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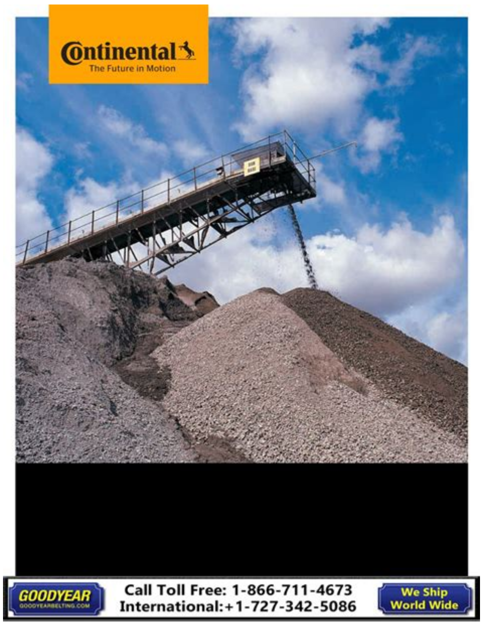

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They are also resistant to oil and grease, as well as aging and atmospheric influences. And they are antielectrostatic. What's more, ContiTech engineers have also succeeded in extending the service of the belts by further reducing scraperinduced cover wear. It has been extended to include additional products such as tube conveyor belts. We offer complete solutions, from fabric and steelcord conveyor belts to specialpurpose products and service material. We offer complete solutions, from fabric and steelcord conveyor belts to specialpurpose products and service material. It has been extended to include additional products such as tube conveyor belts. Ten percent of all coal deposits worldwide are down under, making Australia the biggest coal exporter. The acquisition was concluded on 6 April. The insulation gum isThe cover compounds areThe insulation gum isThe cover compounds areSince we introduced the world's first steel reinforced belt toUsing stateoftheart technology, we ensure superior productShipping from six production plants on five continents. Our worldwide engineering group continues to designMarkets Applications Cover Compounds. See the process diagram for Aggregate, Hard Rock Mining, Sand and Gravel markets on page 6 for alternative belt recommendations. Get a lower costperton conveyed. Tension Range ST500 to over ST10000. A Technically Superior Product. Generations of our engineers have been involved forSuperior strength, durability, easeStacker systems where minimum belt elongation is a criticalThis allows forAdditional time can be saved during installation by usingThere are three component parts toZinc galvanized steel cordThe cords, made up of many wire filaments, are constructedThe galvanized zinc coatingInsulation gum core rubber. Extensive rubber compounding technology has enabledOuter rubber coversCompounds are available to withstandSpecial service compounds areCanada, which require a compound that withstands both lowHigh Tension Capabilities.http://www.kitchensandinteriors.com.au/images/uploadedimages/color-imagerunner-c4580-manual.xml

We continue to lead the industry inFewer Transfer PointsThis allows the designer to reduce the number of transfer points toLimited Takeup Travel. This allows lower cost takeup. Lifelong Splices. Our proven splicing methods, validated on our TwoPulley Splice Tester, result in dynamic spliceAnd when your belt is expected to lastHigh Impact Resistance. Our advanced cover compounds and our insulation gum's superior adhesion combine to provideExceptional Belt TrainingBelts run straight and true because cordsSuperior Troughing CharacteristicsLower CostPerTon. Fewer conveyors and splices, shorter takeups and reduced belt inventory add up to significantLonger belt life, lifelong splices, excellent belt training and reducedOverland conveyors are typically more efficientIndustryleading Belt Monitoring System. If your operation demands belt rip and transverse tear detection, cord or splice damage detection, look. Packaging the Way You Want It. Packaging options include keeper bars, HEX steel reels and oblong reels. All are designed toThere has been significant technicalThe next step to improved conveyor efficiency is the reductionJust as some tires provide lower rolling resistance dependingThe power required to operate a typical conveyor belt hasAs the beltIt has beenThis savings is realized year after year, resulting in an overallOver ten years,Improves splice strength and saves time. There have been significant technical advancements in steelOur patentedConventional splice methods involve the use of cements andThis illustration shows how the top and bottom multigrooveThe result isImproved Performance. Testing on the 2Pulley Dynamic splice tester at our Technical. Center in Marysville, Ohio, shows the results of two identicalThis one test shows theStatic pull splice strength tests conducted at an independentSavingsSavings of 16% to 25% were basedLess Downtime. Conventional. Belt Tension Rating. Minimum Ultimate. Tension Operating Tension.

