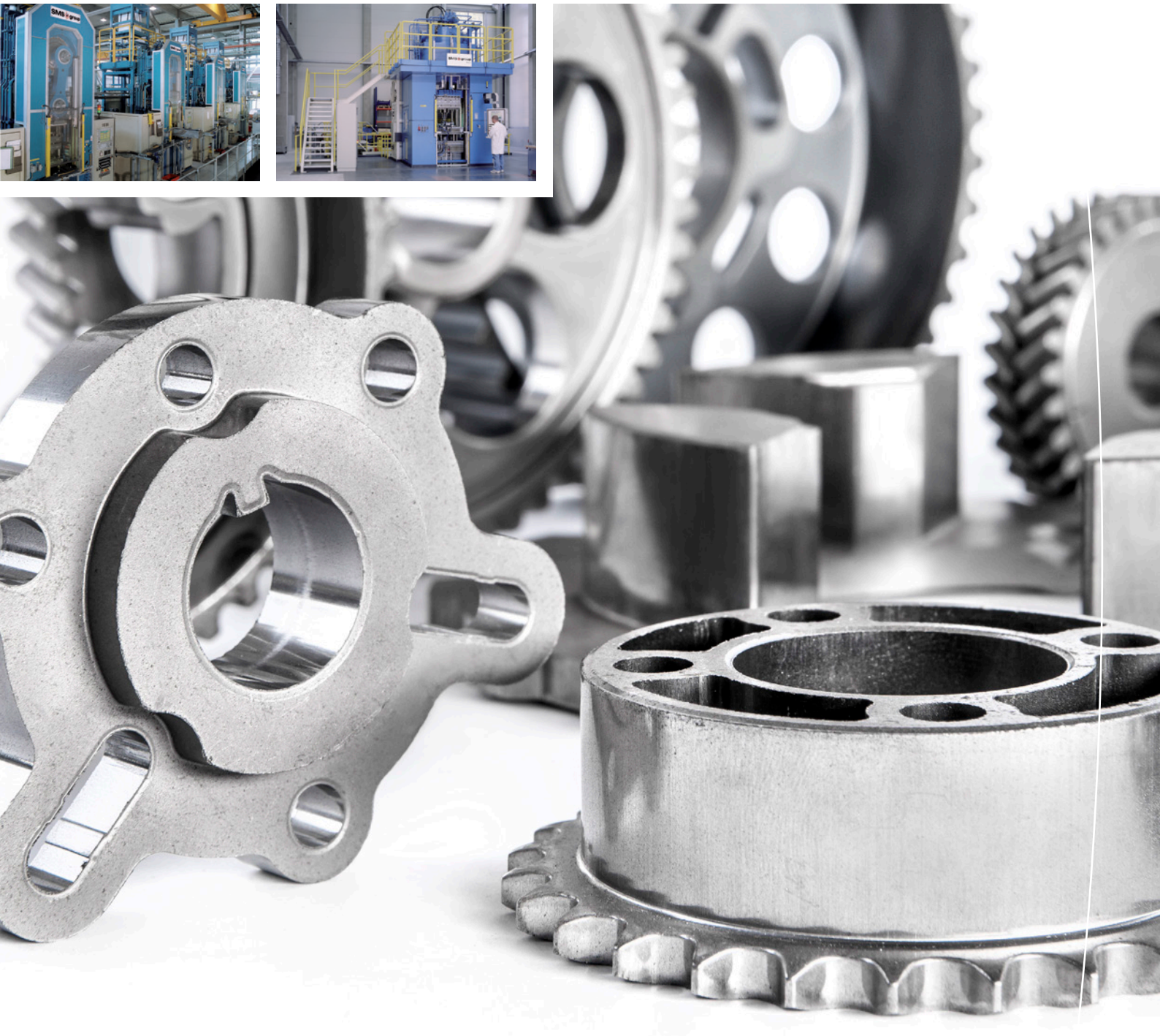
SMS group

Highly flexible, CNC-controlled hydraulic powder presses

Customized solutions for demanding applications



CNC press technology

Outstanding technology, intelligent overall concept

With the hydraulic CNC powder press and controlled hybrid press (CHP) product range, SMS group is able to offer the right solution for practically all applications. The customer can choose from two press ranges, each with different types and press forces, allowing individual configuration to meet the specific requirements. Compared with other systems, the hydraulic CNC positioning during the whole press cycle – and in particular in compacting position – impresses with its high precision, product quality, reliability and gentle operation. The CPA process technology developed and patented by SMS group and the excellent implementation of the hydraulic-mechanical drive were commended with the EPMA Award.

