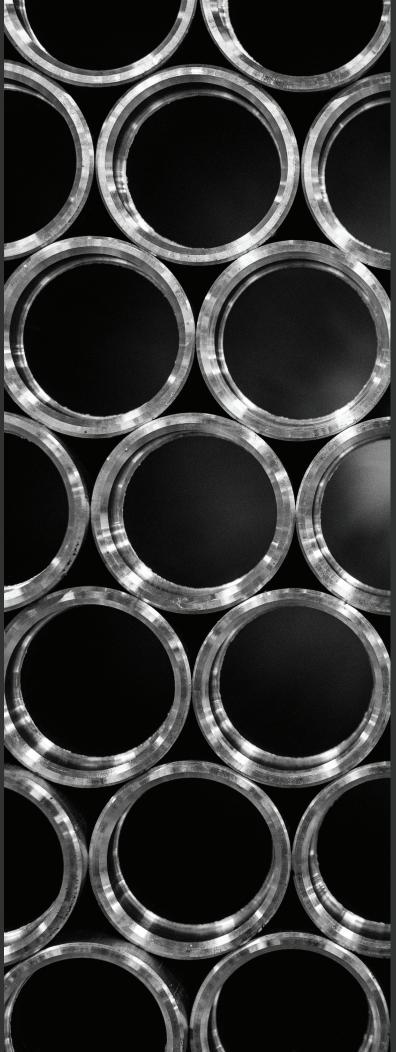


# WEKEP IT MOVING

**ENGINEERED PULLEYS & IDLERS** 

**LARGE PROJECTS** 



Operations around the world demand efficient and reliable systems. Customers are looking for components they can count on when they need them. That is exactly what PPI offers.

PPI components can be used in a wide range of applications from 1 to 10,000 horsepower. Customers around the globe trust PPI conveyor components.

Our promise is simple, provide quality products with a competitive price and unbeatable customer service.

Whether the requirements of your operation are underground or above, PPI is your partner supplying components that will support your productivity goals from beginning to end.



PPI is a world renowned provider of conveyor components and solutions. It is this reputation that drives customers to use PPI pulleys and idlers when reliability is vital.

Manufacturing is at the core of what we do. Investment in state-of-the-art technology and qualified employees assure we remain a leader in providing the highest quality products with the shortest lead times in the industry.

#### IN HOUSE CAPABILITIES

- Shaft machining up to 28" (711mm) in diameter and 315" (8001mm) long
- Vulcanized lagging up to 72" (1829mm) diameter and 192" (4877mm) face width
- Roll rims from plate up to 2" (51mm) thick and up to 120" (3048mm) in diameter
- Special surface protection
- Cast urethane lagging for pulleys
- Total Indicator Run-out (TIR) and roll drag testing for idlers
- Testing and reporting for customer directed inspections
- Thermal stress relief of pulleys up to 72" (1829mm) diameter and 120" (3048mm) face width

#### **ENGINEERING AND TECHNICAL SUPPORT**

A dedicated engineering team utilizing PFEA and P-FLEX to optimize each design. Custom engineering services available

#### FIELD TECHNICAL SUPPORT

Field Service Technicians in the United States, Canada and South America. These resources are available for troubleshooting, surveying and site visits providing complete service from beginning to end.

#### PRODUCT DESIGN

Offering multiple design options including profiled end disc and turbine designs for maximum product predictability and strength

"This manufacturing approach allows us to be very focused, but it also gives greater flexibility to react quickly to the customer needs."

- Roger A. Brown. President of PPI



# **PULLEY PROJECTS**

When it comes to large pulleys no other manufacturer is as well equipped to produce solutions to the world's most challenging applications as PPI. From extreme belt tensions and massive sizes to some of the coldest conveying environments on earth, PPI has the expertise and experience to keep operations up and running.



# PULLEY PROJECT HISTORY

In addition to the ability to produce highly engineered pulleys for the most demanding applications, PPI has the manufacturing capabilities to produce them in unmatched quantities. Below is a sampling of some of the projects PPI has successfully completed around the world.

