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## Forming line for LPG production line





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## 1. Introduction

This document consists of the technical and commercial proposal for the production of LPG vessels including:

- product development:
  - design of the cylinders,
  - design of the Lines
  - optimization of the Lines,
  - design of the external case
- project management;
- machinery supply;
- two-stage training and assistance:
  - at supplier's sites:
    - training,
    - machinery pre-acceptance;
  - at Customer's site:
    - equipment start-up,
    - Training.

### 1.1. Product Part list

Item	Material	Standard	Mechanical Properties			Chemical Properties				
			Yield Point (Mpa)	UTS (Mpa)	Elongation %	% C	% Mn	% Si	% S	% P
1	Footing	EN 10025	-	-	-	-	-	-	-	-
2	Elliptical Dished End Lower	EN 10120	≥ 265	410- 500	-	≤ 0.190	≥ 0.40	≤ 0.25	≤ 0.015	≤ 0.025
3	Shell body ( for > 12 kg's)									
4	Elliptical Dished End Upper									
5	Valve Boss	SAE 1020	-	-	-	-	-	-	-	-
6	Valve Guard Ring	EN 10025	-	-	-	-	-	-	-	-

### 1.2. Energy consumption

		Pieces	Unit	Total
<b>2.2. Drawing Line</b>				
2.2.1. Hydraulic Press	kw	1	45	45
2.1.2. Robot for feeding	kw	1	4	4
<b>2.3. Drilling and Cording Line</b>				
2.3.1. Punching Press	kw	1	4	4
2.3.2. Cording machine	kw	1	3	3
2.3.3. Cording machine for shell body	kw	1	11	11
<b>2.4. Sheet metal cutting line-&gt; Foot Ring, Hand Ring longitudinal cylindrical shell</b>				
2.4.1. Compact Type De-coiler, Straightener and Feeding	Kw	1	15	15

