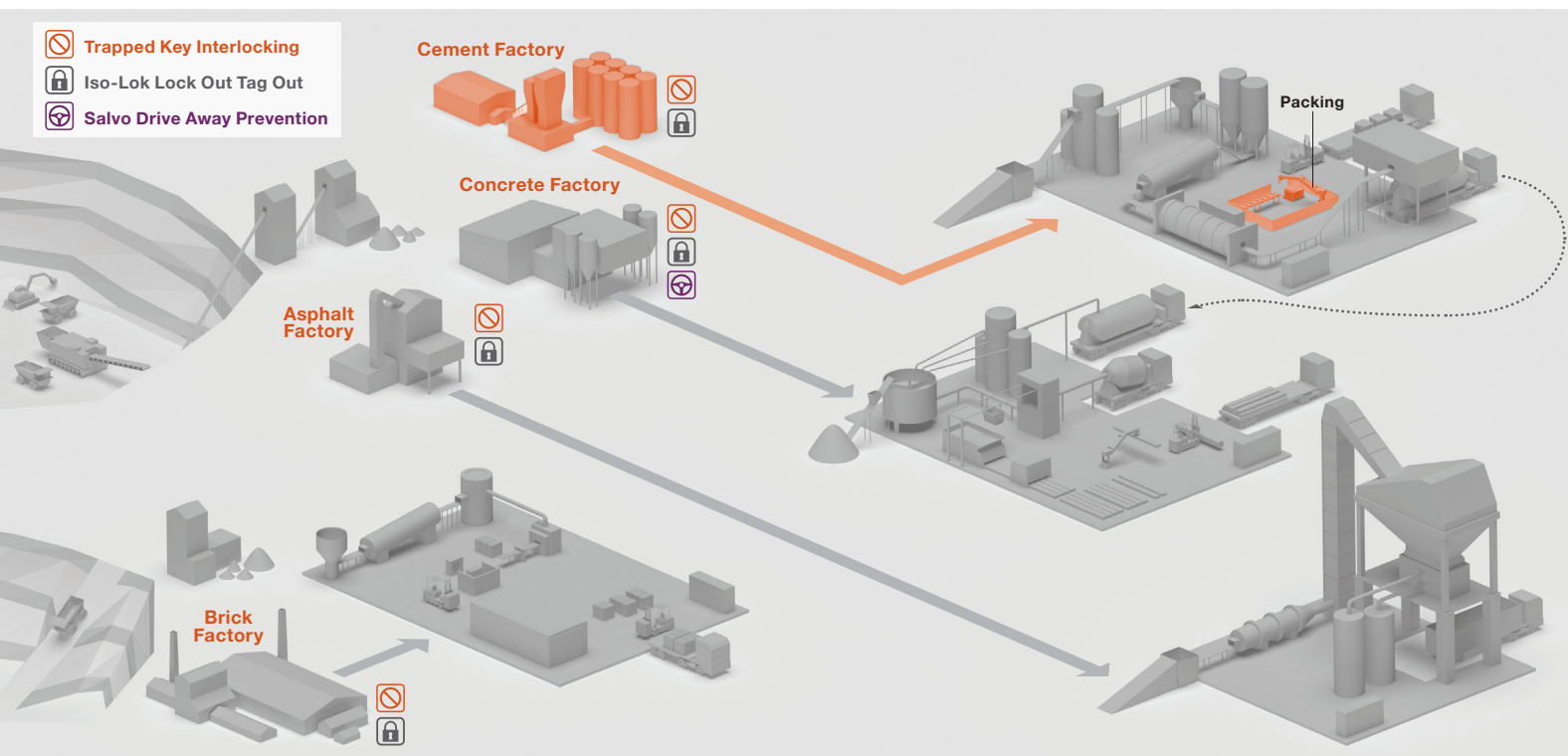
### The Risk

This is a form of secondary packing which secures bags on a pallet. The mechanical arms stretch a plastic cover over the pallet of bags, securing it in place. The moving arms present a danger to operators.



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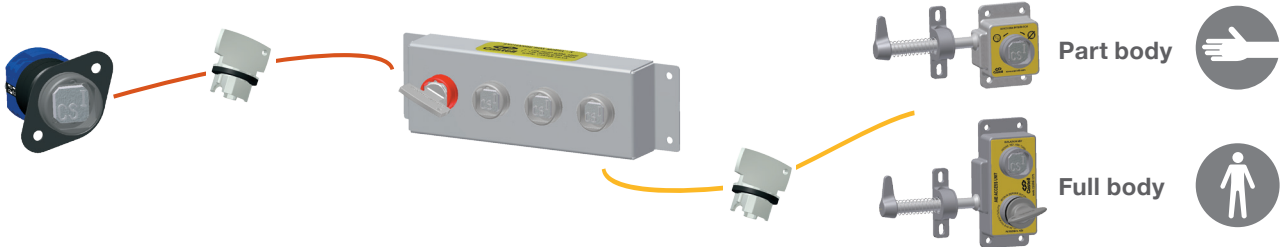


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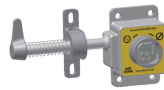


#### 3 Access Control

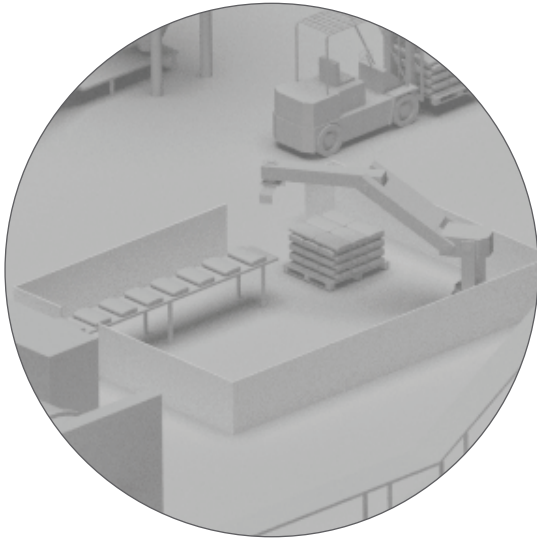


### Benefits

- 1) Extended system life, due to the stainless steel construction of housings and mechanisms, Castell interlock systems offer many years of trouble free operation.
- 2) High level of risk control, as control is in the hands of the operator when in the dangerous area through the personnel key.
- 3) Downtime is reduced as access is mechanical.
- 4) By implementing a process rather than a procedure, efficiency is increased. The system is not dependent on verbal communication. The transfer of the key enables operators to know the status.