| 00 pi c |   | accirca quarion |                    |  |  |
|---------|---|-----------------|--------------------|--|--|
| YEAR    | PROJECT NAME                                  | LOCATION        | QTY. OF<br>PULLEYS |  |  |
| 2019    | Aktogay 2                                     | Kazakhstan      | 61                 |  |  |
| 2019    | Cliffs Toledo                                 | USA             | 86                 |  |  |
| 2019    | Eagle Gold                                    | Canada          | 63                 |  |  |
| 2019    | Oyu Tolgoi                                    | Mongolia        | 11                 |  |  |
| 2019    | Spence  | Chile           | 61                 |  |  |
| 2018    | Baffinland                                    | Canada          | 39                 |  |  |
| 2018    | Chuquicamata                                  | Chile           | 39                 |  |  |
| 2017    | G3 Vancouver                                  | Canada          | 90                 |  |  |
| 2016    | Nordgold Gross                                | Russia          | 121                |  |  |
| 2015    | Oxidos Encuentro                              | Chile           | 66                 |  |  |
| 2015    | Vulcan Materials<br>Stockbridge               | USA             | 241                |  |  |
| 2014    | Belneftegaz                                   | Belarus         | 71                 |  |  |
| 2014    | Cerro Verde                                   | Peru            | 31                 |  |  |
| 2014    | Copper Mountain                               | Canada          | 22                 |  |  |
| 2014    | Gahcho Kue                                    | Canada          | 72                 |  |  |
| 2014    | Morenci SWLP                                  | USA             | 132                |  |  |
| 2014    | Quebalix 4                                    | Mexico          | 20                 |  |  |
| 2014    | Shougang                                      | Peru            | 42                 |  |  |
| 2014    | Viterra Terminals                             | Canada          | 15                 |  |  |
| 2013    | Aktogay                                       | Kazakhstan      | 61                 |  |  |
| 2013    | Bozshakol                                     | Kazakhstan      | 51                 |  |  |
| 2013    | Buenavista<br>Concentrator 2                  | Mexico          | 94                 |  |  |
| 2013    | Deepwater<br>Bulk Terminal                    | USA             | 91                 |  |  |
| 2013    | Eleonore Mine                                 | Canada          | 125                |  |  |
| 2013    | Escondida OGP1                                | Chile           | 61                 |  |  |
| 2013    | Hycroft Mine                                  | USA             | 64                 |  |  |
| 2013    | International Marine<br>Terminal Laydown Yard | USA             | 35                 |  |  |
| 2013    | Las Bambas                                    | Peru            | 83                 |  |  |
| 2013    | Morenci 55k                                   | USA             | 128                |  |  |
| 2013    | Neptune Terminals                             | Canada          | 27                 |  |  |
| 2013    | Port of Sept-iles                             | Canada          | 78                 |  |  |
| 2012    | Agrium Vanscoy                                | Canada          | 58                 |  |  |
| 2012    | Bloom Lake                                    | Canada          | 62                 |  |  |
| 2012    | Burnside Terminals                            | USA             | 19                 |  |  |
| 2012    | Cerrejon                                      | Colombia        | 6                  |  |  |
| 2012    | Cerro Verde                                   | Peru            | 189                |  |  |
| 2012    | Conga   | Peru            | 59                 |  |  |
| 2012    | Constancia                                    | Peru            | 34                 |  |  |
| 2012    | Cormin Callao                                 | Peru            | 62                 |  |  |
| 2012    | Escondida OLAP                                | Chile           | 26                 |  |  |
| 2012    | Highland Valley Copper                        | Canada          | 16                 |  |  |
| 2012    | Imperial Oil Kearl                            | Canada          | 10                 |  |  |
| 2012    | International Marine<br>Terminal Northyard    | USA             | 33                 |  |  |
| 2012    | Ministro Hales                                | Chile           | 76                 |  |  |
| 2012    | Mount Milligan                                | Canada          | 35                 |  |  |
| 2012    | Ridley Terminals                              | Canada          | 71                 |  |  |
| 2012    | Tygart Valley Complex                         | USA 78          |                    |  |  |
|         |   |                 |                    |  |  |

