



Technology that **makes its mark**

► Our technology. Your success.

Pumps • Valves • Service





Supply Multi BIM Datamodells with CADENAS and ARGE,

a user story from a member's point of view

Frank Udo Kimm KSB SE & Co. KGaA
März 2019



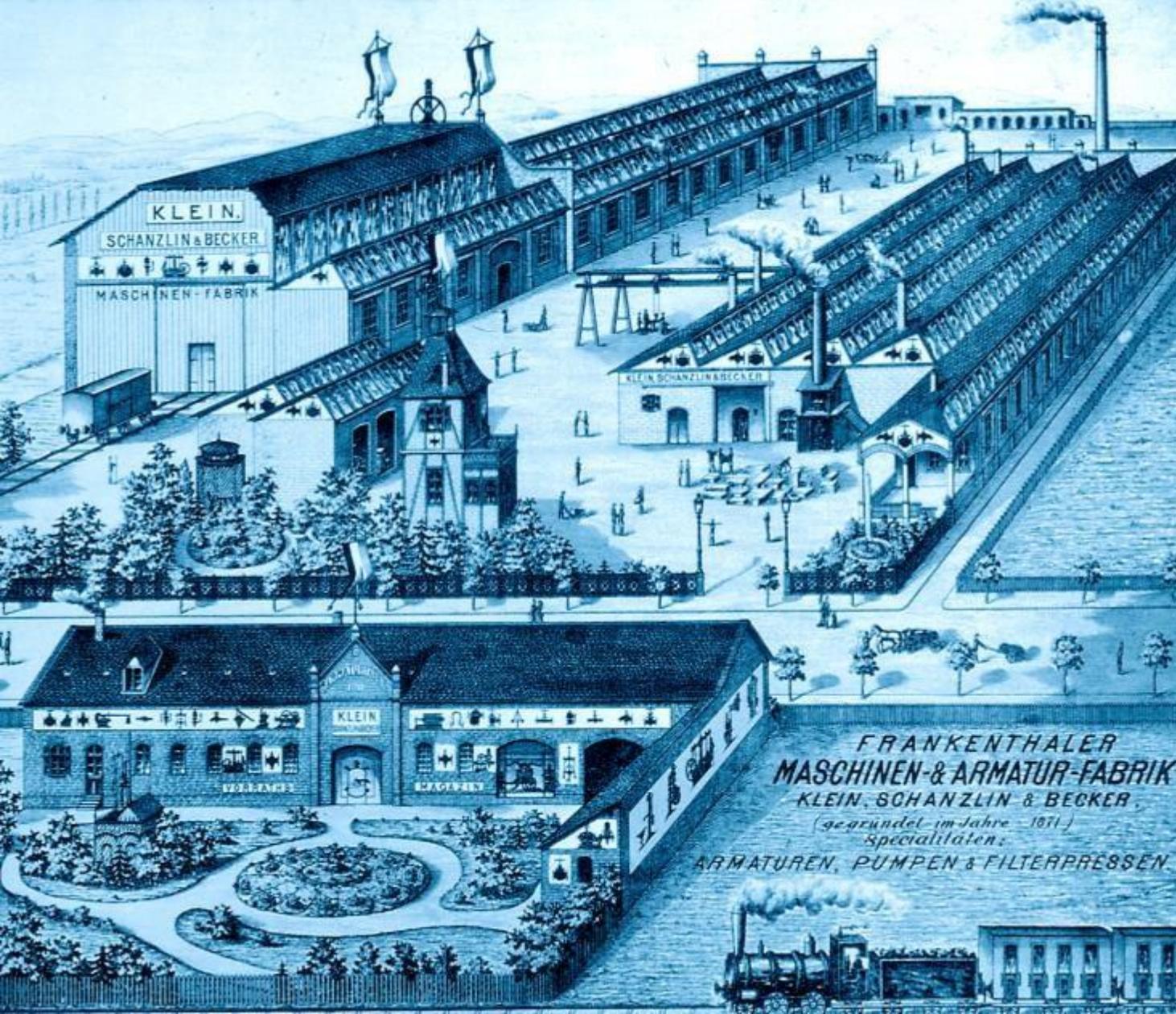
Providing Multi BIM data models with CADENAS and ARGE, a user story from a member's perspective

- Challenge for manufacturers: In addition to geometric data, structured product master data for common BIM CAD systems must also be provided.
- New possibilities through the cooperation of ARGE Neue Medien with CADENAS
- Presentation and discussion of a successful user story for different business types



KSB Group **About Us**

KSB is one of the world's leading manufacturers of pumps and valves, providing a comprehensive range of service offerings.



It All Began with an Idea **Experience since 1871**

The global success story of KSB began over 140 years ago when Johannes Klein laid the foundation for the company by inventing his “boiler feed apparatus”.

Production of

- Valves since 1872
- Pumps since 1873

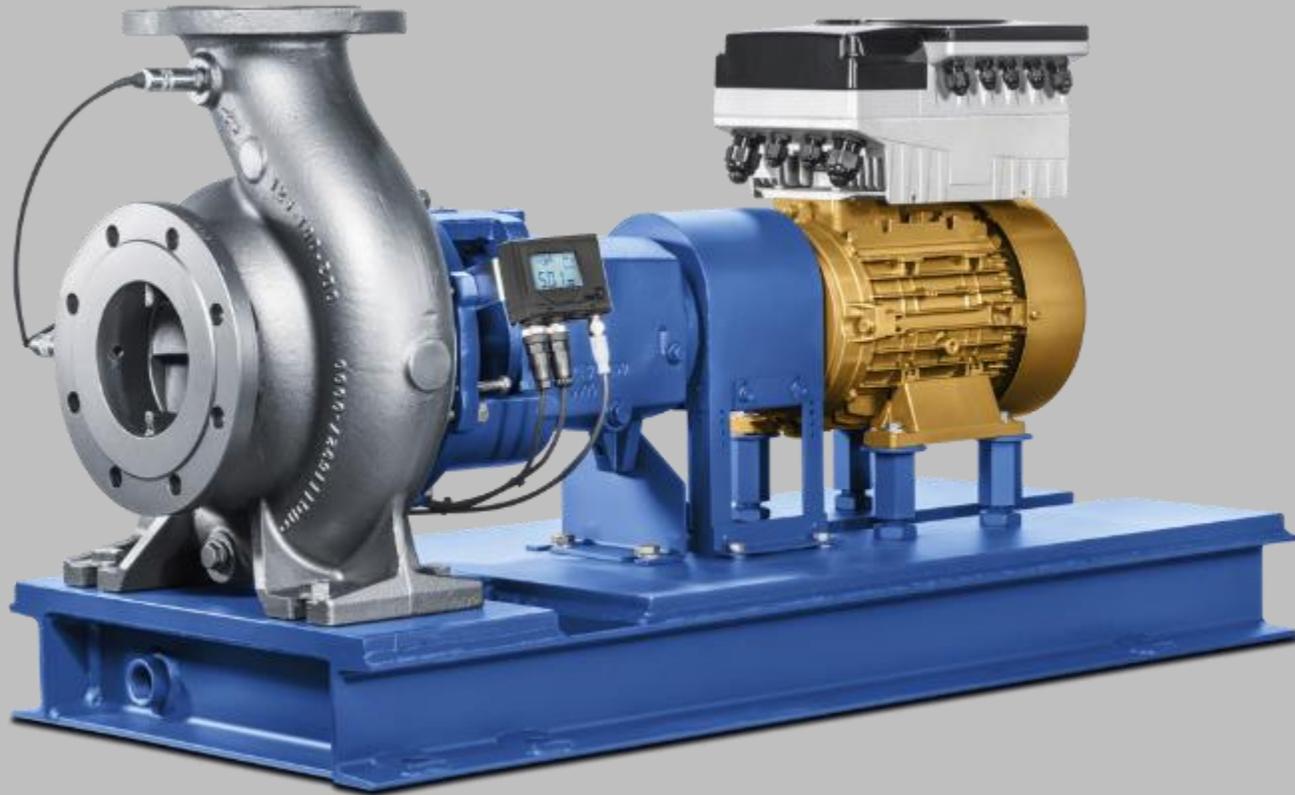
Productplacement

in 20 seconds
on 21
slides...

to enter into the
complexity of our
business

Start





Technical data

- Flow rate up to 1160 m³/h (50 Hz), up to 1400 m³/h (60 Hz)
- Head up to 162 m (50 Hz), up to 233 m (60 Hz)
- Operating temperature -40 °C to +400 °C

Process Engineering **MegaCPK**

- **Applications**
For pumping aggressive liquids in the chemical and petrochemical industries as well as in refinery systems
- **Description**
Horizontal radially split volute casing pump in back pull-out design



Technical data

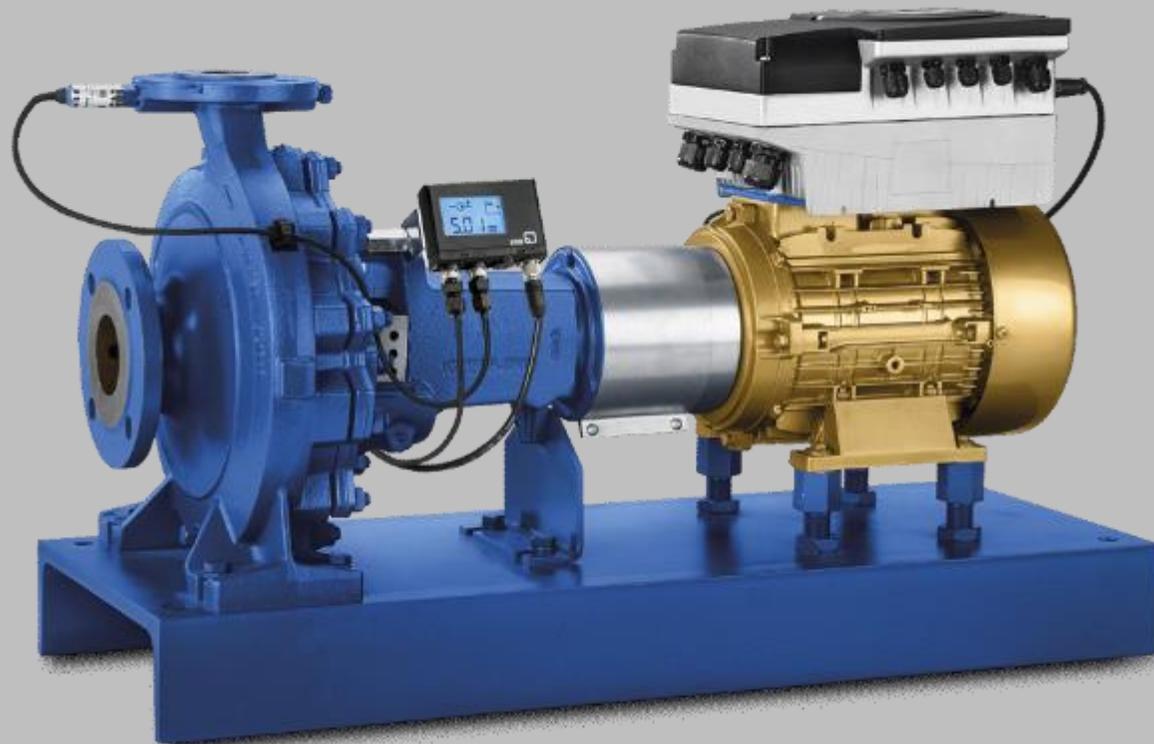
- Size DN 50 to 1200
- Pressure class 150, 300
- Temperature range -50 to +260 °C

