

40 YEARS
OF QUALITY

LPG CYLINDER
PRODUCTION LINES

REPKON

..setting flowforming 'free'.



TURN KEY LPG CYLINDER PRODUCTION PLANT

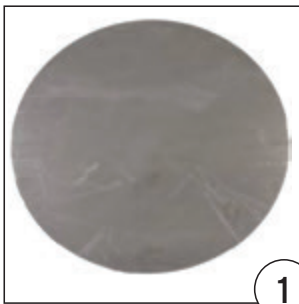
LPG Cylinder Production within the guidelines of the international standards such as EN 1442 involves several process steps starting from forming to final testing that can be streamlined into the following lines:

1. Blanking & Body Forming Line
2. Valve Guard Ring & Foot Ring Production Line
3. Valve Neck (Valve Boss or Neck Ring) Production Line
4. Welding, Heat Treatment and Hydrostatic Testing Line
5. Surface Coating Line
6. Finishing Line with Pneumatic Testing
7. Valve Production Line



PROCESS STEPS

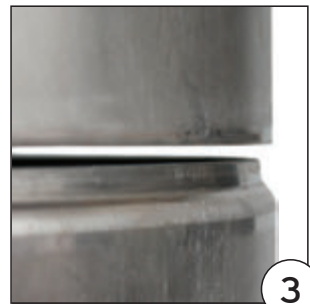
LPG Cylinder Production is composed of several sheet metal forming, surface treatment and testing processes. The process starts with blanking, deep drawing and piercing, trimming and joggling. Next are the welding operations for valve boss, valve guard ring, foot ring and the two halves. The finished cylinder is then heat treated, tested, shot blasted, painted and then the valve is attached and final tested. The main process steps are summarized below.



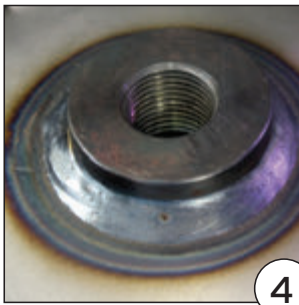
Blanking



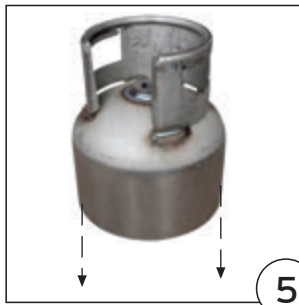
Deep Drawing & Piercing



Trimming & Jogging



Valve Boss Welding SAW



Valve Guard Welding MIG/MAG



Foot Ring Welding



Body Seam Welding SAW



Painting



Valve Attachment

BLANKING AND BODY FORMING LINE

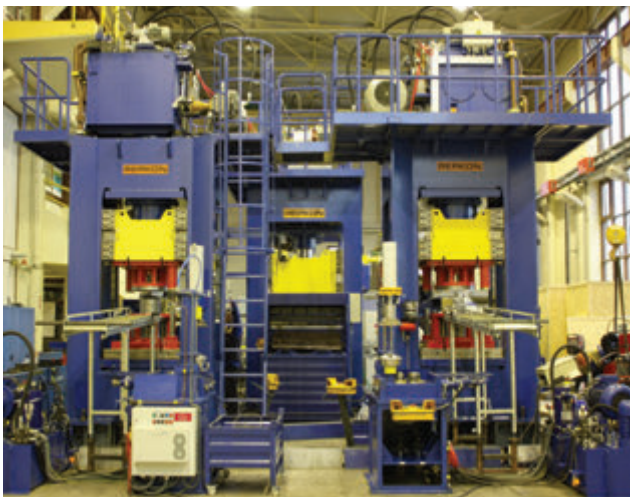
In the core of the forming line there stands a versatile double action REPKON hydraulic deep drawing press that forms the cylinder halves out of round blanks that are blanked by a double blanking REPKON press. REPKON also offers the possibility to work directly from coil material by REPKON combined deep drawing, piercing and blanking die set and press. The edges of the upper and lower halves are further processed by REPKON trimming and joggling machines to the perfection stemming from the sheet metal forming expertise of REPKON to make them ready for the body seam welding, with or without degreasing.



Double Blanking Press



Automatic Loading-Unloading System



Deep Drawing Presses



Automated Forming Line

FOOT RING (BASE RING) AND VALVE GUARD RING (COLLAR) PRODUCTION LINE



Valve Guard Rings (collars)



Foot Ring

Starting either from coiled strip material or already cut sheet steel plate strips, the different shapes of foot rings and valve guard rings require different process steps, different forming machines and different die sets all designed and manufactured in implacable adequacy by REPKON. The typical process steps involves logo embossing and production data marking under single action REPKON hydraulic presses, serial number marking by hydro-pneumatic marking units, blanking of foot ring and valve guard ring blanks, round bending of the blanks, MIG/MAG welding of the foot ring blanks and forming of the final shapes using precisely engineered forming die sets under REPKON forming presses to ensure the welding quality in the welding line.