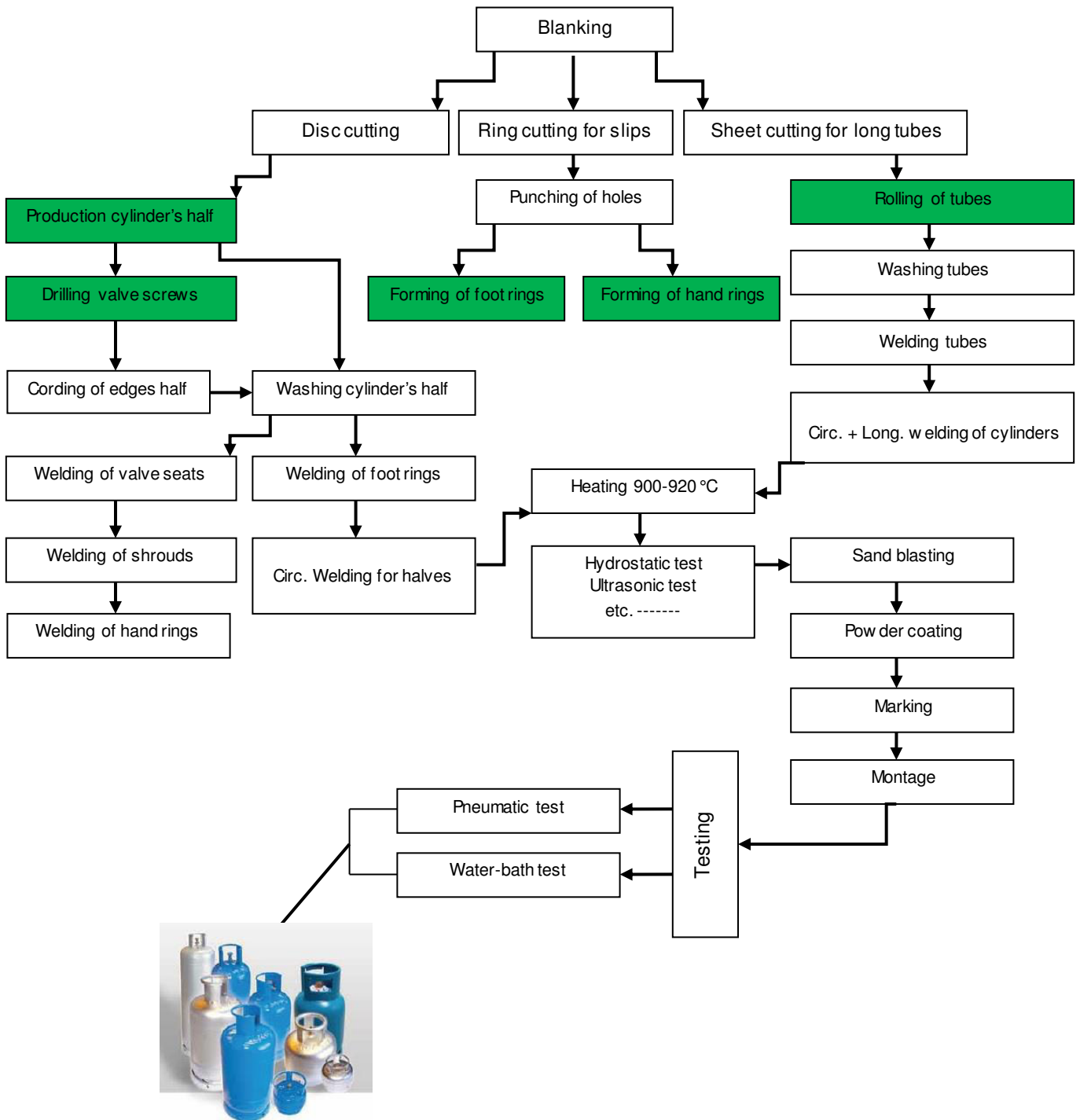


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2.4.2. Eccentric punching and forming press -200t	Kw	1	18	18
2.4.2. Eccentric punching and forming press -80t	Kw	1	7.5	7.5
2.4.3. Sheet Roller machine for rings – 1000 mm	Kw	1	4	4
2.4.4. Sheet Roller machine for body shell – 1200 mm	Kw	1	4	4
2.4.5. Hydraulic forming Press, 100t	Kw	1	11	11



### 1.3. Processing steps:





#### 1.4. Project data (5kg, 9kg, 12kg, 14kg, 19kg and 49kg LPG Cylinders)

- The type of operation is continuous.
- The capacity of the system is up to 250 discs/h (500.000 discs/2000 hours)

#### 2. Production Line -> System includes

- i. Blanking lines
- ii. Forming line**
- iii. Drilling line for valve screw**
- iv. Welding line
- v. Heating line
- vi. Sand blasting equipments
- vii. Washing line
- viii. Testing Line
- ix. Painting line
- x. Marking equipments
- xi. Montage Equipments
- xii. Testing Line
- xiii. Conveyers

