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Technical properties for the Blanking line of LPG-Cylinders





Contents

1. Introduction.....	3
1.1. The steel coils	3
1.2. Product Part list	3
1.3. Energy consumption.....	3
1.4. Processing steps:	4
1.5. Project data (12kg LPG Cylinders)	5
2. Blanking and Forming line -> System includes	5
2.1. Blanking line for circular blanks.....	6
2.1.1. Compact type de-coiler, straightener and servo system feeding machine	6
2.1.2. Hydraulic Blanking press:	8
2.1.2.1. Technical Features.....	9
2.1.2.2. General Features:	9
2.1.2.3. Short description of system:.....	10
2.1.2.3.1. Hydraulic power unit of the press:	10
2.1.2.3.2. Pipe connection to the press.....	10
2.1.2.3.3. Main cabinet.....	10
2.1.2.3.4. Control Panel	10
2.1.2.3.5. Terminal box hydraulic unit.....	11
2.1.2.3.6. PLC program and TP	11
2.1.2.3.7. Sensors:	11
2.1.3. Embossing press 150t for logo with setting wagon.....	11
2.1.3.1. Technical Features.....	12
2.1.3.2. General Features:	13
2.1.4. Front conveyer motorized.....	13
2.1.5. Stacking box for discs	13
2.1.6. Hubwagen for Stacking box.....	14
2.1.6.1. Technische Daten	14
2.1.7. Mechanical Sheer HGS Series.....	14
2.1.8. Dies for disc blanking.....	15



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. The steel coils

Thickness	0,5 –3 mm
Inner coil diameter	480 – 580 mm
Outer diameter Max	1600 mm
Coil width max.	1200 mm
Coil weight max.	6t

1.2. Product Part list

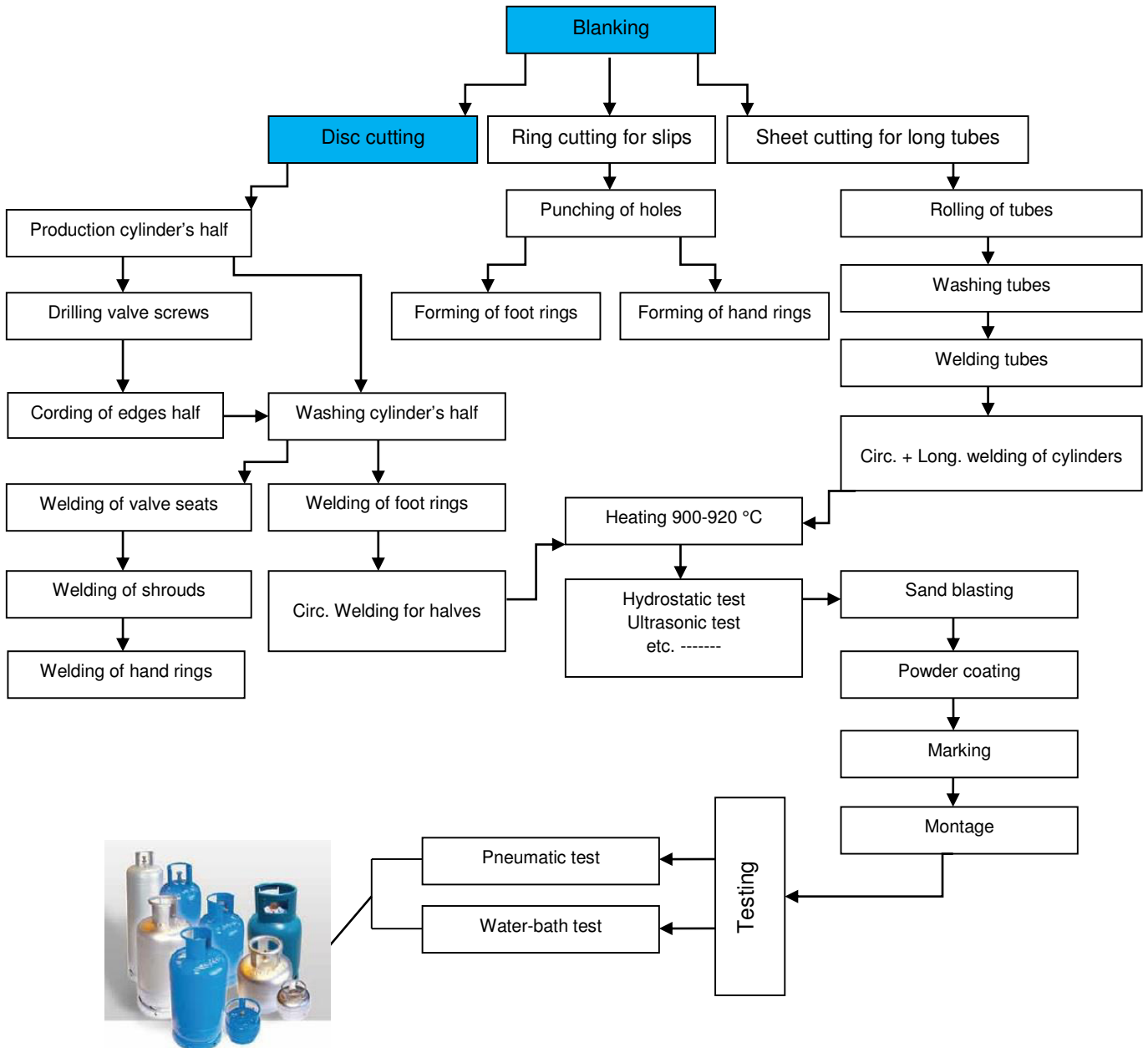
Item	Material	Standard	Mechanical Properties			Chemical Properties				
			Yield Point (Mpa)	UTS (Mpa)	Elongation %	% C	% Mn	% Si	% S	% P
1	Elliptical Dished End Lower	EN 10120	≥ 265	410- 500	-	≤ 0.190	≥ 0.40	≤ 0.25	≤ 0.015	≤ 0.025
2	Shell body (for > 12 kg's)									
3	Elliptical Dished End Upper									


