



# Measurement Solutions

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FOR THE CEMENT INDUSTRY

- **Level**
- **Pressure**
- **Linear Position**
- **Rotational Motion Control**
- **Cable Management**
- **Static Grounding**

# The Products You Need for the Cement Industry

## Guided Wave and Open Air Radar



DR Series Models w/ 2-wire output and easy 3-step setup process ■ Class I, Div 1, Zone 0 installation ■ 10, 24, & 80 GHz models ■ Stable measurement through agitated surfaces, foam, and fine dust in the tank ■ Probe types and materials for all applications

## Process Pressure Gauges



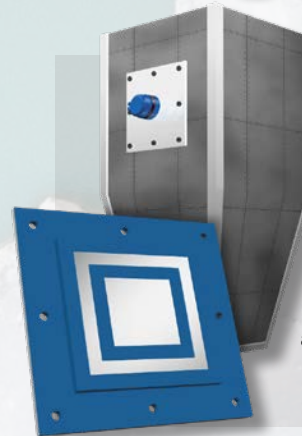
Solid Front case with 316L stainless steel seamless bourdon tube ■ Accuracy  $\pm 0.5$  of span ■ Available in liquid filled or fillable configurations ■ Diaphragm seals available to protect gauges and other instruments

## Point Level Detection



ThePoint or Intellipoint Models ■ Excellent in liquid, slurry or granular applications ■ Ignores coatings on the measurement probe ■ Switching relay or mA output ■ 2-wire or line powered ■ No calibration; easy to install

## Plugged Chute Detector



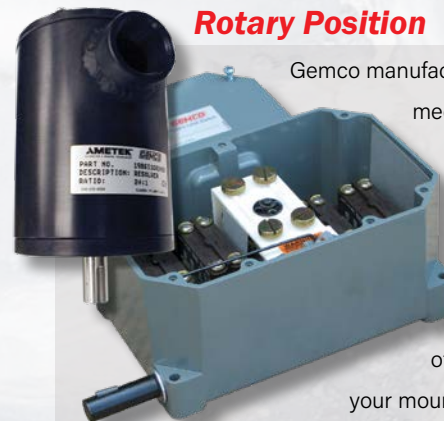
Unique sensor design does not interfere with flow of material ■ Cote-Shield™ technology eliminates false alarms due to coatings ■ Electronics can be mounted remotely, away from high vibration ■ Great for feed bin, conveyor, storage tanks and delivery chute applications

## Linear Position Feedback



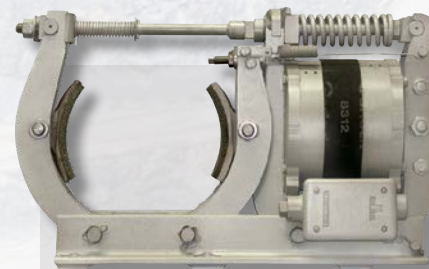
Rugged, magnetostrictive linear displacement transducers ■ Available in Rod, Profile, and Embedded style packages ■ A variety of outputs to meet your sensing needs ■ Most designs are lab tested to a shock resistance of 1,000 G's and vibration to 30 G's

## Rotary Position



Gemco manufactures a complete line of mechanical rotary limit switches that can provide end limits for moving machinery and mechanisms. We also offer absolute single and multi-turn resolvers in a variety of package styles to meet your mounting requirements.

## Industrial Brakes



Gemco Industrial brakes stop virtually any type of industrial machine. These field proven, high performance brake systems are tough, reliable, and provide trouble-free service. AISE rated and made in the U.S.A.

# Cement Manufacturing

**C**ement manufacturing is a complex process that begins with mining. Secondary processes include grinding raw materials such as limestone and clay into a fine powder, called raw meal, which is then heated to a very high sintering temperature that can be as high as 2,700°F (1,480°C) in a cement kiln. In this process, the chemical bonds of the raw materials are broken down and then they are recombined into new compounds. The result is called clinker, which are about the size of marbles. The clinker is ground to a fine powder in a cement mill and mixed with gypsum to create cement. The powdered cement is then mixed with water and aggregates to form concrete that is used in construction.

