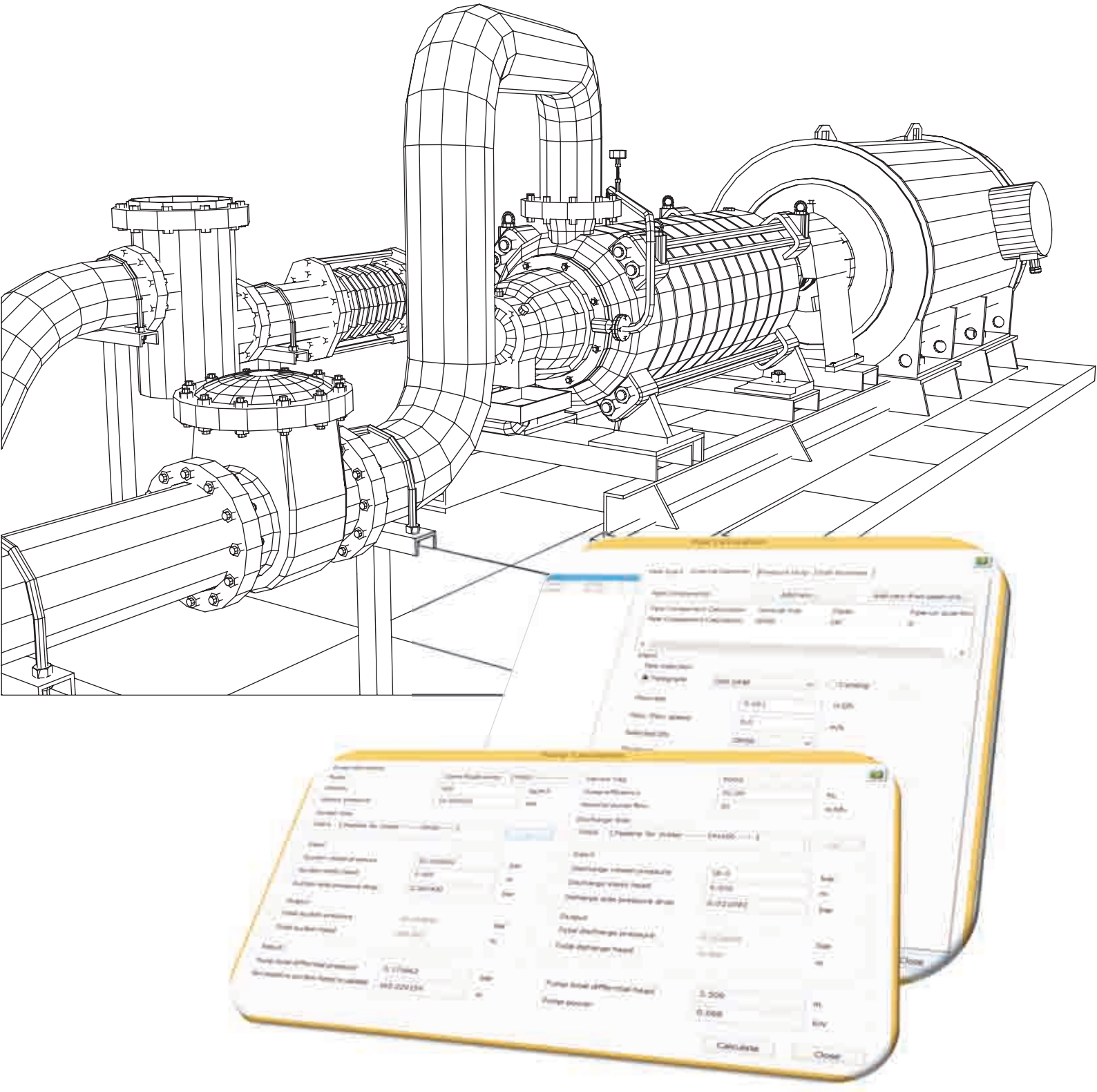
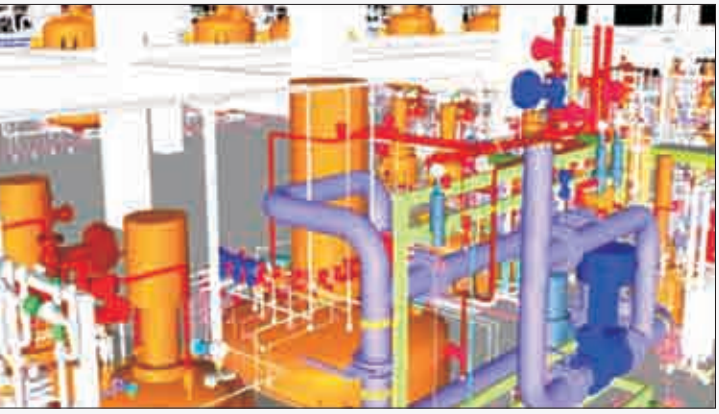
Issue 2016 | 10

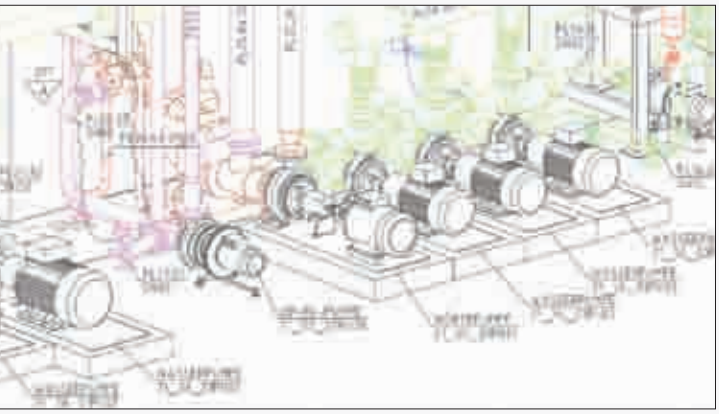
CADISON® WORLD

EXPERIENCES & NEWS



Pipe and Pump Sizing now possible in.... CADISON®





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Ralf Lehmann

Ajit Joshi

Michael Brückner

"With the release of CADISON® R15.5, we have introduced calculations for Process Engineers in the P&ID module. We have also improved our cable tray routing functionality and added SDNF export function to Tekla® for steel detailing. There are many other enhancements that improve usability in Project-Engineer, 3D-Designer, MATPIPE, Steel Layout, Pipe Support and Electrical-Designer modules."

Stefan Kraus

Falko Meier

Prashanth Chunduri

Welcome to CIC 2016…

Dear Customers,

With each passing year, CADISON® adds functionality to improve usability and productivity for our customers. This year we have made few improvements in each of the CADISON® module and have also laid the foundation for significant improvements to come in next year's R17 release. CADISON® R17 will see significant improvements in our 3D Designer and Project Engineer modules.

Our pursuit of being the best integrated multi-disciplinary design and document management tool with a single (common) database continues and CADISON® R15.5 strengthens that mission. Our SDNF export function to Tekla® in the Steel Layout module ensures interoperability with Tekla® which is a big step forward. For Electrical-Designer users we have added automatic PLC I/O drawing creation functionality and made a major improvement in Cable Tray routing function. The same concept will also be used for Pipe routing functionality in CADISON® R17.

At ITandFactory, we remain committed and excited about our CADISON® journey to create the best tool for Plant Engineering. Thank you for coming to CIC 2016 and we hope that the information exchange in the conference will be beneficial to all of us.

Enjoy the Conference!

ITandFactory

Overview of Key Enhancements in

Engineering Calculations in P&ID Designer

CADISON® R15.5 introduces engineering calculations for selection of pipeline and utility pump as per the standards. Process Engineers / Project Engineers can now quickly select appropriate pipeline, perform calculations and deliver P&ID's with complete engineering information (specifications, calculations, etc.).

Pipe Sizing
Pipe Sizing calculation accurately estimates the pipe diameter, pipe thickness and pressure drop in the pipes using 'Resistance Factor' method and considering safety requirements.
User has an option to select the applicable standards for pipe grade or attach a catalog with all the details (specifications). The application also suggests the nominal size, pipe diameter, velocity, total pressure drop and thickness with respect to acceptable / allowable values.

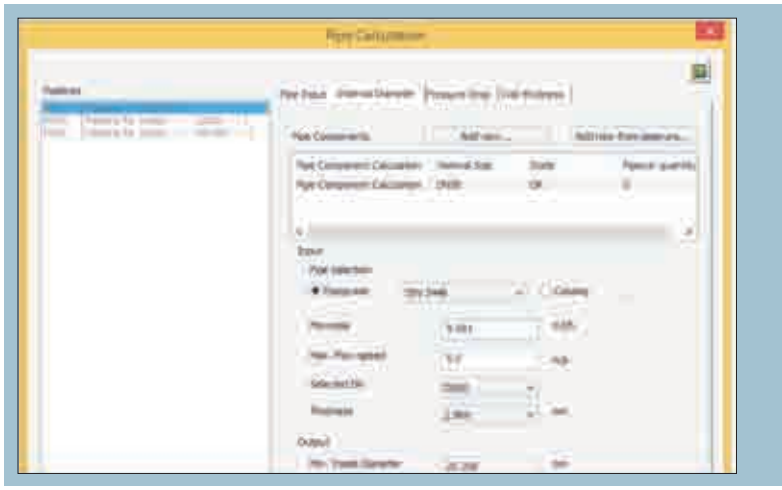
Pump Sizing
With Pump Sizing calculations, users can select appropriate pump while creating P&ID's.
The pump sizing calculation is based on flow rate, total differential head, discharge static head, suction static head, frictional head losses, power parameters, etc.
For example, it does hydraulic calculation for a centrifugal pump and estimates differential head, hydraulic power, motor power, NPSH available, etc. It also helps the users to identify suction and discharge side pipelines in P&ID based on connection points.