| s a sampling of some of the projects PPI has suc |                                   |                 |                    |  |  |  |  |
|--|-----------------------------------|-----------------|--------------------|--|--|--|--|
|  |                                   |                 |                    |  |  |  |  |
| YEAR   | PROJECT NAME                      | LOCATION        | QTY. OF<br>PULLEYS |  |  |  |  |
| 2011   | Camak Quarry                      | USA             | 118                |  |  |  |  |
| 2011   | Caserones                         | Chile           | 96                 |  |  |  |  |
| 2011   | Cerro Verde                       | Peru            | 4                  |  |  |  |  |
| 2011   | Gilgel Gibe                       | Ethiopia        | 124                |  |  |  |  |
| 2011   | International Marine              | USA             | 23                 |  |  |  |  |
| 2011   | IOC Concentrator                  | Canada          | 15                 |  |  |  |  |
| 2011   | Lomas Bayas                       | Chile           | 33                 |  |  |  |  |
| 2011   | Long Harbour Nickel               | Canada          | 62                 |  |  |  |  |
| 2011   | Mildred Lake                      | Canada          | 32                 |  |  |  |  |
| 2011   | Mina Ministro Hales               | Chile           | 30                 |  |  |  |  |
| 2011   | Pascua Lama                       | Chile/Argentina | 99                 |  |  |  |  |
| 2011   | Penasquito                        | Mexico          | 7                  |  |  |  |  |
| 2011   | PT Kaltim Prima Coal              | Indonesia       | 123                |  |  |  |  |
| 2011   | Tutupan                           | Indonesia       | 46                 |  |  |  |  |
| 2010   | Antamina                          | Peru            | 29                 |  |  |  |  |
| 2010   | Antapaccay                        | Peru            | 21                 |  |  |  |  |
| 2010   | El Teniente                       | Chile           | 18                 |  |  |  |  |
| 2010   | Endako                            | Canada          | 29                 |  |  |  |  |
| 2010   | Escondida                         | Chile           | 16                 |  |  |  |  |
| 2010   | Gualcamayo                        | Argentina       | 19                 |  |  |  |  |
| 2010   | New Afton                         | Canada          | 53                 |  |  |  |  |
| 2010   | Pointe Noire Facility             | Canada          | 47                 |  |  |  |  |
| 2010   | Suncoke - Middletown              | USA             | 96                 |  |  |  |  |
| 2010   | Toromocho                         | Peru            | 39                 |  |  |  |  |
| 2009   | Ambatovy                          | Madagascar      | 15                 |  |  |  |  |
| 2009   | Bayovar                           | Peru            | 32                 |  |  |  |  |
| 2009   | Collahuasi Pebbles<br>Project     | Chile           | 34                 |  |  |  |  |
| 2009   | Gabriela "Gaby" Mistral           | Chile           | 25                 |  |  |  |  |
| 2009   | John W. Turk Jr.<br>Power Station | USA             | 53                 |  |  |  |  |
| 2009   | Los Pelambres                     | Chile           | 55                 |  |  |  |  |
| 2009   | Ma'Aden Ras al Khair              | Saudi Arabia    | 149                |  |  |  |  |
| 2009   | Tia Maria                         | Peru            | 144                |  |  |  |  |
| 2009   | Trekkopje                         | South Africa    | 13                 |  |  |  |  |
| 2008   | Aitik Mine                        | Sweden          | 24                 |  |  |  |  |
| 2008   | Andina                            | Chile           | 65                 |  |  |  |  |
| 2008   | Bailey - Crabapple                | USA             | 18                 |  |  |  |  |
| 2008   | Buenavista Quebalix 3             | Mexico          | 44                 |  |  |  |  |
| 2008   | CNRL - Horizon                    | Canada          | 18                 |  |  |  |  |
| 2008   | Cortez Hills                      | USA             | 40                 |  |  |  |  |
| 2008   | El Abra                           | Chile           | 177                |  |  |  |  |
| 2008   | Haverhill North Coke              | USA             | 79                 |  |  |  |  |
| 2008   | latan Generating                  | USA             | 103                |  |  |  |  |
|  | Station  Martin Marietta Augusta  |                 | 213                |  |  |  |  |
| 2008   | Midway Coal                       | USA             | 110                |  |  |  |  |
| 2008   | Oyu Tolgoi                        | Mongolia        | 61                 |  |  |  |  |
| 2008   | Penasquito                        | Mexico 74       |                    |  |  |  |  |
| 2008   | Prairie State                     | USA             | 86                 |  |  |  |  |
|  | Generating Station                | 33/1            |                    |  |  |  |  |