Process Engineering **DANAIS 150**

- **Applications**
Industry and process engineering, power stations, marine applications, shipbuilding, chemical and petrochemical industries
- **Description**
Double-offset butterfly valve in standard design

Building Services **Etanorm**

- **Applications**
For pumping clean liquids not chemically or mechanically aggressive to the pump materials; e.g. for use in water supply, cooling water, fire-fighting and heating systems
- **Description**
Single-stage volute casing pump



Technical data

- Flow rate up to 640 m³/h (50 Hz), up to 740 m³/h (60 Hz)
- Head up to 160 m (50 Hz), up to 160 m (60 Hz)
- Fluid temperature -30 °C to +140 °C



Technical data

- Nominal pressure PN 6, 10, 16
- Material EN-GJL 250
- Permissible operating pressure at -10 to +120 °C (C/CS/IMS/CL), at -10 to +80 °C (EKB) 16 bar

Building Services **BOA-CVE**

- **Applications**
General industrial facilities,
process engineering,
plant engineering,
cooling circuits
- **Description**
Control and measurement
valves for building services
applications



Technical data

- Flow rate up to 3600 m³/h
- Head up to 4500 m
- Temperature up to 210 °C
- Speed up to 6200 min⁻¹

Energy Conversion CHTD

- **Applications**
For pumping boiler feed water in utility power stations
- **Description**
Horizontal high-pressure barrel casing pump with single-entry radial impellers, multistage

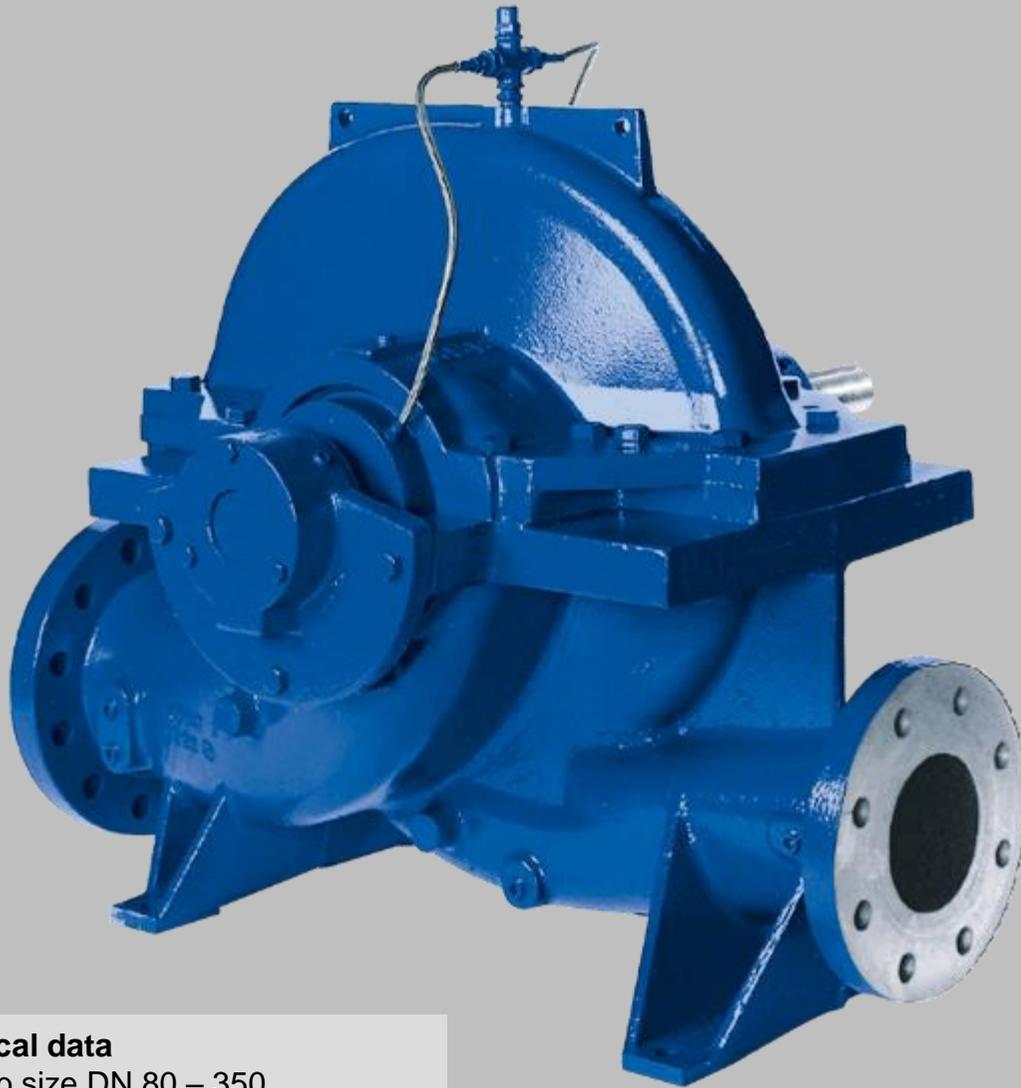


Technical data

- Nominal size DN 50 – 800
- Pressure up to 600 bar
- Temperature up to 650 °C

Energy Conversion **ZTS**

- **Applications**
Industrial plants, power stations, process engineering and shipbuilding. For water, steam, gas, oil and other non-aggressive fluids
- **Description**
Butt weld end gate valve with pressure seal bonnet



Technical data

- Pump size DN 80 – 350
- Flow rate up to 2880 m³/h
- Head up to 210 m
- Temperature up to 80 °C

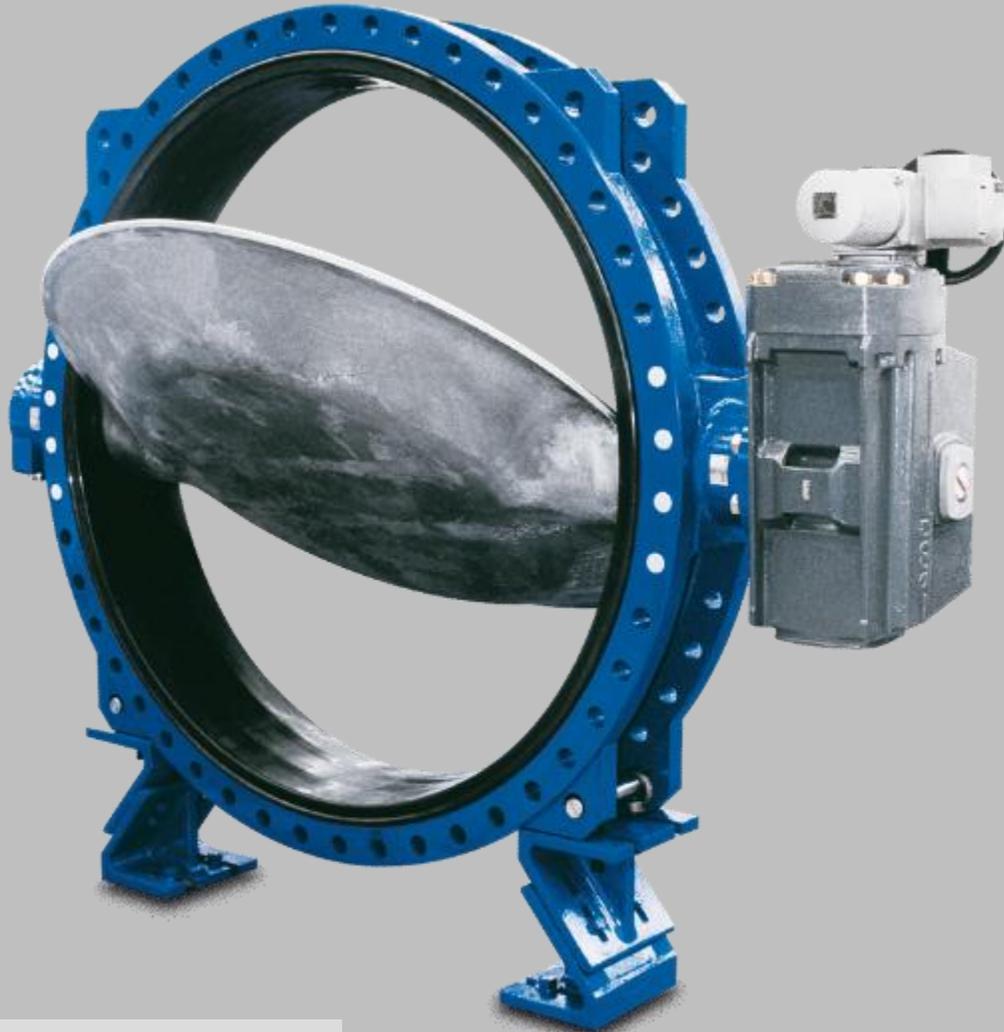
Water Transport **Omega**

▪ Applications

For pumping raw, clean and service water in waterworks, irrigation and drainage pumping stations, power stations, industrial water supply, shipbuilding and offshore engineering

