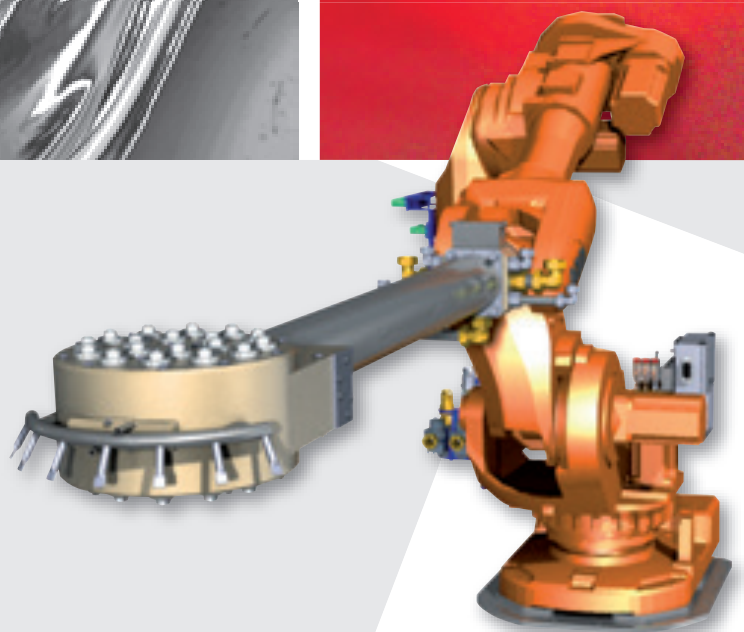


EXCELLENCE IN SPRAYING SOLUTIONS

Always at Your Service - AED



DAG[®]

DELTAForge[®]

DELTAForge[®] DMT[™]

www.aed-automation.com

AED AUTOMATION
Excellence in Spraying Solutions

AED AUTOMATION

AED Automation with headquarters in Dornstadt/Germany, is a leading supplier for spraying systems and foundry automation. With a team of experienced specialists 'Acheson Industries' has been driving this market segment very successfully since 1973. In the year 2010 the company became a vital member of the Wollin Group, now under the name AED Automation GmbH.

With our long standing experience, our commitment to quality and performance, the ideas and actions of our employees, we are continuously striving to meet customer expectations exactly. Based on the idea to make the customer's interest our interest, we work with our customers in the spirit of long-term relationships.

Always at Your
Service - Globally

THE AED EQUATION

DELTAForge® Spraying Technology
+ Automation Competence
+ Full Service Concept
= Leading Edge Process Performance
and Added Value



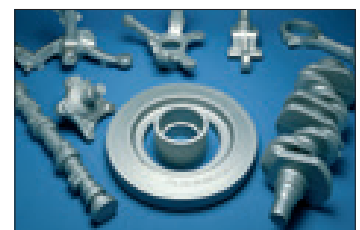
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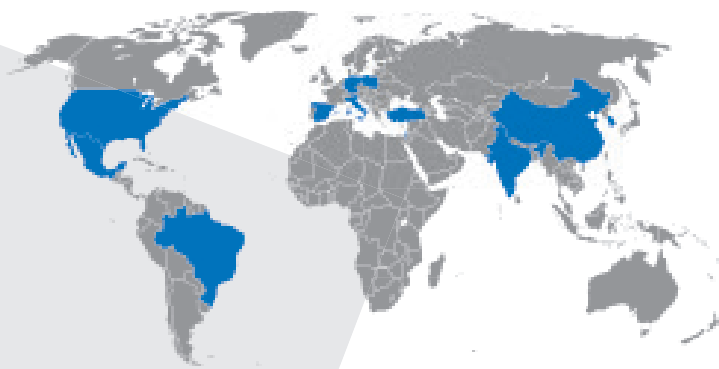


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Spraying technology is our core competence. During the years we extended our portfolio to a full range of foundry and forging automation equipment. Always seeking for best performance and efficiency, we developed our spraying technology and made it leading edge in this segment.

Our external atomization technology has proven as the best solution in numerous applications. It offers best cooling and coating performance, works with low pressure and is very efficient. The results are shortest cycle times and perfect forgings. Our portfolio includes a complete range of products and services - from small spare parts to turnkey solutions.