Benefits
- Built-in feature for quick and error-free calculations during P&ID creation
- Flexibility to enter / change the process parameters (in a dialog box) as per the process requirements
- Improve overall efficiency of process engineers by creating P&ID's with specifications, calculation, and reports for proposal / detail engineering

GA Drawing Enhancements

Pipe End Cut Symbol: Based on customer requests we have added automatic representation of Pipe End Cut Symbols in plan / section views of the GA drawings. The system identifies the pipe cuts (keeping boundary view as reference) while creating orthographic views and add End Cut Symbols to plan / section views.

Insulation and Flow Direction Symbol: Users can now add / delete **Insulation and Flow Direction** symbols in a pipeline from 'Drawing command' itself.

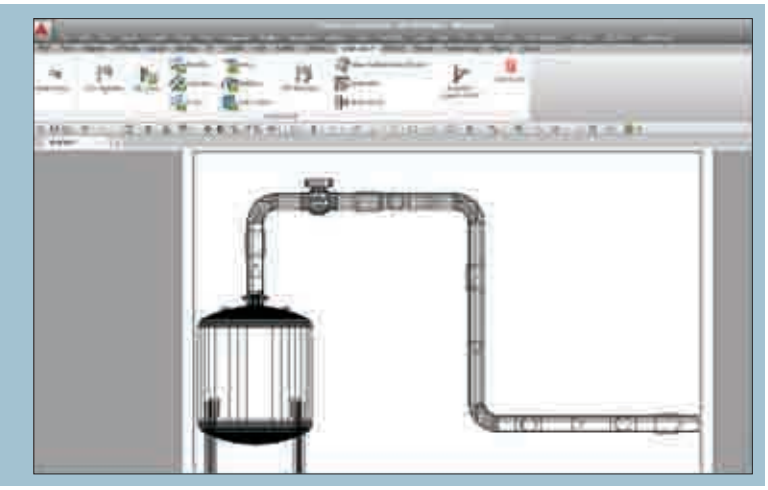


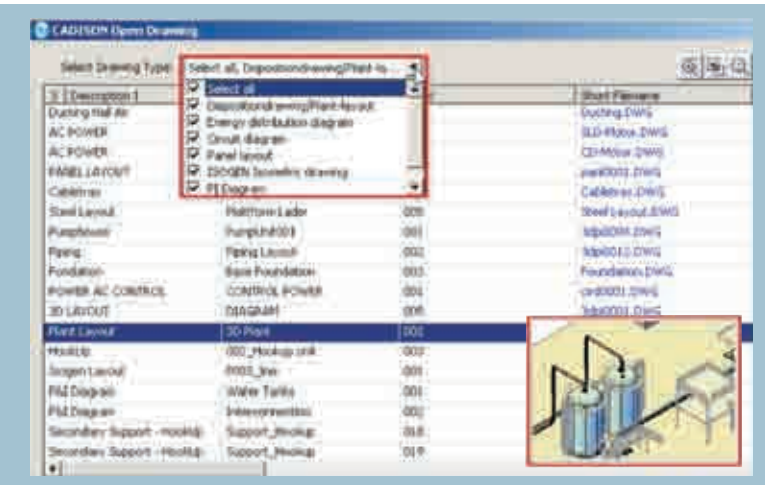
Benefits
- Automatic insertion of symbols improves the visualization of GA drawings
- These symbols will also be exported with the '2D Extraction' command
- Symbols will be updated (location, size, etc.) automatically, if there are any changes in view selection, pipe size, and 3D model displacement

CADISON® R15.5

Enhancement in MATPIPE

With this new wizard, user can quickly create new objects with all necessary data (graphics, data sheets, etc.) by referring to the existing objects in MATPIPE. It provides an additional Catalog type called **"Reference Catalogs",** to be used as a reference at the time of creating new objects. The user will be guided through a wizard to select the reference object, key properties such as nominal sizes, connection points, etc.





Benefits

- Quick creation of new catalogs / libraries as per the company standards
- Improves reusability of Catalogs / Standard Parts over various projects

Enhancements in Project Engineer

Quick selection and preview of drawings with "Open Drawing" dialog box

Users have seen the benefits of CADISON® tree structure for accessing the project data. With CADISON® R15.5, we have introduced 'Open Drawing' dialog box for quick selection of drawings. Users can filter and select the drawing type (for e.g. P&ID drawing, Panel Layout, Isometric, Circuit diagram, etc.) and also preview it before opening the entire drawing.

Benefits

- Improves usability with quick filter / selection dialog box
- User can save the filters used once and personalize the search criteria
- Quick previews (of models / content of drawing) help in selecting right X-refs

Easy Maintenance of Databases

With CADISON® R15.5 enhancement, a user can maintain a database with unique identification name / number thereby avoiding confusion while exporting the latest version of databases. The user can follow specific naming convention for each project / database and maintain different versions with date and time details.

Benefits

- Standardization of naming / identification of databases
- Effective maintenance of databases with revision details
- Automatic version control to access the latest database

Link objects

Link objects command added in CADISON® tree helps user to organize the objects in a specific hierarchy in the project. With the current enhancement, it is possible to link selected objects from the drawing to the objects in a tree with minimum number of clicks.

Benefits

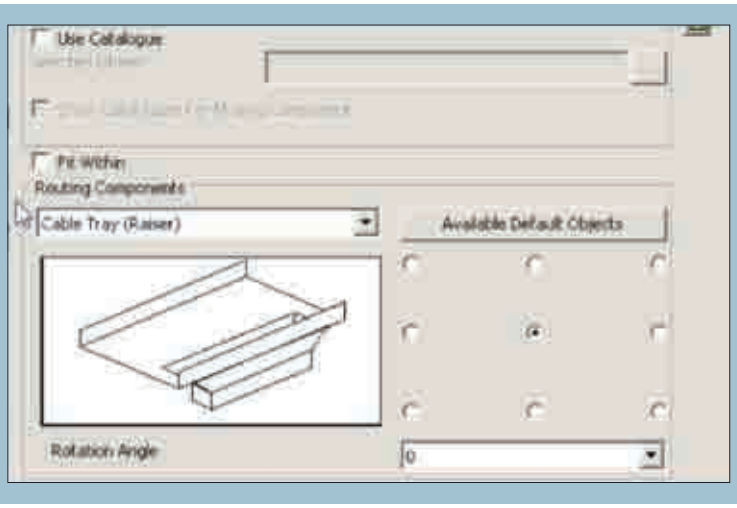
Simplifies the workflow and enables user to select the objects from drawing or tree as per convenience

Overview of Key Enhancements in

Enhancements in Steel Layout

SDNF Export Interface
With the implementation of new SDNF (Structural Steel Detailing Neutral File) export interface in R15.5 it is now possible to export steel structure data to Tekla in SDNF format for further engineering.

Configuration of Standards in Steel Layout
The Steel Layout module wizards such as Ladder, Caged Ladder, Staircase, Handrail, etc. are enhanced to support various standards (DIN, ISO, etc.). It helps the users to create the structures according to the selected standards.



Standards can be configured by an administrator using configuration set functionality (as per the guiding values) and made available for use in a project. Steel Structure Wizards will validate the values entered by users with the guiding values from a standard.

Improved End Cut Representation
With CADISON® R15.5, represention of End-cuts at an intersection is easy for better visualization and accurate BOM. Beam-mitre option is added in addition to the Beam-offset option (available in previous version). This enables users to trim the steel profiles (beam / columns) and avoid an intrusion. The users can also specify beam / column profile lengths in BOM accurately.

Easy Placement of Beams or Columns
Adding multiple steel profiles along with multiple beams and columns in a drawing becomes easy with a new command introduced in R15.5. Users can quickly add the beams and columns with required spacing at a click of a button.

Benefits
- Improved representation of Steel Layout with additional standards
- Accurate BOM generation from the layout drawings
- Export drawings in SDNF for further engineering / Analysis
- Improved usability features for quick layout creation

Enhancements in Electrical-Designer

Cable Tray Routing
With R15.5 cable tray routing is simplified. Auto routing functionality suggests the next component (based on the cursor position) for quick routing. The user can either select the cable tray components from catalog or use the components created earlier.

Benefits
- The user can change the dimensions of cable tray objects at run time for complex cable tray routing. For example, a user can extend the cable route, add branches and route the branch cable tray
- Easy selection and placement of components with alignment / cardinal points, rotation angle and routing suggestions

- Automatic extraction of BOM for cable tray including connection data, material information and a cable list for the entire 3D project or an individual section

Automatic PLC I/O Drawing Creation (from spreadsheets)

With this new drawing feature the users can define project's I/O assignments in a spreadsheet to create a comprehensive set of PLC I/O drawings.

Automatically generate drawings as per the drawing configuration and specifications such as I/O modules, I/O board catalog, signals, addresses & description text, and component & terminal symbols connected to each I/O point.

Benefits
- Options to choose I/O board orientation, PLC split, etc.
- Synchronization between excel spreadsheet and drawing for maintaining updated sheet / drawing
- Eliminates manual drawing creation efforts

Enhancement in Terminal Drawing Feature

With CADISON® Electric-Designer users can easily create and update automatic terminal drawings. The enhanced feature in R15.5 now provides a user with a flexibility to place multiple terminals in a drawing with a single click. It identifies the intersection points with the wires and add the terminals to the points.