US domestic production of cement exceeds 100 million tons valued at over \$10 billion, most of which is used to make an estimated \$50 billion worth on concrete. The most common type of cement is Portland cement but there are over 20 different types to fulfill specialty requirements. From mining, crushing, and raw meal preparation to conveyor transport and silo storage, there are many processes that require critical measurements to ensure the proper handling of materials.

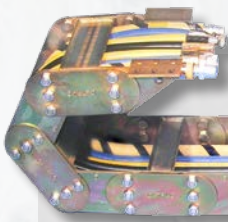
AMETEK is dedicated to helping our customers reliably measure level, pressure, temperature, and position in the harsh environmental conditions of the cement industry.

**We thank you** for considering AMETEK Sensors' products, and we appreciate the opportunity to provide you with the very best in measurement solutions. We are committed to providing you with:

- Best level, pressure and position measurement expertise in the industry
- Best value in the most state of the art instrumentation
- Best customer support and service
- Widest breadth of technologies
- Highest possible product quality
- Best in class products

AMETEK Sensors, Test and Calibration is known worldwide as a premiere manufacturer of high quality instrumentation. We have earned our reputation as a world leader by providing reliable and accurate solutions to the most demanding applications in virtually every industry. It is the purpose of AMETEK Sensors, and our worldwide network of representatives and distributors, to provide the best possible owner experience from our products and solutions.


We pledge to provide you with a quality solution based on over 50 years of field experience that will be perfectly suited for your application.



**Cable Management Systems**

Series 8060 Catrac Model

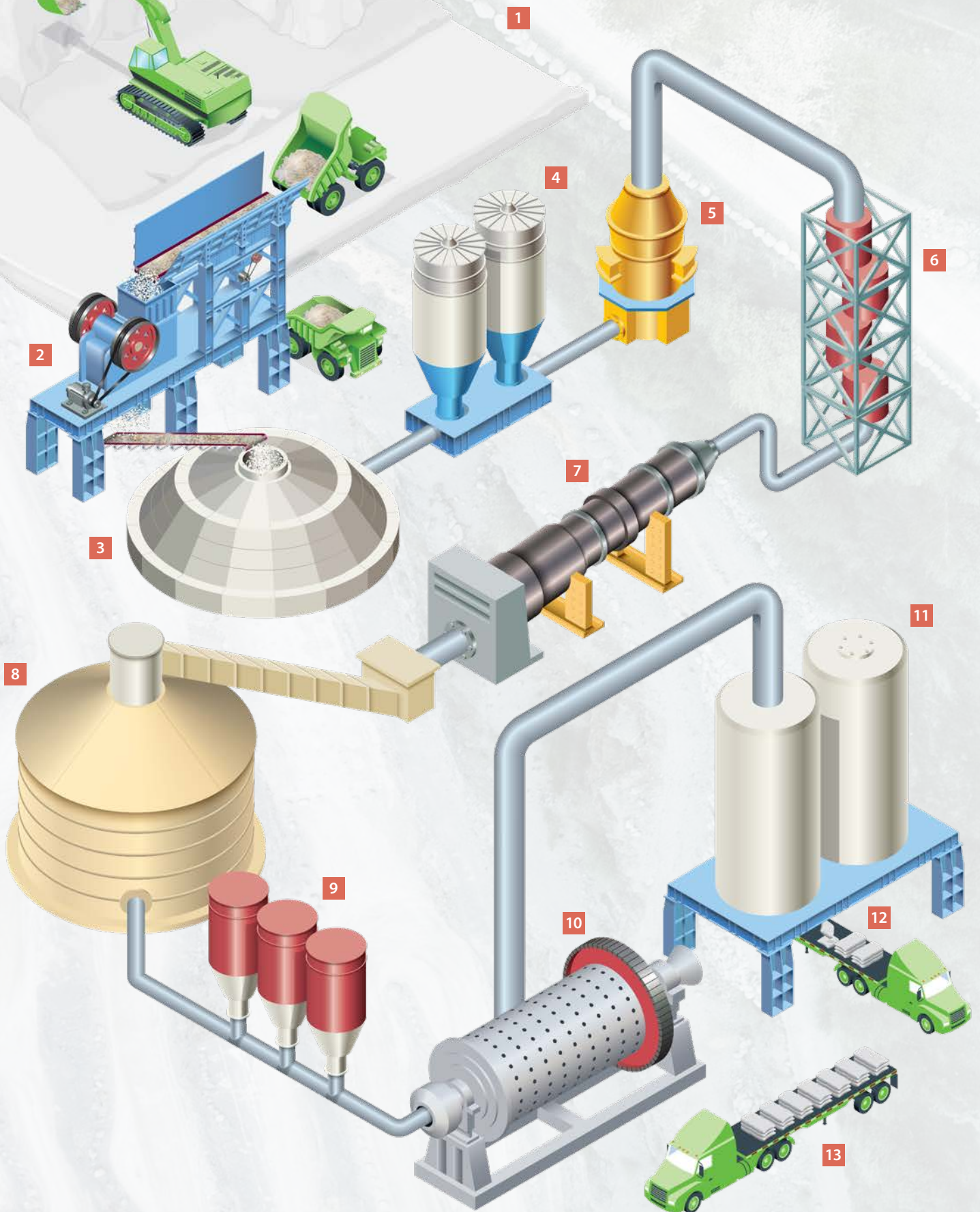
- Protects cables and hoses from abrasion, wear and twisting for machines in motion
- Durable Steel construction to withstand severe hydraulic loads
- Available in a variety of heights, widths, lengths, and materials to meet your needs