Hydraulic CNC presses	**Line of types**		
600 – 2,000 kN	HPM 60 E5	HPM 150 E5	HPM 200 E5
2,500 – 3,500 kN	HPM 250 E5	HPM 350 E5	
5,000 – 8,000 kN	HPM 500 E5	HPM 650 E5	HPM 800 E5
10,000 – 17,000 kN	HPM 1000 E5	HPM 1500 E5	HPM 1700 E5
20,000 – 25,000 kN	HPM 2000 E5	HPM 2500 E5	
Hybrid CNC presses			
1,600 – 3,200 kN	CHP 160	CHP 250	CHP 320

CPA – Controlled punch adapter

Unique powder press process, universal possibilities

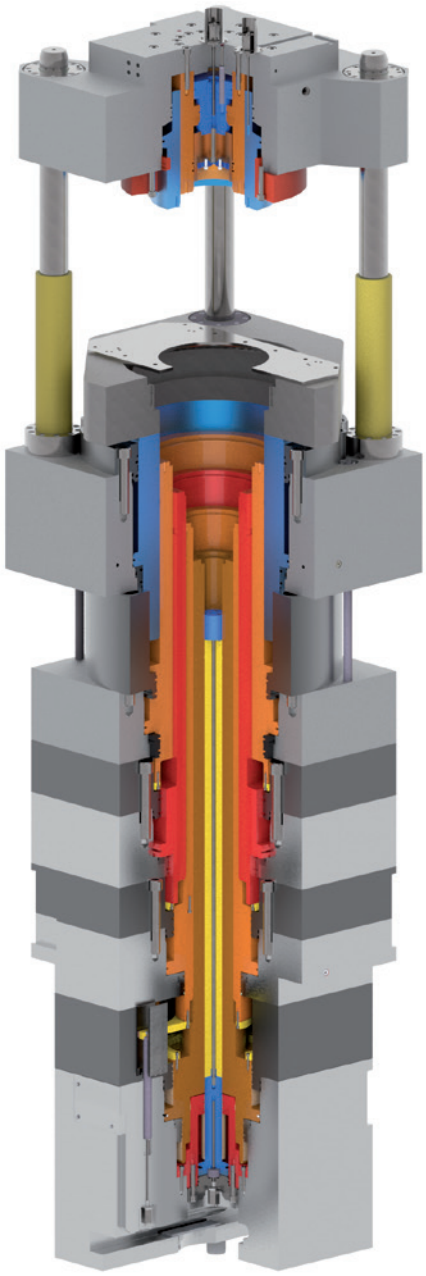
The heart of the hydraulic CNC powder presses and the hybrid presses is the controlled punch adapter patented by SMS group. Equipped with up to 12 axes, it permits extremely flexible operation for the production of highly complex sintered parts. With the CPA technology, several punch levels interact, controlled fully automatically and precisely by the CNC system. SMS group offers a broad range of adapter changing systems – from simple to fully automated. Furthermore, the controlled punch adapter has a well planned and easily accessible design for simple tool changing.

Process engineering of the highest standard

The powder is brought into the desired geometry by controlled movement of the punches – and allowing for their interaction – initially without applying the compacting force. This creates a basic precondition for the later uniform density of the compact. This is followed by the coordinated press compacting process.

With the telescopic arrangement of the cylinders, each CPA axis is guided extremely precisely and can transmit high compacting forces. Thanks to the hydraulic CNC axes, the force of all the punches is applied uniformly and the punch expansion is compensated, particularly during the relief phase.

The result: Compacts without micro-cracks. Furthermore, the compacting process is made far more precise and controlled for a lasting high productivity and product quality.



Benefits at a glance

- Up to 12 axes (optionally even more)
- Forces in the axes from 600 to 10,000 kN
- No risk of cracking in the compacts
- Optimum flowing powder transfer thanks to uniform punch speeds
- Hydraulic pressure relief of the punches on both sides after reaching the compacting position
- Compensation of the elastic punch deflection