▪ Description

Single-stage axially split volute casing pump for horizontal or vertical installation



Technical data

- Nominal size DN 1050 to 4000
- Operating pressure 25 bar
- Temperature range -10 °C to +80 °C

Water Transport **Mammoth**

- **Applications**
Water supply, water treatment, irrigation, drainage
- **Description**
Centred-disc butterfly valve with elastomer liner. With manual gearbox, electric, hydraulic or counterweight actuator



Technical data

- Pump size DN 40 to 700
- Flow rate up to 10,080 m³/h
- Head up to 120 m

Waste Water Treatment **Amarex KRT**

- **Applications**
For pumping all types of abrasive or aggressive waste water in water and waste water management as well as in industry
- **Description**
Vertical single-stage submersible motor pump in close-coupled design

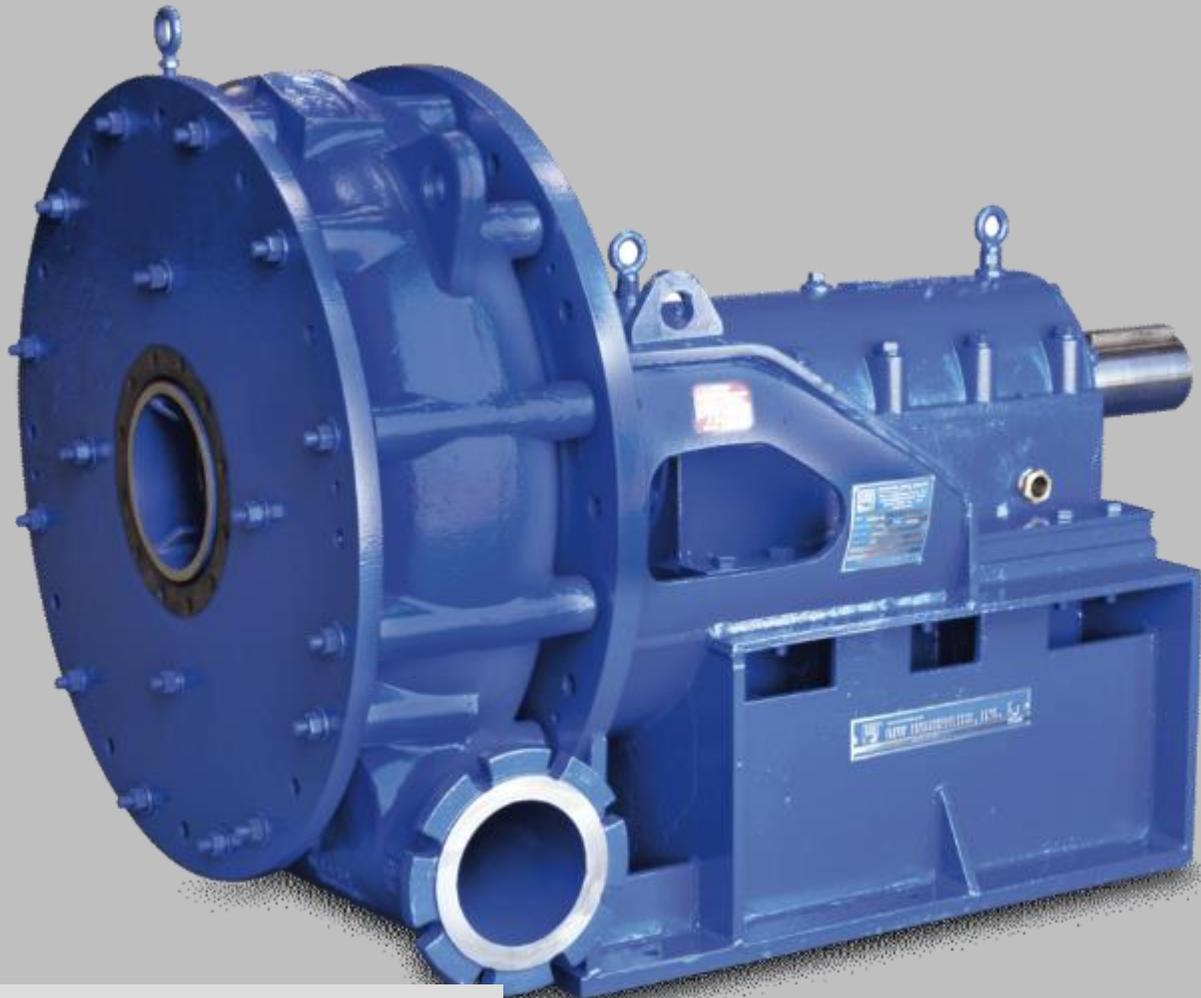


Technical data (AmaDS³ - compact)

- Max. inflow rate 25 m³/h
- Flow rate 5.5 to 6 l/s
- Head up to 85 m (standard model)

Waste Water Treatment **AmaDS³**

- **Applications**
Municipal and industrial waste water transport; drainage applications for hotels, hospitals and camp sites
- **Description**
AmaDS³ is an innovative waste water pump station, also suited for pumped drainage systems covering long distances



Technical Data

- Flow rate 20-13,600 m³/h
- Head up to 90 m
- Operating pressure up to 16 bar

Solids Transport **LSA**

- **Applications**
Ore and tailings transport, cyclone feed, dredging and industrial processes
- **Description**
Premium design white cast iron pump for long service life handling severe slurries



Building Services Reference
Project

District Cooling Plant Abu Dhabi, UAE

Efficient heavy-duty pumps from KSB enable an economical operation at minimum CO₂ emissions of central district cooling systems which air-condition entire residential and business districts in Abu Dhabi.

The cooling plant capacity exceeds 158,000 kW, which is maintained by ten Omega, nine RDLO, three Etanorm and two Movitec pumps.



Process Engineering **Broad Product Range**

Extreme temperatures, high pressures, abrasive and corrosive media and solids-laden fluids: KSB products are equipped for almost every requirement.

Applications:

- General process engineering
- Hot water/heat transfer fluids
- Chemicals/petrochemicals
- Oil/gas
- Marine engineering
- Auxiliary processes



Building Services Reference
Project

Koelnmesse

Pumps type Etanorm 150-200
and Etanorm R 200-250 are at
work in the refrigeration
system (exhibition hall north)
of Koelnmesse.



Building Services Reference
Project

St. Johannes-Hospital, Varel

In a system in St. Johannes-Hospital in Varel near Wilhelmshaven, BOA-CVE-SuperCompact control valves with BOA-Systronic control system are used.



Service
**Global Operations
and Number 1 in
Europe**

- Technical consultancy
- Installation & commissioning
- Maintenance, repair, retrofit
- Maintenance inspection management
- Total Pump Management
- SES System Efficiency Service
- Services for other rotating equipment
- Broad range of spare parts



Water Transport Reference Project
**Drinking Water Treatment
Plant Spannenburg,
Netherlands**

Installed in the Netherlands' biggest drinking water treatment plant, KSB pumps supply several millions of litres of drinking water to over 300,000 people, every day.

The operator has opted for six Omega V 200-320 GB pumps with 37kW motors.



Water Transport Reference
Project

Pumping Station Taksebt, Algeria

For drinking water supply in Algeria, KSB delivered a pumping station with six RDLO 700-980 pump sets as well as various valves, surge vessels and matching control systems.

The station's capacity is more than 7000 litres per second.



Waste Water Treatment
Reference Project

Waste Water Pumping Station St. Petersburg, Russia

Europe's deepest waste water pumping station can count on robust pumps made by KSB.

Twelve submersible motor pumps of the robust and proven Amarex KRT waste water type series are used here. KSB individually tailored their hydraulic systems to the special requirements of the pumping station.



Solids Transport Reference
Project

Minera El Roble, Durango, Mexiko

Some 8000 tons of metals such as gold, zinc, lead and silver are extracted from the Mexican mine per day. For its slurry transport the mining company Peñoles chose the wear-resistant GIW Minerals pump series.

KSB supplied a complete package featuring MDX, LSA, LCC-M, LCC-R, HVF and ZW slurry pumps to Peñoles.



KSB Worldwide **Being Global Means Being Closer**

With its 33 production and assembly sites in 16 countries and a tightly knit global sales and service network, KSB staff are active in more than 100 countries.

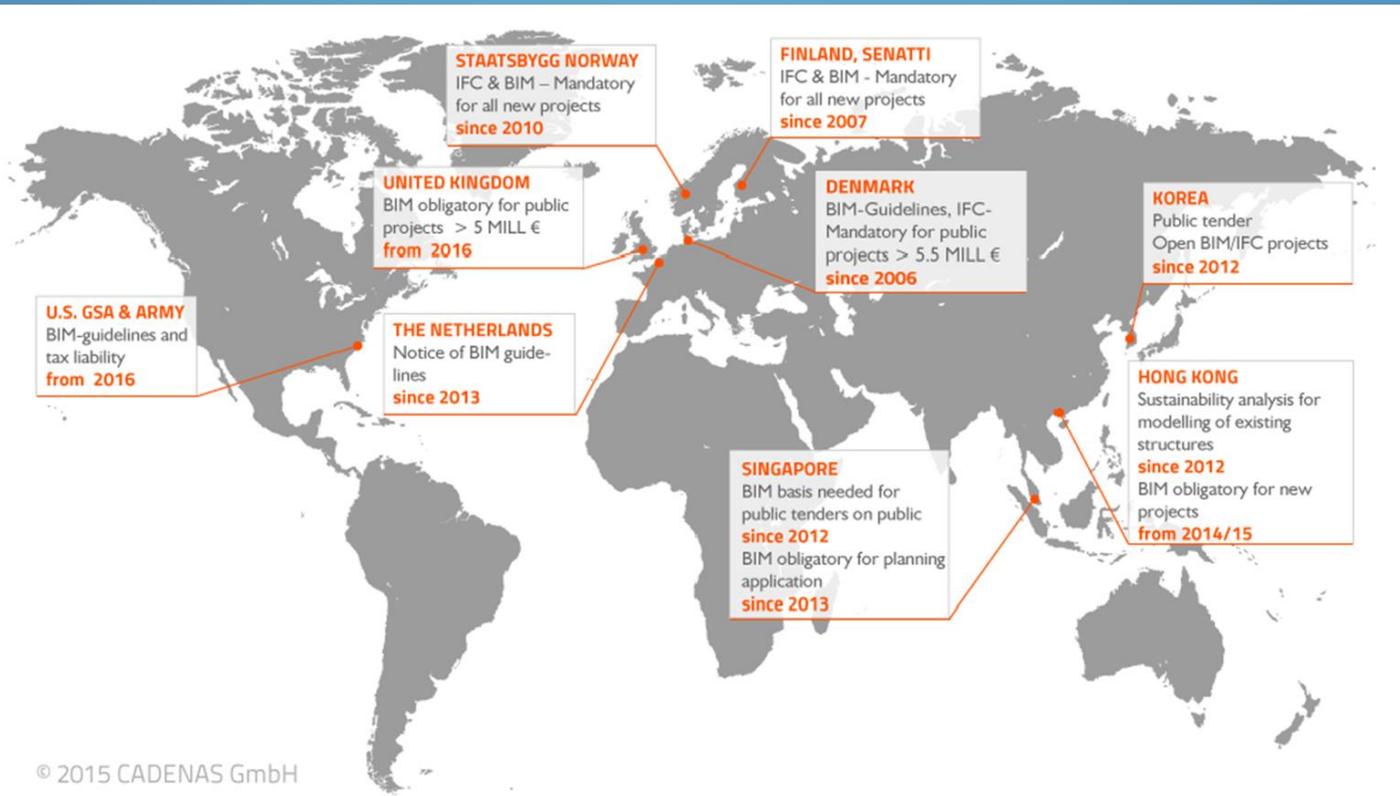
Being global means being closer, production on 5 continents