1.3. Energy consumption

		Pieces	Unit	Total
2.1. Discs Blanking line				
2.1.1. De-coiler	kw	1	7,5	7,5
2.1.1. Straightener	kw	1	11	11
2.1.1. Servo Feeder	kw	1	5,5	5,5
2.1.2. Hydraulic Press, Embossing	kw	1	18,5	18,5
2.1.2.1. Motorized wagon with rail under the press for Press	kw	1	3	3
2.1.3. Hydraulic Press, Blanking	kw	1	45	45
2.1.4. Conveyer for discs outload, motorized	kw	2	3	6
2.1.7. Mechanical Shear	kw	1	4	4



1.4. Processing steps:



 Scope of delivery

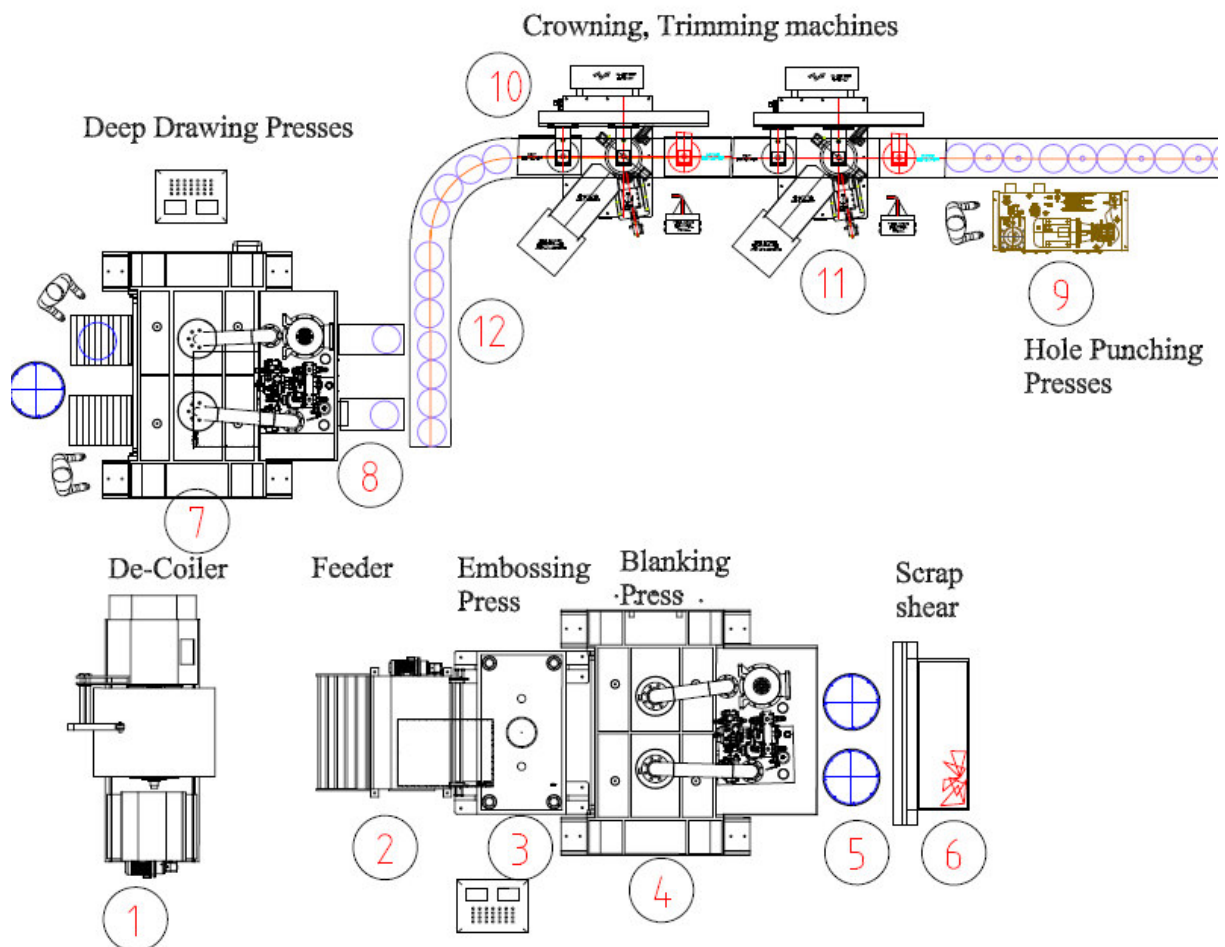


1.5. Project data (12kg LPG Cylinders)

- The type of operation is continuous.
- The capacity of the system is up to 125 cylinders/h