Cable DiameterCable PitchImperial PIW PIW in. in. PIWOther cable diameters may be substituted according to individual requirements. Operating tensions are based on a 6.671Imperial. Belt Tension Rating PIW 6001000 10011926 19272251 22522825 28263200. Cable Diameter in. 0.15 0.18 0.21 0.26 0.32. Belt Tension Rating PIW 32013500 35014200 42014650 46516420. Cable Diameter in. 0.37 0.40 0.44 0.49. Metric. Cable Diameter mm 3.6 4.4 5.2 6.6 8.0. Cable Diameter mm 9.2 10.0 11.0 12.4. Imperial. Belt Tension Rating PIW 685 856 1070 1370 1712. Belt Tension Rating PIW 2140 2697 2997 3425 3853. Belt Tension Rating PIW 4281 4623 5137 5565 5993. MetricMinimum cover gauge is dependent on the belt rating. Contact your sales representative for specific weight information. Recommended Minimum Pulley Diameters. Percent of Rated Tension. Textile tension members. Steel cable tension members. Splice dimensions. 85 87 90 91 92 5 5.1 5.2 5.2.1 5.2.2 5.3 Selection of covers. 96 Cover material. 98 Cover gauge. 100 Abrasion resistance. 101 Impact resistance. 102 Special cover structures. 103 6 6.1 6.2 6.2.1 6.2.2 6.3 Steep angle conveyor belts. Chevron cleated belt. belt. Conveying capacity. Constructional data.Conveying capacity. Calculation of required power. Conveyor belt desing. 9 9.1 9.2 9.3 9.4 Appendix... 130 Index.. 131 Symbols.. 134 Questionnaires. Printed forms for calculation. 125 126 127 129 Conveyor belt calculation D This section of the ContiTech Conveyor Belt Service Manual comprises design fundamentals and data essential for the designing of a conveyor belt system. The calculation procedures and data stated take the current level of technology largely into account with regard to the latest research results and independent tests, provided that these give sufficiently wellfounded information.

Advice is given to enable the appropriate conveyor belt from the to be selected for each individual project and to help both the designer and the user to attain optimum coordination between the conveyor belt, the design of the beltsystem and the practical application. The calculation of the belt conveyor for bulk material set out at the beginning of these calculation principles is based on specifications contained in DIN standard 22101 February 1982 and is supplemented extending design procedures. Essential calculation stages not included in the DIN 22101 standard specifications have been described for instance in publications Vierling The designations of formula quantities have been adapted as far as possible to general guidelines. Designations already well known from technical literature in this field have also been used, however, where we felt them to be beneficial. Only the Sl units or units derived therefrom on which the Units Sl is based are used in the formulae, tables and diagrams. To facilitate comprehension, the units used in the further course of the calculation are stated after the respective formulae, where the units listed in the index of symbols are to be used. A brief dimensional consideration helps in cases of doubt. The units to be used are stated in the case of formulae with conversion factors or dimensionaffected constants. Vierling, A Zum Stand der Berechnungsgrundlagen fur Gurtforderer Braunkohle Warme und Energie 19 1967 No 9,P Vierling, A Zur Theorie der 1972, 3rd edition. 3 D In general, the following data are known before a belt conveyor is designed Type of material to be conveyed e. g. bulk weight, lump size, angle of repose Flow of material to be conveyed e. g. mass flow, volume flow Conveying track e. g. conveying length, conveying height. These data are a basis for selection of the type of belt conveyor and thus for the type of conveyor belt.

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The decision on whether it is a plain standard conveyor belt, a conveyor belt or a special conveyor with the corresponding belt serves as a reference point for the stipulation of the principal data, in particular of conveying speed and belt width, but may necessitate for instance in addition the stipulation of the troughing design, the belt surface profile or the pitch of elevator buckets. The next factors to be determined are motional resistances and required power of the belt conveyor. If the design is already established, it is the size, position and type of the driving motors that have to be recorded besides the data stated hitherto, as these may have a decisive influence on the selection of the conveyor belt. The calculation of the belt conveyor leads on to the peripheral forces at the driving pulleys. Their magnitude depends on the extent of the motional resistances but varies for temporary operating conditions such as starting and stopping. The design of the tension member in the conveyor belt then follows. Its tensile strength is determined mainly the magnitude of the belt tensions. Further influences result from a variety of criteria relating to operation and design. As the strength of the tension member must always have a specific safety margin over the maximum stress, it is essential to stipulate the safety coefficient or to check the available safety margin on selection of the tension member. Special attention must be paid here to the durability of the conveyor belt at the joints. The tension member of the conveyor belt is enclosed in the covers, which thus form an effective protection against external influences. For this reason the material and construction are selected to counteract the effects of the material conveyed and of the environment. Conformity to the tension member must also be observed on selection of the covers.