Necessarily it starts with the right, expertise based selection of the desired spraying system. Here our specialists give their best advice to find the optimum solution for the customer. Our technology with variable interfaces facilitates the integration of our systems in highly automated production environments - automation is an integral part of our daily activities.

The AED service team takes care that the installation and commissioning of our systems are meeting the expectations of our customers in all aspects. A reliable after sales service insures the high performance of your process.

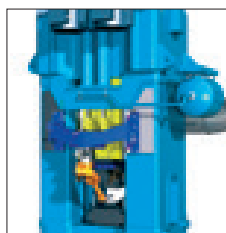
THE PATH TO PERFORMANCE

Inputs



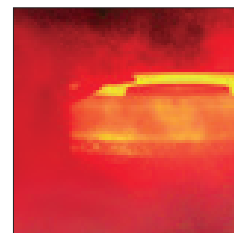
PARTS

- Type
- Size
- Quantity
- ...



PRESS

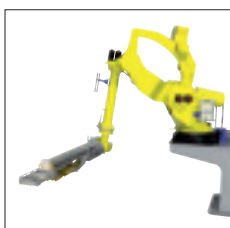
- Geometry
- Environment
- Press Force
- Die set up



PROCESS

- Type
- Size
- Quantity
- ...

Outputs



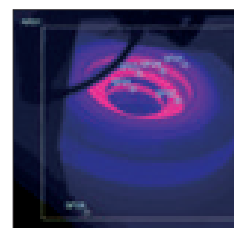
SYSTEM

- Lubricant Supply
- Cooling & Coating
- Automation
- Enabling Functions



INTEGRATION

- Mechanical Integration
- 'One control' philosophy
- Visualization
- Smart Processing