 KSB production sites

 KSB sales and service sites

KSB worldwide Globalization that creates complexity

Countless national regulations and approaches make it difficult for a global player to keep all BIM developments in focus and to serve them comprehensively.



Globalization that creates complexity - diverse regional BIM approaches

Business Type

GT 5 In the beginning
Komplexität there was the axis

GT 4 GT3 plus design
per contract

GT 3 GT2 with manual
BOM intervention

GT 2 Fully configurable, process
from quotation to production

GT 1 Ident numbers,
Stock goods

Markets



Business Type

GT 5 In the beginning there was the axis
Komplexität

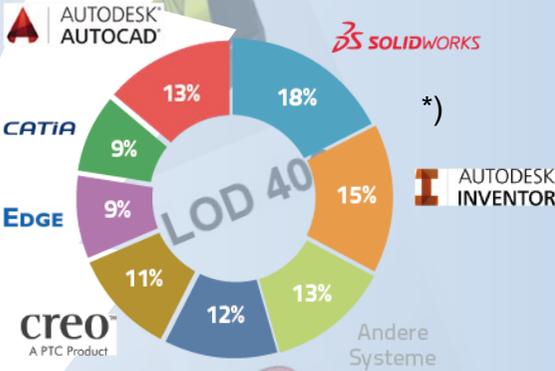
GT 4 GT3 plus design per contract

GT 3 GT2 with manual BOM intervention

GT 2 Fully configurable, process from quotation to production

GT 1 Ident numbers, Stock goods

formats



Markets

classifications



languages



BIM in praxis

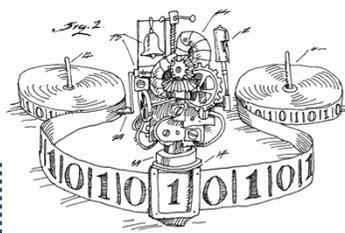
History

1889, Eiffelturm,
.....
1931, Empire
State Building



1936, Alan Turing
„Turingmaschine“

Base of
all
computer



1952, IBM
introduces the
first industrially
manufactured
"transistor

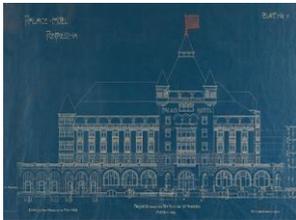


1962, Dr.
Patrick J.
Hanratty
invented
„DAC“,
design
automated
by
computer

IIM
???

BIM to be continued

1861, Alphonse
Louis Poitevin
Developed by
accident
„Blaupause“



Everyone could now work
with a global design

1940 -1950, age of
„Central-
computer“



1971, micro-
processors,
“ADAM“
automatic defining
and machining,
basis for 90% of all
CAD Software

THE HISTORY OF CAD

FATHER OF CAD

PRONTO

By: Dr. Patrick Hanratty



PRONTO was the first commercial numerical-control programming system, sparked everything that is CAD. Known as the building blocks of everything CAD

Dr. Patrick Hanratty, an American computer scientist regarded as the "father of CAD and CAM"

CADD

By: McDonell-Douglas

Used for parts layouts and geometry work, continued to be improved upon and customized for specific uses

Digigraphics

By: Itek

First commercial CAD system, \$500,000.00 per system, only sold 6 copies



ADAM

By: Patrick Hanratty



Interactive graphics design, drafting and manufacturing system written in Fortran and designed to work on virtually every machine. Huge hit that went on to be updated to work on 16 and 32 bit computers, today 80% of CAD programs can be traced back to the roots of ADAM

Unigraphics

By: Siemens NX

High end easy to use software used by many corporations that set a new gold standard for CAD software at this time

Autodesk AutoCAD

First CAD software made for PCs instead of mainframe computers



CADENAS Founded

Founded originally as an engineering firm but realized the potential of the engineering IT age

STEP

Took over from IGES as the new format to use when transferring 3D models from one to another, 1994 was the initial release of STEP that made it an international standard for models, still the most used format

SolidWorks 95

By: Dassault Systemes

Another software that succeeded in ease of use, allowed more engineers than ever to take advantage of 3D CAD technology

CATIA

Conferencing Groupware

By: Dassault Systemes

The first to move online, allowing users to view and annotate CATIA models with others over the internet, quickly followed by others - Unigraphics' IMAN web author and CoCreate's Openspace Web



Autodesk 360

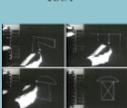
Moved to the cloud, others followed

The Future

Focus on Virtual Reality



1957



Sketchpad

By: Ivan Sutherland

First to ever use a total graphic user interface, users wrote with a light pen on an x-y pointer display, let users constrain properties in a drawing, created the use of "objects" and "instances"

PDGS

By: Ford

Ford and other manufacturers started releasing internally developed CAD/CAM systems



SynthaVision

By: MAGI

First commercially available 3D solid modeling program

ComputerVision

By: Dr. Kenneth Versprille

Rational B-spline geometry added to CAD

CADAM

Used by Lockheed, introduced CAD to aerospace design

MiniCAD

Best selling CAD software for Mac computers



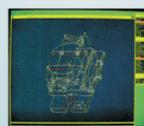
GEOMOD

Featuring NURBS SDRG developed GEOMOD, their geometric modeling product. This model generator was based on precision and accuracy

Pro/Engineer

(PTC Creo)

First mainstream CAD program that took the ideas of Sketchpad and made it come to life, based on solid models, history based features, and the use of constraints, this was a huge turn in CAD history



Autodesk AutoCAD

Releases 13 Made the Autodesk program 3D

eCATALOG

By: CADENAS PARTSolutions

CADENAS enters the native 3D CAD model market with eCATALOG solutions digital product catalogs that featured multiple Native CAD formats for the first time



Solid Edge

By: Siemens

Made as a PLM software, functions on Windows, provides solid modeling, assembly modeling, and 2D orthographic view, response to the success of SolidWorks

Autodesk Inventor

Autodesk's new direction, tried to be more intuitive and simple, also allowed the creation of complex assemblies in record time, still in use, really upped the game in the CAD world



3D CAD App

First APP for 3D CAD manufacturer models by CADENAS



Onshape

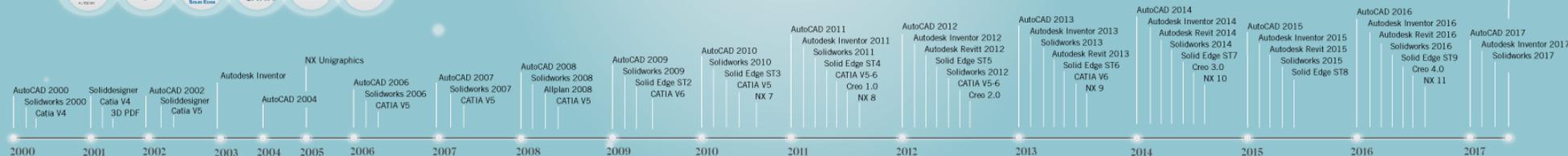
Completely cloud based CAD program



Helping manufacturers "future proof" their catalog by keeping current with future native formats, versions and revisions.

INTO THE FUTURE...