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Conti conveyor belts are supplied to all parts of the world, using those dispatch facilities best suited to the the packaging guarantees safe transport even in exceptional cases. The optimum part lengths can be determined for each particular instance to provide inexpensive shipment and simple assembly. The thickness, width and weight of the belt are to be given special consideration. The conveyor belt calculation process described also conforms with the arrangement of the following chapters. The chart shows both the normal sequence of design stages and the feasibility of starting at any section, provided that specific data or parameters are known. In general the single chapters go deeper into the respective subject with increasing subdivision, so that a rough assessment of the belt structure can be made consulting the general chapter alone. Special reference is made to those calculation points at which an assessment is recommended. 4 Basic expressions and definitions

Continuous conveyors Continuous conveyors are mechanical, pneumatic and hydraulic conveying devices with which the material to be handled can be moved continuously on a fixed conveying track of restricted length from feeding point to discharge point, possibly at varying speed or in a fixed cycle. These conveyors are available in stationary or mobile versions and are used for the handling of bulk materials or piece goods. Belt conveyors Continuous conveyors whose belts have a tension member consisting of synthetic fabrics or steel cables with rubber or synthetic the belts are supported straight or idlers or have sliding support on a smooth base as a tension and support member. The actual conveying is done on the top run, in special cases on the top run and the return run. Belts with cleated top covers, specialpurpose belts or sandwich belts are used for conveying.

11 17 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 10 1 5 13 15 8 7 9 6 16 4 12 3 2 14 Feed Discharge Head pulley drive pulley Snub or deflecting pulley Tail pulley takeup pulley Top run tight side Return run slack side Rop run idlers Return run idlers Feed rollers transition transition Feed chute Belt cleaner transverse scraper Belt cleaner scraper Drive unit Counterweight elevators Continuous conveyors with buckets or similar containers as these either scoop the material or are filled metering hoppers and emptied at specific discharge points. The tension unit consists of belts to which the containers are attached. Transport is effected at any angle from vertical to horizontal. Flow of material Mass or volume of the conveyed bulk material or piece goods per unit of time in continuous conveying. In contrast, the capacity is not Conveying capacity The volume capacity or capacity of material conveyed that can be attained with the given conveying speed and the available area or the container volume and spacing. 6 Conveying speed Speed of the material conveyed. The conveyor belt as the support member determines the speed of the material on it. Centre distance The distance between head and tail pulley of the conveyor. The belt length as the inside circumference of the endless, slack belt results from this distance only when the pulley circumference and any belt loops tension loops, discharge loops etc. present are taken into account. Conveying length The distance between the centre of the material feeding point and the axle of the discharge pulley. If the material conveyed is stripped off, the centre of the material discharge is to be taken instead. In general the conveying length is approximately equal to the centre distance. The conveying length may, however, besmallerthan the centre distance or be variable during the conveying process. Conveying height The difference in height between material feed and material discharge.

Belt conveyors with sections at different gradients yield the section heights allocated to the section lengths. Belt support The belt is generally supported fixed idlers or suspended idlers. The belt can be flat or troughed idlers. Troughing permits a greaterflow of material and promotes improved belt training. The idler spacing is normally larger on the return run than on the top run and can also be graduated within one belt conveyor. Special idler designs or arrangements are frequently selected at the feeding points and for belt cleaning. Flat belt with wall belt troughing troughing Conveyor belt The task of the conveyor belt is to carry the material handled and simultaneously to transmit the driving forces to overcome the motional resistances. The conveyor belt consists in general of the tension member and the top and bottom covers, which form a coreprotecting covering. Those conveyor belts used in belt conveyors are to be regarded as continuous conveying elements composed of one or more belt sections joined together at their ends. Short conveyor belts can also be manufactured in endless versions. 7 Stipulation of principal data Material handled Flow of material handled 2.2 2.1 Conveying track Type of belt conveyor Belt width Belt speed 2.4.2 Carrying capacity 2.3 2.4 2.4.1 Belt support 2.4.3 2.5 The designing of a conveyor belt begins with an investigation into the service requirements and the stipulation of the principal data characterizing the specific application. Data already available can be checked against the guide values stated in this section. The optimum conveyor belt cannot be selected means of the principal data alone, as the operating method and the belt conveyor design also have a considerable influence. If the stress and strain on the conveyor belt are not known in detail, a calculation of the belt conveyor must be executed with reference to the bulk material transport up to approx.

