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Phone +91484 -2422026  
Mobile:+91 94471 22202

Email – [machine@thaimadam.com](mailto:machine@thaimadam.com) , [thaimadam@hotmail.com](mailto:thaimadam@hotmail.com)

# *Thaimadam* Machines

Thaimadam Complex, Fathimapuram,  
Changanacherry - 686 102.  
Kerala, India.

## 6 Colour Heavy Duty Rotogravure Printing Machine



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# Thaimadam Machines

## 6 Colour Heavy Duty Rotogravure Printing Machine

**The machine is heavily constructed** with main frame in 40 mm thick plate. Vibration free operation is assured. The basic design is made from the point of view of machine-operator and is user friendly. The print view and inspection is made easy by providing peculiar window for that purpose. Oil-dipped worm gear box for the transmission makes the machine run smoothly and silently. The air circulation through silent blowers makes the efficiency of the print drying faster and with less pressure on the substrate, reduced noise, and less electrical power.

The initial tasks like loading of cylinders, loading of rolls, register synchronization are made easy through new mechanisms. Once printed cylinders can be reloaded and printed with out going through much of the register synchronization tasks and avoids wastage of substrate.

### **Cartridge Loading of Print Cylinder Inking System**

It is an altogether new idea and bold introduction to the printing machine. The cylinders (printing block) is normally mounted on the machine inside the printing unit. For mounting cylinders normally a shaft is used or a shaft less corn mechanism is used. For both this the operator has to carry the cylinder varying about 10 kg to 25 kg inside the machine which carry a lot of risk of damaging the cylinder. The unloading and loading of printing cylinder in the machine usually takes above 15 to 30 minutes for each colour. The job changing requires printing cylinder to be cleaned before unmounting and the inking system has replenished or change before unmounting the cylinder. These operations takes up a lot of time leaving the machine idle for considerable time.

In Thaimadam machines most of the job changing operations are done outside machine while the printing machine is running. The cylinders are loaded on the shaft and mounted on the cartridge. The required ink is then filled in the tray of cartridge. And thus the cartridge is made ready for mounting on the machine even while the previous job is running on the machine. When the job is finished the finished cartridge is unmounted by slipping out the used cartridge and the new job cartridge is mounted on the machine by pushing inside. For job changing of the colour the idle time required for the machine is less than 5 minutes. The cleaning of finished job is done outside the machine while the new job is running on. The cylinder is cleaned and the ink is drained to the tanks and the cartridge is clean to the accept the next job, outside the machine. This new technology safeguard the security of printing cylinder and eliminate the risk carrying heavy cylinder inside the machine. For a six colour job change Thaimadam machines - Six Colour printing machine requires only less than 10 minutes. This saves considerable idle time of investment and boost up production when compared to other machines.

## **Cartridge Loading of Feed Rolls**

Feed rolls are usually heavy and occasionally is very difficult to mount on the normal machine. The mounting operation is done by either fixing on a shaft or on mounting shaft less holds. Both this operation requires lifting of the rolls and carrying on to the machine. For heavy rolls having more than 100 kg this operation is nightmare for the operators. But in Thaimadam Machines this operation is made simple. The mounting shaft is fixed to the core of the rolls and is mounted on the mounting cartridge at the place specified for the purpose away from the machine. Hydraulic jack mechanism or Chain pulley mechanism can be provided for lifting up the heavy rolls to place on the cartridge. Then the cartridge is carried to the machine on its wheels and slip inside the machine to fix it on the machine.

## **Insert ability to feed rolls in between printing units**

Each printing unit is having a separate roll feed mounting rails, placed just before the printing unit. Thus a normal Thaimadam Machines with six colour printing capability is having six feeding stations. This facility reduces the substrate length considerably and their by reduce the probable wastage. Even while the printing operation is going on, next feed roll can be mounted on the feed cartridge and made ready on the available nearest feed stations. When the running roll is finished the machine need be stopped only for seconds to start the next roll and get running. This mechanism reduces the idle time on the printing machine, for roll change. This type of feed mechanism helps to split the machine to act as two machines.