POPULAR CAD FORMATS



Popular CAD Formats and Versions Added to the CADENAS eCATALOG solutions platform

Changes in the planning behavior of customers

number of CAD formats

Product-variants

Regions

IT security-philosophy

Increasing complexity
required
adaptation of tools

Reached users:
ca.1000

CD dispatch with files

DVD dispatch with files

DVD dispatch with configuration software

File selection and download from homepage

File configuration / download from internet portals

Registered users:
6.800.000

Software download via APP Store

File configuration / download via APP with I-Phone or I-Pod

Time being: 5 years

Erhältlich im
App Store

ANDROID APP ON
Google play

➔ Example:

Product-variants

← Selection of files by picking

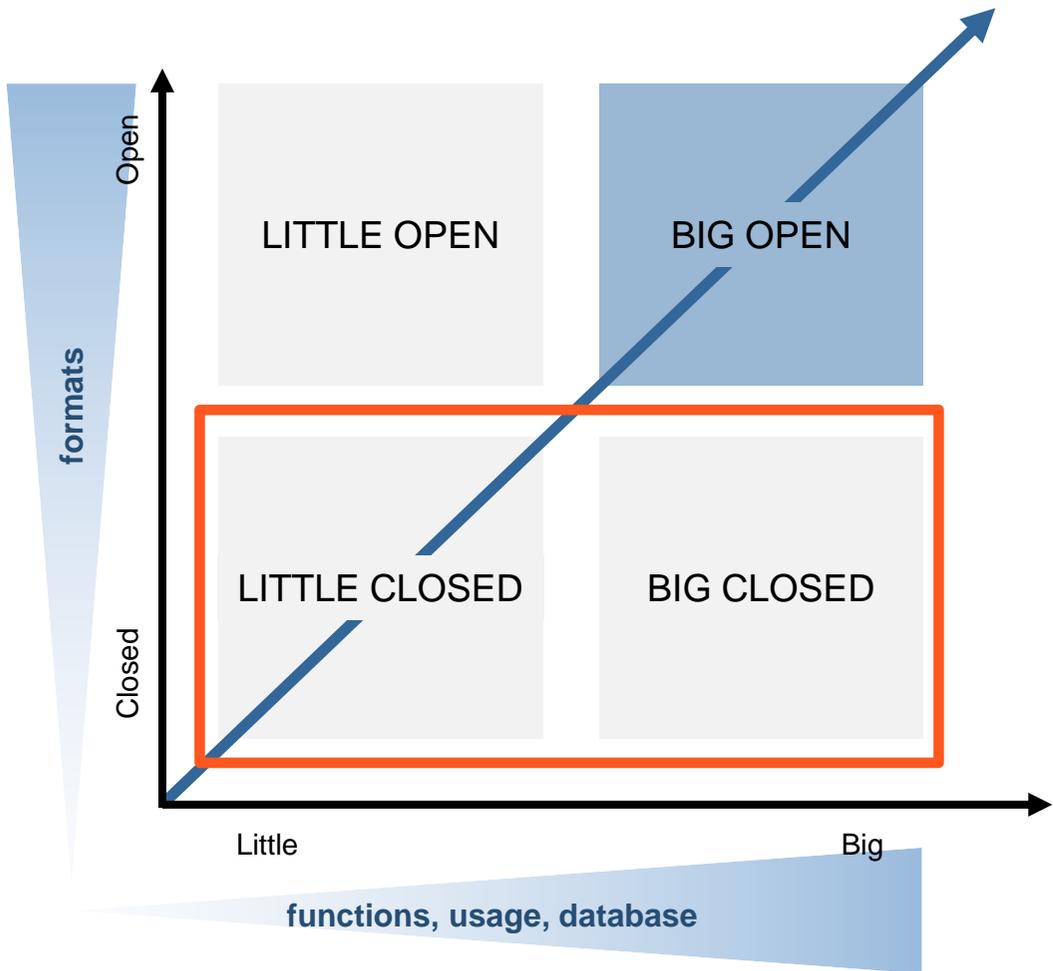
⊗ ...by configuration

→

Complexity driver, example: **CAD Files Provision for Customers**

Risks of unidentified complexity drivers:

- Revision cycles are not adhered to
- Availability of files is not given
- Distribution costs are too high
- Market development is at risk
- Customers migrate to competitors
- ...



Closed BIM:

Closed data exchange

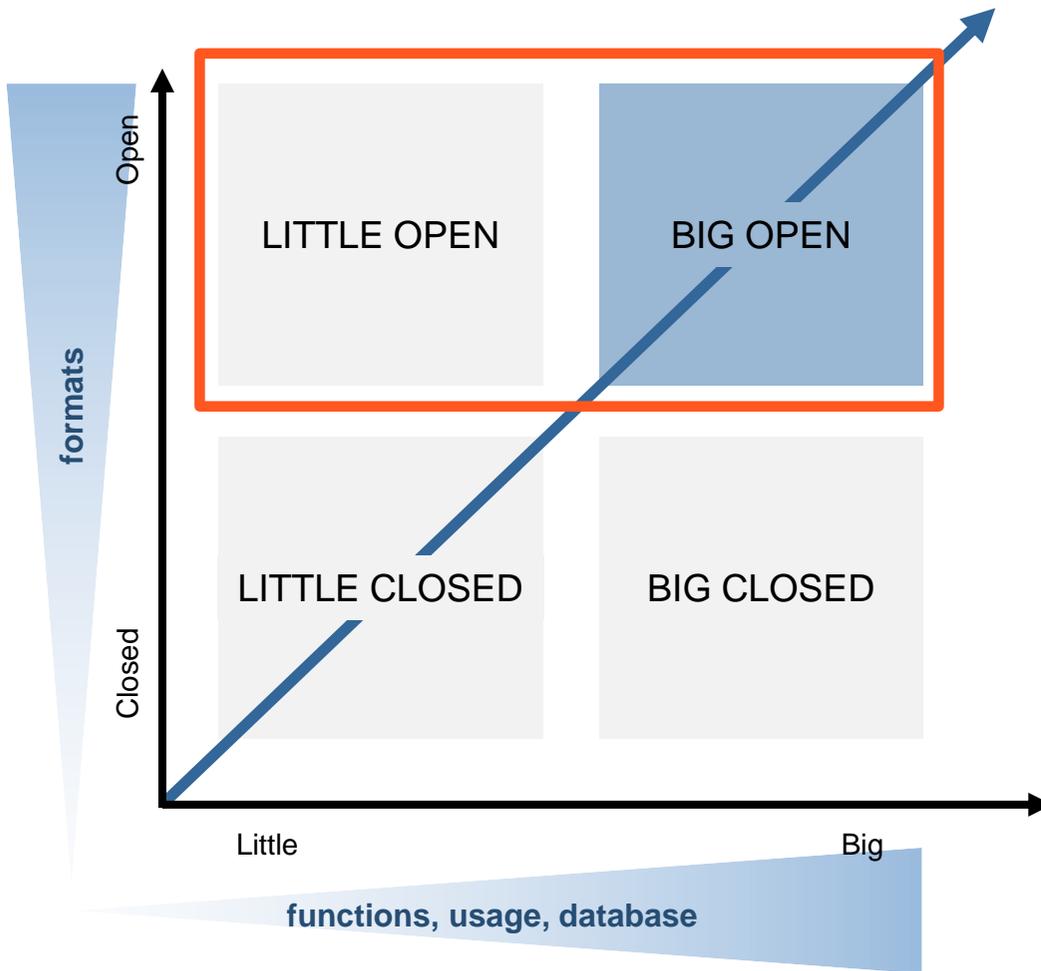
- All participants (planners) work with the same software solution or with a given software package on an object.

Advantage:

- All work on the same platform

Disadvantages:

- Dependence on the efficiency and quality of third party software
- Proprietary software solutions



Open BIM:

open data exchange

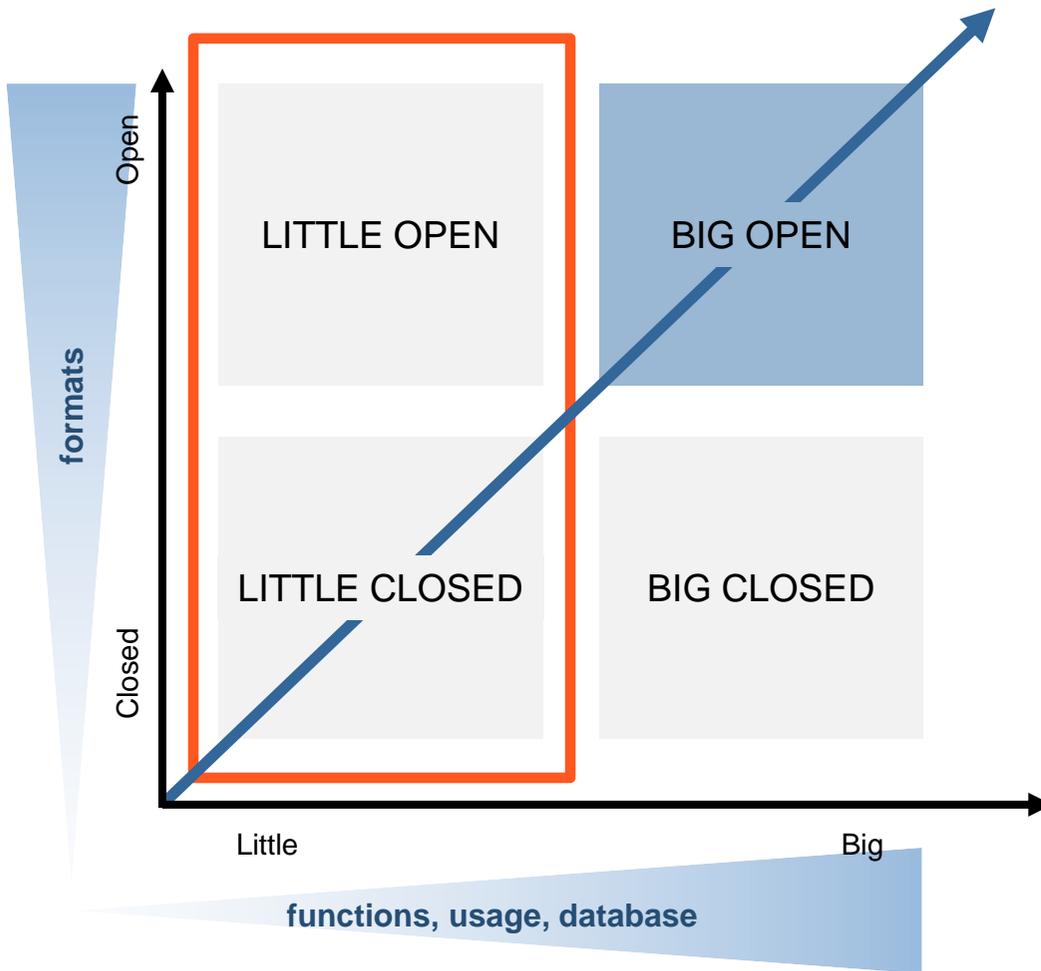
- The participants (planners) work with different software products (CAD, TGA planning software, etc.).
- Data exchange via defined interfaces (e.g. IFC )

Advantages:

- Use of powerful software solutions that strongly support the planning process in the TGA