The necessary conveying capacity of the conveyor belt or belt conveyor to be selected is determined these two values. To what extent downtime may occur through maintenance, breakdown and repairs and to interruptions in conveying must be taken into account when making the selection. Operating hours per year Working days per year 1 2 shifts 3 shifts 365 250 200 2920 1600 5840 3200 8760 4800 1 shift 8 hours Guide values for maximum material flows QV in Belt conveyors Steep angle conveyor belts Elevators 12 approx. approx. 1.400 approx. 1.500 Qm in approx. approx. approx. 2.500 D 2.3 Conveying track D 2.3 Owing to its continuous conveying process, the belt conveyor has relatively low flight loads and can consequently be adapted to any routing. The belt gradient can be changed at random, which may provide the most economic solution for longhaul conveying systems in particular. Certain minimum radii of the concave or convex curves must be adhered to. Laying in horizontal curves is also feasible with belt conveyors. The use of a tension member permits considerable conveying lengths and conveying heights to be attained. Centre distances in the magnitude of 5 to 10 kilometers and conveying heights of up to several hundred meters are no longer a rarity. Belt conveyors with steep angle belts are normally designed for shorter flights at a very steep gradient. The belt guidance can be adapted largely to the specific application in this case too with the use of appropriate supporting elements. Belt elevators are used almost exclusively for vertical transport with conveying heights of up to almost 100 meters. The operating principle permits no curves or significant gradients in the flight. The use of steep angle conveyor belts and elevator belts overlaps in the range of very steep to vertical transport. Individual adaptation of the conveyor element is frequently essential in this instance. 13 D 2.4.1 Belt width D 2.4.

1 The belt width should be selected as far as possible from standardized or customary widths as the dimensions of the idlers and other constructional elements of the belt conveyor are coordinated with these widths. Standard belt widths Belt width B in mm 300 400 500 600 650 1200 1400 1600 1800 2200 2400 2600 2800 3200 800 In the case of troughed belts, the belt width must not fall short of certain dimensions, depending on the lump size edge length of the material to be handled, as the material can otherwise not be transported safely. With strongly eccentric pieces there is furthermore the risk of the belt mistracking and of idlers being damaged material projecting beyond the belt. Minimum belt widths Size k of lumps in mm Mind.Narrower widths are also admissible for oblong lumps or when single pieces are imbedded in mainly fine material. It is to be observed that the troughability too is influenced the belt width. The troughability decreases with diminishing belt width. On final determination of the belt structure, the troughability D 4.3.2 is to be checked. CONTINENTAL conveyor belts are currently available in widths of up to 6400 mm. Textile carcass belts are available from stock in widths of 400 to mm. 15 D 2.4.2 D 2.4.2 Belt speed The selection of the belt speed is of decisive significance for the further designing of the belt conveyor and of the belt. Application features Special cases, e. g. cooling conveyors Conveying speed v in 0.5 Small flows of material, protective transport e. g. coke bench conveyors Standard application conditions and material handled e. g. gravel conveyance Large flows of material, long conveying lengths e. g. overburden conveyance Special cases e. g. jet conveyors 6.5 and more In general a more economic design can be achieved with higher conveying speeds. The greater the conveying lengths and thus the belt lengths, the more significant this is, so that maximum conveying speeds will be selected especially in such cases.

The limits imposed first and foremost the type and nature of the material to be handled can be exceeded in many instances if, for example, additional measures are taken at the feeding points to eliminate or diminish the drawbacks of high conveying speeds. Bulk material features strongly abrasive fine and light fragile coarse grained sized and heavy low conveying speeds slightly abrasive medium bulk weight medium granularity unsized higher conveying speeds Increased conveying speed results in an increased conveying capacity with a constant belt width. It may thus be possible to select a narrower belt width or a simpler troughing design for a given flow of material. In addition, reduced drive tractions and consequently reduced dimensioning of all elements constituting the belt conveyor may result. Drawbacks are increased belt wear, to which special attention should be paid in short belt conveyors, an increased risk of damage to the material handled and increasing power requirements for large capacities. Reduced conveying speed correspondingly results in a larger belt width or a troughing design with the given flow of material. For information on the global flow of sea currents, see thermohaline circulation.Please help improve this article if you can. June 2019 Learn how and when to remove this template message A belt conveyor system is one of many types of conveyor systems. A belt conveyor system consists of two or more pulleys sometimes referred to as drums, with a closed loop of carrying medium—the conveyor belt—that rotates about them. One or both of the pulleys are powered, moving the belt and the material on the belt forward. The powered pulley is called the drive pulley while the unpowered pulley is called the idler pulley.