### Products

Isolation		Exchange	Access	
Isolation will cause the simultaneous disabling of the mechanical arms that pull the plastic over the pallet, and the mechanism which feeds full pallets into the machine.		Where there are multiple points of entry and / or multiple points of isolation required an exchange box will be needed to enable multiple keys to be inserted prior to access keys being released.	The product used to control access has to be based on the access that can be gained, this will be either a part body or full body access lock.	
KSD 	KS 	X 	AI 	AIE 
K 				



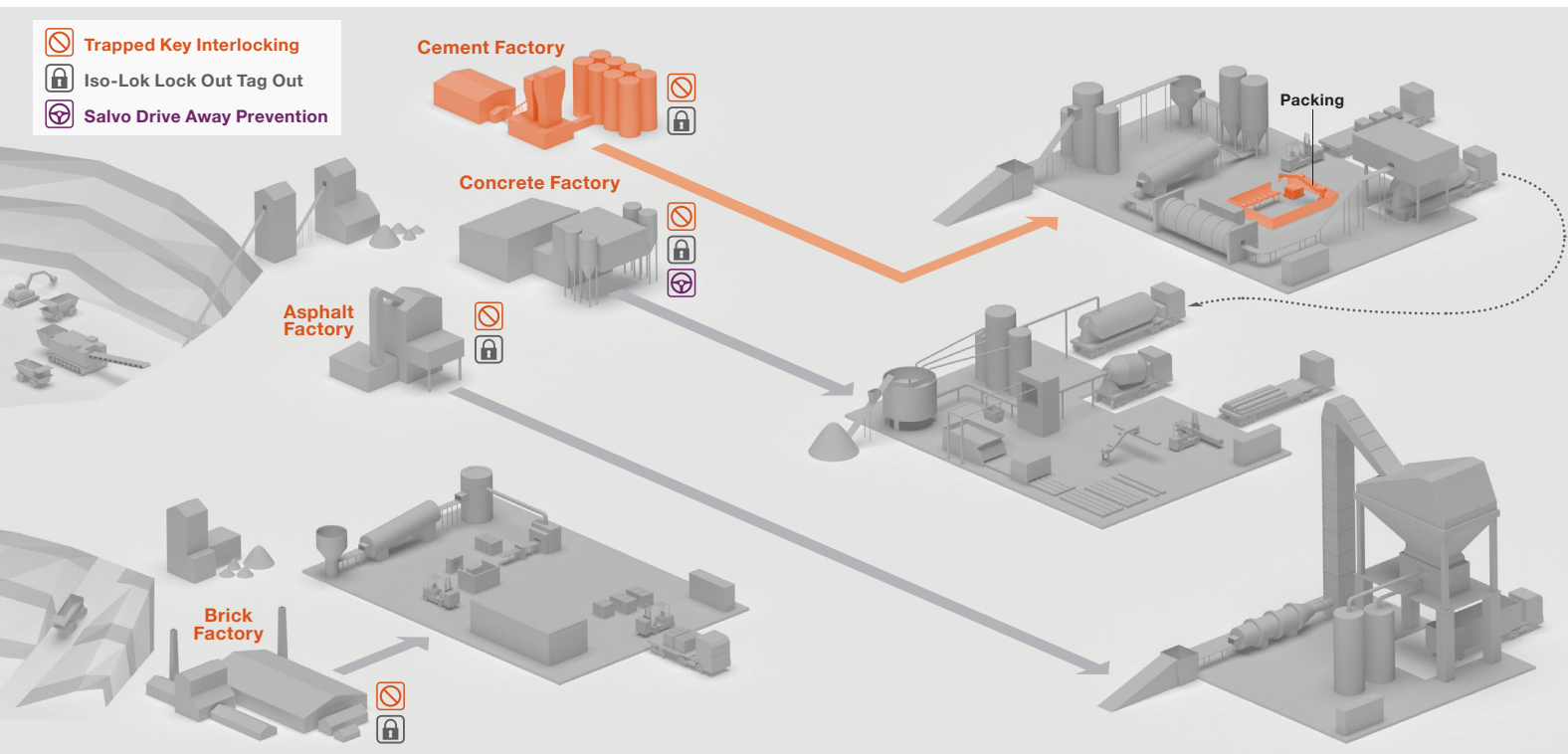
### The Risk

After material is bagged, the bags are weighed. If they are too light, they are automatically rejected from the conveyor. The bags are shredded, and the material passes back into the system to be bagged again. The bag shredder contains rotating blades that must be guarded while operational.



Trapped Key Interlocking

### Aggregates Industry



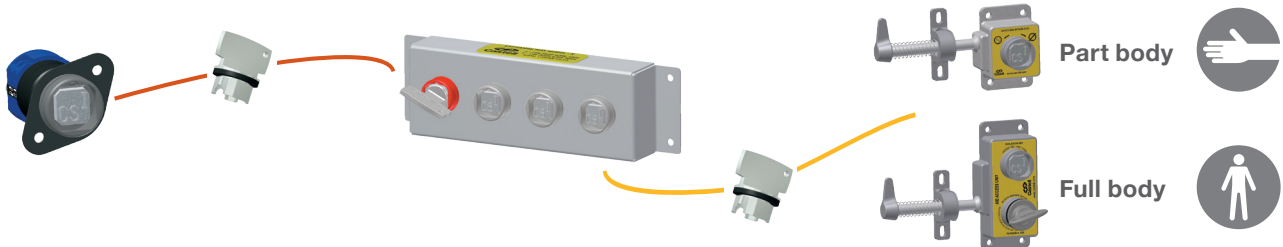
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### Castell Solution