Benefits
- Terminal strip editor provides flexibility to add spare terminals; it can also make modifications such as changing the sequence or numbering
- Manual efforts required to fetch data from multiple locations gets eliminated

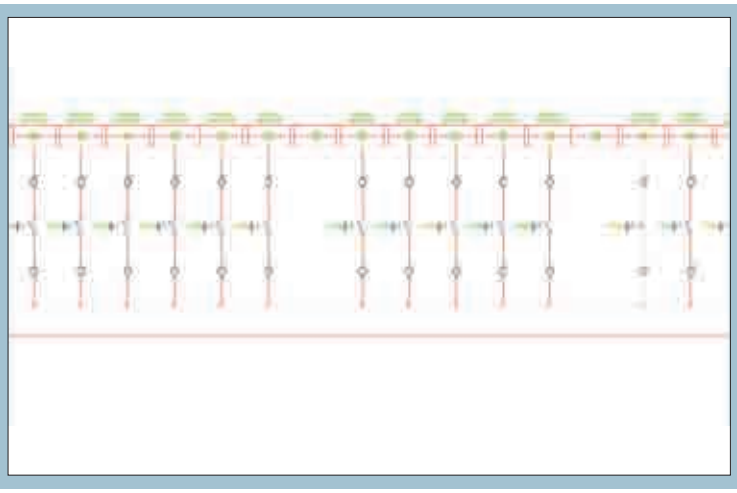
Improved Inventor Interface

The new Improved Inventor Interface provides the facility to validate and modify the invalid connection points of the imported inventor model thereby increasing drawing accuracy. Inventor iProperties are easily exported to CADISON® objects and provide an ability to import XML files in CADISON® environment.

Benefits
- Error free equipment modeling and integration with 3D model
- Improves efficiency by importing data along with the graphics

Easier Creation of Custom (non-standard) Pipe Supports

Users can quickly create non-standard pipe supports manually using steel profiles (beam / columns). A standard pipe support can be modified by adding / removing the required or unwanted profiles using "Assistant for Pipe-Support" wizard. It provides flexibility to the users to modify existing steel structure and convert it into a 'Pipe Support' category to showcase / highlight it in BOM and other reports.



Integrated Engineering and Design with CADISON® Brings Significant Advantages for ISGEC

CADISON® enables productivity and workflow improvements

Isgec Heavy Engineering Limited with more than 5000 employees is one of the market leaders in India for industrial boiler segments. With its strong engineering capabilities for the design of Boilers, Power Plants, Sugar Plants, Pressure Vessels, Heat Exchangers, Presses, etc.; Isgec's vision is to be the most preferred plant supplier in fulfilling growing energy demands with a focus on customer delight, technological innovations, and global reach.

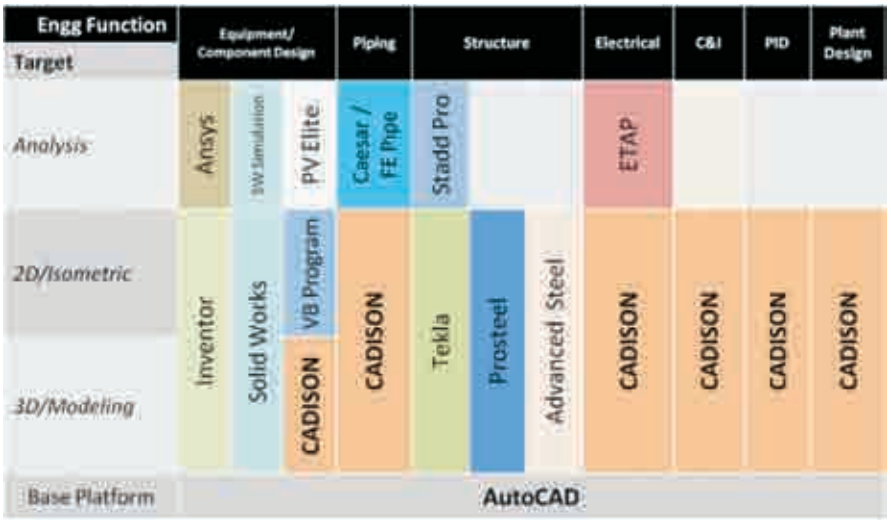
ISGEC's Industrial boiler design team implemented CADISON® in a phased manner. In 2010 the team started using CADISON® for plant modeling by converting fabrication and erection drawings into a 3D model. It avoided reworks during erection & commisioning by early detection of clashes and issues during the design stage itself. CADISON® P&ID module was implemented in the year 2011 to improve the accuracy of instrument's and valves being used through standardization of specifications & catalogs, KKS tagging philosophy, etc.

3D to 2D approach was adopted by ISGEC in the year 2014. It was decided to make all manufacturing drawings through 3D based tools. Existing 3D tools used such as Tekla® for Steel structure and Inventor for Mechanical parts are interfaced effectively with CADISON® using the interfaces (provided by CADISON®). Pipe fabrication and erection drawings were generated using CADSION® ISOGEN which is built-in with 3D-Designer. In the beginning of year 2015, CADISON® was expanded to electrical, instrumentation and piping team to improve design productivity and accuracy.
Today, complete design of Boiler, Sugar plant and Power plant is done in CADISON®.

"First-time-right concept is being adopted by ISGEC to offer a better product at an optimum price"

By standardizing on CADISON®, ISGEC has overcome the following challenges:

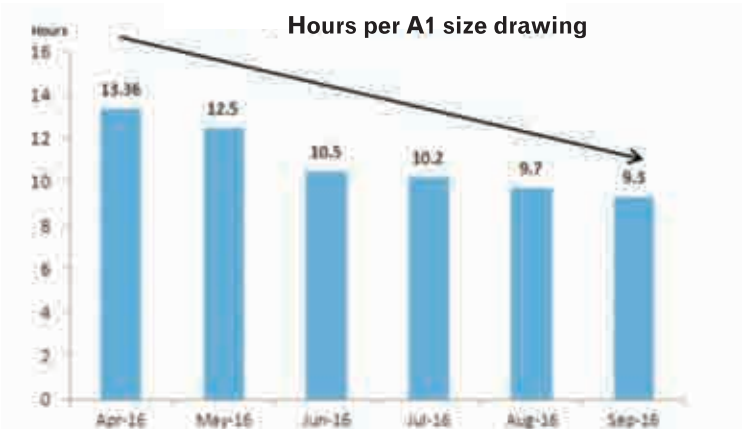
- Shorter plant delivery demand by clients
- Managing design changes by client, supply partners and within design groups.
- Optimize product and plant equipment's cost
- Early detection of issues at site and shop



"CADISON® fits in well into our existing engineering environment and complements our legacy software investments."

Many design tools were explored and CADISON® was chosen for the following reasons:

- Its integrated plant design and engineering capabilities (P&ID, Piping, Electrical, etc.)
- Interface with AutoCAD 3D, Inventor and other AutoCAD tools
- Interface with stress engineering tools such as CAESAR II



100+ plant designs are made using CADISON®.

3D designer and P&ID modules of CADISON® are the show stoppers for Isgec and are extensively used due to its intelligence and connectivity.

Benefits

- Better engagement with client due to model walkthroughs at early stage of project and reduced site punch points
- 3D based model working has given 10% savings in overall project design hours by using a common object-oriented database thereby achieving real integration between different disciplines
- Design errors due to Bill of Material mismatch were brought to zero
- Piping drawing productivity has increased to the tune of 30%

"Most of the designers are familiar with AutoCAD and it was decided to have AutoCAD based CADISON® application for Plant Design. Also, the Total Cost of Ownership of CADISON® is lower and its effect on project costing is minimum"

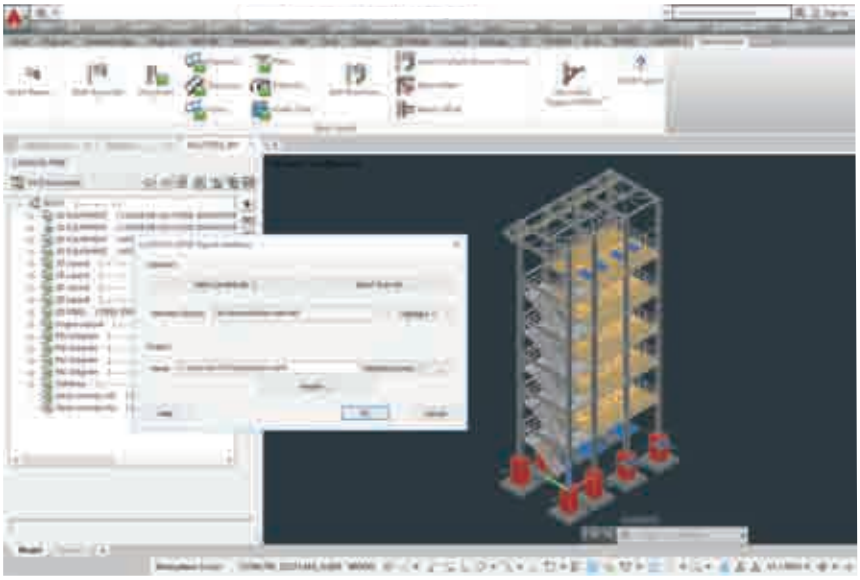
– Mr. ESG Pragasam Associate, Vice President- Engineering

Export to Tekla from Steel Layout Module possible with R15.5

Our continuous enhancements in CADISON® Steel Layout has made it a comprehensive tool for planning, creating and representing 3D steel structures efficiently in plant design. It has wizards which help users to create the structures (as per the standards – DIN, ISO, ANSI, etc.) with minimum inputs. It also allows users to quickly create, edit, and detail custom assemblies like towers, pipe supports, frames, gratings, roofs, etc. and export it to Tekla with our new SDNF interface. The module provides users an ability to extract GA drawings of the structures and generate reports such as Bill of Material (BOM) and quantities (BOQ) as required. These reports give piecewise information or provide categorized report of the steel sections for the type, length, weight and quantity.