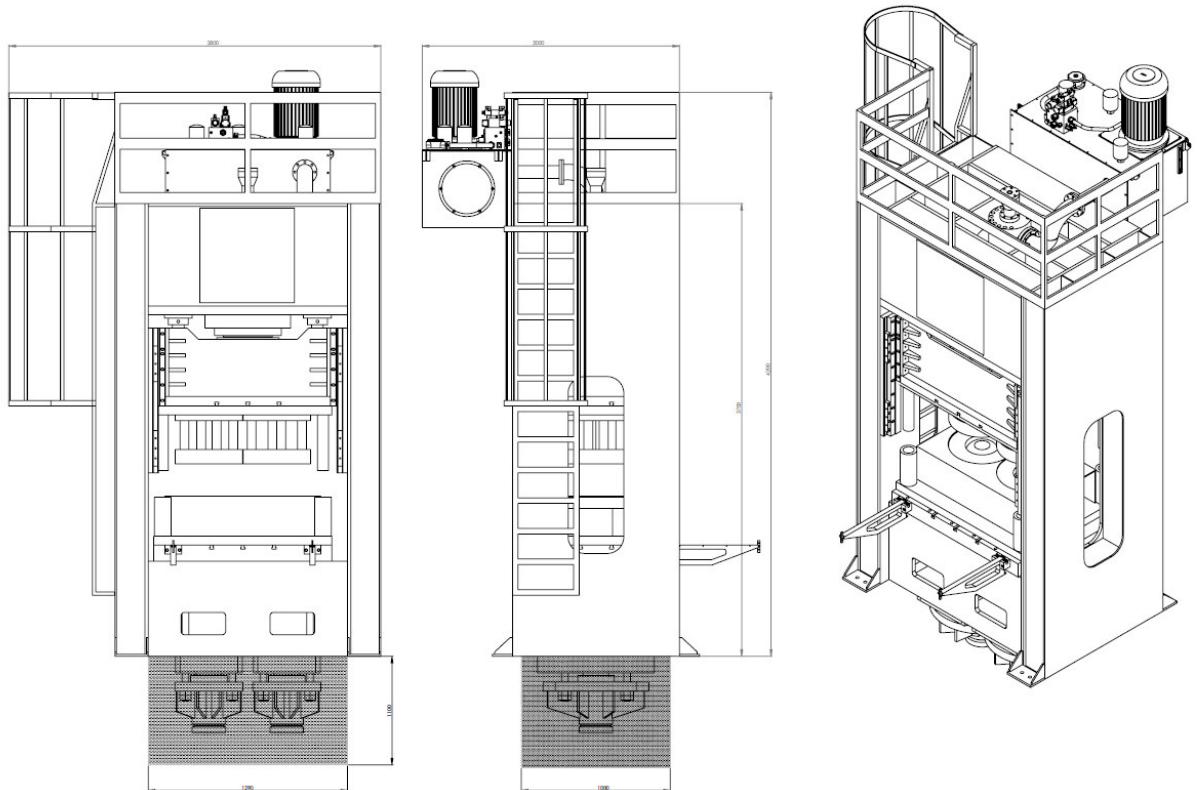


## 2.1. Drawing line:

### 2.1.1. Hydraulic deep drawing press 500t

The halves of the cylinders are produced in this line. The feeding can be done full automatically or manually. For the full automatic production, we use robot for feeding and discharging of products.

If yearly needs are high we can increase the force and table size of the press, thus we can use a die with double or tribal compartments in which two or three pieces of half cylinders can be produced at the same time.

