Flexform™ Deep Draw Presses

Hydroform Deep Drawing

Features and benefits

The Flexform Deep Draw technique enables you to:

- Operate with only one rigid tool half and a flexible rubber diaphragm
- Produce high quality parts at low cost, tool savings typically 50-90% vs. conventional
- Achive draw ratios of up to 3:1, eliminate forming operations and intermediate heat treatments
- Form almost any kind of sheet metal, at thicknesses from 0.1 up to ~16 mm / 0.005”-0.6”
- Reach high accuracy with no or little re-work after pressing

Deep Drawing of Sheet Metal Parts

The QUINTUS® Deep Draw Presses are the most versatile of the Quintus Flexform presses in terms of forming capabilities. Not only can they form the same kind of parts as Flexform fluid cell presses, but also complex and deep parts which require a deep drawing function. This is performed with the rigid tool half – a movable punch and blank holder – and by controlling the forming pressure as a function of the draw depth. The circular Flexform unit contains the flexible rubber diaphragm.

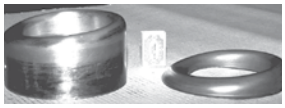
Flexform high pressure technology has been used for decades by such industry leaders as Airbus, Boeing, British Aerospace, Bombardier, Cessna, Daimler, Embraer, Ford, Lockheed, Volvo and many, many others. Users report shorter part lead times, significantly lower tooling costs (one piece instead of two or three), fast prototyping, and easy tool modification after component design changes.

The Flexform concept is simple: sheet metal blanks are formed over a single, rigid shape defining tool half by a flexible rubber diaphragm under uniform hydrostatic pressure. The process results in scratch-free parts regardless of the sheet thickness or complexity of the tool, including undercuts. High forming pressure ensures close tolerance parts direct from the press with little or no secondary hand work required.

Flexform Deep Draw Presses

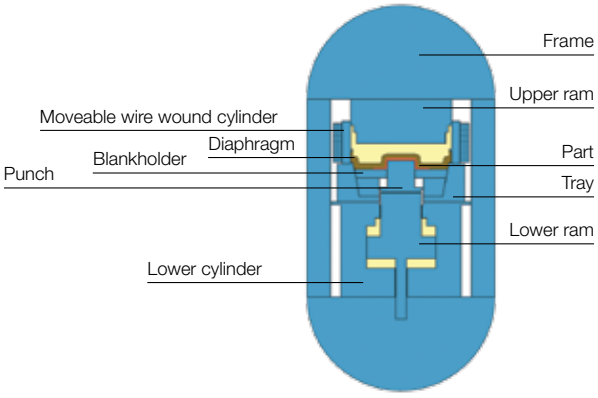
	QFM 0.5-1200	QFM 0.8-800	QFM 1.1-800
Maximum operating pressure	120 MPa / 17,400 psi	80 MPa / 11,600 psi	80 Mpa / 11,600 psi
Total length, including tray stations	3.9 m / 12.8 ft	4.8 m / 15.7 ft	5.2 m / 17 ft
Total press width	2.5 m / 8.2 ft	3.0 m / 9.8 ft	3.0 m / 9.8 ft
Total press height above floor level	3.6 m / 11.8 ft	4.0 m / 13.1 ft	4.0 m / 13.1 ft
Height from floor to tray top	765 mm / 38 in	965 mm / 38 in	965 mm / 38 in
Foundation depth	1.7 m / 47 in	1.5 m / 59 in	1.7 m / 67 in
Total weight on foundation	20 ton	30 ton	50 ton
Forming data			
Press force, MN	30	40	80
Punch force, MN	5.3	10	18
Deep draw tray			
Max blank diameter	535 mm / 21 in	775 mm / 30.5 in	1,095 mm / 43.1 in
Max draw depth	305 mm / 12 in	250 mm / 9.8 in	254 mm / 10 in
Max punch diameter	400 mm / 15.7 in	600 mm / 23.6 in	900 mm / 35.4 in
(For non-cylindrical tools, equivalent tool cross section area is valid)			
Number of tray stations in machine	2	2	2
Cycle time deep draw	60 sec.	60 sec.	77 sec.
(Presumptions used when calculating the cycle time: 50% of max punch diameter and 50% of max draw depth and going to full pressure)			
Flexform tray			
Maximum tray depth	420 mm / 16.5 in	420 mm / 16.5 in	420 mm / 16.5 in
Maximum blank diameter	416 mm / 16.4 in	658 mm / 25.9 in	968 mm / 38.1 in
Cycle time Flexform	45 sec.	40 sec.	60 sec.
(Presumptions used when calculating the cycle time: Tray depth 70 mm / 2.8 in, i.e. filler plate in the tray. 50% average tray loading and going to full pressure)			
Transportation data			
Gross weight of heaviest item	13 ton	25 ton	40 ton
Gross dimensions of heaviest item (LxWxH)	4.6 x 2.3 x 2.0 m 15 x 7.6 x 6.6 ft	4.3 x 2.5 x 2.0 m 14.1 x 8.0 x 6.6 ft	4.8 x 2.9 x 2.0 m 15.8 x 9.6 x 6.6 ft
Control system – all models			
Programmable controller (PLC)		Allen-Bradley	
HMI Operative system		Windows	
Flat color touch screen size		17”	
Application software		InTouch	
Sound level – all models			
Noise level at operator’s station		Below 80 dB(A) equivalent	
Site utilities – all models			
Fluids		Mineral oil, ISO VG46	
Installed power		75 kW	
Voltage (3-phase + ground)		380-480 V	
Frequency		50 or 60 Hz	

The Flexform tray station may also be used for expansion forming, in addition to block tool forming and cavity tool forming.



Jet engine torus ring in 0.5 mm (0.02 in) titanium. Deep drawn in two steps with a steel movable punch and blank holder.
Preforming, intermediate heat treatment and final forming to

Automotive shock absorber support in 2 mm (0.08 in) mild steel. Deep drawn with a movable punch and blank holder in one step to 800 bar (11,600 psi).



For more information please visit **www.quintustechnologies.com** or email **info@quintusteam.com**

Quintus Technologies AB
Headquarters
Europe/Asia Sales & Service
Quintusvägen 2
SE 721 66 Västerås, Sweden
Phone: +46 21 32 70 00
Fax: +46 21 32 73 05

Quintus Technologies LLC
Americas Sales & Service
8270 Green Meadows Drive N
Lewis Center, Ohio 43035
Phone: +1 614 891 2732
Fax: +1 614 891 4568

Service & Support
Europe/Asia
Phone: +46 21 32 73 00
support@quintusteam.se

Service & Support
Americas
Phone: +1 614 891 2732
support@quintusteam.com

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201705-212E