#### 1 Isolation

#### 2 Key Exchange





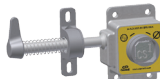




#### 3 Access Control

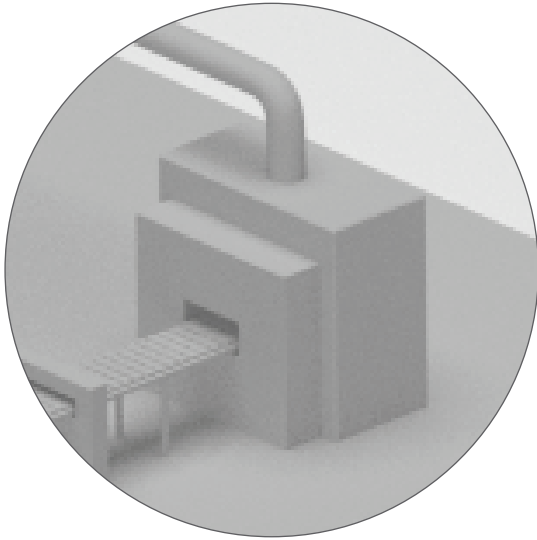


### Benefits

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### Products

Isolation		Exchange		Access	
Turning and releasing of the primary key isolates the blades of the bag shredder and cuts power to the rejection mechanism on the conveyor.		Where there are multiple points of entry and / or multiple points of isolation required an exchange box will be needed to enable multiple keys to be inserted prior to access keys being released.		The product used to control access has to be based on the access that can be gained, this will be either a part body or full body access lock.	
KS 	TDI 	X 	Y 	AI 	AIE 
BEMF 	DAE 	Z 			



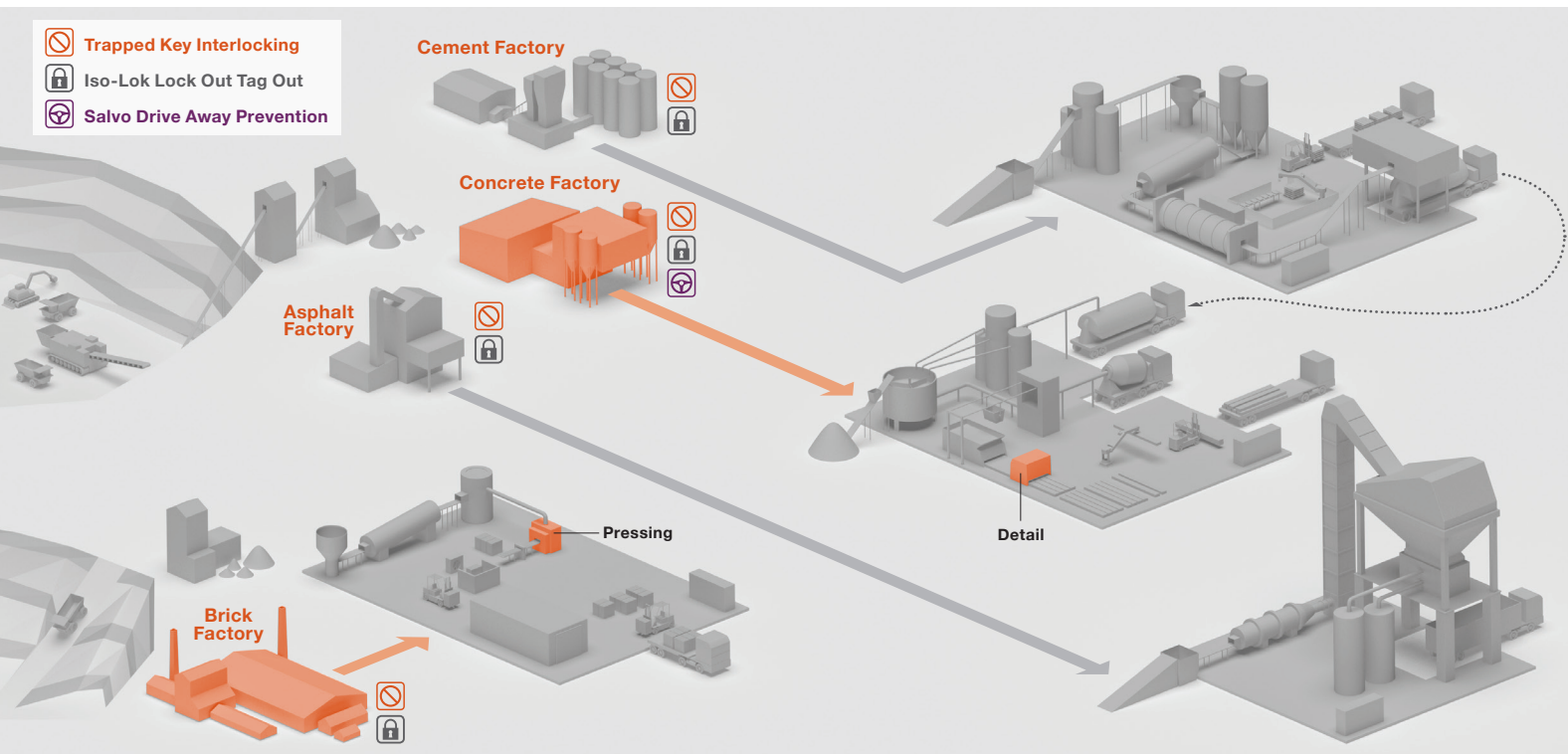
### The Risk

The press applies pressure to a set volume of concrete or clay to produce a regular shape. Large amounts of pressure are required to create the desired product, which presents a serious risk to operators.