SDNF Interface for Detail Engineering

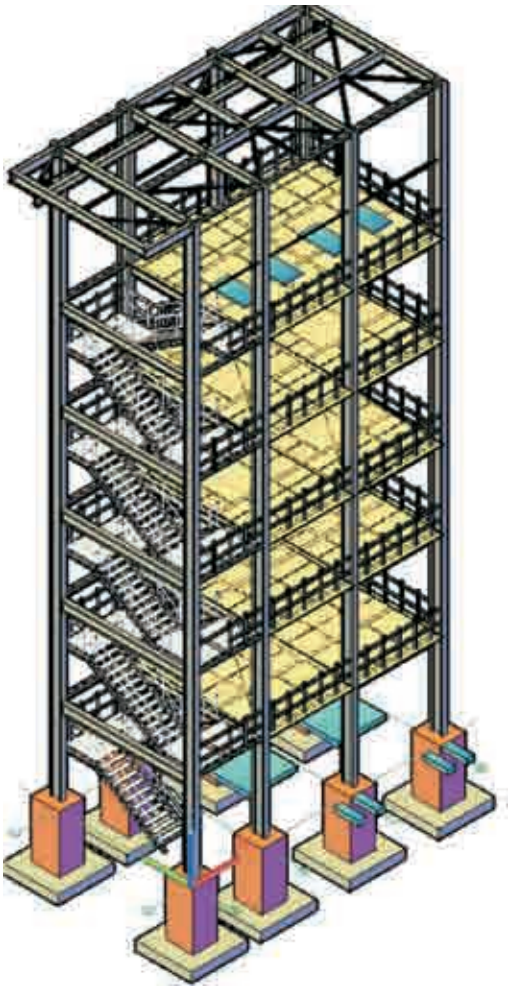
With the implementation of SDNF (Structural Steel Detailing Neutral File) export interface in R15.5, it is now possible to export steel structure data to Tekla® for further detailing.
Users can select steel structures (graphical or from a list / tree) and can preview the selected structures before exporting them to Tekla®.



CADISON® Steel Structures

An option to set 'Material Name', 'Profile Name' conversion in a configuration file enables user to map the materials and profiles (of different standards & types) in Tekla® and CADISON® Steel Layout. This enables user to tweak mapping between two systems to handle any material or profile changes in future versions of CADISON® and Tekla®. Users can also extend this configuration file to other structural detailing tools such as Advance Steel, SDS/2, etc. with some tweaking.

With the SDNF interface CADISON® bridges the gap between 3D Steel Structure layout and fabrication detailing workflows.



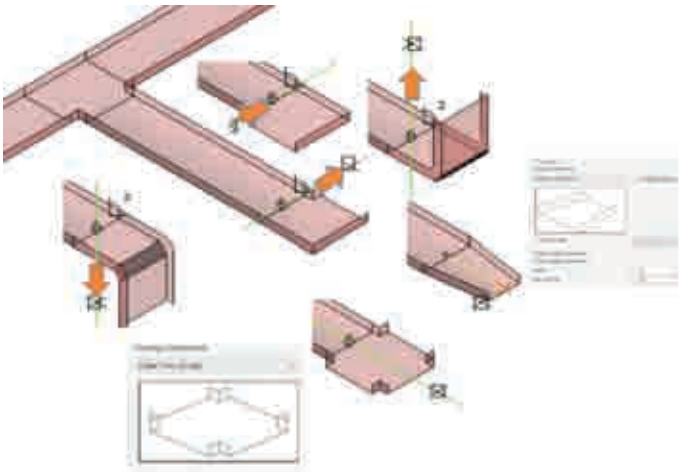
Exported Structures in Tekla®

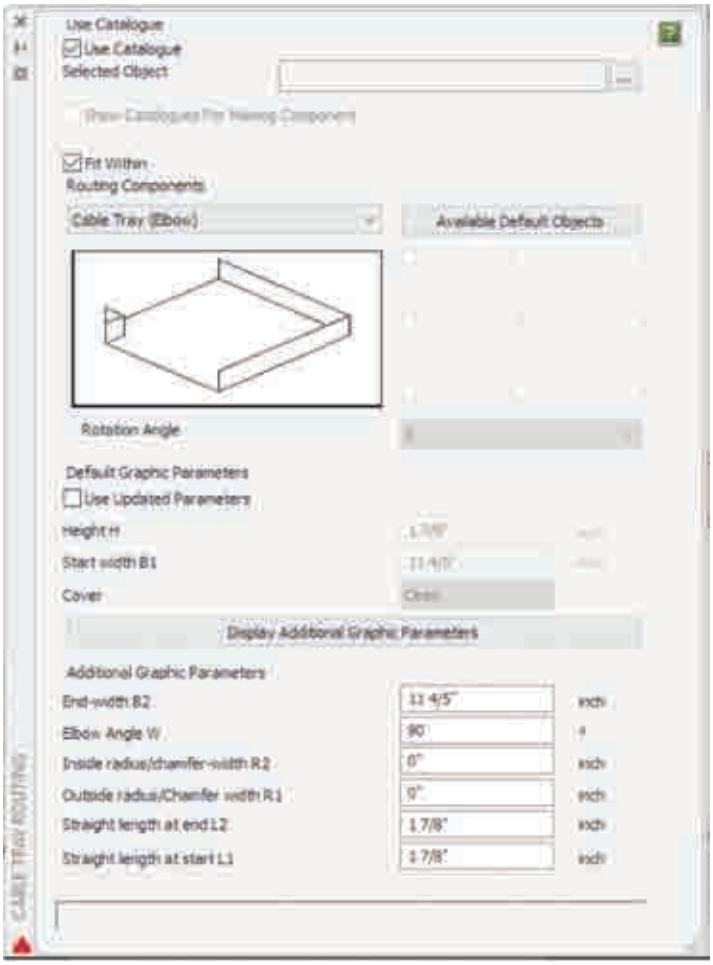
Users of Steel Layout module will benefit from quick layout creation, easy modification through wizards and better representation in GA drawings. It will assist in planning and quickly creating steel structures like platforms, etc.

Cable Tray Routing Made Easier in CADISON® Electrical Designer

With CADISON® R15.5 enhancements, electrical cable tray routing is simplified. It enables the users to quickly create / route complex cable tray(s) with an intuitive interface. This new command has built-in intelligence to automatically suggest the next component for routing based on the cursor position in the drawing. As the cursor position changes, the system will identify the possible options and display the appropriate cable tray objects at the tip of cursor (for e.g. cable tray straight, left elbow, right elbow, bend outside, bend inside, etc.) for quick routing.

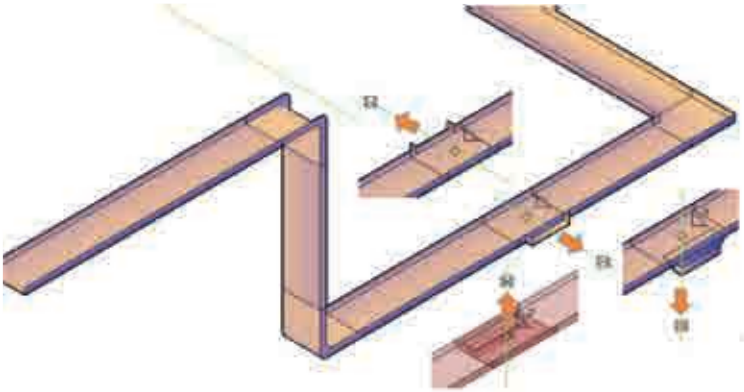
Users have an option to select the specific objects (in a dockable dialog) such as Reducer to change the width of cable tray, select Tee / Cross to specify the branching location, etc. while continuing the routing.
User can use standard / vendor specific catalogs to fetch the dimensions at the time of routing and deliver accurate MTOs as per the standards or vendor specifications.
The UI provides multiple options such as 'fit within', 'reference point' so that cable trays can be aligned with reference to other objects (ex: Pipes, equipments, vessels, structures..) to avoid the collision.
Option to change the tray object dimensions at a





run time ("use updated parameters") option will give the flexibility to change the specific properties (for e.g. depth, based on location needs) of a tray. It enables the user to route a tray end-to-end in single command.

Modifying or Re-routing: This command is also useful for modifying or re-routing the cable tray. Dynamic options to add Tee, Cross, Raiser at any selected point of an existing cable tray empowers the user to create a branch quickly. Moreover, the software fetches the required information for creating branches and suggests the suitable options based on the location of mouse cursor, so that the user can continue routing without selecting or entering multiple parameters as an input.



With the enhancements in CADISON® Electrical-Designer, it has emerged as the best value comprehensive tool for Electrical Design in the world.

Plant Design & Equipment Engineering Solution

CADISON® Project-Engineer is the module for project planning & management, costing, administration, work-flow management, status review and document management.It allows project managers to create and control the project data without any CAD/Graphical interface. It also provides bidirectional interface with MS Projects to plan and track the project status in CADISON®.

CADISON® P&ID-Designer is a spec-driven module for creation of intelligent PFD/P&ID, instrumentation (measurements, hook-up's, etc.), specifications and reports (BOM, Datasheets, lists, etc). It supports various standards (DIN, EN, ISO 10628, ISA 5.1, ANSI, etc.) and also allows users to conform to company standards. CADISON® enables Pipeline Sizing and Pump Sizing calculations for optimum selection of equipments at P&ID stage.

