Helix delta-T6 Conveyor Design software

List of features in the new version 6 software

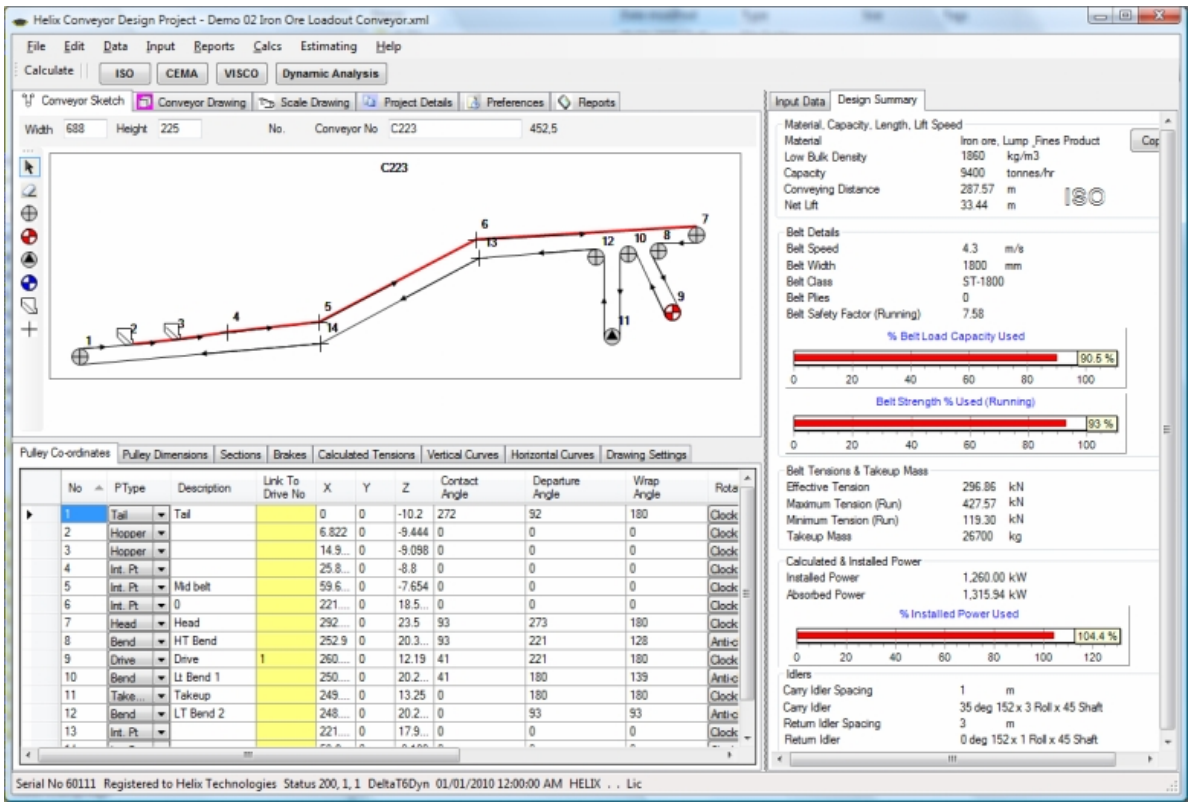
Introduction

Helix Technologies have recently completed development of a new version of the Helix delta-T Conveyor Design software program which was first launched in 1991 and is now used in 25 countries by thousands of conveyor designers. This new program has many new features and is written for the latest operating systems using new software development techniques.

Software Development Tools

The new program, version 6, has been completely re-written in **Microsoft Visual Studio® for .Net** and uses the latest software development tools from Microsoft. It is written in a development language called C# and uses the MS Common Language Runtime compiled for .Net with xml data. This technology is the latest available from Microsoft and this makes it compatible with the latest operating systems including **Windows XP, Vista and Windows 7** and also 32bit and 64bit systems.

All this results in better user more friendly user interface, faster calculations, better reporting tools and will ensure the software has a very long life.