Trapped Key Interlocking

### Aggregates Industry



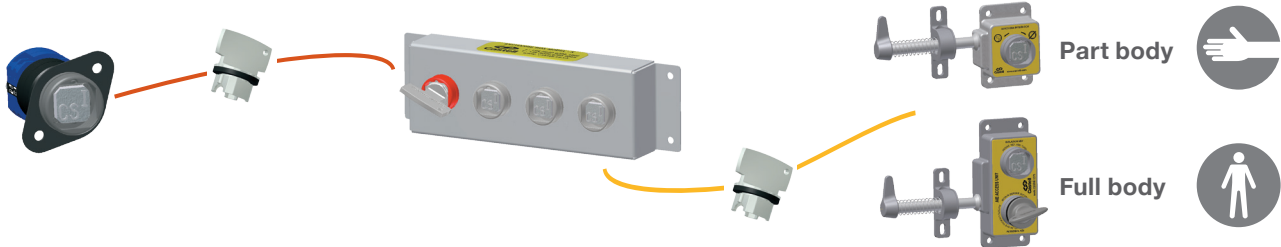
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### Castell Solution

#### 1 Isolation

#### 2 Key Exchange

#### 3 Access Control



### Benefits

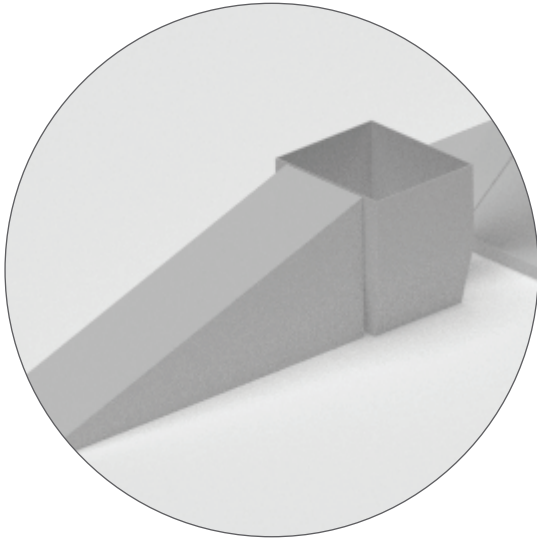
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### Products

Isolation		Exchange	Access	
By turning and releasing Key A from the control panel the electrical system will be deactivated. Key A is now transferred to the MBV air manifold stop valve. By introducing key A into the valve interlock, the valve can be turned and locked in the closed position. Key B can now be removed.		The exchange box allows multiple keys C to be released so access can be gained to multiple areas. These keys can only be released when key B is locked in position.	The product used to control access has to be based on the access that can be gained, this will be either a part body or full body access lock.	
K 	KS 	X 	AI-HD 	AIE-HD 
KSD 	MBV 			

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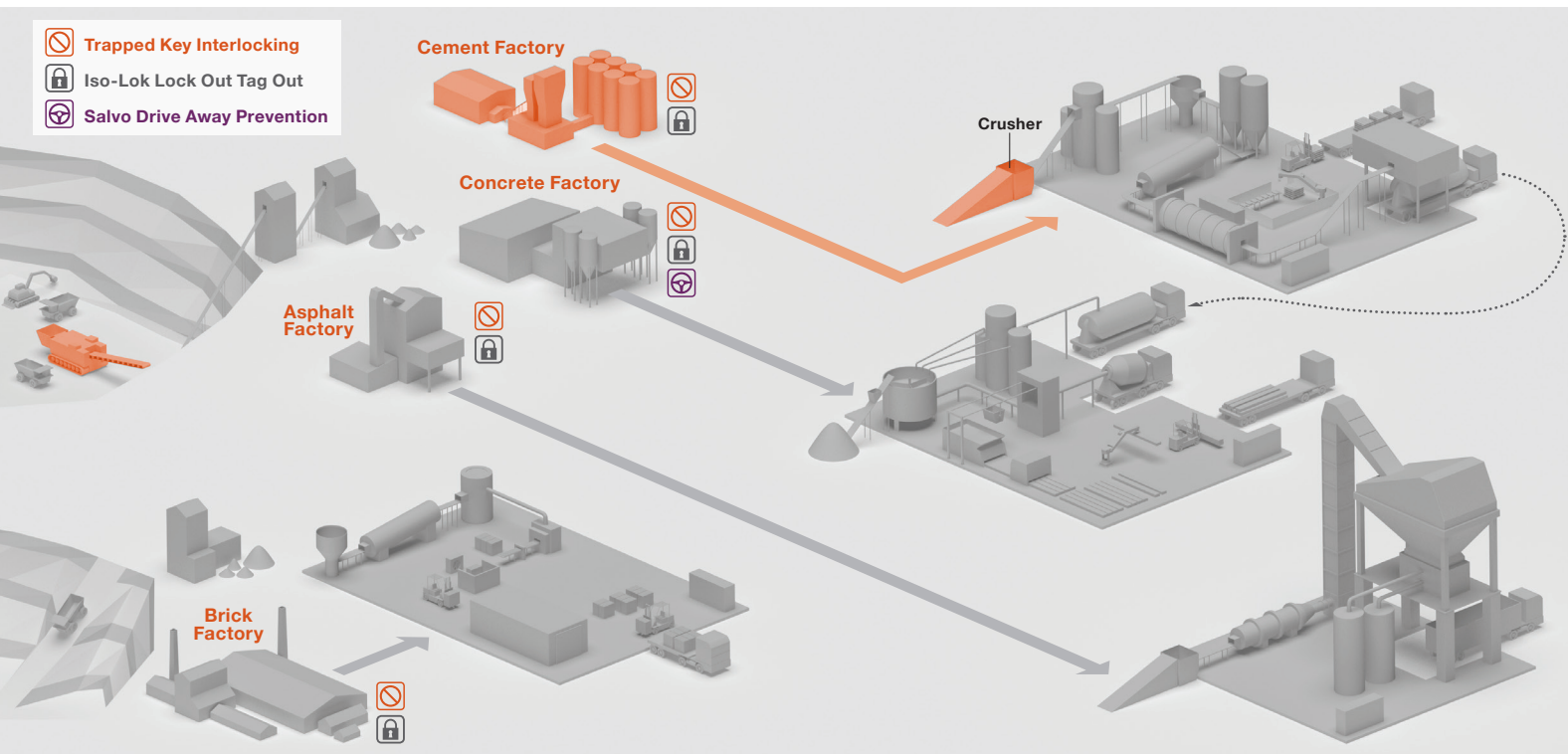
### The Risk

Crushing rock is an automated process that requires very powerful machinery. Access to the crushing jaws or rollers must be prevented while the machine is in an active state. There must also be guards in place as crushers can unexpectedly eject material.



