

**A review and outlook**

DATE: ERP-1... Tabelle Konfigurator Extras Fenster ?

Zylinderschraube ISO 4762 M30x40

ARTIKEL_NR	BENENNUNG	GUEL TIGKZ	WERKSTOFF	ARTIKELGEWICHT	DRUCKBENENNUNG	IDNR	D	D3
Artikel-Nr.	Benennung	Gueltigkz	Werkstoff	Artikelgewicht	Druckbenennung	Identnumm.	Gewindenenn.	Gewindedeker.
589	M24x130	208577	ZYLINDERSCHRAUBE	G	8.8	0.580	ZYLINDERSCHRAUBE M24x130	24.000 20.319
590	M24x130	319327	ZYLINDERSCHRAUBE	G	10.9	0.000	ZYLINDERSCHRAUBE M24x130	24.000 20.319
591	M24x140							
592	M24x140	100706	ZYLINDERSCHRAUBE	G	8.8	0.620	ZYLINDERSCHRAUBE M24x140	24.000 20.319
593	M24x140	264434	ZYLINDERSCHRAUBE	G	12.9	0.610	ZYLINDERSCHRAUBE M24x140	24.000 20.319
594	M24x150							
595	M24x150	214042	ZYLINDERSCHRAUBE	G	8.8	0.500	ZYLINDERSCHRAUBE M24x150	24.000 20.319
596	M24x150	323761	ZYLINDERSCHRAUBE	G	8.8	0.630	ZYLINDERSCHRAUBE M24x150	24.000 20.319
597	M24x150	442146	ZYLINDERSCHRAUBE	G	10.9	0.650	ZYLINDERSCHRAUBE M24x150	24.000 20.319
598	M24x160							
599	M24x160	212880	ZYLINDERSCHRAUBE	G	8.8	1.130	ZYLINDERSCHRAUBE M24x160	24.000 20.319
600	M24x160	264435	ZYLINDERSCHRAUBE	G	10.9	0.680	ZYLINDERSCHRAUBE M24x160	24.000 20.319
601	M24x180							
602	M24x180	219078	ZYLINDERSCHRAUBE	G	8.8	0.750	ZYLINDERSCHRAUBE M24x180	24.000 20.319
603	M24x180	246397	ZYLINDERSCHRAUBE	G	10.9	0.000	ZYLINDERSCHRAUBE M24x180	24.000 20.319
604	M24x200							
605	M24x200	223156	ZYLINDERSCHRAUBE	G	8.8	0.000	ZYLINDERSCHRAUBE M24x200	24.000 20.319
606	M30x40							
607	M30x40	550341	ZYLINDERSCHRAUBE	P	8.8	0.450	ZYLINDERSCHRAUBE M30x40	30.000 25.706
608	M30x45							
609	M30x45	343111	ZYLINDERSCHRAUBE	G	8.8	0.000	ZYLINDERSCHRAUBE M30x45	30.000 25.706
610	M30x50							

Verw. Einstellungen Technische Angaben

Bemassungsansichten: Abmessungen

Darstellungsmodi: Nenngewinde Kernloch

Zylinderschrauben mit Innensechskant v9 | 27.09.2005 | #792 | POB - Ad

DATEI Export ERP Ansicht Tabelle Konfigurator Extras Fenster Hilfe

ISO 4762 x Suchen in Alle Kataloge nach Teilefamilien und Einzelteilen Suche starten

SMS group

Teileauswahl Teilleicht ABC ISO 4762

Zylinderschraube ISO 4762 M30x40

Tabelle Vertikal

In Tabelle suchen... ERP-Variablen Hauptvariablen Nebenvariablen

ERP_PDM_NUMBER	SMSWERKSTOFF	SMSOBERFLAECHE	SMSDESCRIPTION	D	D3	P	DIN962THREAD	L	DIN962CLASS	DIN962OPT1	DIN962OPT2	DIN962OPT3	B		
Materialnummer	Werkstoff	Oberfläche	Größe/Abmessung	Gewinden...	Gewindek...	Gewindes...	DIN 962 Gewinde	Nennläng...	Form A	Flansch	Loch	Spitze	Hilfsma...		
2061	M24x540	10011377	8.8	---	M24X540	24.0	20.319	3.000	Rechtsgewinde	540.000	-	-	-	60.000	46
2062	M24x550	10046800	8.8	---	M24X550	24.0	20.319	3.000	Rechtsgewinde	550.000	-	-	-	60.000	47
2063	M24x580	15838393	8.8	---	M24X580	24.0	20.319	3.000	Rechtsgewinde	580.000	-	-	-	60.000	50
2064	M24x600	10048439	8.8	---	M24X600	24.0	20.319	3.000	Rechtsgewinde	600.000	-	-	-	60.000	52
2065	M24x620	15739682	8.8	---	M24X620	24.0	20.319	3.000	Rechtsgewinde	620.000	-	-	-	60.000	54
2066	M24x650	10046798	8.8	---	M24X650	24.0	20.319	3.000	Rechtsgewinde	650.000	-	-	-	60.000	57
2067	M24x700	10039556	8.8	---	M24X700	24.0	20.319	3.000	Rechtsgewinde	700.000	-	-	-	60.000	62
2068	M24x710	10876264	10.9	---	M24X710	24.0	20.319	3.000	Rechtsgewinde	710.000	-	-	-	60.000	63
2069	M24x740	10004725	8.8	---	M24X740	24.0	20.319	3.000	Rechtsgewinde	740.000	-	-	-	60.000	66
2070	M24x750	14959036	10.9	---	M24X750	24.0	20.319	3.000	Rechtsgewinde	750.000	-	-	-	60.000	67
2071	M24x760	10876261	10.9	---	M24X760	24.0	20.319	3.000	Rechtsgewinde	760.000	-	-	-	60.000	68
2072	M30x40														
2073	M30x40	11162128	8.8	---	M30X40	30.0	25.706	3.500	Rechtsgewinde	40.000	-	-	-	29.500	0
2074	M30x45														
2075	M30x45	10047624	8.8	---	M30X45	30.0	25.706	3.500	Rechtsgewinde	45.000	-	-	-	34.500	0
2076	M30x45	10671008	8.8	A0U	M30X45	30.0	25.706	3.500	Rechtsgewinde	45.000	-	-	-	34.500	0