Program Features

Automatic Selection of Belt and Tension, Power Calculations

- Equipment Selection from Databases for Belts, Idlers, Pulleys & Shafts, Gearboxes, Motors, Fluid Couplings, Brakes etc.
- Draw a sketch of the conveyor Profile and also view a scale drawing and a 3D model of the conveyor
- Calculate Vertical Curve radii and super-elevation (banking) angles for Horizontal curves
- Calculate using **CEMA**, **ISO 5048** or the new **Viscoelastic** method for low resistance rubber belts
- Add any number of Conveyor Pulleys, Drives, Loading points, Trippers, Brakes etc.
- Over 70 reports can be viewed, printed or exported to Word, PDF files or Excel etc.

Helix delta-T has been used as the design tool and proven in many thousands of real conveyor installations in more than 25 countries around the world since 1991. The latest version Helix delta-T 6 brings you even more power and flexibility in your conveyor designs.

Helix delta-T6 includes the new Dynamic Analysis version which was launched in November 2003 and has been improved and enhanced in the latest delta-T6 program.

This new version of the program which has full Dynamic Analysis capabilities is essential for designing high powered conveyors and long overland conveyors. The Dynamic analysis version includes the Standard and Professional versions of the software.

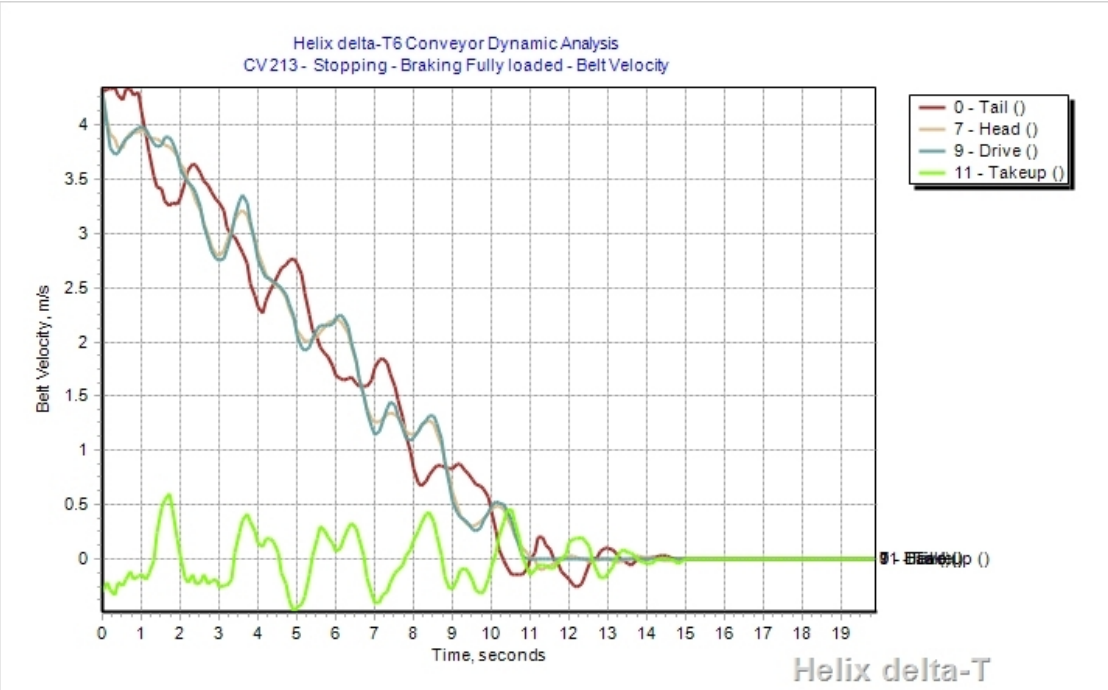
This new version calculates the transient belt Tensions and Velocities during starting and stopping of a conveyor. It can model the conveyor belt transient behavior during Starting Fully Loaded, Starting Empty, Stopping Fully Loaded and Stopping Empty. The program allows the user to input any number of Drives or Brakes and allows for input of Drive Torque / Speed curves, Delay times, Braking Torques, Flywheels and inertia effects. After the Dynamic Calculations have been performed, the user can view and Print two dimensional and surface plot three dimensional graphs for Belt Tensions, Belt Velocities, Strain rates and Take-up movement versus time step for all points along the conveyor.