Trapped Key Interlocking

### Aggregates Industry



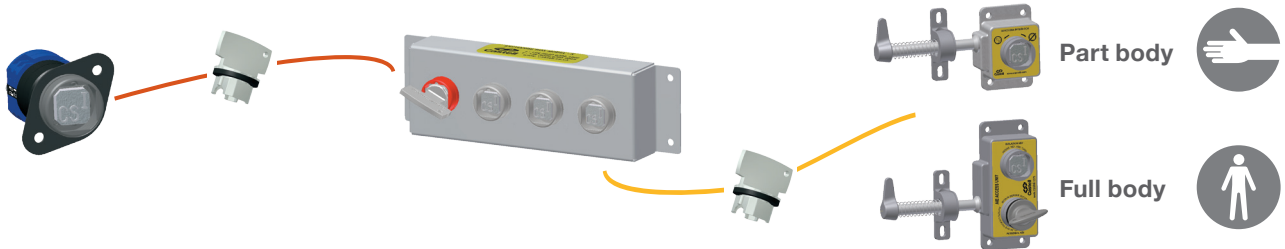
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### Castell Solution

#### 1 Isolation

#### 2 Key Exchange








#### 3 Access Control



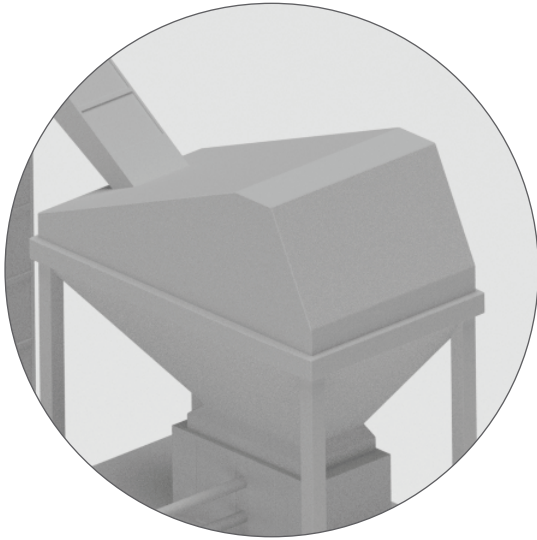
### Benefits

- 1) Extended system life, due to the stainless steel construction of housings and mechanisms, Castell interlock systems offer many years of trouble free operation.
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- 3) Downtime is reduced as access is mechanical.
- 4) By implementing a process rather than a procedure, efficiency is increased. The system is not dependent on verbal communication. The transfer of the key enables operators to know the status.

### Products

Isolation		Exchange	Access	
Isolation of the system will disable the crushing mechanism. Access to the crusher jaws must be prevented while the machine is in an active state. A very long time delay or motor sensing equipment may be used as crushers are often very high velocity.				
Where there are multiple points of entry and / or multiple points of isolation required an exchange box will be needed to enable multiple keys to be inserted prior to access keys being released.				
The access keys will allow access into the crushers jaws and release of the guards. The product used will depend on whether part body of full body access is required.				
KS 	TDI 	X 	AI-HD 	AIE-HD 
BEMF 	DAE 			

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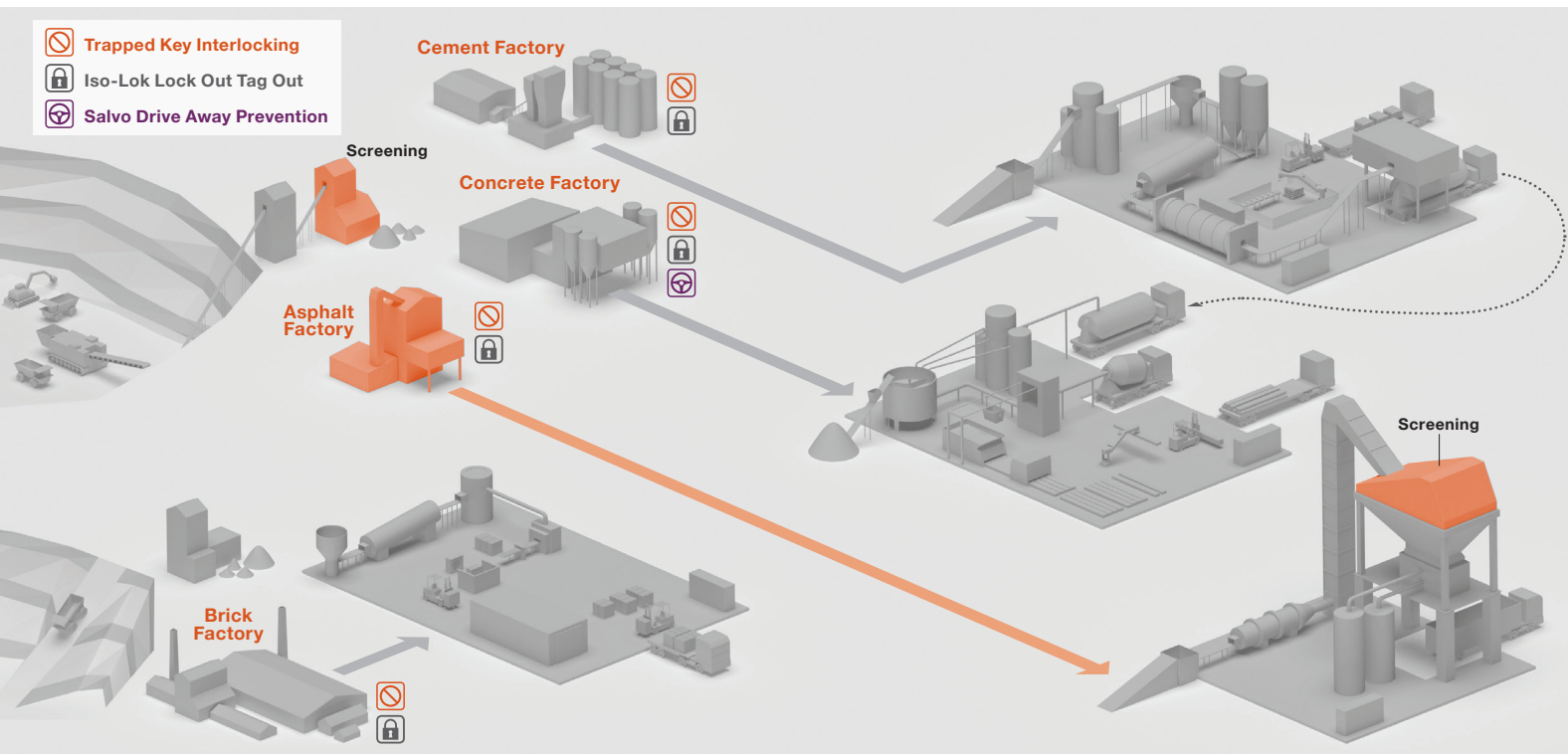
### The Risk