2. Blanking and Forming line -> System includes

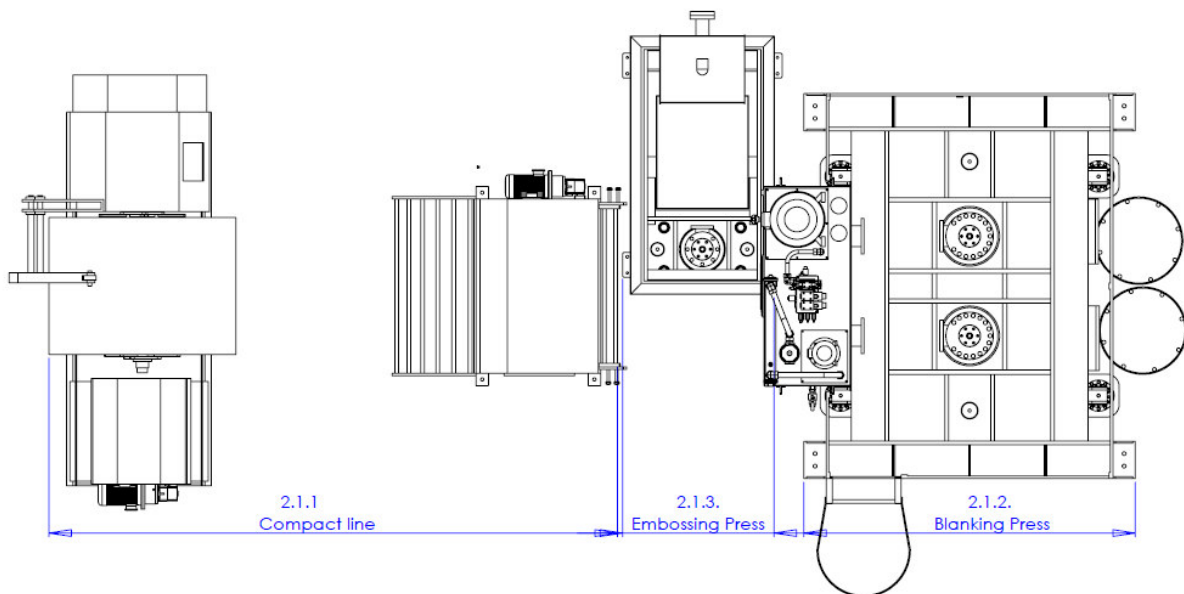
- Blanking lines (1+2)
- Forming line (7)
- Drilling and Cording Line-Piercing Machine (10+11)
- Conveyers into the presses (excluding outside of presses) (12)





2.1. Blanking line for circular blanks

- i. Compact Type CMKS/H2/1300-15-P (0,5-3 mm) max. 15000 kg (1+2)
- ii. Embossing press 150t for logo with setting wagon (3)
- iii. Hydraulic blanking press 500t (4)
- iv. Conveyer for discs' outload, motorized
- v. Stack wagon for discs (5)
- vi. Hubwagen for stack wagon
- vii. Mechanical shear for recycling (6)
- viii. Blanking and Embossing Dies



2.1.1. Compact type de-coiler, straightener and servo system feeding machine



- Coil loading capacity : 15000kg
- Coil outor diameter : 1600 mm
- Coil sheet fixing diameter, inner: 480-580 mm
- Coil fixing type : hydraulic



- De-coiler working direction : left-right
- De-Coiler speed control : yes
- De-Coiler speed : 14 m/min
- Coil car : Motorized
- Coil car Coil fixing : Hydraulic system
- Coil car working system : through the guiding columns
- Top support : pneumatic
- Sheet Width Capacity :120-1200mm
- Sheet Thickness Capacity : 0,5~3 mm (max.400 mpa)
- Rolls Diameters :130mm
- Rolls Properties : AISI 4140
- Rolls Hardness : 58~60 Hrc
- Number of Straightening Rolls : 5
- Number of Pinch Rolls : 2
- Number of Feeding Rolls : 2
- Motor Power : 32Nm
- Piloting feeding : pneumatic
- Straightening reductor amount : 2 set 4 pieces
- Straightening setting : indicator switch
- Motors types : Siemens or Schneider
- PLC system : S7-1200 Siemens
- Total Power : 6 KW
- Height of Straightener : adjustable

Standard Features

- Decoiler speed control system
- Loop control with laser sensor
- Conical locked, keyless gear drive system
- Inlet - outlet guides
- Separately adjustable straightener rolls with indicator
- Feeder piloting system
- Manual machine height adjustment
- 10 inch colored touch screen
- Die memory system
- Various size feeding
- 2 different pres control



2.1.2. Hydraulic Blanking press:

With the press discs with die diameter from 561 for 12.5 kg Cylinders and 448 mm for 5,5 kg cylinders are blanked.