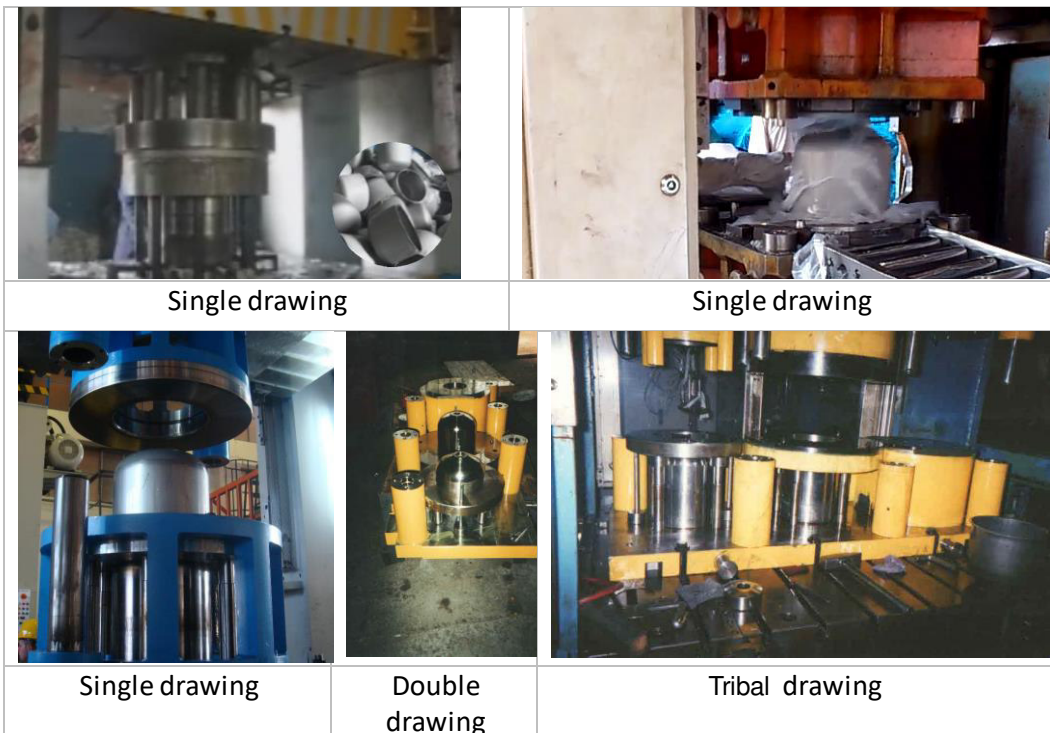


As an alternative, we can offer a cutting and drawing system at the same time. This type system is useful for small cylinders (under 9 kg cylinders). The die makes cutting and at the same time drawing of cylinder.



*For this system please contact with us.*

**2.1.2. Die for deep drawing**



Depends on needs we can use a die with double or tribal compartments





### 2.1.3. Feeding by Robot KR-6-2 (optional)

The discs can be feed into the press manually or by using of a robot.



For details see "feeding system by robot.pdf"

### 2.1.4. Back conveyer motorized



## 2.2. Drilling and Cording Line:

It is used for making of hole for the valves and cording on the edges.

Necessary machines:

- i. Punching Press
- ii. Punching Die
- iii. Cording machine





In demand, we can make the punching process full automatic. Thus, the feeding of half-cylinders can be done with an integrated conveyer and fixing of cylinder to the punching Die is done pneumatic under cylinder.

*For this solution please contact with us.*

#### 2.2.1. Mechanical press EEP300, 40t

The feeding of the half-cylinder into the press is done manually, punching is done automatically.



#### 2.2.2. Die for making hole of valve (Ø45)

#### 2.2.3. Cording machine for the edges of tubes for welding (Trimming and Joggle Machine)

The feeding of the half-cylinder to the machine is done manually, cording is done automatically.



In demand, we can make the cording process full automatic. Thus, the feeding and fixing of half-cylinder can be done with an integrated conveyer into the cording Die is done pneumatic cylinder.



*For this solution please contact with us.*

#### 2.2.4. Sheet Roller Machine for 37-50 L Tubes. (Optional)



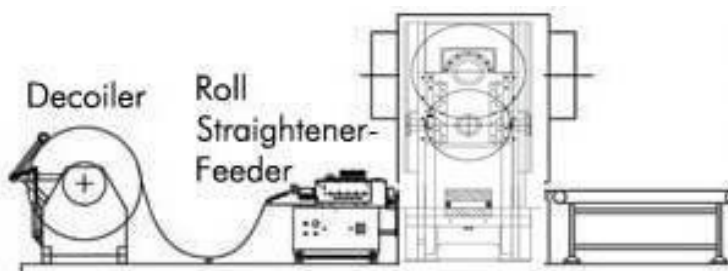
#### 2.2.5. Fixing table for Halves

#### 2.2.6. Conveyer, motorized

### 2.3. Sheet metal cutting line-> Foot Ring, longitudinal cylindrical shell, Hand Ring cutting line.

**Three machines are needed:**

- Compact Type De-coiler, Straightener and Servo System Feeding Machine: CMKS/H2/600-6-P
- Mechanical Shear: HGM 100
- Eccentric punching and forming press: EEP300 – 100t
- Sheet Roller machine
- Hydraulic forming Press, 300t



<http://www.atm-group.de/download/cmks1.wmv>

#### 2.3.1. Compact Type CMKS/H2/600-6-P# (200 mm 0.5-3,2 mm max .500 kg)

#### 2.3.2. Eccentric/Hydraulic forming press 300t



Used for rolling of the Foot Ring and Hand Ring

**2.3.3. Eccentric punching and forming press 60t + Forming pneumatic support**

**2.3.4. Eccentric punching and forming press 40t + Forming intern bending**

**2.3.5. Sheet Roller Machine for Foot Rings and Hand Rings**



**2.3.6. Dies**

1x Punching Die for Foot Ring

1x Punching Die for Hand Ring

1x for Forming of Foot Ring,

1x for Forming Hand Ring

1x for production of longitudinal cylindrical shell





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