The Dynamic calculation process uses sophisticated Variable Step Runge Kutta method integrators for solving the complex differential equations, including flexible, easy to use boundary condition specification by the user.

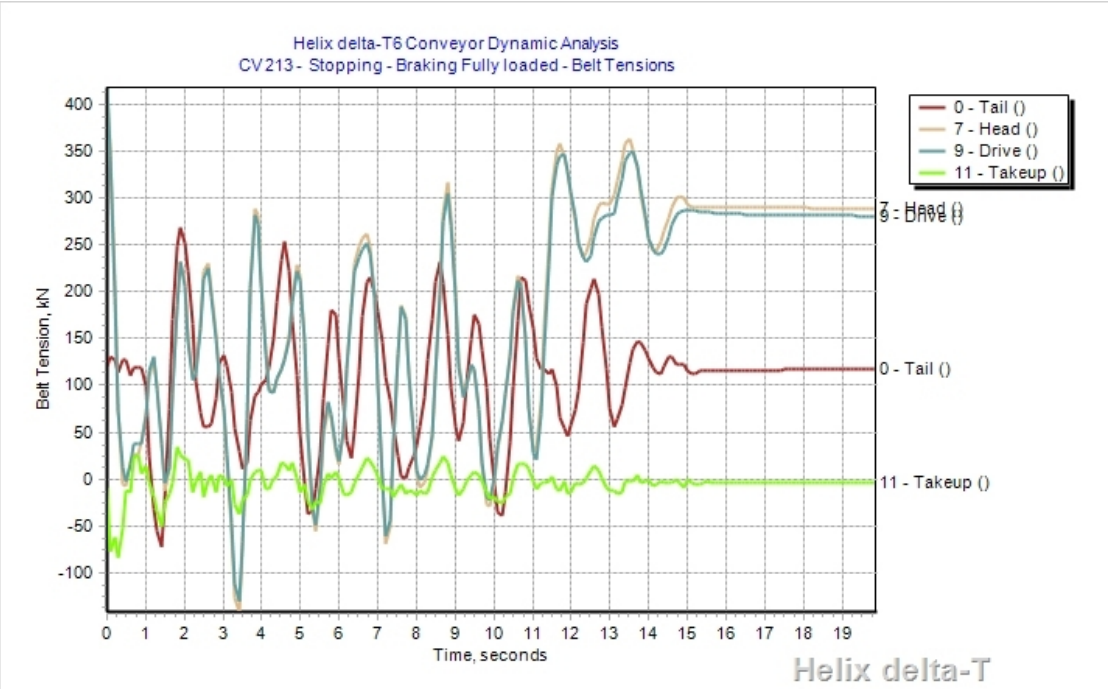
The Dynamic Calculations are easy use to use and Engineers who have static conveyor design experience can perform these complex dynamic simulations using this very powerful software.

Example of Dynamic Analysis - conveyor stopping loaded

Belt Velocities



Belt Tensions



Note Tension rise as conveyor comes to rest and holdback locks up.

The program will automatically calculate the belt tensions in the system, select a suitable belt from the database, calculate the pulley and shaft sizes required, select a suitable electric motor, fluid coupling and gearbox from the databases, calculate the idler shaft deflections and bearing life and then present the full conveyor design in reports which can

be viewed, printed or exported to Word for Windows, Excel, PDF files and other applications.

Belt tensions can be viewed graphically, and the Calc section provides useful procedures for calculating discharge trajectories, hopper pull-out forces, vertical curve radii, horizontal curve banking angles and belt drift, trough transitions distances and other frequently performed routines. Context sensitive on screen Help will guide you through the operating procedures and provide the formulae used in the calculations.