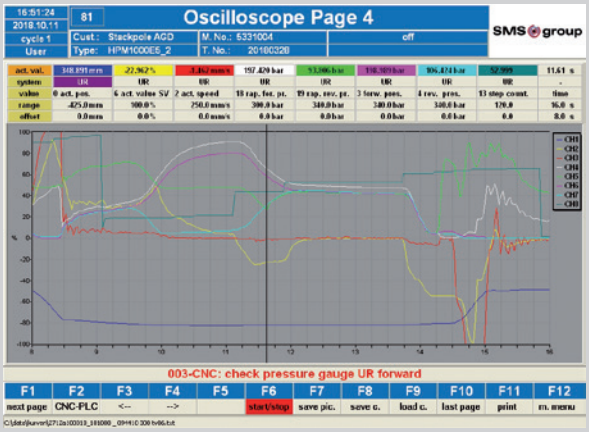
Process and quality control

The intelligence of the presses

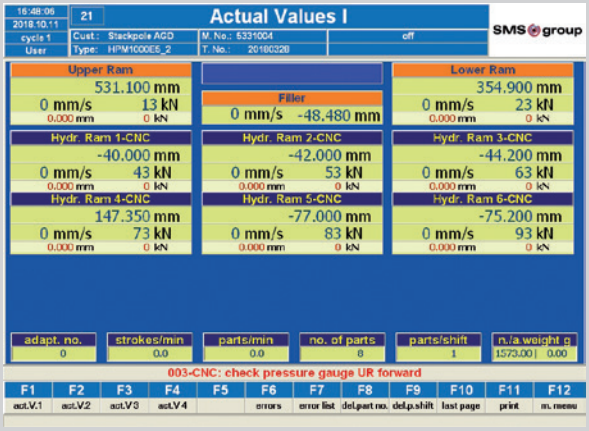
The CNC system of the powder presses has a clearly structured and easy-to-use operator interface. Machine operators are therefore familiar with the machine and its functions within a minimum of time. Easily comprehensible programming applications, actual value/nominal value real-time analyses, fault displays and diagnostic functions are available. The process data for repeat parts can naturally be saved in a database, thus shortening the set-up time in the future. The new part shapes can be pre-calculated automatically using our integrated, operator-friendly part calculation program. These calculation data are used as the basis for fast and reproducible presetting of the press, thus saving time.

Automated quality functions

When data are entered, the CNC system performs a plausibility check, thus helping to avoid operator errors. It provides all the operating data for the compacting process, monitors the sensors, compares actual and nominal values and records all the vital process data for quality assurance as part of the statistical process control (SPC). With the continuous quality documentation, plant operators can meet the demands of the relevant standards or the customer's specifications without additional work. Parameters monitored are i.a. the position and force of the top and bottom punches and the part weight. The compacting force curves of all the press axes involved in the process are also monitored and recorded in relation to their preset tolerances. The statistical evaluations serve for both process and production optimization on the machine and for quality documentation. The CNC system can be integrated into a network so that the recorded SPC process data can be forward directly to the responsible employee.



Oscilloscope diagram for all functions



Actual machine values

Benefits at a glance

- Easily comprehensible visualization
- Fully automated process control
- Fully automated quality control
- Statistical evaluation for process or production optimization
- Remote access for service and software updates
- Technological support

Fields of application and references

Unlimited possiblities

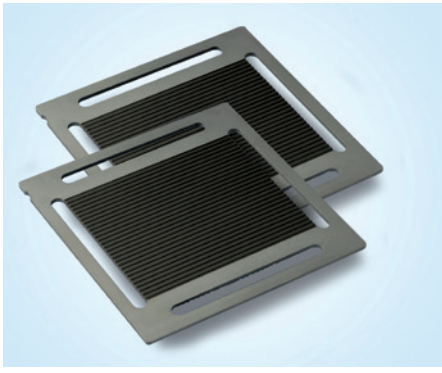
Powder presses from SMS group permit a broad product spectrum to meet present-day and future demands. High-strength materials and even “green products” are increasingly being produced on the machines. These include, for example, surface-contoured interconnector plates, the key components in high-temperature fuel cells. Thanks to the flexible modification and cost-effective expansion possibilities of the presses, plants operators can be sure of investing in a future-proof technology. That is why leading compact manufacturers rely on SMS group as partners.