| esstully completed around the world. |                            |                |                    |  |  |  |
|--------------------------------------|----------------------------|----------------|--------------------|--|--|--|
| YEAR                                 | PROJECT NAME               | LOCATION       | QTY. OF<br>PULLEYS |  |  |  |
| 2008                                 | Springerville Unit 4       | USA            | 57                 |  |  |  |
| 2007                                 | Andacollo                  | Chile          | 32                 |  |  |  |
| 2007                                 | Black Thunder              | USA            | 11                 |  |  |  |
| 2007                                 | Comanche Unit 3            | USA            | 74                 |  |  |  |
| 2007                                 | Gabriela "Gaby" Mistral    | Chile          | 22                 |  |  |  |
| 2007                                 | North Antelope<br>Rochelle | USA            | 30                 |  |  |  |
| 2007                                 | Safford                    | USA            | 153                |  |  |  |
| 2007                                 | Veladero                   | Argentina      | 29                 |  |  |  |
| 2006                                 | AEP - Mountaineer          | USA            | 75                 |  |  |  |
| 2006                                 | Belle Ayre                 | USA            | 32                 |  |  |  |
| 2006                                 | Cerro Verde                | Peru           | 67                 |  |  |  |
| 2006                                 | CNRL - Horizon             | Canada         | 27                 |  |  |  |
| 2006                                 | Gabriela "Gaby" Mistral    | Chile          | 72                 |  |  |  |
| 2006                                 | Muskeg River<br>Oil Sands  | Canada         | 11                 |  |  |  |
| 2006                                 | Roxboro Plant              | USA            | 94                 |  |  |  |
| 2005                                 | BHP Spence                 | Chile          | 82                 |  |  |  |
| 2005                                 | Cerro Verde                | Peru           | 32                 |  |  |  |
| 2005                                 | Chuquicamata               | Chile          | 45                 |  |  |  |
| 2005                                 | Cowal Gold                 | Australia      | 30                 |  |  |  |
| 2005                                 | Port of Immingham          | United Kingdom | 99                 |  |  |  |
| 2005                                 | San Cristobal              | Bolivia        | 36                 |  |  |  |
| 2005                                 | Suncor Steepbank           | Canada         | 15                 |  |  |  |
| 2005                                 | Syncrude SWQR              | Canada         | 14                 |  |  |  |
| 2004                                 | El Refugio                 | Chile 82       |                    |  |  |  |

# **QUALITY PULLEY CHARACTERISTICS**

BALANCING – Balancing specifications define the maximum amount of pulley imbalance acceptable for the application. The International Standards Organization (ISO) specification ISO 1940/1 is typically used as a guide for pulley balancing by pulley manufacturers. Typically, pulleys are static balanced to bring them into specification.

BEARING HOUSINGS – Evaluations are performed based on imposed loads, operating environment, operational speeds and customer preference. Split pillow block housings in various types, such as; SAF, SAFD, SDAF, SNG and SDCD are common. Housings are available in cast iron, ductile iron and cast steel.

END DISC – End disc design relates to the selection of end disc material composition, thickness, shape and hub configuration for the conveyor pulley. As with shaft selection, the key to end disc design is the ability to predict the stresses in the end disc assembly, and then limit them within acceptable parameters by the selection of disc thickness, disc material, shape and weld methods (if utilized).

LAGGING – Vulcanized in-house with our extruder system and auto-clave. Multiple rubber compounds available depending on application, thicknesses, hardness, and groove options available. Rubber lagging can be machined to meet customer TIR requirements. Ceramic lagging available in two forms; pads installed in hot-vulcanized and cold-bond method or Vulcanized Engineered Ceramic (VEC). In-house urethane lagging offered for demanding applications where high temperature, high abrasion, and oil and chemicals are a concern.

LINE BORING – Line boring is used for many high tension pulleys with locking assemblies to improve hub alignment and shaft run out. PPI line bores all pulleys with locking assemblies 9.44882" (240 mm) or larger.

LOCKING ASSEMBLY – While the XT® hubs and bushings provide reliability and a cost effective method of attaching pulleys to a shaft on conventional pulleys, keyless locking assemblies are often used on high tension pulleys. The selection of a shaft to pulley connection is extremely critical as it must transmit not only the torque but also the bending loading between shaft and pulley. For high tension pulley systems, PPI recommends keyless locking assemblies. While generally used on shafts 12 inches (305mm) or greater in diameter, they are available from less than an inch (20mm) to over 23 inches (600mm), larger upon request.

NON-DESTRUCTIVE TESTING – Nondestructive testing methods are often performed on pulley welds to insure quality. Methods such as Ultrasonic Testing, Magnetic Particle Testing, Charpy Testing and Dye Penetrant Testing are the common nondestructive test procedures used by pulley manufacturers.

RIM – Because the rim experiences full belt tension, every high tension pulley system rim is analyzed for stresses generated by the tension as well as the wrap of the belt, and the end couple that is caused by the bending moment being transferred to the rim by the end disc. Typically, high tension systems will use high modulus belts, requiring the rim be machined to ensure concentricity between the rim and the shaft.

SHAFT – Shaft deflection and shaft bending stress are fundamental elements of high tension pulley system design. Limits are based on CEMA recommendations and customer specifications. Standard shafting used in PPI pulley assemblies is 1045. Other shafting materials, such as 4140, are optional based on customer specifications and when the design requirements exceed shafting specifications.

THERMAL STRESS RELIEF – Testing has shown a significant increase in life for pulleys that are thermally stress relieved. This cost-effective option has proven to be so valuable for the longevity of the product. PPI offers this service our manufacturing facilities.