Technische Angaben (3) Stückliste

Vorderansicht Nenngewinde

Zylinderschraube ISO 4762 M30x40

02.05.2022 #2901 bepo - Teilemanagement (Parts management) Admin Dev

# 20 years of SMS group and CADENAS

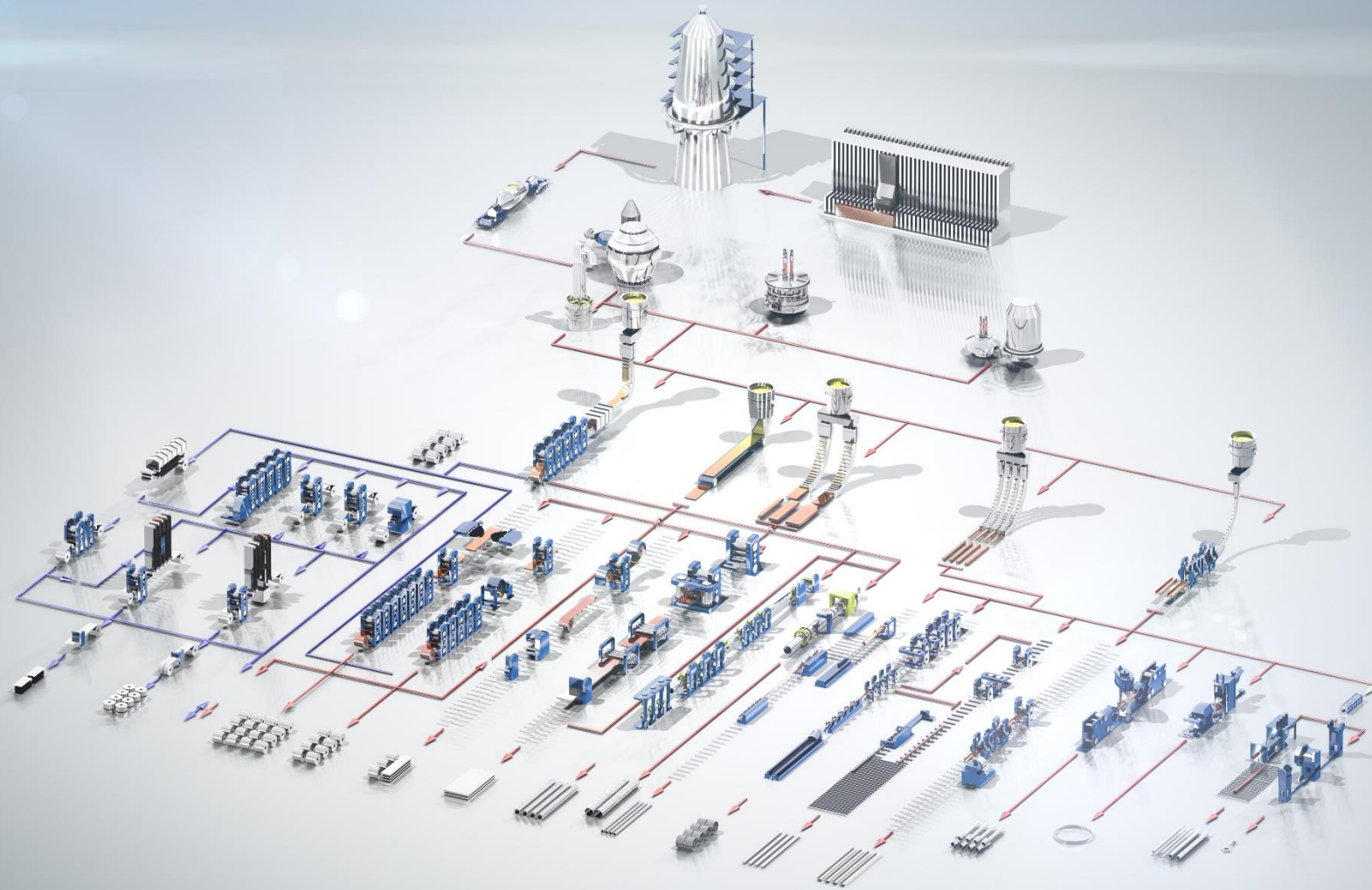
A review and outlook – CADENAS Industry Forum 2023