After being crushed, rocks are separated dependent on size. Screening decks are large vibrating platforms, usually directly connected to a conveyor system. The risk comes from the moving platform, and the rocks which are passing through the screen.



Trapped Key Interlocking

### Aggregates Industry



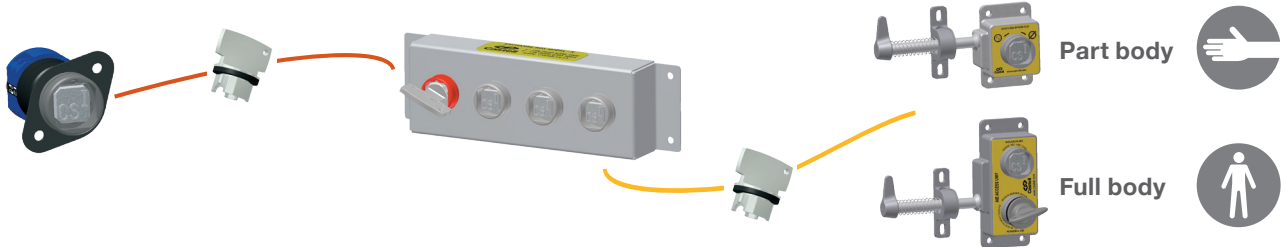
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### Castell Solution

#### 1 Isolation

#### 2 Key Exchange

#### 3 Access Control

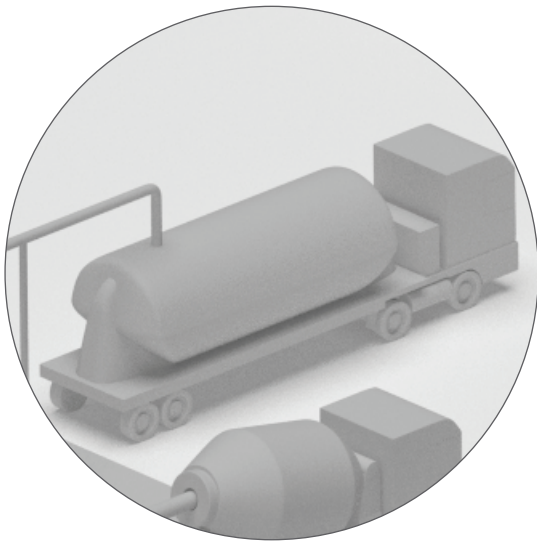


### Benefits

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- 3) Downtime is reduced as access is mechanical.
- 4) By implementing a process rather than a procedure, efficiency is increased. The system is not dependent on verbal communication. The transfer of the key enables operators to know the status.

### Products

Isolation		Exchange	Access	
Isolation of the system will disable the motors that power the vibrating decks. The conveyor that directly feeds the screening deck must be simultaneously isolated to avoid pile up of produce.		Where there are multiple points of entry and / or multiple points of isolation required an exchange box will be needed to enable multiple keys to be inserted prior to access keys being released.	The access keys will allow access into the crushers jaws and release of the guards. The product used will depend on whether part body or full body access is required.	
KSD 	KS 	X 	AI-HD 	AIE-HD 
K 				