**Rota-Reel**

- Compact and light weight
- Ruggedly built for reliable performance
- Internal spring mechanism provides easy extension and automatic retraction
- Perfect for static grounding of mobile equipment during loading and unloading

# Cement Process Technology





	APPLICATION	MEASUREMENT	AMETEK SOLUTION
1	Quarrying Limestone and Heavy Equipment Requirements	Accurate position of hydraulic cylinders	Model 958 Embedded & Compact Housing LDTs
		Rotation control on shovel position and Deflection measurements on booms	Resolvers, 955 Brik LDT
		Rotary position	2000 / 2006 Rotary Limit Switch (General Purpose and Hazardous Environments)
		Quarry Pile	DR6400 Open Ar Radar
		Brake control on rail cars and end limit determination during mineral dumps	Brakes and 1980 Cam Boxes
2	Crushing Limestone (Primary & Secondary Crusher, Screen and Mill)	Primary Crusher Bulk solids overflow protection.	<b>LEVEL:</b> ThePoint Level Switch; Plug Chute Detector; Intellipoint Level Switch; DR7100 GWR; DR6400/DR6500 Radar; Clearline Pump Protection
		Blockage	<b>PRESSURE &amp; TEMPERATURE:</b> Model 1981 Solid Front Pressure Gauges and Diaphragm Seals, and Model ADJ or BAC Bimetallic Thermometers and Thermowells
		High level	
		Continuous level monitoring and pump protection	<b>POSITION:</b> 955 Brik and 950MD/953VMax Linear Displacement Transducer
3	Conveyor Transport, Storage and Pre-homogenization of Raw Material	Bulk solids and liquids total level and overflow protection	<b>LEVEL:</b> ThePoint Level Switch; Plug Chute Detector; Intellipoint Level Switch; DR7100 Guided Wave Radar; DR7400/DR7500 & DR6400/DR6500 Open Air Radar; Clearline Pump Protection
		Blockage	<b>PRESSURE &amp; TEMPERATURE:</b> Model 1981 Solid Front Pressure Gauges and Diaphragm Seals, and Model ADJ or BAC Bimetallic Thermometers and Thermowells
		Storage Tank Pressure & Temperature	
4	Proportioning Equipment—proportioning of limestone and clay before grinding. Raw mix is stored in a pre-homogenization pile after grinding raw mix to fine powder	Level of limestone, clay and pre-homogenization pile	<b>LEVEL:</b> ThePoint & Intellipoint Level Switch; DR7100 Guided Wave Radar; DR6400/DR6500 Open Air Radar
5	Raw Mill	Silo Level	<b>LEVEL:</b> ThePoint & Intellipoint Level Switch; DR7100 Guided Wave Radar; DR6400/DR6500 Open Air Radar
6	Preheater Tower—Pre-heater chamber consists of series of vertical cyclones from where the raw material passes before facing the kiln. Pre-heating chamber utilizes hot gas emissions from kiln	Temperature and Pressure	<b>PRESSURE &amp; TEMPERATURE:</b> Model 1981 Solid Front Pressure Gauges and Diaphragm Seals, and Model ADJ or BAC Bimetallic Thermometers and Thermowells