CADISON® 3D-Designer is the module which allows the users to build plant layouts, pipeline routing and equipment modeling. It also provides various design assistants / wizards such as 'Tank Assistant', 'Nozzle Assistant' for creating 3D vessels and tanks. It uses ISOGEN for extracting isometrics and enables users to automatically generate orthographic (GA) drawings for construction documentation. Its integrated report generator enables users to generate various types of reports (BOM, MTO's, Datasheets, etc.).

CADISON® Electric-Designer is a comprehensive solution for schematic & controls design, sizing calculations (Cable, Transformer & Battery sizing, and Earthing calculations), 3D cable tray & panel layouts, automatic report generation, bill of materials (BOM) and material take-offs & lists.

CADISON® MATPIPE is an independent module for development and management of pipe classes, creation of parameterized 3D components, preparation and integration of manufacturer's catalogues and maintenance of up-to-date catalogue data in the system with import & export functionality of MATPIPE.

CADISON® Steel Layout is a tool for planning and creating 3D steel structures and custom assemblies (ladders, staircases, platform, hand rails, pipe supports, frames, etc.). The users can also extract GA drawings and generate Bill of Material (BOM) and quantities (BOQ) required. Its SDNF export features allow the users to the export steel structures to Tekla® for further detailing.

CADISON® Pipe Support Modeler is a wizard which assists the users to create and edit different types of predefined secondary supports in an easy and intelligent manner. Hook-ups can be generated automatically and inserted/displayed in the documents (Drawings / Isometrics). Users can also quickly create non-standard pipe supports manually using steel profiles (beam/columns).

CADISON® Project-Navigator is a 'viewing Tool' for accessing engineering data of your projects. The navigator has been designed for the teams which normally are not involved in planning & design of a plant but are responsible for operation and maintenance (i.e. mere data consumers).

CADISON® Archiver CADISON® Engineer2Web enables the users (at remote location/site) to gain direct web access to CADISON® object data. The data and structures generated by using Project-Engineer, P&ID Designer, 3D Designer and other modules can be viewed, edited or re-integrated over a standard web browser.

CADISON® Engineer2Web CADISON® Engineer2Web enables the users (at remote location / site) to gain direct web access to CADISON® object data. The data and structures generated by using Project-Engineer, P&ID-Designer, 3D-Designer and other modules can be viewed, edited or re-integrated over a standard web browser.

CADISON® ERP-Interface CADISON® provides an access to the known ERP systems (Enterprise-Resource-Planning) for dynamic data exchange via an open ERP Interface. This bidirectional interface combines the ERP and engineering workflow for creation of a highly integrated system. For instance, orders can be directly released and controlled from the engineering workflow.

CADISON® Inventor Interface The CADISON® Inventor interface enables users to import an Autodesk Inventor part or assembly into CADISON® environment as a CADISON® object. Add-on menu in Inventor will assist users in exporting Inventor part or assembly file into SAT and XML format. The interfaces have a provision to define connection points on planar face of any shape (in Inventor as well as in CADISON® import wizard) enabling users to import objects with or without connection points.

CADISON® CAESAR II Interface CADISON® provides an interface with industry standard CAE software CAESER II for quick and accurate analysis of piping system subjected to wide variety of loads taking in to account weight, pressure, thermal, seismic and other static and dynamic conditions based on user defined variables and accepted industry guidelines. CAESAR II interface adds the ability to export pipeline or selected pipe data form CADISON® 3D-Designer to neutral ASCII –format.cii file.

CADISON® ROHR2-Interface makes it possible to transmit all pipeline systems created with CADISON® 3D-Designer to ROHR2 for quick and accurate analysis of piping system. All the required information will be completely transmitted in the form of NTR files for analysis.

ontz GmbH
ADISON® technology -

Integrated Pipe Sizing Calculations

Engineering Calculations has been one of our development focus from the last couple of releases to make CADISON® a comprehensive engineering solution thereby enabling users to do quick and accurate calculations and subsequently get away with manual/excel based calculations. As a part of this initiative, we have introduced our first Mechanical Calculation in CADISON® P&ID-Designer & Project-Engineer modules for Process / Project Engineers to do Pipe and Pump Sizing Calculations.

CADISON®users are familiar with objects and properties (like media, pipeline, pipe runs, etc.) and have been using the object data (graphics, engineering data) for generating various types of reports and data sheets as per the project requirements. The key questions asked were, what more can be done with these properties? And can it be used to do calculations such as pipe sizing, pressure drop, etc.?

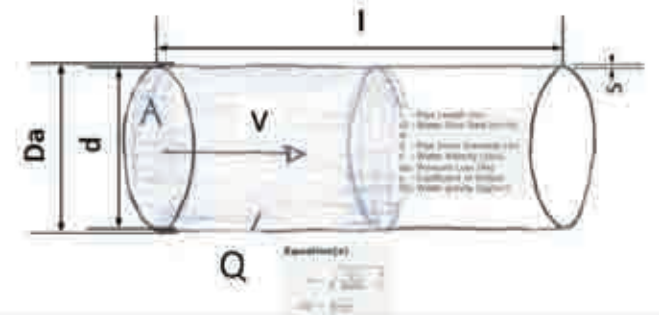
With CADISON® R15.5, we have enabled engineering calculations by adding more properties. Process Engineers / Project Engineers can now quickly select appropriate pipeline, perform calculations and deliver P&ID's with complete engineering information (specifications, calculations, etc.).

In this article, we give an overview of Pipe Sizing Calculation. Today, users do the calculations using excel-based formulas for different pipelines separately and then manually feed the data into the engineering system/tool. As the design progresses, the input parameters used for the calculations also undergo modifications; this becomes a tedious task to re-enter the updated parameters and redo the calculations, which is prone to errors too.

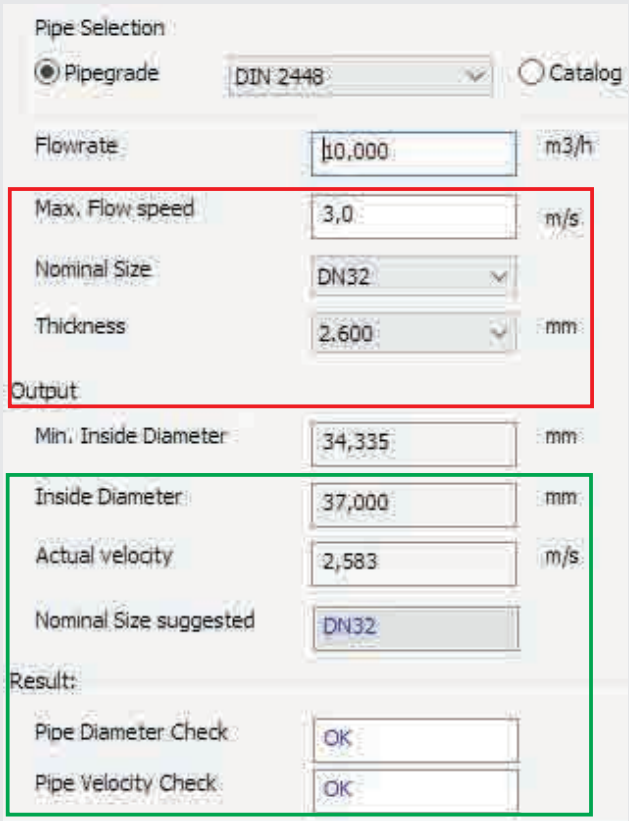
With CADISON®, users can perform the calculations within the system by using available object/catalog data (media, pipe classes, nominal size, thickness, etc.).

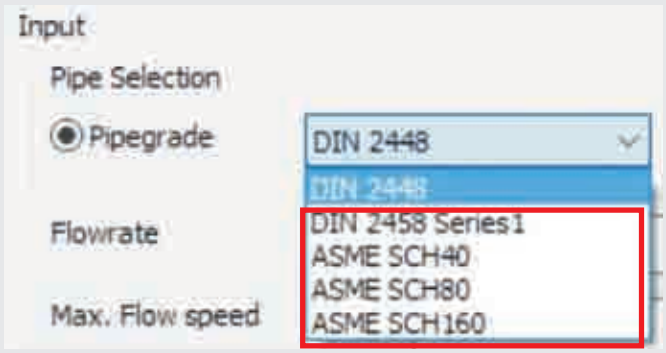
- Select desired pipeline for calculation
- Reuse the data from the Media (Flow rate, Max Flow Speed, etc.) and Pipeline
- Reuse the data for Pressure Drop calculation
- Reuse the data for Pump Sizing Calculation
- Reuse Catalog data (pipe classes nominal size and thickness)

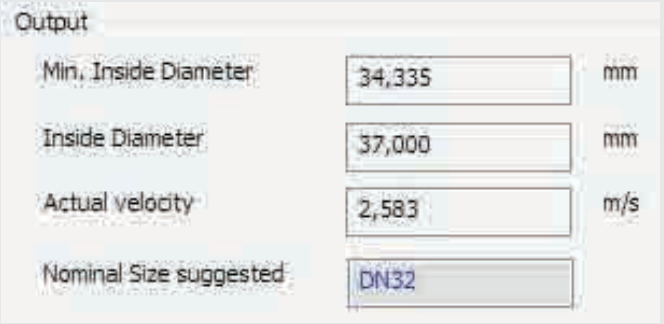
For example, for calculating internal pipe diameter, you need flow rate and acceptable maximum flow



Water Flow Rate	Q	10	m3/h
Water Velocity	v	1	m/s
Diameter in m	D	0,059	m
Diamater in mm	$d_{calculated}$ (mm)	59,47	mm
chossed Diameter		42,40	mm
		Nominal size ist zu klein	
Calculated DN		DN40	
Calculatetd (Sel) DN		DN32	
Selected DN		DN32	42,4
Recalc Velocity		1,967	m/s
		Geschwindigkeit ist hoh	
Variable			
kalkulation in mm		1000	
kalkulation in s		3600	
Short		3,6	







speed; for which the user can choose the pipe information from DIN 2448 or select available piping classes in the system. The application calculates the minimum allowable (inside) diameter and the actual velocity and also suggests the Nominal Size and Thickness. The user gets information whether the pipe diameter / pipe velocity is correct in comparison to the input parameters.