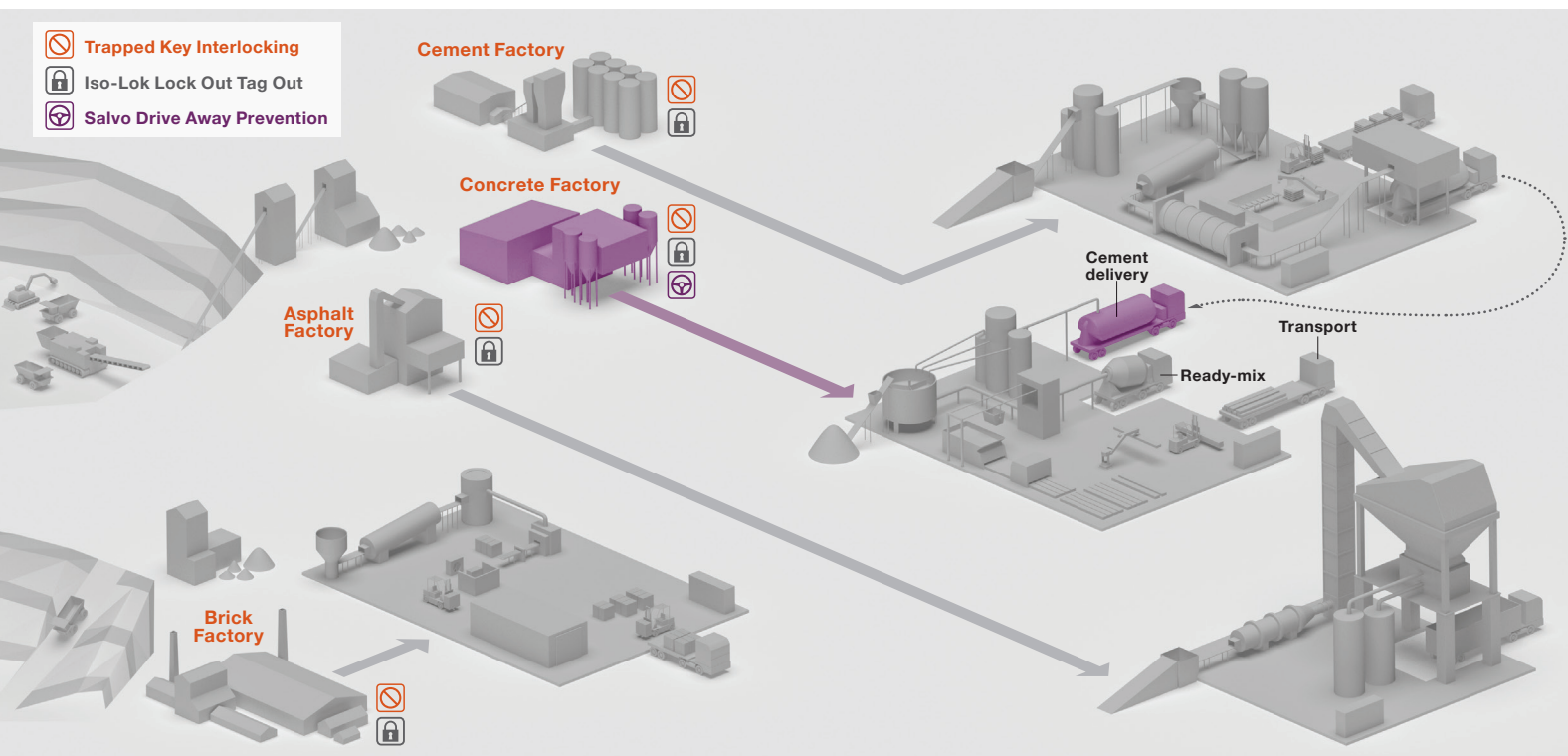
### The Risk

Loading and unloading tankers without an engineered safety mechanism can lead to the risk of driveaways and pulloffs whilst the cement is being transferred. This leads to risks of spills and asset damage.



Salvo Drive Away Prevention

### Aggregates Industry



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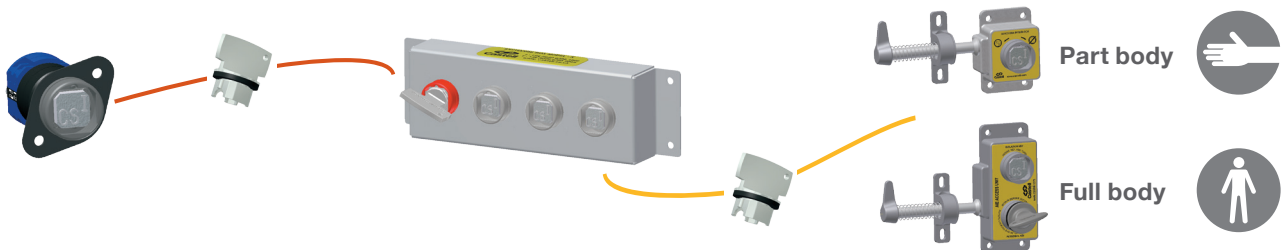


## Castell Solution

### 1 Isolation

### 2 Key Exchange







### 3 Access Control

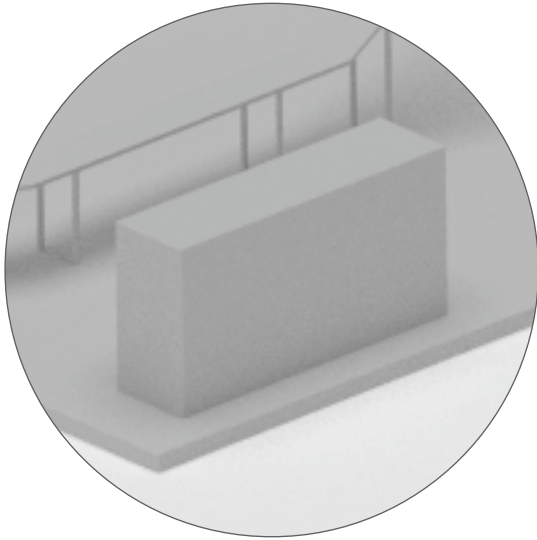


## Benefits

- 1) Improved safety, as the vehicle is immobilised while unloading is taking place.
- 2) Increased efficiency, as the loading is not dependent on verbal communication.
- 3) Reduced downtime, as equipment is not damaged by accidental driveaway.
- 4) Robust nature of the Castell safety products meaning the system can have many years of trouble free operation.

## Products

Isolation	Exchange	Access	
<p>The Salvo coupling is used on the emergency airline to isolate the vehicle. The key can only be removed when the Salvo coupling is fitted, this prevents access to the hose, transfer or gantry mechanism until the vehicle is safely locked in position.</p>	-	<p>The hose or transfer mechanism is prevented from being connected to the tanker until the vehicle is locked in position with the Salvo coupling. Additional keys can then be released to allow a valve to be operated, commencing the flow of cement from the truck.</p>	
<p>Salvo Coupling</p> 	-	<p>MBV</p> 	<p>KS</p> 
		<p>AI</p> 	<p>AIE</p> 
		<p>KSS</p> 	