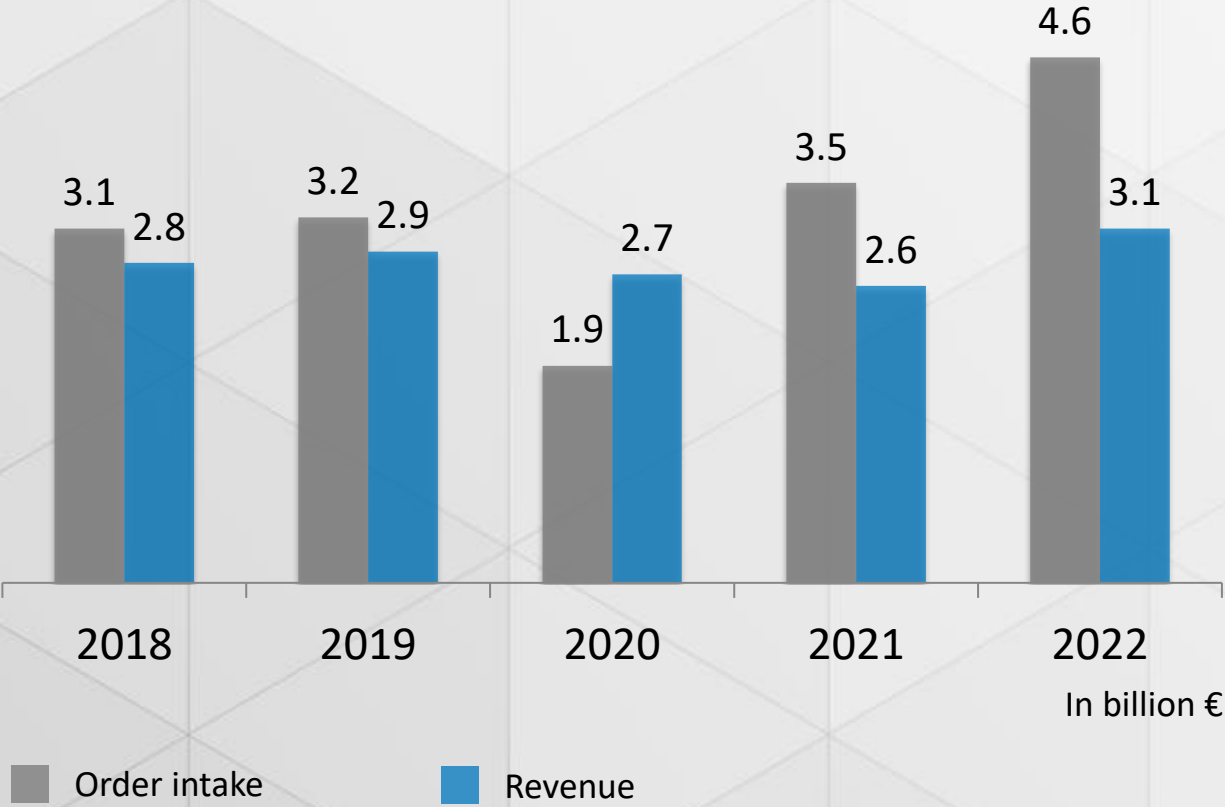
# Leading Partner in the World of Metals





## Our plants are at the heart of SMS group

- › Ironmaking & reduction plants
- › Metallurgical plants and environmental technologies
- › Continuous casters
- › Hot and cold rolling mills
- › Strip processing lines
- › Long product plants
- › Forging plants
- › Non-ferrous plants
- › *Technical Service*
- › *Electrics & Automation*
- › *Digitalization*



# SMS group at a glance



- 150** **Experienced partner**  
Family business with a history of more than 150 years as a technology leader
-  **Worldwide**  
≈14,500 employees
-  **Local**  
95 workshops and sites globally
-  **Full-liner**  
For the entire metallurgical process chain
-  **Comprehensive services**  
Lifecycle services for equipment, automation and digitalization



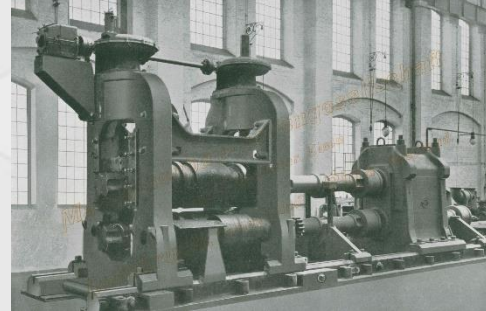
# 150 years of shaping the future

1871



**Many roots – one company**  
Carl Eberhard Weiss starts a forging business

1904



**Global reach and local expertise**  
We supply our first rolling mill to China

1952



**A partner for megaprojects**  
Building the first integrated steel plant in India

1989



**Pioneering solutions**  
We invent CSP® technology – a revolution in sustainability

2016



**Life cycle partner**  
The Learning Steel Plant – our first fully digital steel production facility

2023



**#turningmetalsgreen**  
Shaping the future of metals and drive the green revolution



# H2 Green Steel

## The world's first 100% hydrogen-based steel plant

- › CO<sub>2</sub> emission reduction up to 95%
- › Based near **Boden, Northern Sweden**
- › Start-up of first plant: **2025**
- › Capacity of phase 1: **2.5 million t/year**, phase 2: **5 million t/year**
- › SMS group supply from **melt shop to finishing lines**