Following equation is used for calculation (The pipe sizing calculation is available in both metric and imperial units) :

Equation(s)

$$d = \sqrt{\frac{Q_w}{3600v} \cdot \frac{4}{\pi}}$$

l : Pipe Length (m)
Q : Water Flow Rate (m³/h)
w
d : Pipe Inner Diameter (m)
v : Water Velocity (m/s)

In the Pipe input section the users have an option to select a pipeline and choose between the spec-driven calculations or DIN/ASME based pipe diameter and thickness values (available in the system).

To start the calculation, it is required to check the media and the pipeline data; user needs to enter flow rate and maximum flow speed. The application suggests the nominal size and thickness with respect to acceptable / allowable values.

The following output will be given by the system:

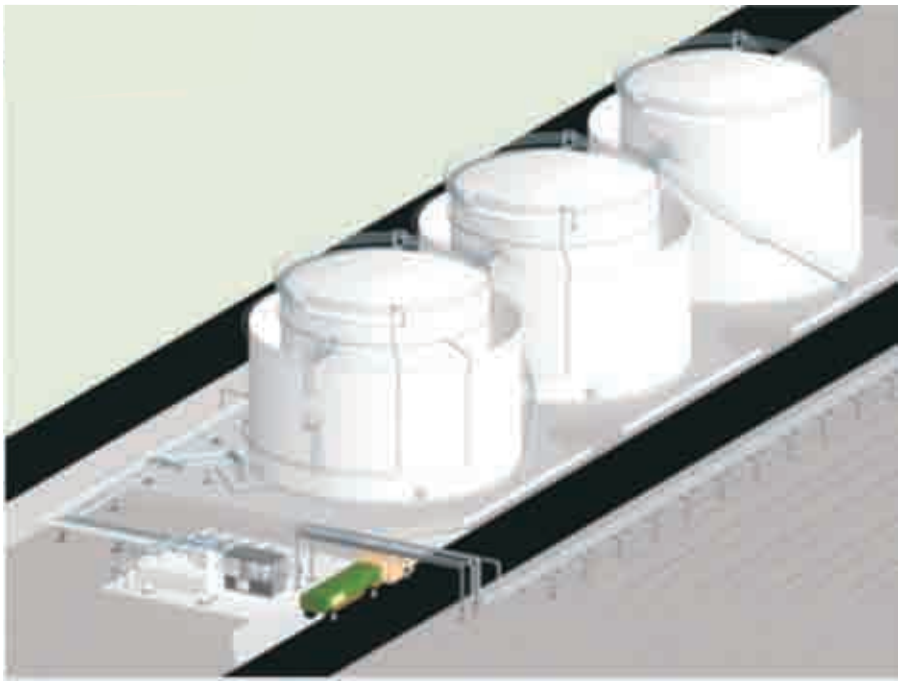
- Min. Inside Diameter (required, calculated)
- Inside Diameter (selected Nominal Size)
- Actual velocity (calculated)
- Suggested Nominal Size

The User can now simulate different velocity and nominal size to get the right value for the pipeline selected. CADISON® will show the warning if the parameters are incorrect and input parameters need to be changed (for e.g. nominal size). In this example, the velocity was changed from 3.0 m/s to 2.5 m/s. The result box notifies a user (in red text) that the pipe diameter / pipe velocity is NOT OK. The user can also extract the reports for documentation purpose at every step.
This example shows, how an integrated Pipe sizing Calculation help a user in reducing the manual work.

Author : Michael Brückner
Technical Director ITandFactory GmbH

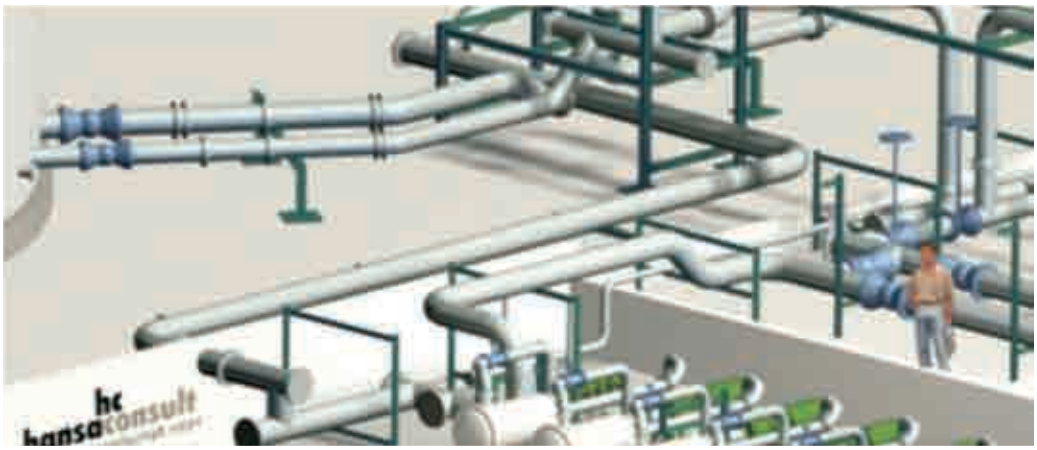
Designs Airport fuel farms and underground fuel piping network using CADISON®

Headquartered in Reinbek (Germany), The company is a global solution provider for airports, fuel farm / terminal operators and oil companies to ensure a safe and eco-friendly fuel infrastructure. Their projects involve design of airport fuel farms and underground fuel piping network (fuel hydrant system) for safe handling, storage and transfer of hazardous fuel.
Engineers at Hansaconsult use CADISON® solution for detailed design including P&ID, 3D Piping Design, Electrical Engineering, Reports (Bill of Quantity, Cable Lists, TAG Lists), Stress Calculations and Creation of Piping Isometrics.



"We have successfully executed over 100+ projects worldwide with CADISON®, and what we like the most is that CADISON® has all disciplines in one system with a single database, and creating Reports / Isometrics / BOQ / Lists, etc. are possible in a very easy way. With CADISON®, we are in control of the whole design process, from A to Z."

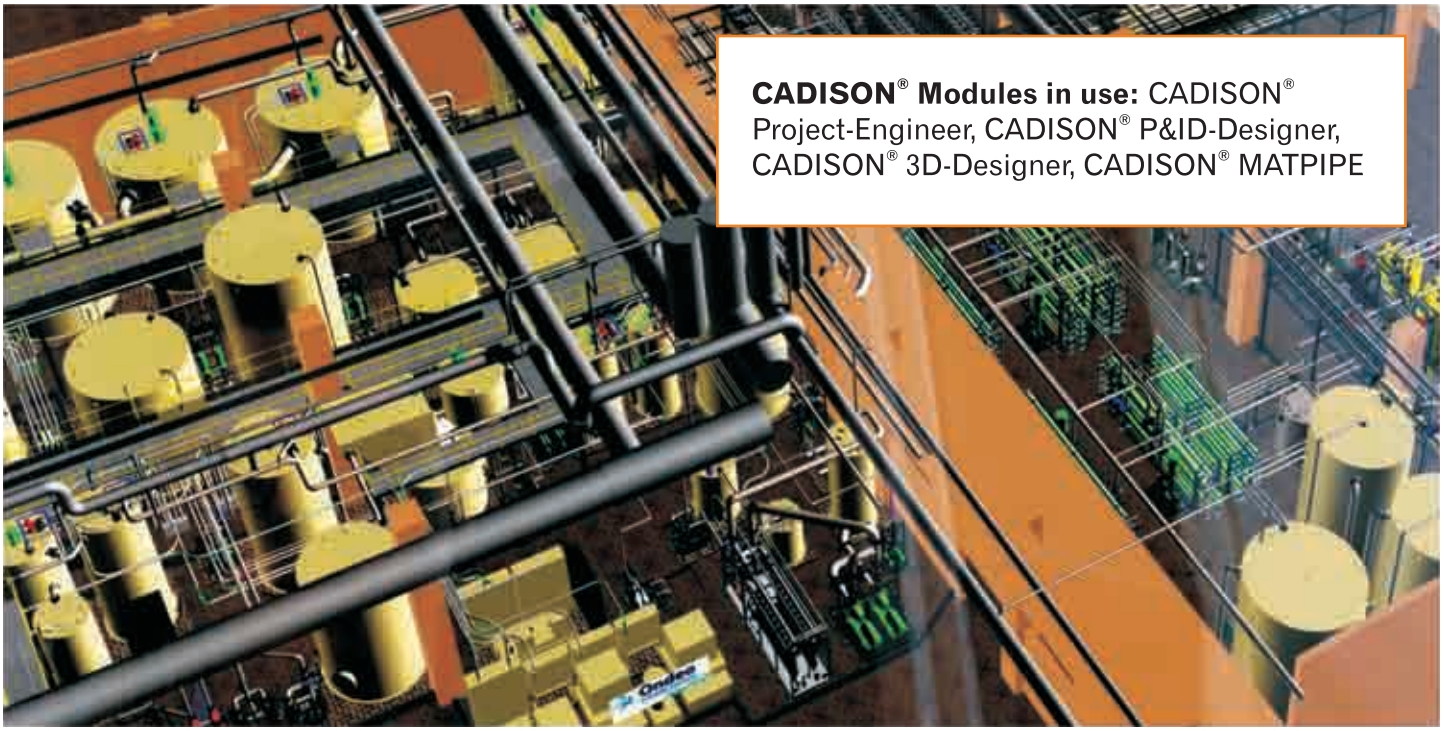
Marc Remy, D&R Engineer



H+E GmbH chooses CADISON® to integrate it's engineering workflow for Industrial Water Treatment Projects

H+E GmbH (HAGER + ELSÄSSER) is one of the leading providers in the international market for industrial process water and wastewater treatment solutions. Since its founding in 1932 in Stuttgart, the company has successfully completed over 30,000 installations worldwide and therefore built an enormous practical experience. This experience still is the basis for the daily work of the experts at H+E.