WELDING – Each weld is carefully optimized in the design phase with PFEA. From joint preparation through pre-heat and welding, each is done to the appropriate American Welding Society [AWS] specification.







# **IDLER PROJECTS**

PPI has been engineering and manufacturing conveyor components for over four decades. Over that time, PPI has emerged as the industry leader providing a full line of CEMA rated idlers. In addition to standard CEMA idlers, the experienced staff of engineers review unique application requirements and design idlers to meet specifications in the most productive manner. Customers look to PPI to provide idlers that meet their specific project requirements in the most demanding applications around the world. Whatever the application may be, PPI is the preferred choice for top of the line conveyor components.



2014 ARIZONA, UNITED STATES



2013 NORTH CAROLINA UNITED STATES



2011 CHILE



2009 COLOMBIA



2013 PERU



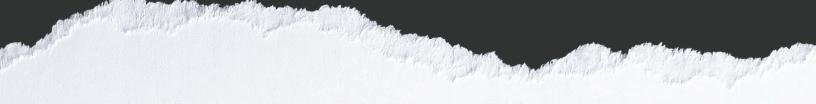
2012 ARIZONA, UNITED STATES



2008 MEXICO



2005 KENTUCKY UNITED STATES



# **IDLER PROJECT HISTORY**

Whatever material conveyed PPI can provide idlers to meet the most demanding applications. Recognized as the industry leader, PPI provides a broad idler product line as well as new and innovative product solutions.

PPI's experienced engineering staff will evaluate each application and provide cost effective solutions while maintaining optimal product performance. Refer to the project list below for a sampling of the wide range of PPI idlers serving operations around the world.

| Refer | to the project list b      | elow for a sar           | npling of th   | ne wide range of  | PPI idlers serving         | operations a                | round the wor                              | d.  |
|-------|----------------------------|--------------------------|----------------|---|----------------------------|-----------------------------|--|---|
| YEAR  | PROJECT NAME               | LOCATION                 | CEMA<br>SERIES | BELT WIDTH  | BEARING SIZE               | BELT SPEED<br>FPM (MPS)     | QTY. OF<br>CONVEYORS                       | DETAILS   |
| 2019  | Eagle Gold                 | Canada                   | D&E            | 42" to 72"<br>(1219mm<br>to1829mm)                            | 6305 & 6308                | 12 (4)                      | Supplied idler structure                   |   |
| 2019  | Cliffs                     | USA                      | C, D, & E      | 36" & 54"<br>(914mm<br>& 1372mm)                              | 6204, 6305 & 6307          | 20 (6)                      |  |   |
| 2018  | Baffinland                 | Canada                   | C, D, & E      | 36", 48", 54" & 84"<br>(914mm, 1219mm,<br>1372mm<br>& 2134mm) | P204, 6305 & 6308          | 7(2)                        |  |   |
| 2017  | Nordgold Gross             | Russia                   | C & D          | 48" (1219mm)  | P204 & 6305                | 49 (15)                     | Low temperature bearings                   |   |
| 2017  | G3 Vancouver               | Canada                   | D              | 72" (1829mm)  | 6305                       | 16 (5)                      | Offset center roll                         |   |
| 2016  | Koch Enid                  | USA                      | C&D            | 36", 48" & 60"<br>(914mm, 1219mm,<br>1524mm)                  | 6204 & 6305                | 14 (4)                      | Nine conveyors<br>& five pipe<br>conveyors |   |
| 2016  | Port Dikson                | Russia                   | D&E            | 36", 42" & 54"<br>(914mm, 1219mm<br>& 1372mm)                 | 6305 & 6307                | 11 (3)                      | Low temperature bearings                   |   |