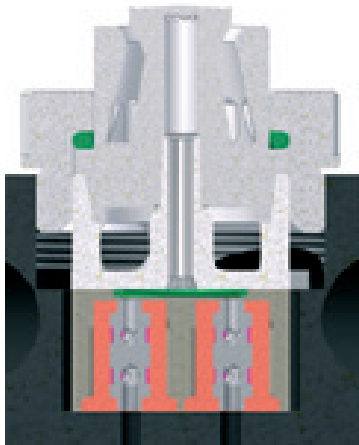
PERFORMANCE

- Thermal Balance
- Die Life
- Forging Quality
- Cost Effectiveness

AED PORTFOLIO OVERVIEW - FORGING

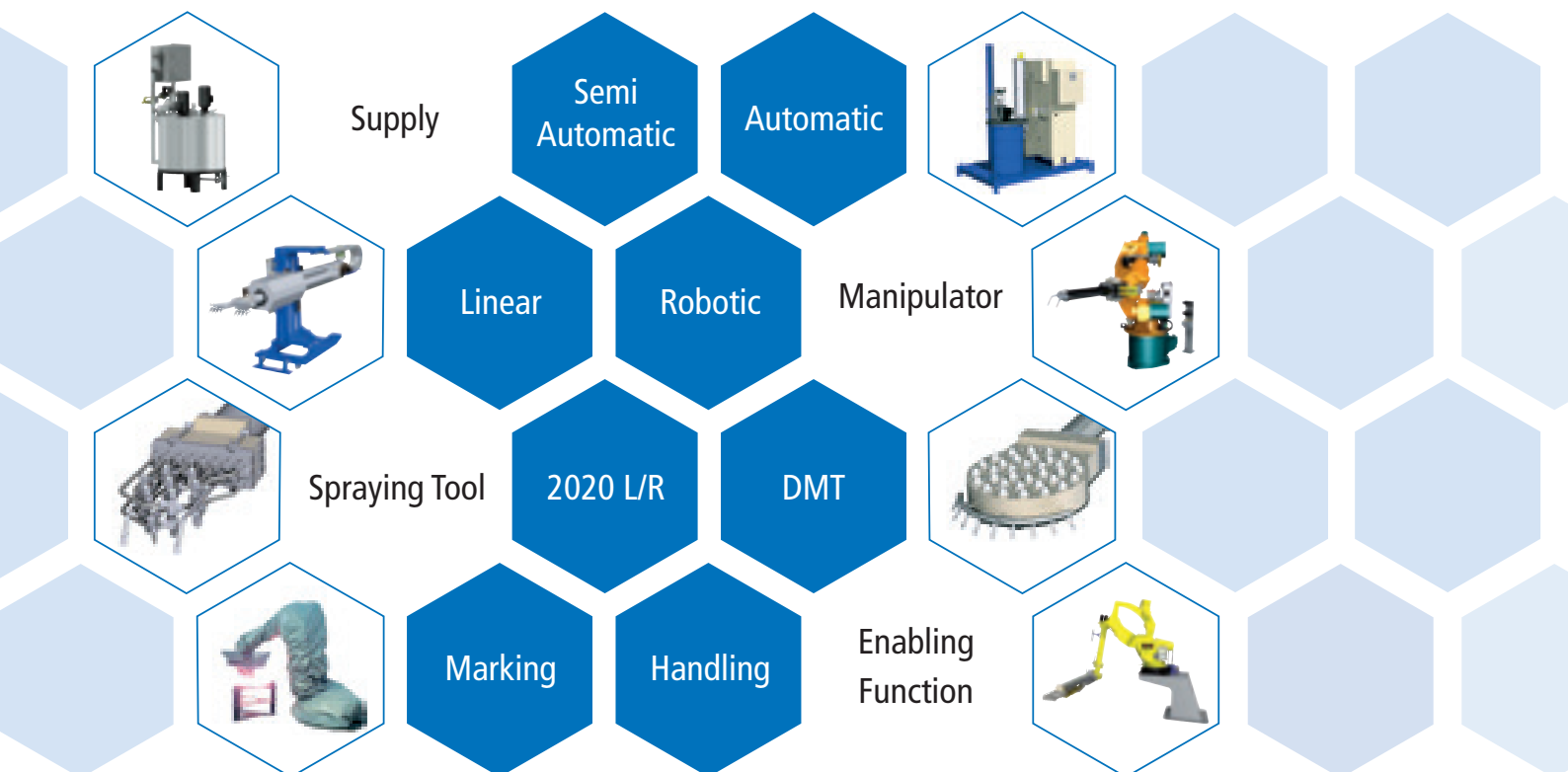
With our flexible product platforms we are able to offer our customers the best possible system that is needed for the individual process. We offer many degrees of freedom related to