Examples of potential applications

- Compacting of complex metal powder parts
- Production of compacts from powder materials such as iron alloys, ceramics, metal oxides, carbide metal, ferritic and graphite powders
- Sinter forging
- Composite compacting
- Sizing

Excerpt from the reference list

- Ames Group, Spain
- Chepetsky, Russia
- DAAZ, Russia
- Federal Mogul, England, France and India
- Forschungszentrum Jülich, Germany
- GAZ, Russia
- GKN Sinter Metals, USA, Canada and Germany
- GTP, USA
- Han Dok, Korea
- Miba, Austria
- Netshape Technologies, USA
- Ningbo Tongmu, China
- PMG Füssen, Germany
- Plansee SE, Austria
- Schunk Group, Germany
- Stackpole Canada Inc., Canada
- Toyota Motors, Japan, Thailand, Poland
- University Hanover – IFUM, Germany
- University Kassel, Germany



Industry 4.0 solution – Intelligent Alarm Management „Smart Alarm“

All alarms in an intelligent and clear interface

To reach the highest overall equipment effectiveness, it is very important for our customers to monitor the plant condition. Conventional visual display systems do not always meet this requirement on HMIs (Human Machine Interfaces). Our intelligent alarm management Smart Alarm combines all alarms in a structured graphical overview and allows fast and efficient troubleshooting for employees on site.

With an smart prioritization, a direct link-up with proposals for solutions, automated notifications and intelligent analyses, Smart Alarm puts a stop to lengthy fault analyses. To further increase your productivity, we are constantly working on our product.

Failure detection
Detect the cause of a disturbance fast and effectively.

Performance measuring
Observe the results after maintenance activities.

Equipment availability
Increase equipment availability by enabling immediate troubleshooting.

Overview
Monitor all production lines in one central system.

Transparency
Get notified about critical alarms anytime and anywhere.

Knowledge transfer
Document solutions for alarms right where they occur.

eDoc:
First step to a smart plant

Digital documentation

The digitalization of technical plant documentation offers our customers new possibilities of efficiency increase and is an important step on the way to the ‘smart plant’. Bills of materials, drawings and individual documents of equipment are integrated into one database.

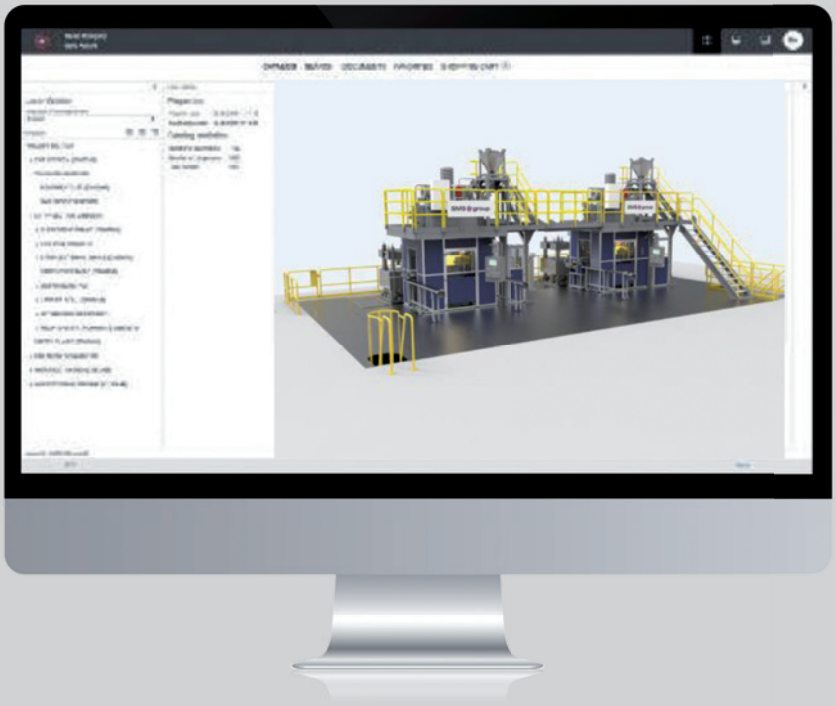
The provided interactive navigation in this data makes parts identification most easy. Additional information like operating instructions or technical data sheets become available on single-item level and mobile devices.

Time-consuming searches for necessary information belong to the past. Thus, one of the main benefits is an overall transparency from site to single part with a smart and fast navigation to the total equipment. An included RFQ (Request For Quotation) function and interfaces to ERP (Enterprise Resource Planning) systems enable eDoc to optimize sourcing of spare parts.

In addition to the possibility of quick enquiries, eDoc can be linked to other digital products of SMS group’s Smart Maintenance Solutions as well.

Your benefits:

- Overall plant transparency from site to single part via integrated data structures-/views
- Smart and fast navigation through the total equipment
- Part identification via equipment trees, drawings with hotspots and flexible search functions
- Improved parts management by same parts search functions



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