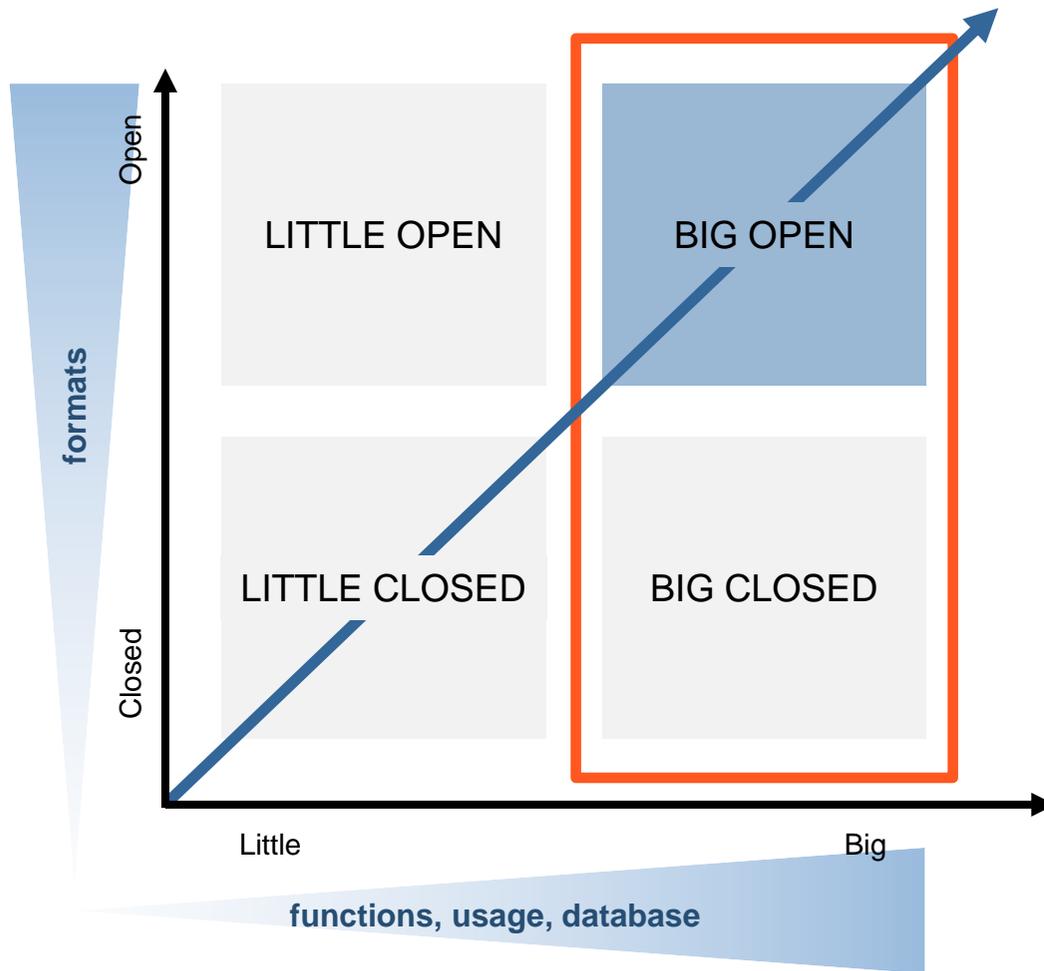
Disadvantages:

- Non-trivial and lossy data transmission via interfaces



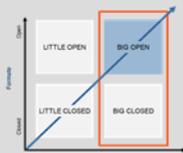
Little BIM:

- Basic functions of high-quality, collision-free and model-based planning using the BIM methodology
- Execution often in only one single planning office, e.g. architect, or only in one planning discipline: 'isolated solution'



BIG BIM:

- As many model requirements of the client as possible are fulfilled
- Interdisciplinary cooperation of all partners involved in the planning, execution and use of a structure
- Model can be used after completion also for cost calculations, model construction, visualizations and energy calculations, etc.



BIG BIM

architect

in-house technicians

civil engineer

structural engineers

Builder owner

project leader

Facility Manager

design manager

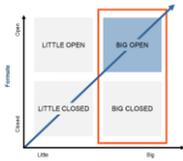


BIG BIM includes the active networking of all parties involved in the construction process

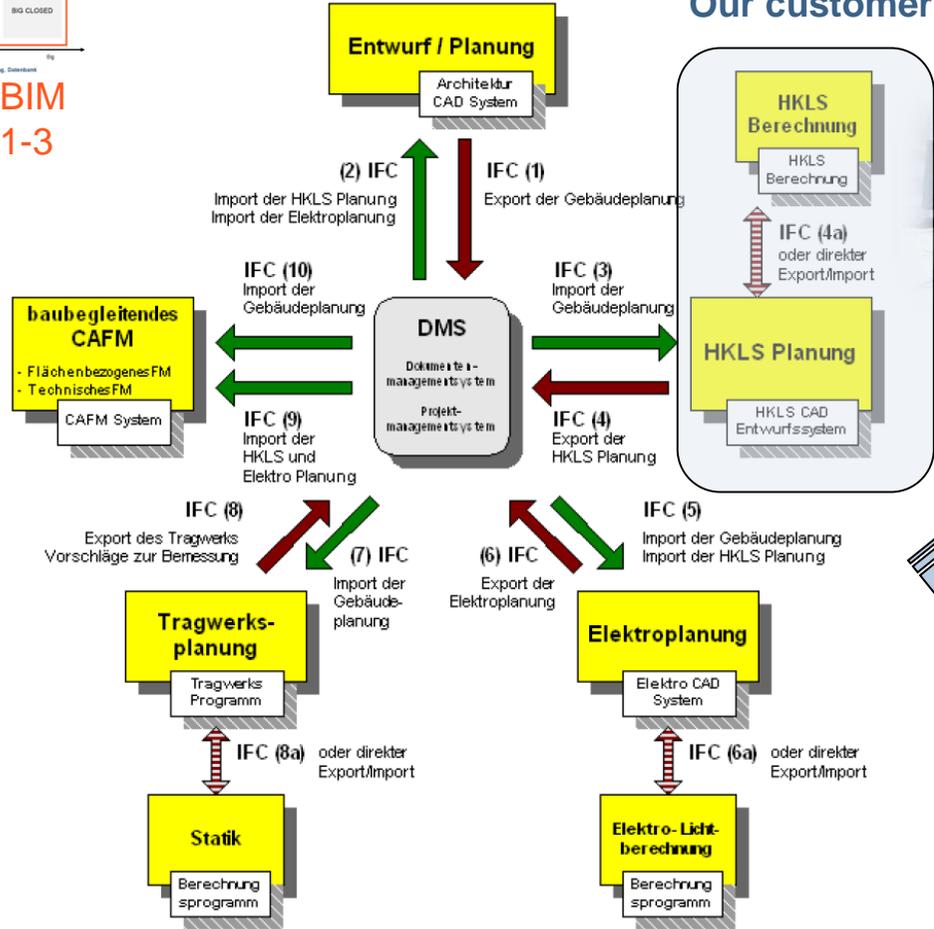
Clearly defined interfaces are required between the connected processes.

With the buildingSMART data model, Industry Foundation Classes (IFC), data can be exchanged between different proprietary software applications.

The  IFC data scheme comprises information from all disciplines involved in the construction project over its entire life cycle.



**BIG BIM
GT 1-3**

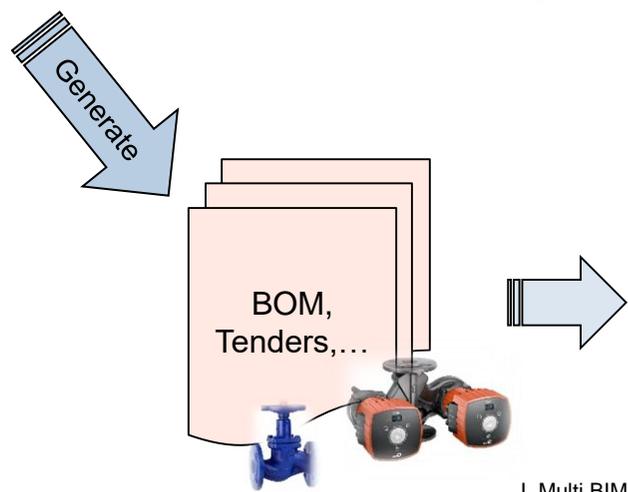


IFC Interface in the design phase)*



Formats?
Classifications?
Languages?
Specifications?
LOD, LOI?

Producer Portfolio



)* Quelle: Anwenderhandbuch Datenaustausch BIM / IFC, Seite 16, Building Smart IAI Industriellianz für Interoperabilität e.V., Ausgabe 2006



E-business at KSB

Where Links Mean Business

Web-Shop

- 99,256 orders with an order intake of € 183.5 million
- More than 30,000 pumps and valves, as well as 1.6 million spare parts lists available
- Direct integration of the customer order system

KSB EasySelect®

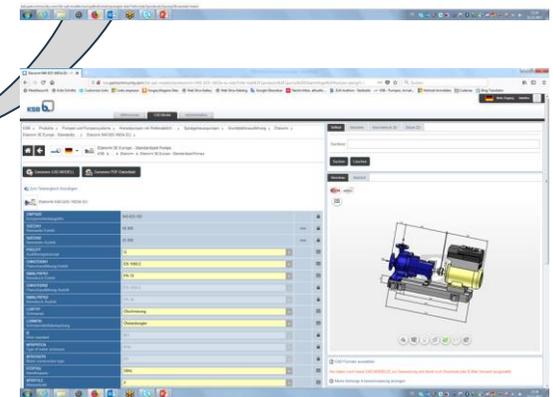
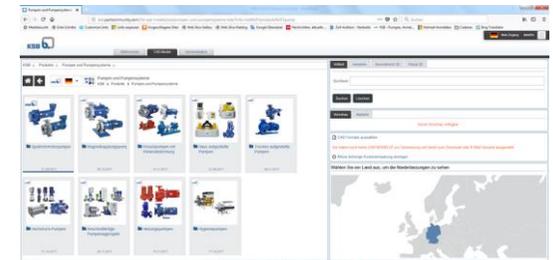
- Software for selecting the right pump and valve for the job