- choice of system
- positioning
- integration
- value adding functions

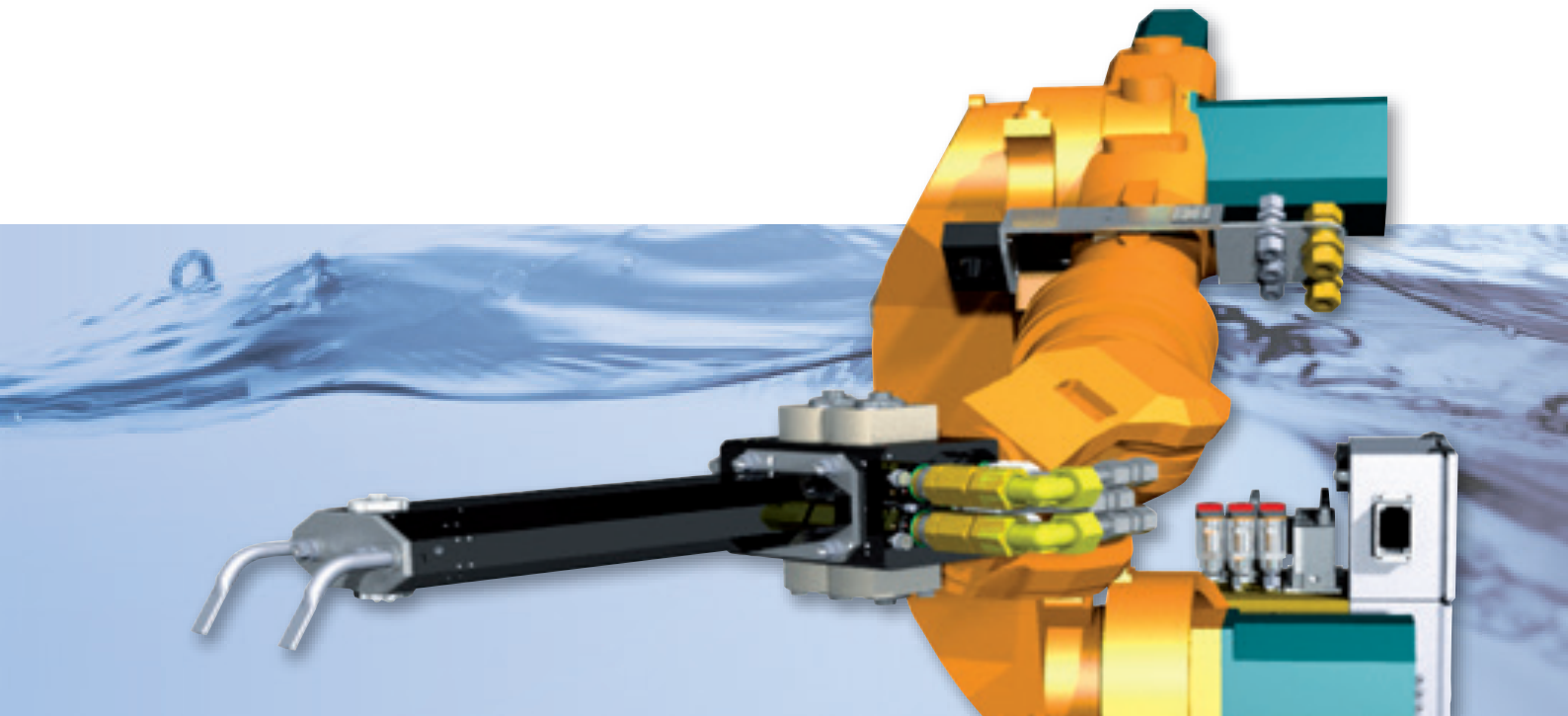


Our spraying technology has been invented using our in-depth knowledge for best performance. Leading edge spraying has a name: Deltaforge®

- Patented
- Tool integrated valves for perfect control
- Powerful spraying
- Precise - optimized spraying pattern
- Easy to maintain
- Very low tendency for clogging
- Very high average availability
- Easy to change (if needed)



SUPPLY SYSTEMS



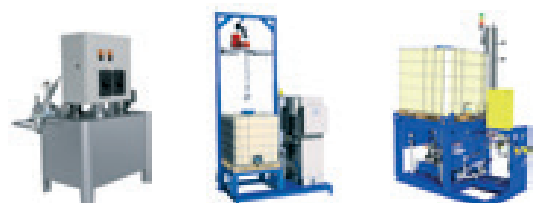
AED is supplying a broad range of systems for dosing, mixing and supplying the lubricant to the connected spraying system. Media resistant materials, well proven components and our expertise based design guarantee high performance, low maintenance requirements and long service life. All systems have been proven in daily forging practice - even in severe conditions.

General advantages:

- Optimized fluid handling avoids lubricant contamination and negative impacts from shear
- Dosing pumps selected according to specifications (delivery rate, dosing accuracy, media compatibility,...)
- Sophisticated mixer technology for best homogenization
- Integrated recirculation for pigmented lubricants
- Stand-alone or fully integrated control system
- Special tailor made solutions possible