| 2015  | Stockbridge Quarry         | Georgia                  | D&E            | 30" to 54"<br>(762mm<br>& 1372mm)                             | 6305, 6307<br>& 6308       | N/A                         | 51   | Standard catalog products   |
| 2015  | Tutupan                    | Indonesia                | G              | 83" & 95"<br>(2100mm<br>& 2400mm)                             | 6312                       | 925 & 1,083<br>(282 & 330)  | 2  | Garland Idlers  |
| 2015  | Morelos                    | Mexico                   | D, E, & F      | 48" & 84"<br>(1219mm<br>& 2134mm)                             | 6305, 6307,<br>6308 & 6310 | 13 to 370<br>(4 to 113)     | 36   | F7 unequal troughters with removable-end brackets, low profile transition toughers              |
| 2015  | Ekati                      | Northwest<br>Territories | E              | 54" & 72"<br>(1372mm<br>& 1829mm)                             | 6308                       | N/A                         | 2  | PPI True Impact System for low temperatures   |
| 2015  | Enid                       | Oklahoma                 | C&D            | 36", 48" & 60"<br>(914mm, 1219mm<br>& 1524mm)                 | 6204 & 6305                | 59 to 709<br>(18 to 216)    | 14   | Nine troughed conveyors and five pipe<br>conveyors, all rames galvanized, FAG brand<br>bearings |
| 2015  | Medina                     | Texas                    | C, D, & E      | 30" to 96"<br>(762mm to<br>2438mm)                            | P204, 6305,<br>6307 & 6308 | 257 to 521<br>(78 to 159)   | 60   | Idlers for 60 conveyors plus 106' of D6 TIS impact bed and 30' of E7 TIS impact bed             |
| 2014  | Morenci SWLP               | Arizona                  | E              | 54", 60" & 72"<br>(1372mm, 1524mm<br>& 1829mm)                | 6307 & 6308                | 580 to 1000<br>(177 to 305) | 13   | Banked trougher and v-return assemblies for overland, machined rubber groove return rolls       |
| 2014  | Hammond Transfer           | Indiana                  | C&D            | 42", 48", & 54"<br>(1067mm, 1219mm<br>& 1372mm)               | P204 & 6305                | N/A                         | 8  | Stainless steel shafts, galvanized frames, under slung style frames, plastic rolls              |
| 2014  | Calhidra                   | Mexico                   | C&D            | 30", 36" & 48"<br>(762mm, 914mm<br>& 1219mm)                  | P204 & 6305                | 150 to 200<br>(46 to 61)    | 4  | Special 5-roll 70° trougher assemblies  |
| 2014  | Vernal Pit & Mill          | Utah                     | D              | 42" (1067mm)  | 6305                       | 900 (274)                   | 1  | 2,700' long overland with curve, banked troughers and banked under slung style returns          |
| 2013  | Convent Marine<br>Terminal | Louisiana                | E              | 72" & 84"<br>(1829mm &<br>2134mm)                             | 6307 & 6308                | 888 (271)                   | 4  | Retractable frames, wide base, PPI Rigid Rail<br>Structure                                      |
| 2013  | Imouraren Mine             | Niger                    | E              | 79" (2000mm)  | N/A                        | 39 (12)                     | 10   | 10 feeders with 242 live-shaft impact rollers with PPI type E bearings                          |
| 2013  | Hertford                   | North Carolina           | С              | 48" (1220mm)  | P204                       | 272 (83)                    | 2  | Pipe conveyor rolls and brackets  |
| 2013  | Constancia                 | Peru                     | D&E            | 42", 66", & 72"<br>(1067mm, 1676mm<br>& 1829mm)               | 6305, 6307<br>& 6308       | 216 to 688<br>(66 to 210)   | 7  | Idlers for seven conveyors plus 60' of TIS impact<br>bed, all galvanized frames.                |