**BIG BIM
GT 1-3**

KSB-PARTcommunity www.KSB.com

1 Navigation in the portal: select the desired version via product tiles...

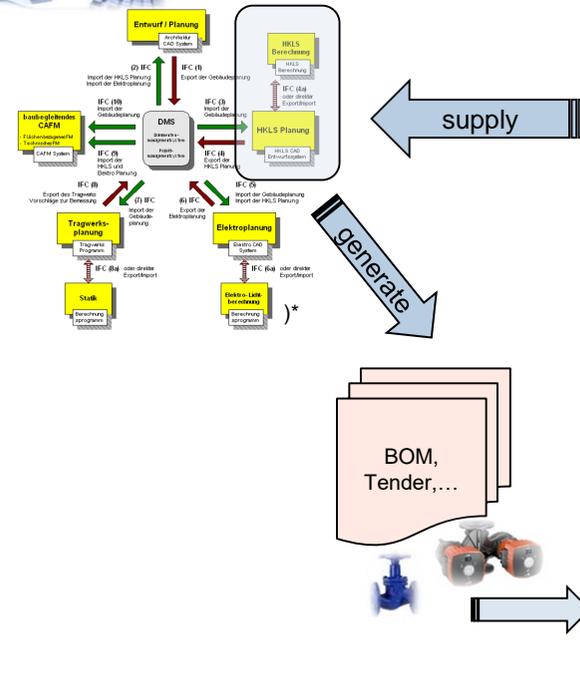


2 Select required execution in yellow drop down fields

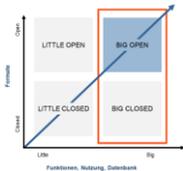


CAD

3 CAD File via Mail or Download



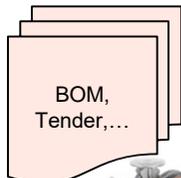
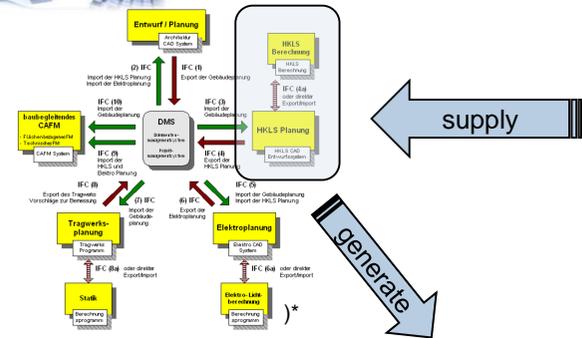
*) Quelle: Anwenderhandbuch Datenaustausch BIM / IFC, Seite 16, Building Smart IAI Industriallianz für Interoperabilität e.V., Ausgabe 2006



**BIG BIM
GT 1-3**



Our customer

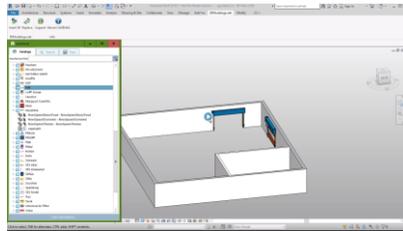


1

Request
BIMcatalogs.net App in
Software



The BIMcatalogs.net app for
Revit, ARCHICAD, ALLPLAN,
SketchUp and Tekla gives
planners direct access to original,
manufacturer-certified BIM and
CAD content.



3

CAD

CAD File via
Connection

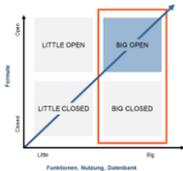


2

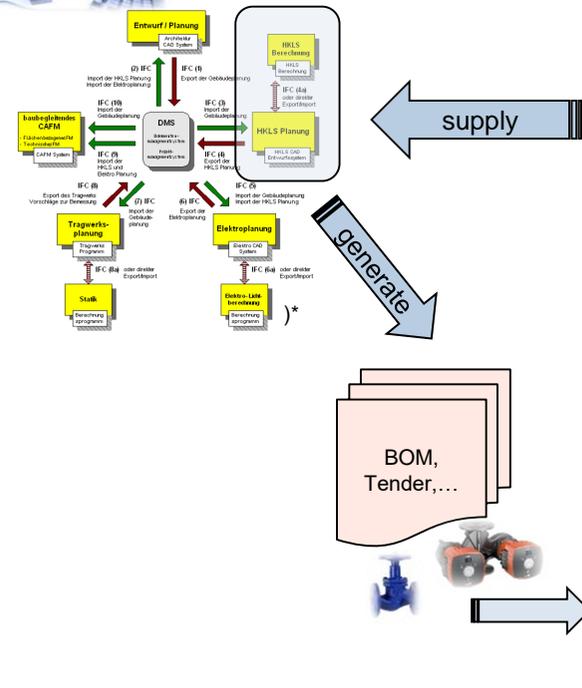
Navigation in the portal: select
the desired version via
product tiles...

KSB-PARTcommunity
www.KSB.com

*) Quelle: Anwenderhandbuch Datenaustausch BIM / IFC, Seite 16,
Building Smart IAI Industriellianz für Interoperabilität e.V., Ausgabe 2006

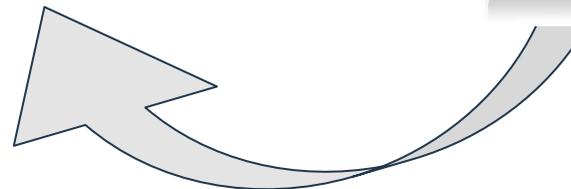


**BIG BIM
GT 1-3**



CAD

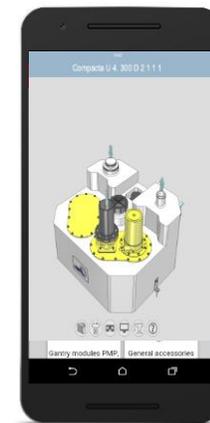
3 CAD File via Mail



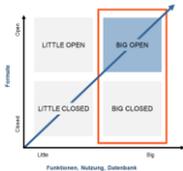
2 Select requested execution

PARTcommunity als APP

1 Navigation in APP: select the desired version via product tiles...



*) Quelle: Anwenderhandbuch Datenaustausch BIM / IFC, Seite 16, Building Smart IAI Industriellianz für Interoperabilität e.V., Ausgabe 2006



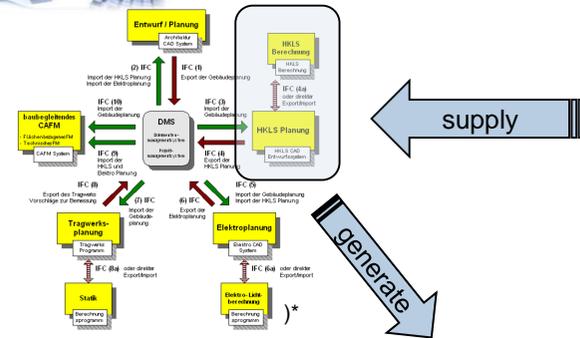
**BIG BIM
GT 1-3**

CAD

3 CAD File via Mail

KSB Easy Select Produktkonfigurator

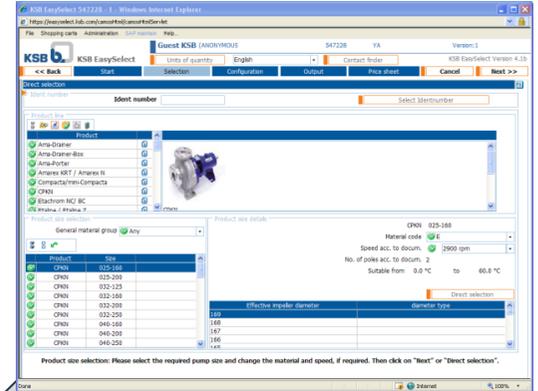
1 Current configuration result
via KSB EasySelect



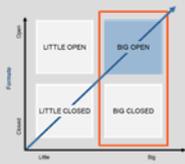
BOM,
Tender, ...



2 Link to KSB PARTcommunity in the
documentation output, automatic
request for CAD files of configured
pump



*) Quelle: Anwenderhandbuch Datenaustausch BIM / IFC, Seite 16,
Building Smart IAI Industriallianz für Interoperabilität e.V., Ausgabe 2006



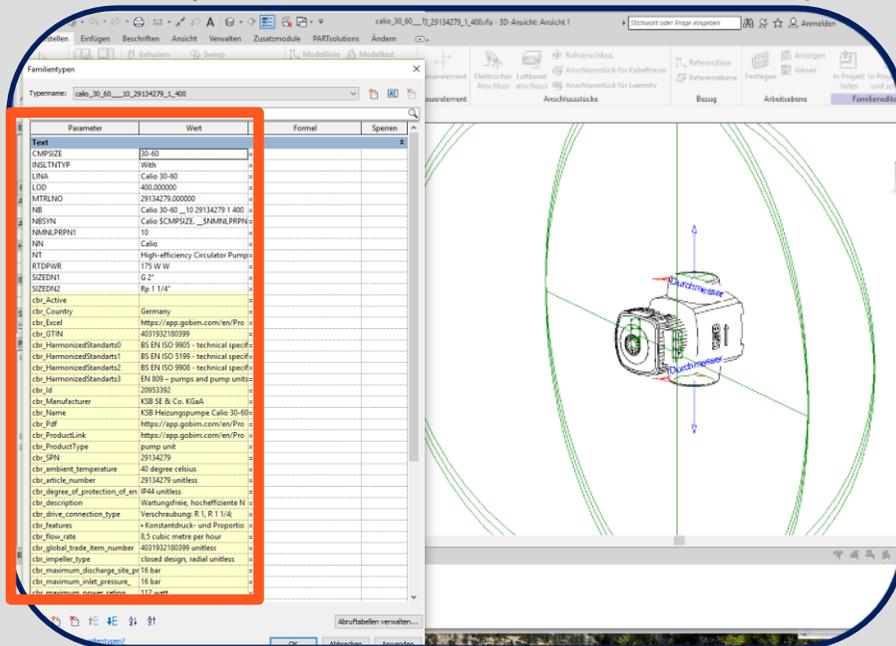
BIG BIM



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BIG BIM requires structured product data in addition to the CAD files



view in CAD
Software Revit

The client requests structured data in the AIA)*, which are entered by the planners and enriched over the course of the project.

Cadenas implements such requirements, e.g. in Autodesk® Revit®.

*) AIA: Customer information requirements, requirements of the customer as a basis for the creation of the BIM project development plan. Describes the client's requirements, processes and IT infrastructure for digital project management with BIM.