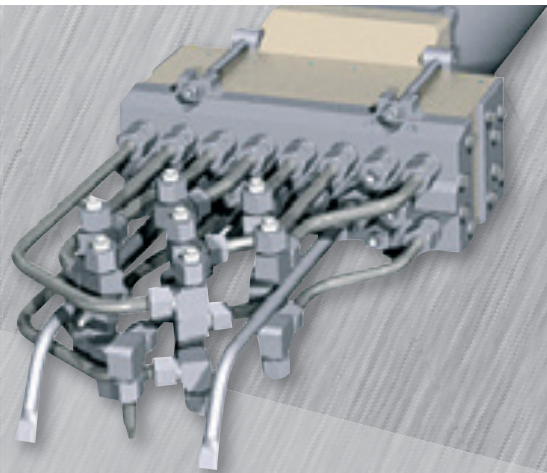
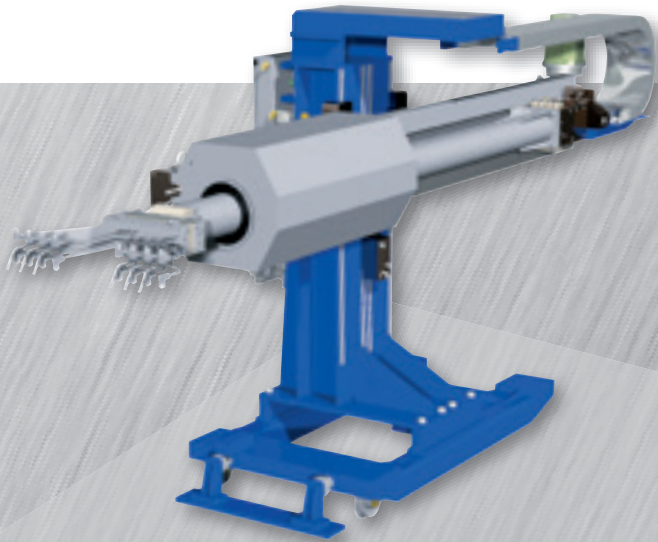
Besides our standard systems we also offer tailor made systems like powder mixers, homogenizing units, high volume tank systems etc... - adapted to the requirements of specification and process. Various sensors for flow rate, filter systems, mixer and pump variants complete our offer.

	DAG 181-S70/200	DAG 183 BMS	DAG 184 CSS
Dosing	Manually or Externally, e.g.w. Cestaro Pump	Automatic - Integrated pump	Automatic - Integrated Pump
Mixing	Supply tank	Mixing tank	Inline
Mixing Ratio	-	1:2 to 1:30	0:1 to 1:50
Mixing Control	-	Sensors for filling level and weight	Micromotion
Output rate	~ 50 l/min @ 5 bar	76 to ~ 120 l/min @ 6 bar	133 l/min @ 6 bar
Installed Power	1,6 kVA	2 kVA	-
Air Consumption	-	20 l/s @ 6 bar	-
Variants	Twin Tank; Customized Systems	Reinforced output; dual mixing ratio; low quantity BMS;...	Customized systems



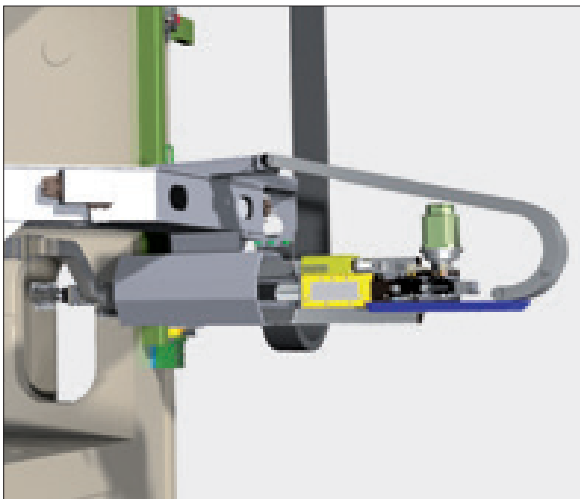
LINEAR SYSTEMS DAG® 2020 L

AED's unique DAG® 2020 Servo Linear Technology reciprocator is available in one- or two-axis versions in four different sizes, suitable for forging machines with a press force up to over 12500 tons. The cool/spray/blow circuits are programmable per cavity and available from two to several circuits. DAG 2020 Technology offers a unique combination of benefits.



DAG® 2020 L Manipulator

- Compact design
- Powerful drive system
- Flexible positioning
- Standardized components, unique pneumatic and fluid system technology
- Nearly zero maintenance
- Special variants are available, e.g. press mounted version