Technical requirements for 5,5 kg cylinders:

- Coil material: JIS SG295(P265NB) or JIS SG255(P245NB) non-Picked
- Coil width: 855 mm
- Coil thickness: 3 mm
- Disc diameter: 448 mm
- Feeding size: 554 mm
- Number of disc per stroke: 2 discs
- Cycle time: 6 s



Technical requirements for 12,5 kg cylinders:

- Coil material: JIS SG295(P265NB) or JIS SG255(P245NB)
- Coil width: 1080 mm
- Coil thickness: 3 mm
- Disc diameter: 561 mm
- Feeding size: 574 mm
- Number of disc per stroke: 2 discs
- Cycle time: 6 s

The chemical composition of the body material as per European Standard EN 10120

- C max 0,19
- Si max 0,25
- Mn min 0,4
- P max 0,025
- S max 0,015
- Al min 0,02

Hydraulic Blanking press

- **Operating Type:** Hydraulic Cutting Press with shock absorber cylinders
- **Structure Type:** Fabricated Four- Column Press
- **Pressing Direction:** Main Ram: Down

Main cylinders (RAM)

- It is equipped with a decompression valve:
 - It can be set for the required force delivered before the ram returns automatically to the top of stroke.
- Ram is hard chrome plated.
- The contact surface of the main ram will be hardened, grounded and polished to maintain excellent parallelism with bed.
- Provision of standard threaded holes and groove locking of ram with dies

Tables

- Table plate will be T-slotted (Inter Slot Distance 150 mm), surface grounded to maintain excellent parallelism with main ram.



2.1.2.1. Technical Features

Force	kN	4000-5000
Table (Bed table)	mm	1700x2200
T-slots		yes
Daylight opening		1000
Main-Cylinder, 1x		
	Force	kN
	Effect	1
	Stroke	mm
	Pressure	bar
Speed-Cylinder. 2x		
	Effect	2
	Stroke	mm
	Pressure	bar
Speed for main cylinders		
	Approaching	mm/s
	Working	mm/s
	Backwards	mm/s
Setting speed	mm/s	10
Pre-fill valve	NG	100
Shock absorber cylinder		4
Weight	kg	>35.000

- Pressures are adjustable via pressure transmitter.
- Distance limit switch control – sensors made by Novotechnik
- PLC-Control
- High performance heat exchanger
- Oil-Filtering-System
- Automatic central lubrication system
- Shock absorber cylinder: hydraulic

2.1.2.2. General Features:

- Hydraulic unit will be installed on the top of the press for good accessibility. It is equipped with:
 - Oil tank, pumps, motors, valves,
 - regulators, gauges,
 - manifold block,
 - Pipes and fittings etc.
- The control panel will be provided with digital indicators showing all above mentioned details in addition to motor starter, push buttons, contactors, timers.
- Provision of overload protection valves on all pressure lines
- Provision of pre-set pressure locking facility on all pressure lines
- Provision of timer for preset pressure application.
- Electric control system will be PLC based. See “electrical features” below.
- The sliding surfaces will be nitrated for excellent guidance and wear.
- Provision of Oil temperature monitoring, cooling and filtration system



- Provision of operator's safety curtains.
- Equipped with central lubrication system

2.1.2.3. Short description of system:

2.1.2.3.1. Hydraulic power unit of the press:

The hydraulic unit is used as an oil pressure for all hydraulic circulation to the press and it is designed as a self-assembly unit.

On the top of the oil tank the pump, motor and all operating and display elements are attached. As the main pump, we have used the pumps with a constant flow pump (optional electronic pressure and flow control inflation. With this pump the Press speeds and speeds of the other cylinder will be routed.)

The pump circuit is protected by a pressure safety valve. All Hydraulic components are mounted on a hydraulic block. The current system pressure is displayed on a digital display of the pressure switch with two outputs. The ads are built oil tanks of oil condition (oil temperature, oil level, oil pollution indicator, etc.). All ads serve an unattended and automatic operation.

The hydraulic unit has a filter cooling system. Here will be equipped a high performance heat exchanger. The return filter type RF330 with a filter 5um has optical-electrical contamination indicator.