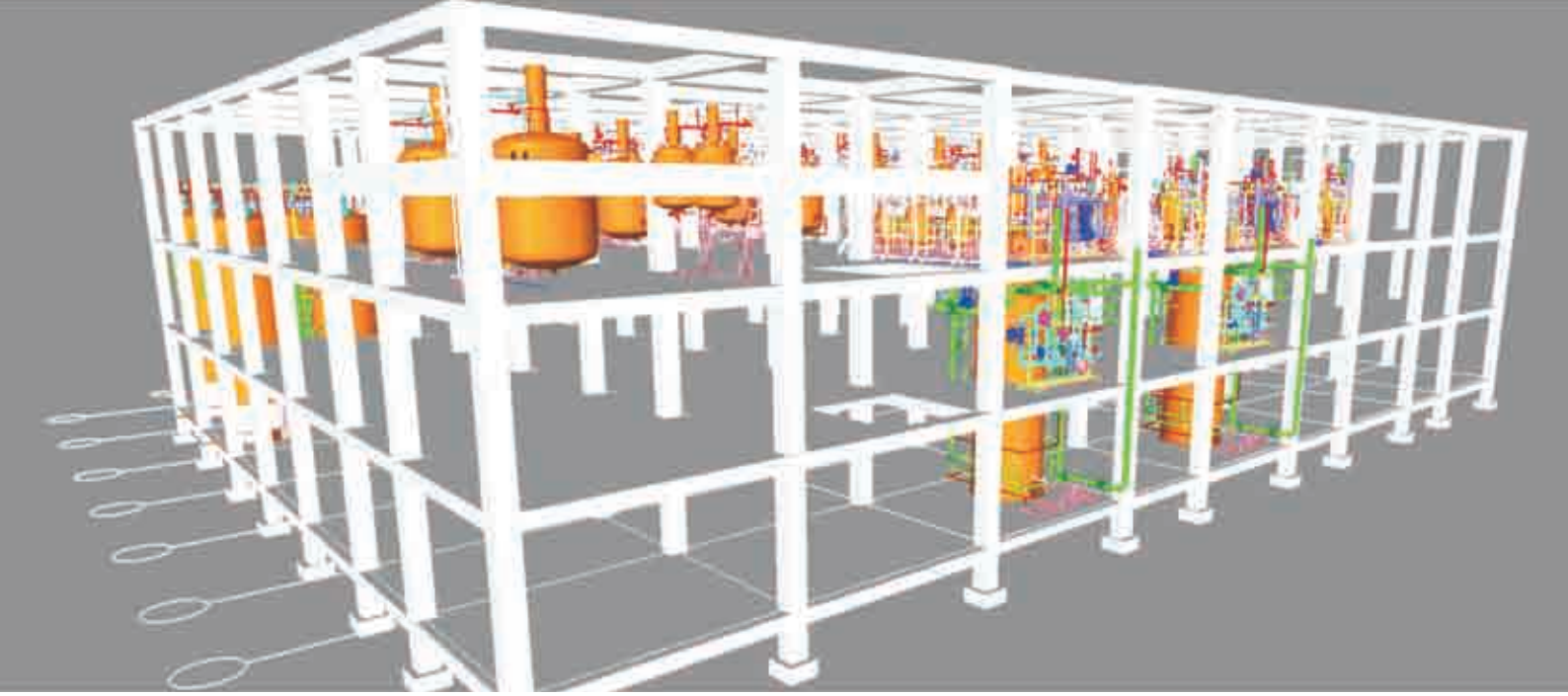
H+E has been leveraging the CADISON® 3D solution for over 8 years for their design and construction. P&ID's were prepared in different solutions and not integrated with their construction department. With growing demand internationally from customers for large projects (with need for more thorough planning/engineering), H+E decided to completely integrate their engineering workflow and began evaluation of the various P&ID solutions in the market. After a thorough evaluation, H+E chose to implement CADISON® P&ID-Designer in their engineering teams globally.



CADISON® Modules in use: CADISON® Project-Engineer, CADISON® P&ID-Designer, CADISON® 3D-Designer, CADISON® MATPIPE

" The key considerations for us were better handling of large projects, ability to enable external engineering offices to work with our engineers seamlessly, full integration & control over the complete workflow, and efficient generation of customized reports."

Mr. Ralf Sattler,
Head of Detail Engineering & Assembly



Enzyme Manufacturing Plant designed in CADISON®

No. of Pipelines: 2440
Duration: 75 days (10 weeks)

"We are impressed with the progress on this project using CADISON® software. Reports generated from CADISON® meets our expectations in terms of quality, timeliness and accuracy. Our engineering team is quite happy with the result and confident about extracting BOQ's and Reports with ease as required in future, directly from live models created using CADISON® 3D. Before CADISON® all jobs were done in AutoCAD. We had to prepare each and every drawing & Bill of Quantity manually, resulting in productivity loss and excess inventory".

Prashant Patel, Sr. Manager Projects
IDMC, Anand - India

Project Details :
Inputs : Pipe specifications used - 2 (OD pipes - SS304, SS316L); Process P&ID; Equipment GA; Civil layout.

Deliverables extracted from P&ID : Pipeline list, Valve list, Equipment List, Misc-components list, Instrument Index.

Deliverables extracted from 3D : Equipment Piping, BOQ, Navisworks (Nwd) models, Isometrics, General Arrangement Drawings

Working in CADISON® : The project was executed by a team of 3 engineers who converted 15 nos. of P&ID into intelligent CADISON® P&ID's and modeled 45 vessels in CADISON® 3D-Designer consisting of Fermenter's ranging from 50liters to 30kiloliters, Probiotic vessels ranging from 50-3000 liters, Harvest vessel 60 Kiloliters, Nutrient Dosing Vessel ranging from 50 liters to 10 kiloliters, Media preparation vessel ranging from 1000 liters to10 kiloliters and 6 CIP Skids.
The equipment was placed in a floor plate of 30,000 sqft each in 3 floors (total 90,000sqft) including the Maintenance platforms. Final interconnected pipe routing, transfer line routing & cable & duct routing are in progress.

IDMC LIMITED has emerged as a reliable supplier of equipments for Dairy, Fruit and Milk based beverages, Carbonated soft drinks, Raw fruit handling & Fruit pulp process, Pharmaceutical, Bio-technology and healthcare sectors.
IDMC also provides thermal management solutions covering Process industries including Dairy, Pharma, Beverages, Brewery, Fruits & Vegetables, Power plants, Airports, Steel plants & Shipyards. IDMC as a premium turnkey solution provides process solution along with Automation right up to installation & commissioning.

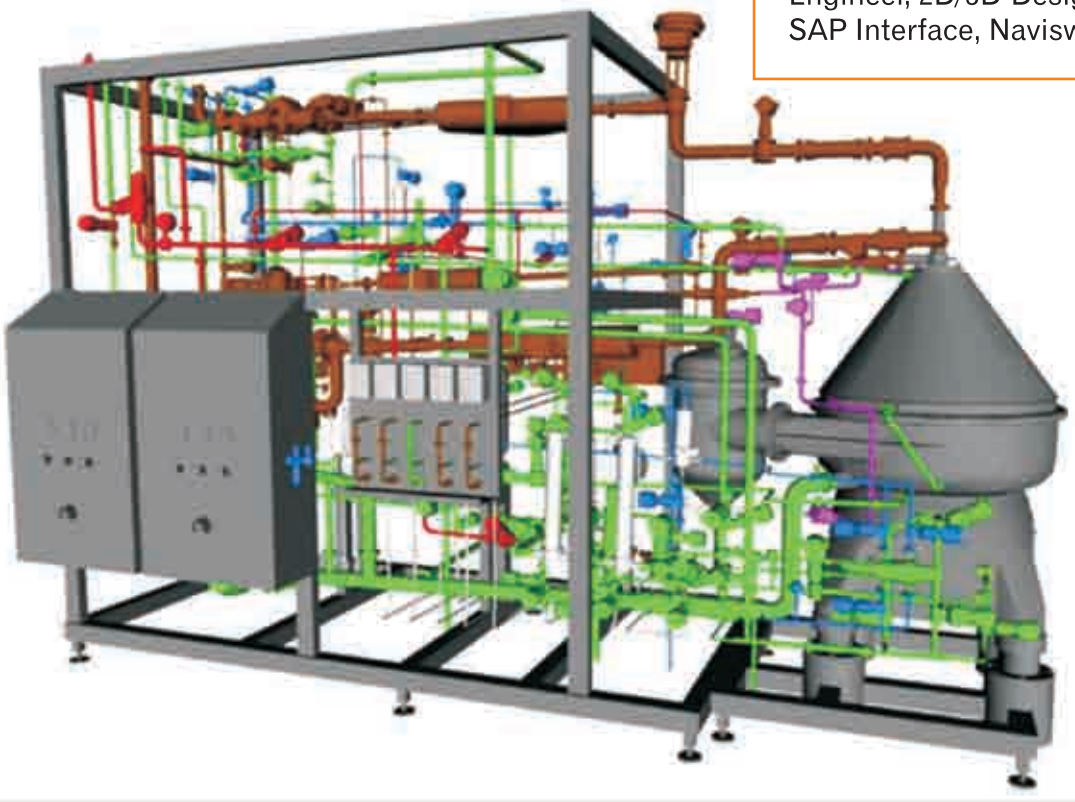
The GEA Seperation Solution team has been leveraging CADISON® as their core engineering system since 2001

GEA is one of the largest suppliers for the food processing industry and a wide range of process industries. As an international technology group, the company focuses on process technology and components for sophisticated production processes in various end-user markets.