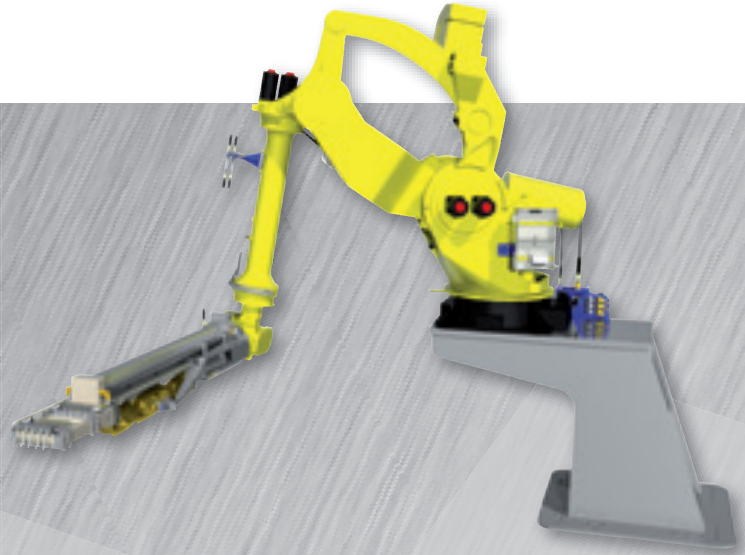
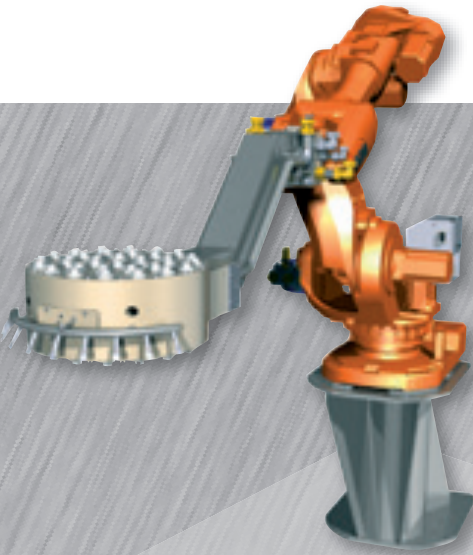
DAG® 2020 L Spraying Head

External atomization spray technology of Deltaforge® nozzles eliminates blocking to almost zero. Customized spray head configuration optimizes cooling efficiency and film formation. This ensures optimal metal flow and part release avoiding interruption of production by 'stickers'. It reduces overspray, providing a clean working environment and minimizing waste. The distribution manifold is especially designed to ensure quick and smooth changes of spray heads. Air-blow tubes, for cleaning scale and water/lubricant residues from cavities, are easy to add.

	Technical Data
Power supply	3 x 400V/50 Hz - 2,5 kVA
Control Voltage	24 V DC
Interface	Parallel
Stroke length	1000 to 2000 mm
Spraying Height	975 to 1475 mm
Size	L x w x h 2140-3140 x 1293 x 1947 mm
Spraying Circuits	2 x 1 to 2 x 4
Spraying Tool	8-fold to 29-fold
Air Consumption	≤ 1200 l/s @ 6 bar
Lubricant Consumption	≤ 1,2 l/s @ 6 bar
Water supply	0,5 l/s (flushing)

ROBOT SYSTEMS

Robot based systems offer the opportunity to have a standard environment for peripheral functions like spraying, handling etc. They are versatile, flexible and cost effective. AED was pioneering the market segment by offering robot based spraying systems since 1996; DAG® 3000 Robospray™ and Deltaforge® DMT™ and DAG® 2020 R are well known brands in the market.



Spraying Robot - 2020 R or Deltaforge® DMT

- Robots of various make and size are used
- Fully integrated system
- Ease of use philosophy - one control concept
- Robot sprayware allowing powerful spraying and perfect control
- Flexible positioning
- Intuitive, graphical user interface
- Integrated safety features
- Lightweight design

Deltaforge® Spraying Technology

combined with 2020 R or DMT™ spraying tool:

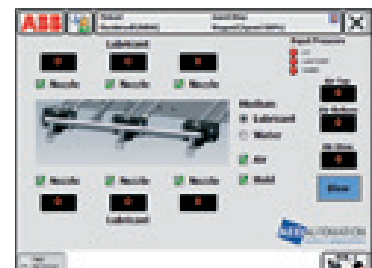
- Many variants in size, shape and function
- Very high cooling efficiency
- Perfect surface coating
- Selective media change
- High availability
- Durable
- Easy maintenance