There are two main industrial classes of belt conveyors; Those in general material handling such as those moving boxes along inside a factory and bulk material handling such as those used to transport large volumes of resources and agricultural materials, such as grain, salt, coal, ore, sand, overburden and more.A conveyor belt uses a wide belt and pulleys and is supported by rollers or a flat pan along its path. In combination with computercontrolled pallet handling equipment this allows for more efficient retail, wholesale, and manufacturing distribution. It is considered a laborsaving system that allows large volumes to move rapidly through a process, allowing companies to ship or receive higher volumes with smaller storage space and with less labor expense. Belt conveyors are also manufactured with curved sections that use tapered rollers and curved belting to convey products around a corner. These conveyor systems are commonly used in postal sorting offices and airport baggage handling systems. Rubber conveyor belts are commonly used to convey items with irregular bottom surfaces, small items that would fall in between rollers e.g. a sushi conveyor bar , or bags of product that would sag between rollers. The belt is looped around each of the rollers and when one of the rollers is powered by an electrical motor the belting slides across the solid metal frame bed, moving the product. In heavy use applications, the beds in which the belting is pulled over are replaced with rollers. The rollers allow weight to be conveyed as they reduce the amount of friction generated from the heavier loading on the belting. The exception to the standard belt conveyor construction is the Sandwich Belt conveyor. The Sandwich Belt conveyor uses two conveyor belts, instead of one.For conveying Bulk Materials like Grains, Ore, Coal, Sand etc., over gentle slopes or gentle curvatures, a troughed belt conveyor is used.

The trough of the belt ensures that the flowable material is contained within the edges of the belt. The trough is achieved by keeping the idler rollers in an angle to the horizontal at the sides of the idler frame. Like a Troughed Belt Conveyor, a Pipe Conveyor also uses idler rollers. However, in this case, the idler frame completely surrounds the conveyor belt helping it to retain the pipe section while pushing it forward. In the case of travel paths requiring high angles and snakelike curvatures, a Sandwich Belt is used. This transport option is also powered by idlers.In certain applications, Belt conveyors can also be used for static accumulation or cartons.In 1905, Richard Sutcliffe invented the first conveyor belts for use in coal mines which revolutionized the mining industry. Incorporating a halftwist, it had the advantage over conventional belts of a longer life because it could expose all of its surface area to wear and tear.It is common for belts to have three layers a top cover, a carcass and a bottom cover. The purpose of the carcass is to provide linear strength and shape. The warp refers to longitudinal cords whose characteristics of resistance and elasticity define the running properties of the belt. The weft represents the whole set of transversal cables allowing to the belt specific resistance against cuts, tears and impacts and at the same time high flexibility. The most common carcass materials are steel, polyester, nylon, cotton and aramid class of heatresistant and strong synthetic fibers, with Twaron or Kevlar as brand names. The covers are usually various rubber or plastic compounds specified by use of the belt.For example, the highest strength class conveyor belt installed is made of steel cords.Material flowing over the belt may be weighed in transit using a beltweigher. Belts with regularly spaced partitions, known as elevator belts, are used for transporting loose materials up steep inclines.

Belt Conveyors are used in selfunloading bulk freighters and in live bottom trucks. Belt conveyor technology is also used in conveyor transport such as moving sidewalks or escalators, as well as on many manufacturing assembly lines. Stores often have conveyor belts at the checkout counter to move shopping items, and may use c heckout dividers in this processs. Ski areas also use conveyor belts to transport skiers up the hill. Industrial and manufacturing applications for belt conveyors include package handling, trough belt conveyors, trash handling, bag handling, coding conveyors, and more. Integration of HumanMachine InterfaceHMI to operate the conveyor system is in the developing stages and will prove to be an efficient innovation.Single flight means the load is not transferred, it is a single continuous systems for the entire length. This conveyor is a cable belt conveyor system with a 31kilometrelong 19 mi conveyor feeding a 20kilometrelong 12 mi conveyor. Cable belt conveyors are a variation on the more convention idler belt system. Instead of running on top of idlers, cable belt conveyors are supported by two endless steel cables steel wire rope which are in turn supported by idler pulley wheels. This system feeds bauxite through the difficult terrain of the Darling Ranges to the Worsley Alumina refinery. It was design by Conveyor Dynamics, Inc.The third longest trough belt conveyor in the world is the 20kilometrelong 12 mi Curragh conveyor near Westfarmers, QLD, Australia. Conveyor Dynamics, Inc.The conveyor is actuated by three synchronized drive units for a total power of about 1.8 MW supplied by ABB two drives at the head end in Bangladesh and one drive at the tail end in India. The conveyor belt was manufactured in 300metre 980foot lengths on the Indian side and 300metre 980foot lengths on the Bangladesh side.