

Drag and Flight Conveyors Design Calculation

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Drag and Flight Conveyors

Drag conveyors are used where multiple loading or discharge points are required and a totally enclosed conveyor is needed for dust containment, capable of handling fine materials ranging from dust to 8 inch (200 mm) lumps, where capacity requirements are high, 200 - 400 TPH. Drag conveyors are used when the material is somewhat fluid, such as TSP (fertilizers), lime meal, and grain cement.

3. Chain conveyor or apron chain conveyor calculation system. The load functions are calculated as indicated below:

$$T = H_1 + H_2 + H_3 + H_4$$

$$P_{ch} = \frac{Q_{ch} \times L_1}{3.6} + Q_{ch} \times L_2 + H_5 + H_6$$

$$H_1 = \frac{Q_{ch} \times L_1 \times H_1}{2}$$

$$H_2 = \frac{Q_{ch} \times L_2 \times H_2}{2}$$

Where:
 T = Total chain force or total work chain tension - (kgf) (lbf)
 P_{ch} = Upper chain tension - (kgf) (lbf)
 H₁ = Down chain tension - (kgf) (lbf)
 H₂ = Lift chain tension - (kgf) (lbf)
 Q_{ch} = Conveyor chain load - (t/h) (lb/h)
 Q_m = Conveyor material weight - (kg/sec) (lb/ft)
 L₁ = Total conveyor skirt length (including inclined/declined) - (m) (ft)
 L₂ = Conveyor horizontal skirt length - (m) (ft)
 L₃ = Conveyor slope (inclined) / declined extension skirt length - (m) (ft)
 H₃ = Total chain weight (use manufacturer's tables according to chain type)
 H₄ = Driving power (kW) - (HP)
 F = Upper chain friction factor = 0.25 ~ 0.35
 F₂ = Down chain friction factor = 0.35 ~ 0.55
 F₃ = Lift chain friction factor = 0.25 ~ 0.35
 v = Chain conveyor speed - (m/s) - (ft/min)
 D = Driving sprocket diameter - (mm) - (in)
 L = Conveyor skirt length
 E = Bulk density of conveyed material - (kg/m³) - (lb/ft³)

4. To calculate the driving power (CV or HP), use the following formula:

Where:

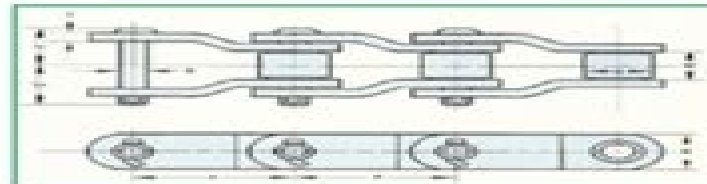
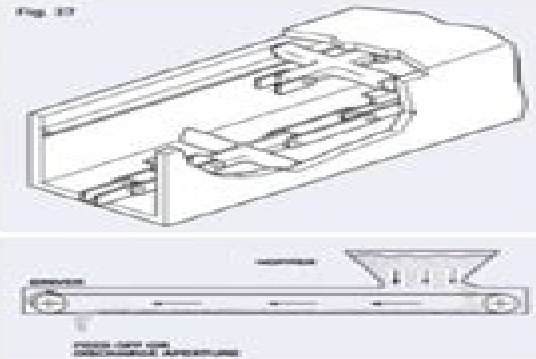
$$H = \frac{T \times v \times 60}{1000}$$

Where:

$$H = \frac{T \times v \times 60}{33000}$$

Where:
 H = Driving power (kW) - (HP)
 T = Total chain force or total work chain tension - (kgf) (lbf)
 v = Chain conveyor speed - (m/s) - (ft/min)

Fig. 37



CHAIN CONVEYORS OR APRON CONVEYORS SUMMARY:

Chain conveyors or also called apron conveyors are commonly used in mining and moving industries to transport heavy materials. The manufacturing industry also use widely chain conveyor for carry coal lumps, pellets, gang bones and general industrial containers. These conveyors can be single or double chain drive or Caterpillar type chains. Single chain conveyors are generally easy to install, and have very minimum maintenance for users.

Many industries sectors use chain conveyor technology in their production lines. The automotive industry commonly uses chain conveyor systems to carry car parts through paint plants. Chain conveyors also have widespread use in the rubber and cement plants, metal finishing and steel-making industries.

Chain conveyors are also used in the printing and coating industry, ceramics, thermal treatment of metals, food and discharge systems of boilers. In automatic printing systems the products are attached to an apron head chain conveyor, keeping products off of the floor allows for higher productivity levels.

Chain Calculation Manual For Chain Conveyors

Alwyne Meade



Chain Calculation Manual For Chain Conveyors:

Standard Handbook of Chains American Chain Association, 2005-09-20 Since its founding the American Chain Association ACA has set the standard of excellence in developing the chain industry and enhancing the benefit to customers The first edition of Chains for Power Transmission and Material Handling served as the keystone reference to the field for more than twenty years Fully updated with the latest developm

Conveyors Patrick M McGuire, 2009-08-05 This is probably the first book in 40 years to comprehensively discuss conveyors a topic that seems mundane until the need arises to move material from point A to point B without manual intervention This book gives industrial designers engineers and operations managers key information for determining which type of conveyor to purchase and how to use it to meet their transport needs It discusses requirements for specific products or materials and environmental factors including extreme temperatures Each chapter covers a specific type of conveyor including chain belt and gravity varieties highlighting the primary features such as load capacity and rate and operation

Design Manual for Roller and Silent Chain Drives Jackson and Moreland, Boston, 1966

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The Complete Guide to Chain, 1997

An encyclopedia of the ceramic industries, being a guide to the Alfred Broadhead Searle, 1929

Materials Handling Handbook Raymond A. Kulweic, 1991-01-16 Sponsored jointly by the American Society of Mechanical Engineers and International Material Management Society this single source reference is designed to meet today s need for updated technical information on planning installing and operating materials handling systems It not only classifies and describes the standard types of materials handling equipment but also analyzes the engineering specifications and compares the operating capabilities of each type Over one hundred professionals in various areas of materials handling present efficient methods procedures and systems that have significantly reduced both manufacturing and distribution costs

Springer Handbook of Mechanical Engineering Karl-Heinrich Grote, Hamid Hefazi, 2021-04-10 This resource covers all areas of interest for the practicing engineer as well as for the student at various levels and educational institutions It features the work of authors from all over the world who have contributed their expertise and support the globally working engineer in finding a solution for today s mechanical engineering problems Each subject is discussed in detail and supported by numerous figures and tables

Pulp and Paper Manual of Canada, 1956

American Machinist, 1913

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Mechanical Handling with Precision

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