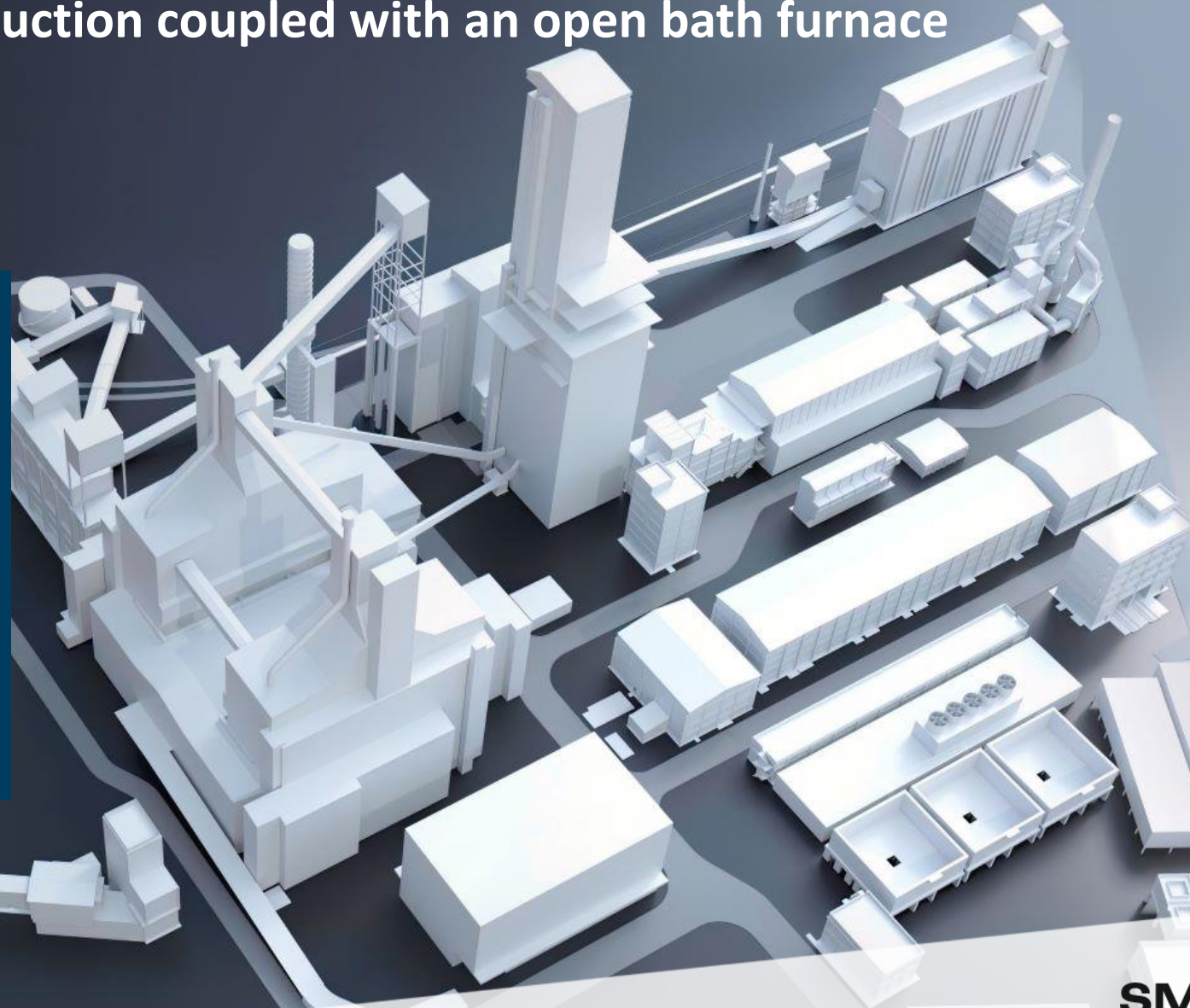


# thyssenkrupp Steel

## Natural gas-based direct reduction coupled with an open bath furnace



- › Annual saving of **over 3.5 million metric tons of CO<sub>2</sub>**
- › Based in Duisburg
- › Start-up of first plant: **2026**
- › Capacity of **2.5 million metric tons** of directly reduced iron
- › **Engineering, delivery and construction** of a hydrogen-powered direct reduction plant, two innovative melters





## Spotlight: Primobius

### Special process of recycling Lithium-Ion batteries

- › CO<sub>2</sub> minimal process
- › High purity of recovered materials  
(lithium, cobalt, nickel)
- › Scalable
- › Industrial applicable
- › High scrap rate in battery production

» Industrial recycling facility  
Hilchenbach JV with NEOMETALS,  
cooperation with Mercedes-Benz