The block for all hydraulic cylinders is designed to all safety requirements for this type of machines (pressing) is satisfied. Mainly, the safety standard is EN693. This block allows all movements of the movable plate. The block unit and is equipped with valves to your concept of company Parker.

The piston and rod side of cylinder pressure sensors are installed type HYDAC EDS344 or similar.

2.1.2.3.2. Pipe connection to the press

The pipes to be carried out in NG42 Walform hydraulic installation. The larger nominal sizes welded in the flange. After welding, all complete pipe connections are stained.

2.1.2.3.3. Main cabinet

Main cabinet is used for blanking line. In which the automation for the Blanking Press and Compact line are wired. The main cabinet will be cooled with air radiator. For the main cabinet will be used with a dimensions' of 2000x2200x400 (Inclusive 200mm base) RITTAL type TS. In the door or the side of the cabinet is the main switch MOELLER with the main control switches from SIEMENS. The supply of the press 400V TNC, the performance is made concrete in construction.

- The power supply 24V DC SIEMENS.
- The low-voltage SIEMENS.
- PLC SIEMENS SIMATIC S7 1200
- Spring clamp WEIDMUELLER.

2.1.2.3.4. Control Panel

Control units are mounted in a separate cabinet in which control buttons and control switches are installed.



- Touch Panel TKP1000 SIEMENS.
- Control panel and main cabinet will be connected to the rigid plug (HARTING). It is possible to prepare some items for the connection.

2.1.2.3.5. Terminal box hydraulic unit

The terminal box is the component of aggregate with dimension of 300x600x210mm. The unit is supplied with wiring. After installation of aggregate, the terminal box is connected with main cabinet, security elements, motors, and heater.

2.1.2.3.6. PLC program and TP

The program of the press is done according to the blanking purposes. By default, these functions and operations are programmed:

- Manual operation
- Automatic operation
- Image Sensor with display
- Display image with hydraulic
- Complete diagnostic, messages and faults, hours of operation payer
- Archiving of messages and faults

Option:

- The connection to the visualization or the File Save As.
- Supplement the sensor from the bar code or the chip.
- Reprogramming of the tool control of the press
- The cabinet can be equipped with air conditioning.
- We can also provide visualization and data memory.
- For fast service, the press can be modified with internet connection.

2.1.2.3.7. Sensors:

The linear measuring movement is carried out with SSI interface.

2.1.3. Embossing press 150t for logo with setting wagon

With the press logos (-----) will be printed on the discs.



Hydraulic Blanking press

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- Provision of standard threaded holes and groove locking of ram with dies



Tables

- Table plate will be T-slotted (Inter Slot Distance 150 mm), surface grounded to maintain excellent parallelism with main ram.

2.1.3.1. Technical Features

Force	kN	1500
Table (Bed table)	mm	700x900
T-slots		yes
Daylight opening	mm	500
Main-Cylinder, 1x		
	Force	kN
	Effect	2
	Stroke	mm
	Pressure	bar
		250-280
Speed		
	Approaching	mm/s
	Working	mm/s
	Backwards	mm/s
		>50
Setting speed	mm/s	10
Weight ca	kg	7.500

- Pressures are adjustable via pressure transmitter.
- Distance limit switch control – sensors made by Novotechnik
- PLC-Control