You can also create and view a 3D model of the conveyor. The program also allows you to dynamically calculate Vertical and Horizontal curve geometry for the conveyor.

In addition, delta-T provides an in-depth analysis of conveyor belt tensions under different operating conditions such as running fully loaded, running empty, starting fully loaded, starting empty, braking fully loaded, braking empty and coasting. A new sketch facility allows users to sketch the conveyor profile and enter data in tabular format.

New Features in delta-T version 6

- The new Professional version includes the following features:
- Completely New design report formats - over 70 reports can be generated easily, with excellent presentation of the design.
- Belt Tension calculations for Running, Starting and Braking including accelerating and stopping times.
- Calculation to **ISO, CEMA and VISCO** standards with auto friction factor calculation.
- Viscoelastic Calculation using conveyor belt rubber properties for the friction factor calculation. This state of the art method allows use of **Low Resistance Rubber** belts and allows the user to design long overland conveyors economically.
- Bar and 3 D line graphs of belt tensions under different loading and starting and braking conditions.
- Improved Braking calculations including a Brake database and Brake Selection routines. These include adding constant torque, variable torque and velocity ramp (S curve) controlled braking systems.
- Improved equipment database for Belts, Idlers, Motors, Gearboxes, Fluid Couplings, shaft couplings, holdbacks and Brakes etc. Copy and Paste data from Excel.
- New Database system compiled directly into the program – this system uses xml files for data storage eliminates previous issues with the older DBISAM file system.
- Ability to import or copy and paste data directly from xml, csv and Excel spreadsheets to conveyor design or equipment databases.
- New improved Sketching facility to quickly add pulleys, hoppers and drives to your conveyor.
- New scale drawing system for live feedback on Vertical curve radii - just edit an intersection point on the screen and the vertical curve is redrawn in front of you so that you can see immediately if you can fit the radius into the geometry.
- New Horizontal Curve Calculation routines - belt drift and banking angle calculations, with live on-screen feedback about radii.

- New combined horizontal and vertical compound curve banking angle and belt drift calculations.
- New belt edge tension rise calculations for vertical and horizontal curves.

Design Reports

- Export design reports directly to MS Word® Excel® or PDF® file formats plus others.
- Create a single PDF® file with all design reports in the file.
- Improved Belt Selection routines with diagrammatic feedback on belt width vs. load area and edge distance.
- Improved Take-up Travel distance calculations including thermal expansion, permanent stretch, dynamic stretch and splice allowance.
- Estimating and Costing schedules for all conveyor equipment from civil & electrical to conveyor components.
- New comprehensive instruction and context sensitive help files
- New Belt Feeder / Hopper pullout calculations.
- New Trough Transition distance calculations.

Dynamic Analysis Calculation Features

- Easily model the belt transient tensions and velocities during Starting and Stopping of conveyors.
- Add Torque Control or Speed Control on drive acceleration and on braking.
- Add Delay times for multiple drives for Dynamic Tuning
- Ramp and S curve starting and stopping control for starting and stopping
- Add Flywheels to pulleys to optimize starting and stopping
- Add Capstan Winch control to take-up ropes to control stopping conveyors.
- Add Low and High Speed Brakes to pulleys as required.
- View the movement of the Take-up pulley during Starting and Stopping
- Predict the maximum Transient Belt Tensions at any point along the conveyor as well as the timing of these transients.
- Calculate Dynamic run back belt tensions due to holdback locking up
- Compare the Dynamic Calculations results with the rigid body static calculations in the delta-T6.
- Predict the magnitude of transient loads on conveyor structures.
- Calculate the torque loadings on gearboxes and couplings during starting and stopping. Eliminate conditions which may cause costly equipment failures.
- Calculate Dynamic forces on holdbacks (anti runback devices)
- Perform Dynamic Tuning by changing the start delay times on different drives.

Helix delta-T6 will save you time and reduce your plant capital, maintenance and operating costs.