**Primobius**  
Battery recycling without limits





## Manufacturing

# The most modern heavy workshop for quality components

- › **850 employees** and over 55,000 m<sup>2</sup>
- › **In-house manufacturing** of key components
- › **Pre-assembly and testing** of quality-relevant units and hydraulic systems
- › **Close cooperation** between engineering, manufacturing and global sourcing





## Integration

# Switch on and start production quickly and safely

- › Realistic **3D real-time simulation**
- › **Tested software** before delivery
- › **High product quality** from the very beginning
- › **Trained personnel** at an early stage
- › Faster **commissioning and ramp-up**





# Additive manufacturing

## Weight reduction + multi functions → CO<sub>2</sub> reduction

- › Aviation and aerospace
- › Automotive
- › Machine engineering and tooling
- › Medical applications

## Expertise in the whole value chain of additive manufacturing

- › Powder atomization plants
- › Turnkey solutions for additive manufacturing series production
- › Additive manufacturing applications

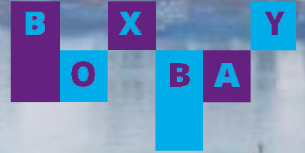




## Technology transfer to boost logistics efficiency

# Disruptive technology for container handling

- › Container storage 11 tiers-high
- › 200% more capacity than a conventional terminal, one third of the space
- › Faster turnaround times and reduced congestion in ports
- › Lower OPEX, direct access to each container, no reshuffling
- › Modular, scalable and expandable
- › Fully automated and digitalized
- › Truly green technology, fully electric powered by solar energy



» FAST – SMART – GREEN



# 20 years CADENAS@SMS group

## The Beginning → SMS Eumuco

1997 – First inconclusive discussions with SMS Schloemann-Siemag (today's SMS group) and CADENAS

2002 – Starting position @ SMS Eumuco

The time before CADENAS

Up to the year 2002:

- ca. 80 ME10 workplaces under HP-UX 10.20
- ca. 25 MEDUSA workplaces on Windows
- ca. 10 Pro/E workplaces on Windows
- ERP system: PSIpenta/PflASt (self-created)
- Each CAD system has its own library of standard parts → three different standard parts systems
- Many different catalogs of different quality
- Different search options and operating concepts
- Many parts created by users themselves
- No connection to the ERP system →
  - Significant search times
  - Article duplicates
- Updates to new standards have to be made very late or not at all, as there is a very high amount of care required.





# 20 years CADENAS@SMS group

## The Beginning

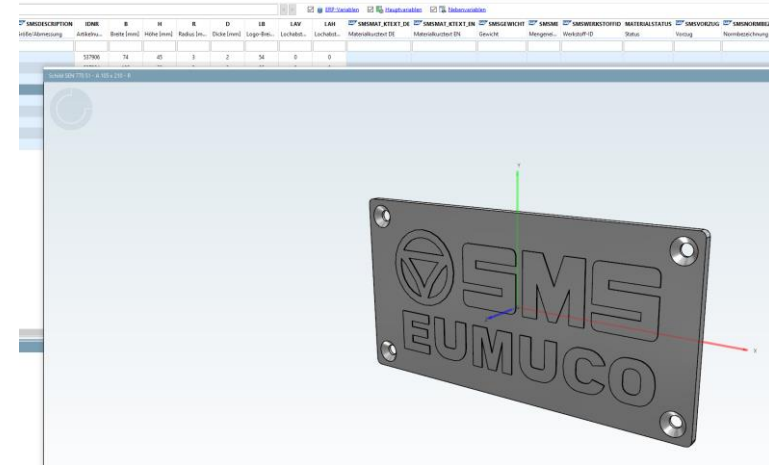
2002 – The solution → CADENAS PARTsolutions

- Uniform standard parts system for all three systems
- Bidirectional connection to the ERP system
- Integration of supplier catalogs into the standard parts system
- Integration in Pro/Intralink with automatic updating when the article master data is changed in CADENAS

And that is true to the present day, only the systems are different. +X

The wishes at that time (2006):

- Catalog updates messages with content of the changes
- Scriptable option of catalog updates including download





# 20 years CADENAS@SMS group

## The Beginning → SMS DEMAG

2004-2006 –  
Introduction of SAP

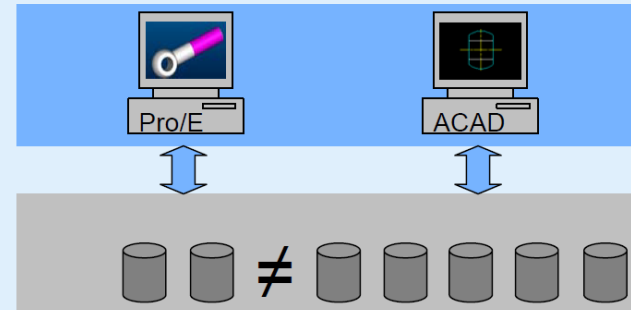


PARTsolutions@SMSDemag

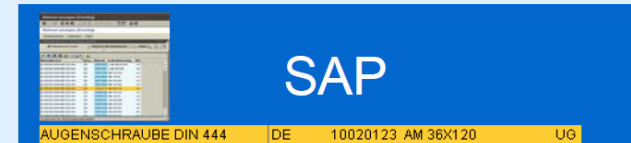
- The problems are the same, the solution too.
- But: Additionally introduced standard and catalog parts management.