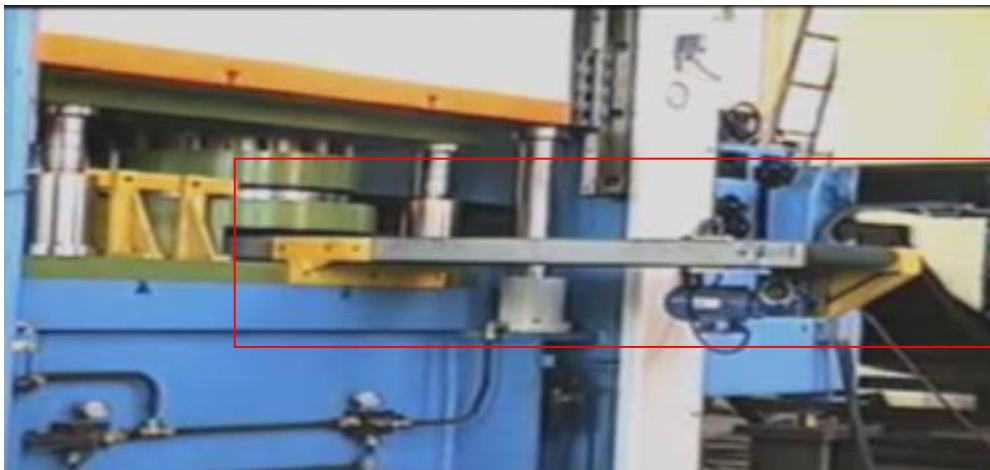
- High performance heat exchanger
- Oil-Filtering-System
- Automatic central lubrication system

2.1.3.2. General Features:

- Hydraulic unit will be installed on the top of the press for good accessibility. It is equipped with:
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- The control panel will be provided with digital indicators showing all above mentioned details in addition to motor starter, push buttons, contactors, timers.
- Provision of overload protection valves on all pressure lines
- Provision of pre-set pressure locking facility on all pressure lines
- Provision of timer for preset pressure application.
- Electric control system will be PLC based.
- The sliding surfaces will be nitrated for excellent guidance and wear.
- Provision of Oil temperature monitoring, cooling and filtration system
- Provision of operator's safety curtains.
- Equipped with central lubrication system

2.1.4. Front conveyer motorized

Discs are carried out with the conveyers into the stack wagon. If the stock wagon is filled Blanking line stop automatically till replacing of the filled wagons and re-setting the system.



2.1.5. Stacking box for discs

The blanked discs are stacked into the box. After reaching given amounts the wagons must be replaced with empty ones by using of pallet truck (Hubwagen).



- Carrying capacity : 1200 kg
- Dimensions : 600x600x1000 cm
- Total width : 55 cm
- Weight ca. : 200 kg



2.1.6. Hubwagen for Stacking box

The blanked discs are stacked into the box. After reaching given amounts the wagons must be replaced with empty ones by using of pallet truck (Hubwagen).

2.1.6.1. Technische Daten

- Carrying capacity : 2500 kg
- Fork length : 115 cm
- Total width : 55 cm
- Weight : 61 kg
- Tandem- Fork rolls : Ja



2.1.7. Mechanical Sheer HGS Series

Scrap shear is used rest of sheet to cut in small pieces. Shear is installed in front of blanking line.

Technical features

- Cutting thickness max: 3 mm
- Cutting length max. 1360 mm
- Motor: 4 kw
- Weight c a. 1600 kg
- PLC system: Controlled with same system with Blanking line.
- Cutting unit per sharpening: ca. 50.000-100.000 pieces.





2.1.8. Dies for disc blanking

Disc-Blanking Dies will be produced as a double cutting system.



- Cutting knives and punching dies: DIN 1.2379 Sverker 21 (Assab/Sweden) hardened up to 58-60HRC and grinded.
- Blank-holder ring: DIN 1.2363 or DIN 1.2842 hardened up to 58-60 HRC and grinded
- Die-tables and support-tables: 10027-1/2 carbon steel
- Embossing dies: DIN 1.2791 or Viking (Assab / Sweden) hardened up to 56-58 HRC
- Die centering pins: DIN 1.8620 induction hardened and grinded
- Centering pin guiding bushes: DIN 1.1705 G Cu Sn-12 tin-bronze

Technical features for 5,5 kg Dies:

- Disc diameter: 448 mm
- Size ca. : 1.850 x 1.450 x EBH 730 mm

Technical features for 12,5 kg Dies:

- Disc diameter: 561 mm
- Size ca. : 2.000 x 1.550 x EBH 730 mm