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| YEAR | PROJECT NAME             | LOCATION            | CEMA<br>SERIES | BELT WIDTH   | BEARING SIZE                | BELT SPEED<br>FPM (MPM)    | NUMBER OF<br>CONVEYORS | DETAILS   |
|------|--------------------------|---------------------|----------------|--|-----------------------------|----------------------------|------------------------|---|
| 2013 | Eleonore                 | Quebec              | D, E, & F      | 30" to 84"<br>(762mm to<br>2134mm)   | 6305, 6307,<br>6308, & 6310 | N/A                        | 27                     | Bearings with low temperature grease, return rolls with molded urethane coating             |
| 2012 | Metcalf 55k<br>Expansion | Arizona             | E&F            | 54", 60", 72",<br>96", & 120"<br>(1372mm, 1524mm,<br>18229mm,<br>2438mm<br>& 3048mm) | 6307, 6308,<br>& 6310       | 32 to 790<br>(10 to 241)   | 37                     | 22 conveyors, 13 feeders ranging from 54" to 120" belt width                                |
| 2012 | El Teniente              | Chile               | E              | 48" & 60"<br>(1219mm<br>& 1524mm)  | 6307 & 6308                 | 197 & 492<br>(60 & 150)    | 2                      | Wide base frames, low drag bearings, removable-end bracket style frames                     |
| 2012 | Ministro Hales           | Chile               | E              | 54" (1372mm)   | 6307 & 6308                 | N/A                        | 1                      | One overland conveyor, banked troughers and v-return frames                                 |
| 2012 | Pascua Lama              | Chile/<br>Argentina | C, D, & E      | 18" to 60"<br>(457mm<br>to 1524mm)   | P204, 6305,<br>6307, & 6308 | 43 to 629<br>(13 to 192)   | 36                     | 21 conveyors and 15 feeders, removable-end bracket style troughers                          |
| 2012 | Calhidra                 | Mexico              | С              | 30" (762mm)  | P204                        | 300 (91)                   | 1                      | 1 km long overland using PPI rigid rail idler structure and idler assemblies.               |
| 2011 | Endako                   | British<br>Columbia | E              | 54" & 72"<br>(1372mm<br>& 1829mm)  | 6307 & 6308                 | N/A                        | 2                      | Bearings with low temperature grease.<br>Trougher frames with removable-end brackets.       |
| 2011 | Lomas Bayas              | Chile               | E              | 48" & 60"<br>(1219mm<br>& 1524mm)  | 6307 & 6308                 | 1,083 (330)                | 4                      | Four overlands totaled 13,635'  |
| 2011 | Carlsbad                 | New Mexico          | С              | 25" (625mm)  | P204                        | 335 (102)                  | 1                      | Pipe conveyor rolls, panels, and hardware.  |
| 2011 | Antapaccay               | Peru                | C, E, & F      | 36", 72" & 96"<br>(914mm, 1829mm<br>& 2438mm)  | P204, 6307,<br>6308, & 6310 | 79 to 640<br>(24 to 195)   | 11                     | Wide base frames. Removable-end bracket style frames.                                       |
| 2011 | Callao Terminals         | Peru                | D              | 30", 36", 54" & 60"<br>(762mm, 2438mm,<br>1372mm<br>& 1524mm)                        | 6305, 6307,<br>& 6308       | N/A                        | 17                     | 11 conveyors and 6 feeders.   |
| 2011 | IOC Terminals            | Quebec              | F&G            | 72" (1829mm)   | 6310 & 6312                 | N/A                        | 6                      | Bearings with low temperature grease. Offset center roll troughers.                         |
| 2010 | El Teniente              | Chile               | E              | 48" & 60"<br>(1219mm<br>& 1524mm)  | 6307 & 6308                 | 106 to 472<br>(32 to 144)  | 3                      | Wide base frames. Removable-end bracket style frames.                                       |
| 2010 | Rodemacher               | Louisiana           | D              | 20" (500 mm) Pipe  | 6305                        | 827 (252)                  | 1                      | Supplied 9,196 pipe conveyor rolls.   |
| 2010 | Lazaro Cardenas          | Mexico              | D              | 30", 36", 42",<br>48" & 72"<br>(762mm, 914mm,<br>1067mm, 1219mm<br>& 1829mm)         | 6305                        | N/A                        | N/A                    | ISO rolls and frames. PPI supplied 1,710 rolls, 676 frames, and 1,200 return drop brackets. |
| 2009 | Los Pelambres            | Chile               | D&E            | 36", 48", 54" & 60"<br>(2438mm,<br>1219mm, 1372mm<br>& 1524mm)                       | 6305, 6307,<br>& 6308       | 393 to 492<br>(120 to 150) | 13                     | Wide base frames. Removable-end bracket style frames.                                       |
| 2009 | Collahuasi               | Chile               | D              | 36" & 42"<br>(914mm &<br>1067mm)   | 6305                        | 531 (162)                  | 2                      | 70 of our True Impact Systems (TIS)   |
| 2008 | Penasquito               | Mexico              | D&E            | 60" & 84"<br>(1524mm<br>& 2134mm)  | 6305 & 6308                 | 260 to 614<br>(79 to 187)  | 10                     | Retractable-style frames. Special self-aligners. Special drop brackets.                     |