The AED Benefits

- High process quality
- Best in class 'total cost of ownership'
- Environment-friendly
- Low costs per piece

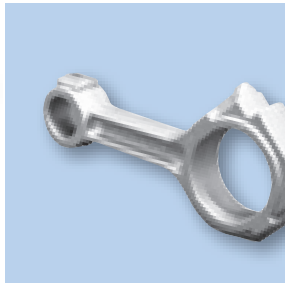
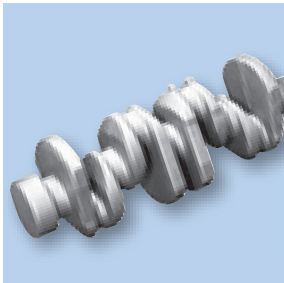
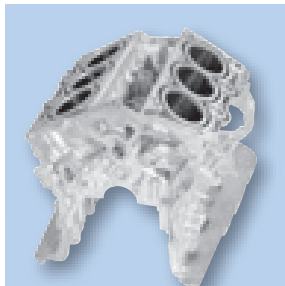
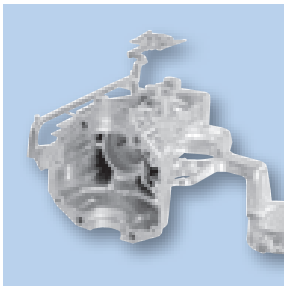
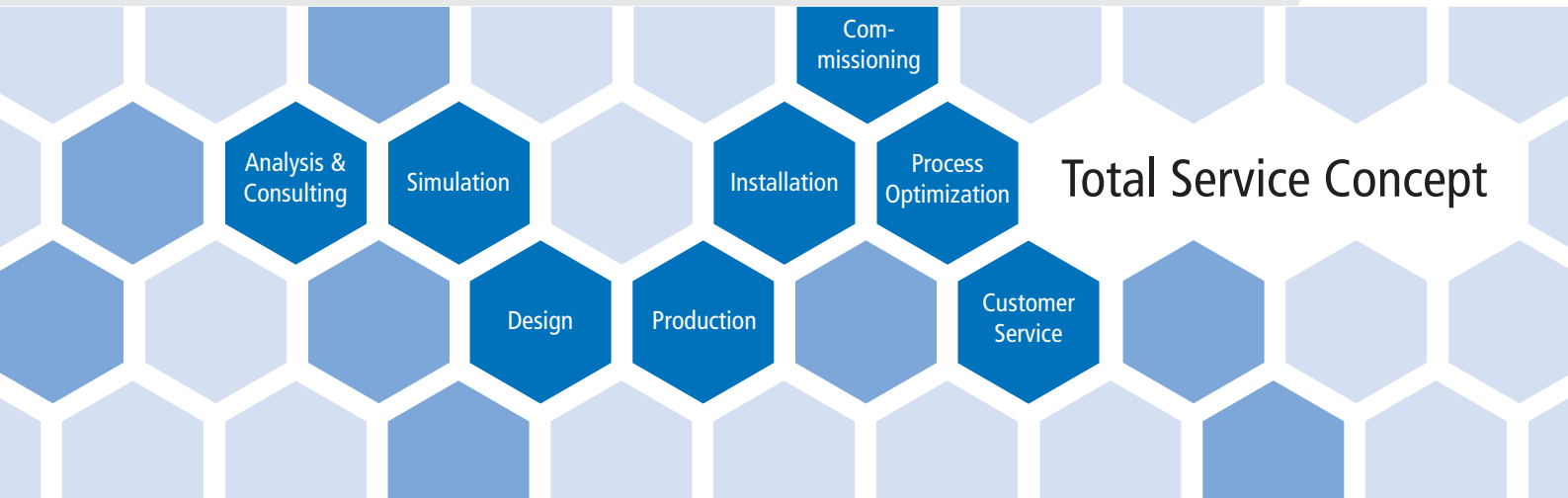
By the way:

We also supply handguns and static spraying systems (AED 600 ST).



AUTOMATION AND INTEGRATION

AED is spraying automation - but we can do more. When it comes to line automation, AED can also supply and integrate equipment for various automation functions - complete systems from one source.



Always at Your Service - AED

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