Valve Guard Ring Forming Line



Foot Ring Forming Die Set



Valve Guard Ring Forming Die Set

VALVE BOSS (VALVE NECK OR NECK RING) PRODUCTION LINE



Forged & Flash Trimmed Valve Boss



Final Valve Boss

The steel rods of the neck ring start off material are first cut in required dimensions and precision by saw, the pieces are induction heated up to forging temperature of 1200 °C, de-scaled by de-scaling hammers and forged under the forging press in the die sets to get the performs to be further processed by flash trimming and hole piercing operation followed by the precise turning operation to get the final shape with valve threads.

Forging Line



Forging Press



WELDING, HEAT TREATMENT & HYDROSTATIC TESTING LINE

The submerged arc welding technique is applied on the welding of body halves on the seam welding machine and generally on the welding of the valve boss to the upper cylinder half. The welding automats with reliable welding power packs and control units are utilized to achieve the uncompromising weld quality with degree of automation needed for the required production capacity per customer. The MIG/MAG welding technique is applied for the welding of foot rings and valve guard rings with the body halves.

In order to relieve all the stresses caused by forming and welding operations, the cylinders are passed through a heat treatment furnace where they are heated upto 930° C degrees of temperature for certain time before getting cooled gradually.

The hydrostatic testing of the heat treated LPG cylinders can be done on automated carousel type machines or on fixed station type machines to increase the internal pressure up to 35 bars for visual inspection as per requirements of the cylinder design specifications.



Valve Boss Welding

Valve Guard Ring Welding

Foot Ring Welding



Body Seam Welding

Annealing of Cylinders

Hydrostatic Testing Carousel

SURFACE COATING & FINISHING LINE

The LPG cylinder surfaces are shot blasted by the shot blasting machine in order to clean up the scales caused by the heat treatment operation to prepare the surface for the painting and / or zinc spraying. The double layer oven cured painting of the cylinders is achieved automatically by the robotic paint application system in the painting line as the cylinders are conveyed on an over head conveyor system through the primary and final coat painting cabinets separated by flash off tunnels before they get cured in the canopy type modern paint curing oven. After the tare weighing and marking of the cylinders, the valves are attached by automatic torque controlled screwing machines and tested against any leakage at the valve region by the pneumatic leakage testing machine of the finishing line. One of the batch type quality control equipment called by the international standards is the burst expansion testing unit where the volumetric expansion ratio and the burst pressure is measured to the full satisfaction of even most stringent requirements.



Painting Line



Burst Expansion Test



Painting Line



Pneumatic Leakage Testing Unit

LPG CYLINDER VALVE PRODUCTION

The valves of LPG cylinders are made out of brass material by forging. The induction heater, the forging press, the flash trimming press, the shot blasting machine, transfer machines to manufacture valve body pieces, the CNC lathes for smaller valve pieces, the washing machine, the toolings and die sets are the general manufacturing line machines that are engineered by Repkon for the specifically designed valves from the customer. The valve pieces are assembled on the assembly and testing line where operational turn on turn off pressure levels and safety release pressure levels are adjusted, set and tested as per applicable international standards.



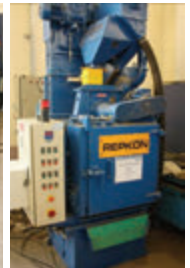
Jumbo Valve



Forging



CNC Lathe for Machining



Shot Blasting



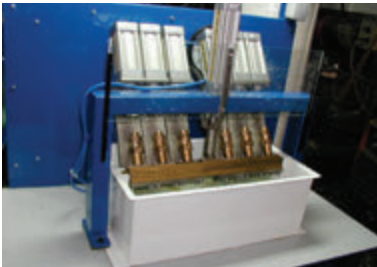
Transfer Machines for Machining



Chip Washing Machine



Assembly & Testing Line



Safety Pressure Adjustment





REPKN MACHINE & TOOL INDUSTRY AND TRADE INC.

PLANT

BALIBEY MAHALLESİ, FABRIKA SOKAK, NO:1 34980 SİLE, İSTANBUL / TURKEY

PHONE: +90 216 739 59 06 (pbx) FAX: +90 216 739 59 14 E-MAIL: repkon@repkon.com.tr

www.repkon.com.tr

PRINTED ON MAY 17, 2017