### Motivation: Project new parts management system

- Several CAD systems
- Various part libraries with different contents
- No coupling of part libraries and ERP system



≠ • Data Stocks  
• Contents of the master data





## 20 years CADENAS@SMS group

### Implementation by SMS DEMAG in 2006

- Start of integration of German locations (Dü and Hi)
- Connection to Creo, AutoCAD (and Inventor later on)
- SAP connection
- Creation of a central parts management office for creating and maintaining standard and catalog parts → 5 employees
- Provision of missing geometries in the CADENAS format → own modeling
  - The previous requirement is that all possibly geometry-relevant standard and catalog parts must be made available in PARTsolutions

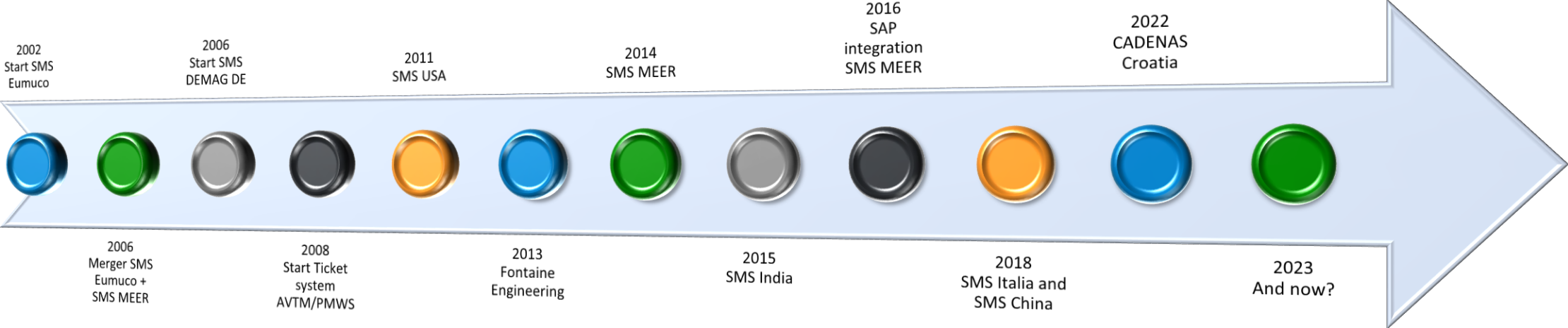


## 20 years CADENAS@SMS group Implementation by SMS DEMAG in 2006

- Standard parts were converted and cleaned from old system → standards Office had already created standard parts centrally in the old system → ca. 25,000 active standard parts (in old system 60,000)
  - Today: Approx. 134,000 active standard parts
- Catalog parts (approx. 973,000 "bought-out items") were not converted → Greenfield central system
  - Today approx. 152,000 active catalog parts worldwide
- Cover letter to manufacturer for generating catalog content (Purchineering initiative)
- Approx. 1100 Users
- Site-based installation → mirroring of data required
- Idea back then: We only need about 80 manufacturers.



# 20 years CADENAS@SMS group Timeline



# 20 years CADENAS@SMS group

## In the meantime?

- Company has renamed itself twice
  - SMS DEMAG → SMS SIEMAG → SMS group
- Various mergers of the old companies
  - SMS Eumuco + SMS MEER → SMS MEER
  - SMS MEER + SMS SIEMAG → SMS group
- CADENAS is still there and still says so.
- 2008: Dedicated request system for standard and catalog parts (AVTM / PMWS)
- 2012: In-house Department parts Management (previously part of the standards Office)
- Various migration projects (SMS USA, Fontaine Engineering, SMS MEER, SMS India, SMS Italia, SMS China)





## 20 years CADENAS@SMS group In the meantime?

- Parts Management (PM) has grown further and become international
  - Own departments of the PM in India and Italy under the leadership of SMS group DE
  - Anticipation of the new way of working of the SMS group
- Conversion from data distribution via Robocopy to PARTapplicationServer
  - Major Simplification
  - One master server, the rest proxies
  - Performance? → runs when the line fits.
- Scaling of PARTsolutions worldwide → no problem (also through PARTapplicationServer)

# 20 years CADENAS@SMS group

## Status Today (2023)

- Over 3,000 potential CAD users, of which ca. 1,500 actual users in CADENAS PARTsolutions
- Approx. 100 PARTsolutions user per day
- Approx. 152,000 catalog parts in SAP
- Approx. 134,000 standard parts in SAP
- Approx. 3,800 manufacturers, of which approx. 1,800 are relevant for geometry (2008 were 240)
- 202 official catalogs used (from 948; unfortunately we do not need BIM, 2008 were 43)
- Approx. 1700 self-produced catalogs



# 20 years CADENAS@SMS group

## Status Today (2023)

- Approx. 1,200 persons can request standard and catalog parts → all persons in the new system.
- Team Parts Management incl. CADENAS Croatia: 21 persons
  - 8 CADENAS Croatia, of which 1 modelers
  - 2.5 SMS Germany
  - 1.5 SMS Italia
  - 9 SMS India, of which 5 modelers
- Provision of data via PARTapplicationServer