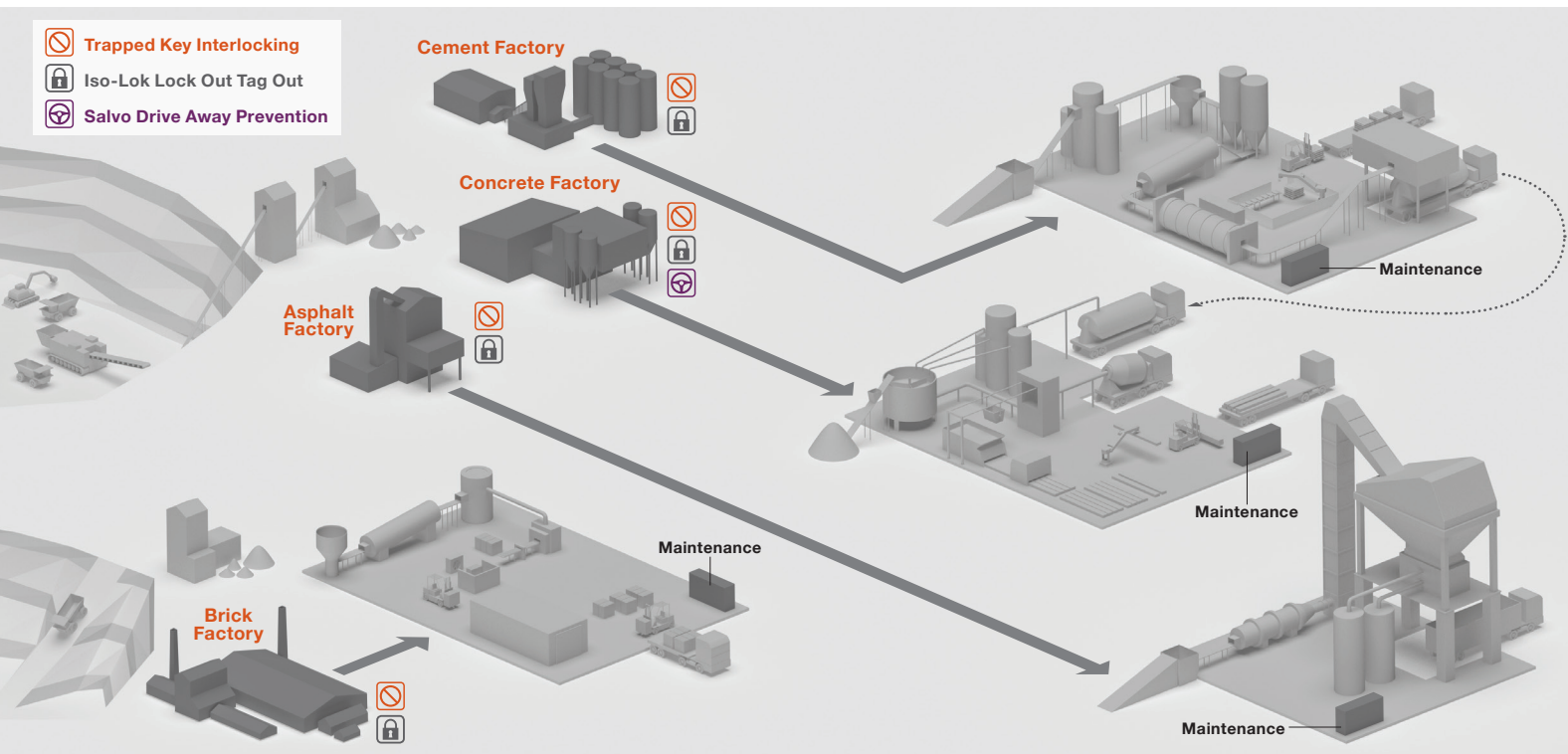
### The Risk

During maintenance, engineers can be working on an area of plant or equipment that is remote from the point of isolation. This may create hazards that are not normally present when the machinery is in normal operation.



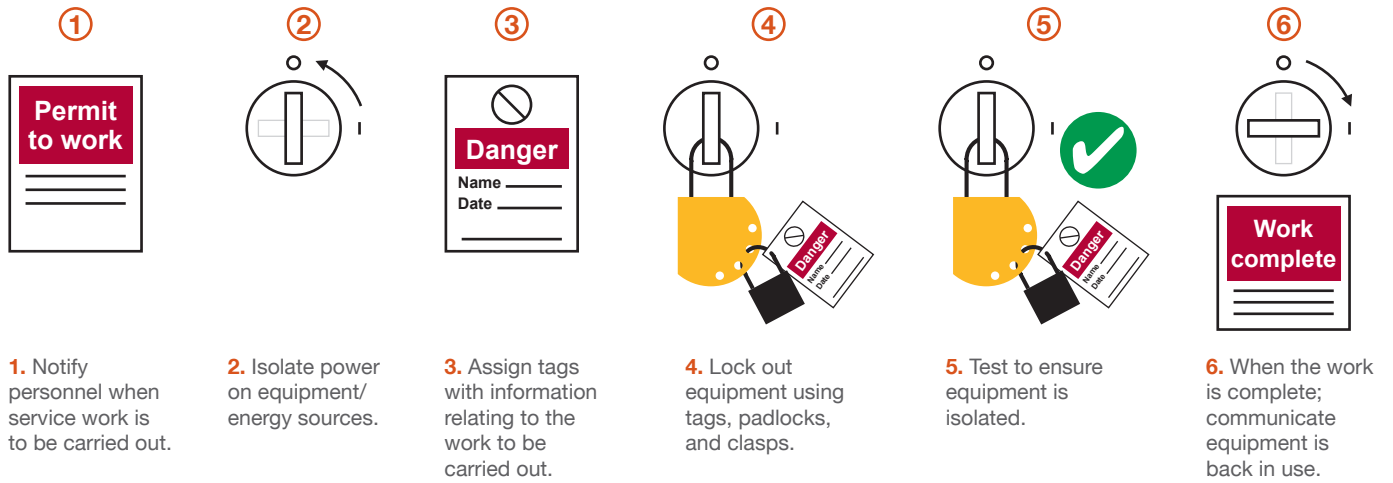
Iso-Lok Lock Out Tag Out

### Aggregates Industry



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### Castell Solution



### Benefits

- 1) Lock out tag out offers a lower level of safety compared to trapped key interlocks. This makes the system more suitable for engineering intervention.
- 2) Castell provide Iso-Lok padlocks in a range of materials including stainless steel and brass. This ensures protection can be provided whatever the environment demands.
- 3) Iso-Lok Padlocks are high quality hand built padlocks that are high integrity and are built to ensure that there is no chance of clashing (where one key fits a padlock with a different code).
- 4) Castell record all Iso-Lok differ codes for each padlock sold. This means that Castell can ensure that the same differ code is never shipped to a site unintentionally.

### Products

Isolation			
<p>The use of Iso-Lok padlocks and clasps can be used to isolate machinery by engineers. In a lock out tag out system where each engineer has individual padlocks the clasp allows each engineer working on the equipment to use their padlock to lock out the machine. This ensures the machine cannot be turned on until each engineer has finished their task and removed their padlock.</p>			
<p>Padlocks</p>	<p>Clasps</p>	<p>Cabinet</p>	
<p>Valve</p>		<p>Station</p>	

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