



**Advanced  
Forming**

# Hydroforming



## The pressure should be in the press, not on you

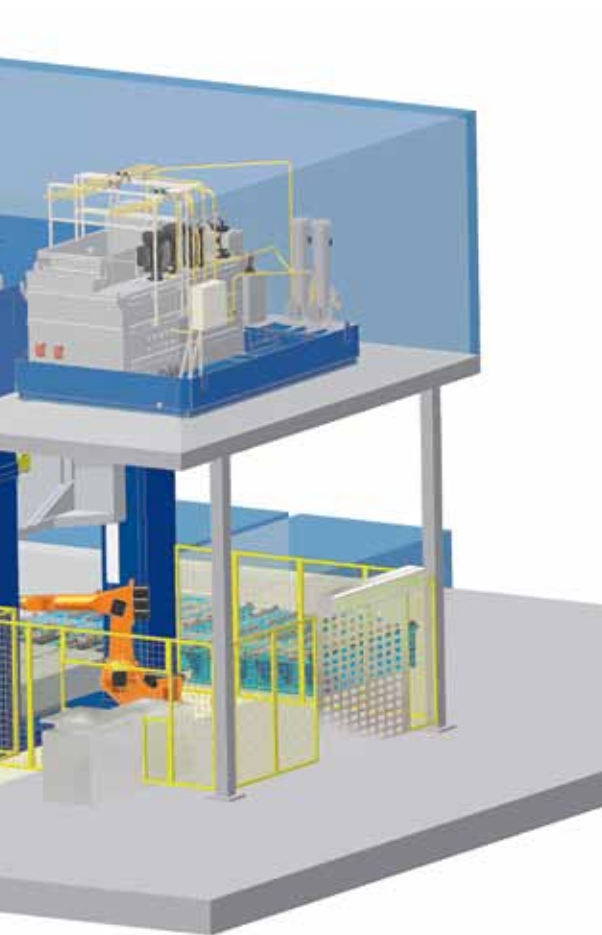
Planning for a hydroforming production solution can be complex for any company, expending much of your time and resources. On the other hand, you could talk to AP&T first.

Since the late 1960's we have been exploring this fantastic technology, which makes it possible (among other things) to produce high precision, complex parts in fewer operations with less material used. Over the years, we have been learning more and more together with our customers and are proud to say that we have introduced a number of innovative solutions to hydroforming technology; solutions that have dramatically cut cycle times and increased productivity.

Hydroforming technology is an integral part of AP&T's commitment to the market. We not only offer an outstanding hydroforming product range, we also share our extensive knowledge of the entire production process with our customers - helping them create the perfect solution for their specific need. You are always welcome to visit our hydroforming R&D center in Sweden to see this continuing development for yourself and perhaps even participate in it.

Don't make your hydroforming project more complex than necessary. Talk to AP&T first.





# Hydroforming cell, single press, retrofit? The choice is yours

AP&T's hydroforming presses and related products use state-of-the-art technology. Among the unique benefits we offer is the AP&T specific NC control, which helps to create short cycle times and the most accurate repeatability on the market. Also, our modular design is shared across our entire product line, making it easier to integrate our hydroforming presses into complete production lines.

Hydroforming press products from AP&T can be divided into three groups:

## Long stroke presses for smaller forces

In the first part of the process, the long stroke presses work identical to a normal AP&T hydraulic press. The slide is pressed down as normal and highly pressurized liquid is pumped into the tool where the HF process takes place.

## Short stroke presses for larger forces

The working sequence: slide goes down making the pre-forming and closes the tool. The slide blocking device mechanically blocks the slide to upper press frame. The short stroke cylinder now enables the tool locking force and the hydroforming takes place.

## Retrofit High Pressure System

The High Pressure System in combination with the HNC control system is the heart of the hydroforming process. It delivers highly pressurized liquid to the tooling. This unit is to be used on existing press equipment.

## Hydroforming with rubber diaphragm

This specially developed press, model HMD, uses a pressure dome in combination with a rubber diaphragm. A draw cylinder from below is pressing towards the diaphragm and the part is formed by the dome pressure.



# Products



## HF

Short stroke press  
 Forces up to 100,000 kN (11.250 US tons)  
 Bed up to 3,600 x 2,700 mm (141.7" x 106.3")  
 Tie rod design  
 Prism guiding of slide



## HNC

Servo/NC control system that uses the latest in hydraulic motion technique. The system is adapted for hydroforming applications and operates with high accuracy in positioning, speed control and pressure regulation.



## HPS Retrofit

Water and hydraulic high pressure system with HNC control for retrofit. Includes functions like quick-fill pump, pre-form pump, pressure intensifier, tool axes and on/off valves.



## ODEN-FT

Long stroke press  
 Forces up to 25,000 kN (2,800 US tons)  
 Bed up to 3,600 x 2,800 mm (141.7" x 110.2")  
 Tie rod design



## ODEN-F

Long stroke press  
 Forces up to 12,500 kN (1,400 US tons)  
 Bed up to 2,500 x 1,900 mm (98.4" x 74.8")  
 Mono-block frame



## HMD

A hydroforming press with an oil supported diaphragm.  
 Forming pressure 35/70/100 MPa (5,000/10,000/15,000 psi)  
 Blank diameter  $\varnothing$ 380/635/810 mm (15/25/32 inches)  
 Press frame force 9,200 - 40,000 kN (1,035 - 4,500 US tons)





## Hydroforming is more about process than about presses

Knowing the right way to hydroform a detail is much more than just buying the right press. You need to adapt the tool to the press and optimize the forming sequence. You might need automation or other logistical solutions. You might need an effective tool change system. And you might need a partner who knows how to find the right solution for you.

AP&T is that partner when it comes to hydroforming. Our core competence is in the entire production process, where over the years we have helped our customers become more effective by choosing the right total solution. In return, we have learned much from our customers as well. We continue to learn from our involvement with major European manufacturers in some of the industry's leading technological projects.

On these pages are some examples of what we have done and who we have done it for, so far.

## References

- Akrapovic Exhaust System Technology** Slovenia
- Daimler/Mercedes Benz Cars** Germany
- hde Solutions** Germany
- HYUNDAI HYSCO** South Korea
- Sapa Profiler** Sweden
- Lithonia Lighting** USA
- FAW Car** China
- Mora Aerospace** Czech Republic





### **AP&T is One Responsible Partner®**

AP&T designs, manufactures and markets automation, presses, tools and complete production lines for the metal forming industry. We are experts in forming technology and automated flows and can deliver everything from stand-alone presses, automation products and tools to complete manufacturing solutions. We are totally committed as a supplier - a concept we call One Responsible Partner®. Our customers are from the automotive, household appliance and indoor climate industries, among others, and we offer a complete line of products to meet the needs of most companies who work with sheet metal forming. We have a presence in more than 20 markets through our own divisions as well as through our agents. Our philosophy is simply to be where our customers are.

AP&T North America, Inc. » 4817 Persimmon Court, Monroe, NC 28110 Phone (704) 292 2900 Fax (704) 292 2906 » e-mail [info@apt-usa.com](mailto:info@apt-usa.com) » Internet [aptgroup.com](http://aptgroup.com)

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