# 20 years CADENAS@SMS group

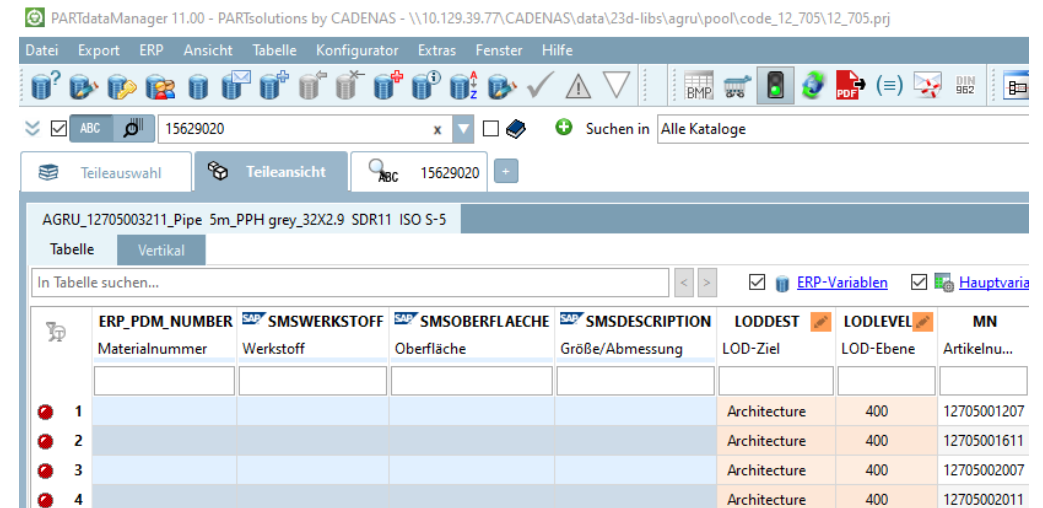
## Lessons Learned - Negative

- Purchineering initiative failed
- Seamless integration did not work for us
- Q&S catalogs only work very unreliable with CREO
- No-one uses PARTconnection (screwed/bolted connection tool) except us
- Switch V8 → v9 or: How to do it better.
  - Software ran very unreliable
  - All catalogs prepared in-house had to be adapted and re-zipped due to a new Suchindex → expenditure of 9 months
  - PARTident omitted → PARTwarehouse is a monster

# 20 years CADENAS@SMS group

## Lessons Learned - Negative

- Data model of the tables has potential for optimization; instead of individual tables → database (possibly as cloud solution?)
- Again and again new functions are forgotten by major customers in the mechanical engineering and plant construction sector
  - Currently: Different LoD for BIM and Mechanical Engineering → BIM preset!
  - Prevents automatic generation in CREO
- AutoCAD 2D derivation is always a little difficult.



The screenshot shows the PARTdataManager 11.00 software interface. The title bar indicates the file path: \\10.129.39.77\CADENAS\data\23d-libs\agru\pool\code\_12\_705\12\_705.prj. The menu bar includes Datei, Export, ERP, Ansicht, Tabelle, Konfigurator, Extras, Fenster, and Hilfe. The toolbar contains various icons for file operations and data management. The main window displays a table for the component 'AGRU\_12705003211\_Pipe 5m\_PPH grey\_32X2.9 SDR11 ISO S-5'. The table is titled 'Tabelle Vertikal' and has a search bar 'In Tabelle suchen...'. The table columns are: ERP\_PDM\_NUMBER, SMSWERKSTOFF, SMSOBERFLAECHE, SMSDESCRIPTION, LODDEST, LODLEVEL, and MN. The table contains four rows of data, each with a red circle icon in the left margin.

ERP_PDM_NUMBER	SMSWERKSTOFF	SMSOBERFLAECHE	SMSDESCRIPTION	LODDEST	LODLEVEL	MN
Materialnummer	Werkstoff	Oberfläche	Größe/Abmessung	LOD-Ziel	LOD-Ebene	Artikelnu...
1				Architecture	400	12705001207
2				Architecture	400	12705001611
3				Architecture	400	12705002007
4				Architecture	400	12705002011



# 20 years CADENAS@SMS group

## Lessons Learned - Positive

- Software and parts management are accepted and is a matter of course
- Highly scalable software from local to global
- The right software at the right time
- Central parts management with CADENAS PARTsolutions: It is worth it  
→ worth proof Bachelor's thesis Tobias Popies
- Unconsciously and not intended: Training in the digital twin

# 20 years CADENAS@SMS group

## Lessons Learned - Positive

- Greatest Benefit:
  - Expandability
  - Integration slides/stickers (but only shelf)
  - Central surface
  - Linking with SAP
- Automatic catalog installation is possible
- eCatalog-Solutions for self-created catalogs have proven to be successful
- Search and filter options as well as geometry exchange are very simple

20 years CADENAS@SMS group  
Lessons Learned – Totally underestimated (of many)