GEA's separation solutions & systems are being developed and produced in Oelde (Germany). The centrifuges combine high separating and clarifying efficiencies as well as high throughput capacities with maximum savings in terms of energy, water and disposal costs.

Today **GEA Separation Solution** team has around 1400 active projects with around 30,000 in archive. CADISON® is used right through customers offers (Proposal) and project support till fabrication. The established CADISON®-SAP Interface brings in tight integration with procurement department.

CADISON® Modules in use: Project-Engineer, 2D/3D-Designer, ISOGEN, MATPIPE, SAP Interface, Navisworks Interface.



"This unit for the pharmaceutical industry, has been completely planned and engineered with CADISON®. All parts / components are engineered in detail and ordered directly from the system. Today, CADISON® is an integral part of our complete engineering workflow, with many optimizations done in the system in close collaboration with the CADISON® team."

Mr. Frank Kretschmann

Addressing critical client demands for innovation and time-to-market in various industries like Beverages & Dairy, Chemicals & Pharma, Environmental Technology, Renewable Resources, Marine & Energy has driven GEA to **establish a highly integrated and optimized engineering workflow right from concept phase to installation & commissioning.**

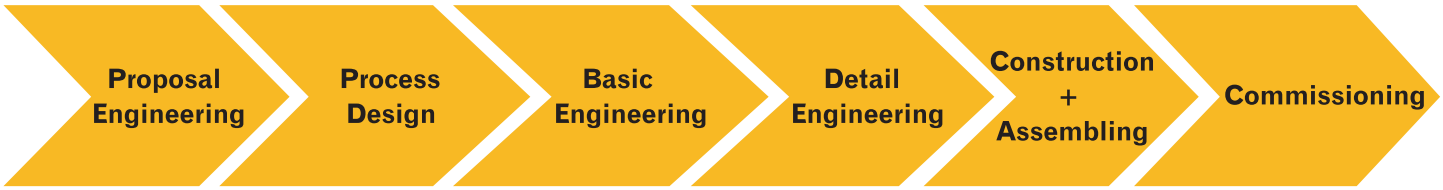
Efficient Plant Engineering Needs

- **Digital Plant : [3D]**
  For every real plant, a digital plant should also exist. What is needed are standards and an object-oriented integrated single database system which network 2D and 3D planning on an inter-tool and inter-disciplinary level. A fully integrated and intelligent Plant Information Modeling system (BIM for Plants) is required to ensure efficient Plant Engineering.

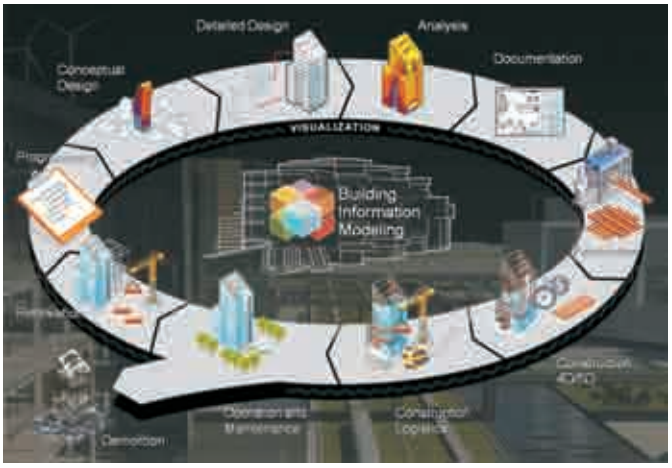
- **Integrated Project Planning, Monitoring & Workflow Management : [4D]**
  An efficient solution will include project status reviews tied into the defined workflows which allows monitoring of project progress and has the facility to directly feed the information into MS Project or other Scheduling tools for project schedule monitoring. The solution must also provide the planning facility to define the Work Breakdown Structure (WBS) with estimated timelines. In short, it should serve the needs of the Project Office involved in planning, monitoring, costing, controlling and reporting. Built-in PDM (document management).

- **Integrated Project Cost Estimation : [5D]**
  An integrated project costing system with a tree structure will enable cost estimation at the drawing, logical group and project (plant) level. This capability enables monitoring of the cost build-up as the project progresses and allows comparison with estimated costs at the appropriation or budgeting phase.

- **Real-Time Change Management**
  A major challenge in plant engineering is the avoidance of rework and errors that takes place due to design changes (several iterations) as the project progresses. Solutions that provide real-time change management capability can assist in reducing the number of errors and rework that occurs during the engineering cycle.



Information gathered at any stage including proposal phase should be available during later phases to avoid any information loss or duplication of efforts in collection of information. This is possible with a highly integrated and optimized engineering workflow right from proposal engineering and concept phase to installation & commissioning.



Object-oriented 3D Digital Plant Model

Definition of a true PIM (Plant Information Modeling) System :

A truly modern Plant Information Modeling System would consist of an object-based system with a single centralized database where design data is stored in a structured way – as “intelligent objects” filled with information and properties. Such a system would also have built-in capabilities of revision control, administration tools, cost estimator, project coordination, catalog creation & control system, a good & easy report generation capability, integration between various disciplines including change management, ability to identify clashes and the ability to interface with various complementary information systems like ERP, Analysis, etc.

If design and engineering companies apply some of the modern CAD tools, the design process results in a database that includes information about the plant geometry (3D), materials, P&IDs and control paths, power supply schematics, equipment lists, suppliers of materials and equipment.

With CADISON®, we make the BIM implementation more plant specific and hence our version of BIM is i^2 **PIM**

CADISON® Training and Webinar

Below is the training schedule for all modules at our Bad Soden office. Please check our website (www.cadison.com) for the detailed training calendar. If you are interested in participating or arranging for trainings for your team, please contact us at: training@cadison.com

Training Schedule

Topics	Date
P&ID-Designer (2 Days)	02.11 - 03.11.2016 06.12 - 07.12.2016 10.01 - 11.01.2017 07.02 - 08.02.2017 07.03 - 08.03.2017
3D-Designer (3 Days)	29.11 - 01.12.2016 13.12 - 15.12.2016 17.01 - 19.01.2017 21.02 - 23.02.2017 21.03 - 23.03.2017
MATPIPE (2 Days)	23.11 - 24.11.2016 24.01 - 25.01.2017
Steel Layout (1 Day / 8 hrs) Online Training	02.12.2016 20.01.2017
Administrator	12.01 - 13.01.2017
Reports	26.01 - 27.01.2017
Object Model	31.01 - 02.02.2017

Webinar Schedule **2016-2017 (Q1)**

Topics	Date
Shortcut in the CADISON®	04.11.2016
Overview of Steel Layout	02.12.2016
Overview of Pipe Sizing Calculation	13.01.2017
Shortcut in the Visio® PID Designer	03.02.2017
Best Practice: MATPIPE	03.03.2017
Overview of Electrical Calculations	07.04.2017

Note:- All webinars will be on 1st Friday of every month.
Time:- 11 am onwards (German time)
Language:- German (English webinars will follow later)
Duration:- 30 Minutes
Version:- CADISON® 15.5 & AutoCAD 2016

Register:-
http://cadison.com/en/news-events/cadison-webinars

Updates:

CADISON® R15.5 now supports Windows 10 Pro and Enterprise versions

CADISON® now supports Windows 10 Pro and Enterprise (64-Bit) editions of operating systems along with the Windows 7 Professional, Enterprise, and Ultimate (64-Bit) versions.

CADISON® now supports AutoCAD 2015, 2016

CADISON® R15.5 released on AutoCAD 2015 & 2016 (64-Bit) along with AutoCAD Architecture 2015 &2016 (64-Bit) and AutoCAD Mechanical 2015 & 2016 (64-Bit) versions. CADISON® also supports three versions of Microsoft Office and Visio Professional.

For System Requirement Visit:- http://cadison.com/en/support-services/system-requirements

CADISON® Events

ITandFactory GmbH, conducted Technical Seminars on i^2 **PIM** (intelligent and integrated Plant Information Modeling) across US, Germany and India.

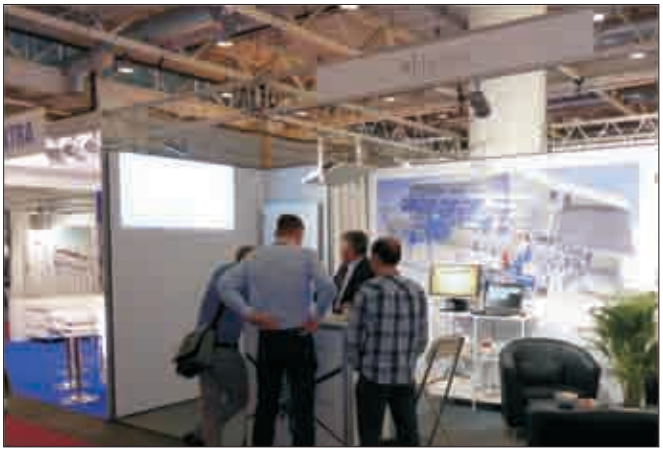
Bad Soden, Germany

Minneapolis, USA

Gelsenkirchen, Germany

Houston, USA

Milwaukee, USA



ITandFactory @ ILMAC 2016

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