	APPLICATION	MEASUREMENT	AMETEK SOLUTION
7	Kiln—Raw material is heated up to 1450°C. High temperature of kiln makes slurry of the material. Kiln heating on the exit side by the use of natural gas and coal.	Silo Level for Coal Measurement and Temperature	<b>LEVEL:</b> ThePoint & Intellipoint Level Switch; DR7100 Guided Wave Radar; DR6400/DR6500 Open Air Radar <b>TEMPERATURE:</b> Model ADJ or BAC Bimetallic Thermometers and Thermowells
8	Clinker Cooling and Storage	Clinker Silo Level	<b>LEVEL:</b> ThePoint & Intellipoint Level Switch; DR7100 Guided Wave Radar; DR6400/DR6500 Open Air Radar
		Pressure & Temperature	<b>PRESSURE &amp; TEMPERATURE:</b> Model 1981 Solid Front Pressure Gauges and Diaphragm Seals, and Model ADJ or BAC Bimetallic Thermometers and Thermowells
9	Secondary Additives and Proportioning	Bulk Solids and Liquids Storage Levels	<b>LEVEL:</b> ThePoint & Intellipoint Level Switch; DR7100 Guided Wave Radar; DR7400/DR7500 & DR6400/DR6500 Open Air Radar
10	Grinding Mill	Bulk Solids Level	<b>LEVEL:</b> ThePoint & Intellipoint Level Switch; DR7100 Guided Wave Radar; DR6400/DR6500 Open Air Radar
11	Storage	Bulk solids and liquids total level and overflow protection	<b>LEVEL:</b> ThePoint Level Switch; Plug Chute Detector; Intellipoint Level Switch; DR7100 Guided Wave Radar; DR7400/DR7500 & DR6400/DR6500 Open Air Radar; Clearline Pump Protection
		Blockage	<b>PRESSURE &amp; TEMPERATURE:</b> Model 1981 Solid Front Pressure Gauges and Diaphragm Seals, and Model ADJ or BAC Bimetallic Thermometers and Thermowells
		Storage Tank Pressure & Temperature	
12	Bagging and Dispatch	Bulk Solids	<b>LEVEL:</b> DR7100 Guided Wave Radar; DR6400/DR6500 Open Air Radar
		Blockage	<b>LEVEL:</b> Plug Chute Detector
		Packaging	<b>POSITION:</b> 955 Brik and 950MD/953VMax Linear Displacement Transducer
		Temperature and Pressure	<b>PRESSURE &amp; TEMPERATURE:</b> Model 1981 Solid Front Pressure Gauges and Diaphragm Seals, and Model ADJ or BAC Bimetallic Thermometers and Thermowells
13	Transportation	Loading & Unloading	<b>LEVEL:</b> ThePoint Level Switch; Plug Chute Detector; Intellipoint Level Switch; DR7100 GWR; DR6400/DR6500 Radar; Clearline Pump Protection
		Static Grounding for transport trucks (Bonding & Grounding)	<b>HUNTER:</b> 700-50R and 200-20R Rota-Reel Static Bonding Reels



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