# 20 years CADENAS@SMS group

## What happens next?

- Since 03/2023 Master Data Management Department
- Change-over to S/4 HANA
- Further connection of SMS companies/Paul Wurth → data migration projects
- Update V12 (probably 2024)
  - Change-over to web interface (ENTERPRISE 3Dfindit) if it works
  - PARTwarehouse in operable (prel. 2023)
- Further investigations use Q&S catalogs
- Change-over to new ticket system from MEDAXperts/CADENAS (09/2023)
  - Simplified Operation
  - PARTsolutions connection to ticket system
  - Connection designation catalog Standard parts (in v2 also catalog parts)



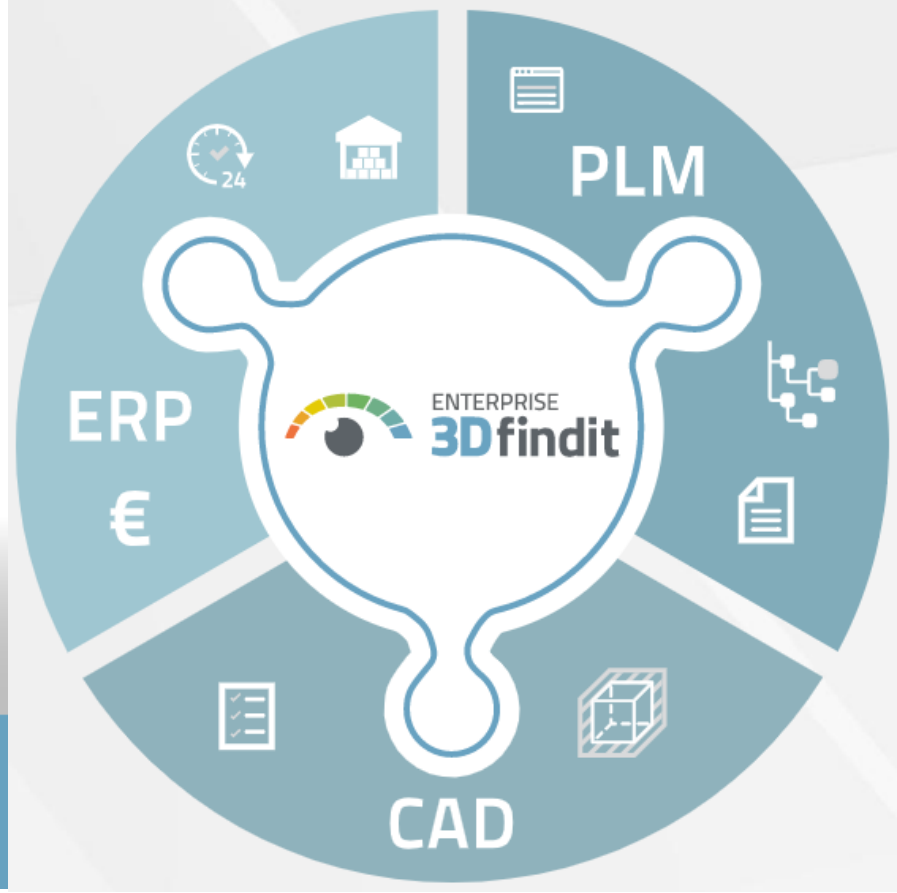
# 20 years CADENAS@SMS group

## SMS group # MDM Ticket System – Key Features



- #1 Stammdaten Request
- #2 CAD Part Request

Das neue „Wünsch-Dir-was“ Ticketsystem für Kaufteile & Stammdaten-Anlage



## 20 years CADENAS@SMS group

### SMS group # MDM Ticket System – Key Features

- Data transfer from the PARTsolutions catalogs to the ticket system
- Ticket system with SMS fields for central new creation of standard and catalog parts in SAP
- Integration SMS designation catalog with AutoComplete
- Duplicate check for standard and catalog parts
- Weight calculation for standard parts
- Status network for modeling missing standard and purchased part geometries
- Automatic creation of SAP basic data via the PARTsolutions SAP R3 or SAP 4/HANA MM interface
- Monthly dashboard for evaluating the number, status, master data quality of the processed tickets
- Ticket system Ready for ENTERPRISE 3Dfindit



# 20 years CADENAS@SMS group

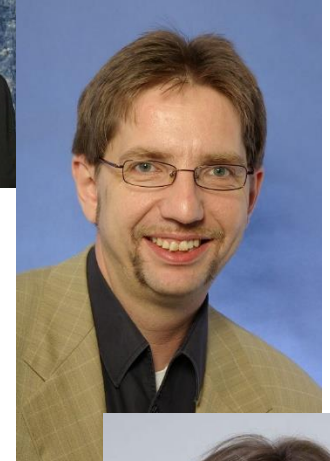
## Live Demo

- Previous Ticket System
- New Ticket System
- CADENAS PARTsolutions

# 20 years CADENAS@SMS group

## Conclusion

- Master data management and obsolescence management has been and continues to be important and is becoming increasingly important
  - Digital Twin
  - Legal requirements for master data
    - Material Compliance
    - Hazardous Goods (Lithium Batteries)
    - Product Carbon Footprint
  - Processes
  - AI
- CADENAS PARTsolutions helps in this process.
- Decision was right.



**SMS  group**