### QUALITY IDLER CHARACTERISTICS



TUBE/SHELL - Bearing housing to tube weld is fully under the tube edge protecting it from wear. A variety of tube diameters and tube thicknesses are available.

SEAL – The service life of the idler is directly proportional to the quality of seal. PPI seals are designed and manufactured for a long and trouble free life. Large diameter stationary seal. Highly effective centrifugal seal. Effective radial and labyrinth seals.

BEARINGS – Sized for your application. Sealed for life ball bearingsmeans no need to re-grease. Low rotational resistance. Sixteen arc minutes of angular deflection. High quality 52100 hardened and tempered bearing steel. Improved surface grinding to near motor quality sound levels increasing operating life. C4 radial clearance guaranteeing housing fit up clearance. Increased axial clearance to reduce roll drag. Contact seals with radial and axial lips increasing contamination protection. PPI uses third party testing to benchmark the bearings used in our idlers to recognized worldwide brands. Name brand bearings available if desired. Available bearing sizes: 6203, P204, 6204, 6305, 6306, 6307, 6308, 6310, and 6312.

LUBRICATION – Bearings factory supplied with 60% fill of 100 viscosity polyurea grease assuring excellent sealed for life lubrication. A range of special greases are also available for extreme conditions. Alternate grease fill available depending on application.

SHAFTS – Excessive shaft deflection is a common cause of bearing failure. PPI designs limit the extent of deflection to within the baring limits. Shaft diameters are selected for the idler assembly for given loading conditions.

FRAMES – Cross members are designed for optimum strength to weight ratio while providing adequate support for the rolls under loaded conditions. PPI frames have wide heavy duty formed end brackets, heavy duty footpads for a solid base, wide center brackets for heavy loads and minimal roll gaps. Custom designs

are available to meet individual requirements.

REDUCED NOISE – PPI has incorporated noise reduction into our design considerations. PPI's manufacturing processes keep total indicator run out (TIR) to a minimum. Doing this creates a roll that provides optimal roll to belt contact minimizing the potential for belt vibration.

REDUCED WEIGHT – Alternative designs and materials have allowed PPI to develop products lighter weight products. Rolls can either be manufactured from lightweight materials such as HDPE, Nylon, aluminum or can employ alternative designs such as hollow shafts.

MINIMIZED ROLL TIR – Minimizing roll TIR can prevent vibration and reduce noise generation. PPI rolls are checked regularly during manufacturing to assure they comply with PPI quality standards. PPI can offer rolls that meet tighter TIR requirements for more demanding specifications, including scale quality rolls. The standard TIR value published by CEMA for scale quality rolls is 0.015 inches.

BALANCE – Unbalanced rolls can cause excessive vibration throughout the conveyor system. These vibrations can cause damage to conveyor structure as well as the idler roll itself. By purchasing top of the line materials with stringent specifications and utilizing exclusive build processes PPI rolls maintain exceptional balance characteristics. PPI can also meet a range of dynamic balancing specifications to meet customer requirements.

LOW TEMPERATURE – For low temperatures (-20 F or -29 C and below) our rolls can be fitted with bearings with special grease.

ROLL DRAG – Roll drag has been a key focus in PPI's roll design and is tested routinely to ensure quality. PPI has developed an idler seal configuration that offers exceptional protection from contamination while maintaining acceptable roll drag performance. Testing has shown that PPI's standard rolls fall within the CEMA published allowable values for roll drag. In applications where roll drag becomes a major factor that affects power consumption and horse power requirements PPI offers several different types of seal and bearing configurations to meet customer's demanding specifications.

SURFACE TREATMENT – Most non-machined surfaces shall be painted unless otherwise protected by such means as rubber, plastic, plating, etc. Standard paint applied to rolls and frames is a high solids alkyd enamel giving an approximate dry film thickness of 1 mil. Other options are available such as a urethane primer with an alkyd enamel top layer giving an approximate dry film thickness of 1.7 mils, or a high performance two component urethane primer with a top layer of high performance, high solids, and two component urethane giving an approximate dry film thickness of 1.7 - 2.5 mils. PPI can meet many other paint requirements depending on customer needs. Exposed shafting is unprotected unless otherwise specified.

Hot Dip Galvanizing is another option for frames and brackets. Galvanizing forms a metallurgical bond between the zinc and the underlying steel, creating a barrier that is part of the metal itself. During galvanizing, the liquid zinc reacts with the surface of the steel article to form a series of zinc-iron alloy layers.

# **OTHER SPECIAL PRODUCT OFFERINGS**



#### **IDLERS**

Engineered Idler Product Line Retractable idler frames

Galvanized frames
Catenary idlers

Stainless steel frames

Lagged idler rolls

Pipe conveyor idler panels

Rubber grooved rolls

Rubber Disk Returns with Massed Ends

Retro Rolls®

Return roll cages
HDPE or Nylon Rolls

Pillow Block Bearings

Catenary and Rigid Rail Idler Structure

Impact Systems

Five Roll "Cradle Style" Troughers

Under Slung Frames Swing Down V-Return V-Return Self-Aligners

Banked Idlers

DIN/ISO Rolls and Frames

#### **PULLEYS**

Deflection Wheels
EZ Mount Pulley & Shaft System
Static Shaft Pulley (SSP®)
Apron Feeder Shafts
Herringbone Wing

Other Services

Tier I and Tier II Pulley restoration services

Field Service Technicians

#### Accessories

Take-Up Frames with hydraulic assist available
Bearings – SAF, SAFS, SD, SDAF, SDAFS, SNG, and many other manufacturers' bearings
Lagging – Rubber, Ceramic, VEC, and Urethane
Low-Speed Couplings

Motor and Reducer Packaging





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CRP 004-06