Geben Sie Schlüsselwort(e), eine Bestellnummer oder einen Typenname für die Volltextsuche ein Suche

Calio Z 29134897
 KSB > BIM Daten - KSB Produkte > Pumpen und Pumpensysteme-BIM Daten > Calio Z-BIM Daten > Calio Z - High-efficiency Circulator Pump

Generiere CAD MODELL
 Generiere PDF-Datenblatt

Zum Teilevergleich hinzufügen

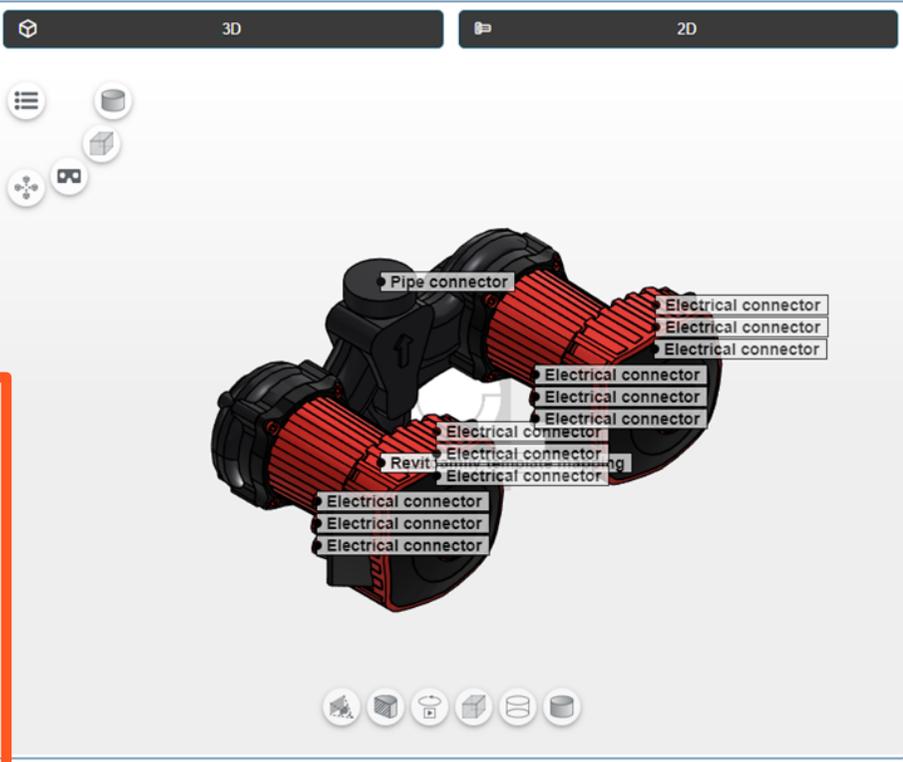
MTLNO Material number	29134897		
CMPSIZE Komponentenbaugröße	030-060		
NMNLPRPN1 Nominal pressure	PN 10		
RTDPWR Rated Power	175 W		
PIPING	R1 1/4"		
PUMP	G2"		

Zusätzliche Informationen

Standardmäßig sind alle Eigenschaften sichtbar.
Verwenden Sie die Checkboxes unten, um die Eigenschaftsliste wie gewünscht einzuschränken.

<input type="checkbox"/> EPD	<input type="checkbox"/> COBie.Type	<input type="checkbox"/> Ifc
<input type="checkbox"/> FM	<input type="checkbox"/> EN ISO 5199	<input type="checkbox"/> EN ISO 9905
<input type="checkbox"/> EN ISO 9908	<input type="checkbox"/> EN 60034-1:2010	<input type="checkbox"/> EN 61800-1
<input type="checkbox"/> EN 60146-1-1	<input type="checkbox"/> EN 61800-5-1	<input type="checkbox"/> General properties
<input type="checkbox"/> Frequently used properties		

Structured, classified product data



CAD Formate auswählen

Sie haben noch keine CAD MODELLE zur Generierung und damit zum Download oder E-Mail Versand ausgewählt.

Meine bisherige Kosteneinsparung anzeigen

Vählen Sie ein Land aus, um die Niederlassungen zu sehen

Zusätzliche Informationen

goBIM Einbinden Klassifikationen

Structured, classified product data

Standardmäßig sind alle Eigenschaften sichtbar.
Verwenden Sie die Checkboxes unten, um die Eigenschaftsliste wie gewünscht einzuschränken.

EPD
 FM
 EN ISO 9908
 EN 60146-1-1
 Frequently used properties

COBie.Type
 EN ISO 5199
 EN 60034-1:2010
 EN 61800-1

Ifc
 EN ISO 9905
 EN 61800-1
 General properties

General ▶

Harmonized Standards ▶

Classifications ▼

System	Code	Description
NS 3451	315	utstyr for sanitærinstallasjoner
NS 3451	325	utstyr for varmeinstallasjoner
NS 3451	375	utstyr for komfortkjøling
Ifc 2x4	IfcPump	pump
SFG20	45-01	pumps - general
revit categories	(-2001140)	mechanical equipment
TFM komponentkoder	JP	pumpe
TFM komponentkoder	JQ	pumpe i VA-installasjoner
CPV	42122000-0	pumps
Uniclass 2 - Products	Pr_65_53	pump products
Omniclass 2012	23-27 17 00	pumps
Uniclass 2015_Products Table	Pr_65_53	pump products
UNSPSC	40151500	pumps
CI/SfB	y	general engineering services
NRM 3	5	Services
BSAB	PKB	pumpar
Uniclass 1.4	L7114	Pumps for water supply/distribution
Uniclass 1.4	L7531	HVAC circulation pumps

Leistungsdaten ▼

Property	Description	Value	Unit
Drehzahl	minimale Drehzahl Dauerbetrieb	1000	Umdrehungen pro Minute
	maximale Drehzahl Dauerbetrieb	3500	Umdrehungen pro Minute
Energieeffizienzindex	Energieeffizienzindex	<= 0.23	ohne Einheit
Nennndruck/Druckstufe	Druckstufe	PN 10	ohne Einheit
Temperaturklasse	Temperaturklasse	TF 110	ohne Einheit

Geometrische Daten ▶

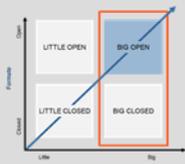
Elektrische ▶



CAD Formate auswählen

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Wählen Sie ein Land aus, um die Niederlassungen zu sehen

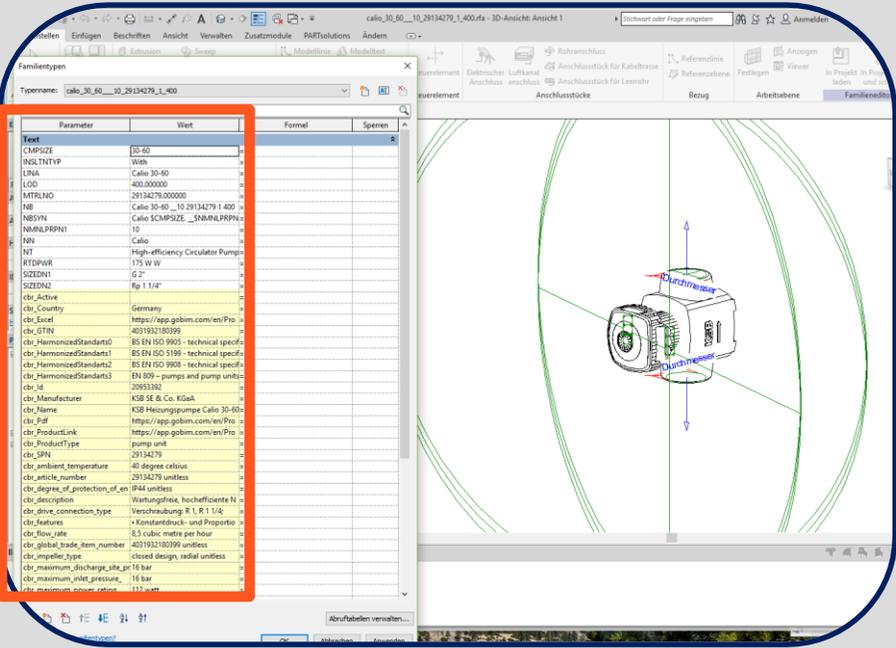
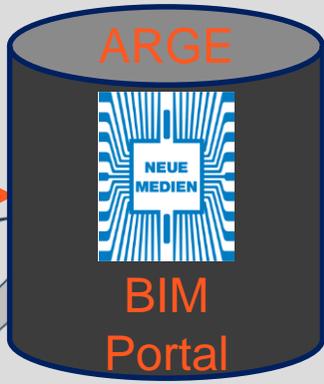
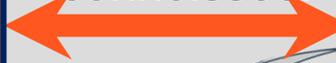


BIG BIM

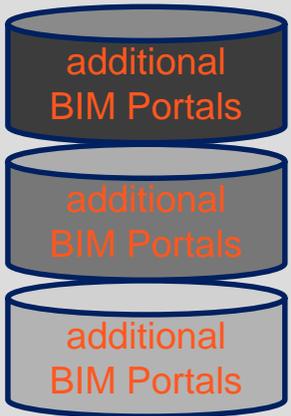
Data-quality guideline



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view in CAD Software Revit



ARGE BIM Portal: CAD Files inclusive Structured, classified product data

In connection with the structured product data of the SHK industry portal in combination with the CAD file provision of Cadenas, MULTI CAD product data can be provided.



Kontakt



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Info:

Frank Udo Kimm studierte Maschinenbau an der RWTH Aachen. Er startete seine Tätigkeit als Ingenieur im Technischen Vertrieb bei der KSB Aktiengesellschaft und sammelte dort nationale und internationale Vertriebserfahrung. 2002 wurde er zum Vice President Product Management berufen und war bis 2010 verantwortlich für das weltweite Ergebnis der von ihm verantworteten Produkte. Heute zeichnet er neben der Technischen Dokumentation verantwortlich für den Ausbau des Global-Language-Managements und seit 2014 für das Prozessmanagement im Konzern. Im Rahmen der digitalen Transformation stellt die KSB AG die Weichen, um mithilfe neuer Prozesse und Technologien ihr Produkt- und Leistungsportfolio der digitalen Welt anzupassen. Dabei wird KSB von CADENAS bereits seit dem letzten Jahrtausend unterstützt.