## **Split ability of the machine**

Thaimadam printing machine can be split into two to act as two separate printing machines. Thus on a six colours printing machine we can do either a single colour and a five colour job simultaneously OR a two colour and four colour job OR two three colour jobs simultaneously. The splitting operation is made very simple and requires only few minutes to make the machine ready for doing two print jobs and viz. This enable the machine to give double output.

## **Universal Reversibility**

The machine is universally reversible to print on both side of the printing format. To print on Poly film tubes to make poly bags both side printing is necessary. The Cross-bar Reversing Mechanism is easlily movable in between any colour printing unit. The printing format is twisted to the other face so that the printing thereafter will be on the other face. The changing operation does not involve any change in the machine and hence no additional time spending is involved in changing to double side printing from single side printing.

## **Unique Viewing Window**

In the conventional machines, the operator has to sit down and look upwards the leaning inside the machine to get a view of the printed format or the doctor blade assembly if anything goes wrong the operator has to face a lot of troubles to get a clear picture of this situation. Almost all the upper area constituting drying chamber is enclosed and cannot see inside of the machine. This problem is completely eliminated in Thaimadam Machines.

The design of the printing machine is made in such a way to provide a unique viewing window for the operator for inspection of the printing operation. The front portion of the drying chamber is opened up as a window and is protected by glass. The glass faced window provide easy view of the complete printing process at the same time protect hazardous solvent vapor. This enable the clear view of doctor blade assembly, impression rollers and the printed substrate inside the window is adequately lighted up so that the printing image is clearly visible to scrutinized its colour and print registers. This protects the operator from the hazardous vapor of ink and solvent. The appearance of the machine is made simple and elegant by the cylinder. The control panel is placed immediately near to the viewing window, the operation and necessary correction can be done while viewing through the window.

## **Distributed Control Panel**

In normal machines the electrical controls of different drives are placed on a control panel which is separated from the machine and placed and the back of the operator side. The Rotogravure Printing Machine are very long in size, the operator has to come to the control panel for every operation of the control like on /off drives to boost up its power and down and the likewise operations. Similarly on emergency the operator has to run to the control panel to take immediate action. In Thaimadam Machine, the control panel is distributed through each printing unit and winding station. Almost all operations can be done from any control panel because clone switches are given for almost all operations. The operator can do any operation from any point where the operator is standing just by a stretch of hand.

The built-in distributed control panels are extremely comfortable for the operators. Almost all the basic operations on run-time can be done from any of the panel attached to each printing units. The operator can on / off any drive like winding drive, main-drive, dryer air circulators, lights etc., increase / decrease the winding torque, speed of main-drive etc., adjust web alignment etc., from any control panel. Power distribution is from very safe buss-bars supported by high quality MCB and circuit terminators. The electrical equipment like dimmer state, rectifiers etc. are isolated from machine and are enclosed in separate cabin placed suitably away from operation side. Necessary pilot lamps are provided so that the status of the machine and switches can be ascertained at any point of time.

### **Register Synchronization:**

The register synchronization (Calendaring) is done by motor drives. Feather touch push button switches for that purpose is very comfortably placed in each of the control panel. Actuate register can be easily attained and maintained with out much efforts for the operator.

### **Micro processor Controlled Automatic Register Controls**

Automatic Register Controls are available as optional attachment. This eliminates the viewing error at high speed printing and assures the accurate register of all colours resulting very high quality print out put.

### **General specifications**

Main Frame	Main frame constructed in 40 mm thick M.S. plate. The general construction is sturdy for vibration free, durable operation.	
Web Feeding System	Shaft unwinding system with felt-clutch for break, on wheels and detachable from main machine. Can be loaded out side the machine.	3 Units
Web winding System	Surface winding driven by torque motor fixed to two ends of the machine with twin winding shafts	2 Units
Cylinder-Cartridge	On wheels fitted with inking system, detachable from main machine. Cylinder and ink can be loaded out side the machine.	6 Units
Drying System	By heaters and blowers mounted on each printing unit with ducts to distribute on both side	6 systems
Required floor length	14 Meters for convenient operation	
Machine Height	2.5 Meters	
Machine Width	Depends on the various web width of the machine	

## Electrical specifications of the available sizes

All drive motors are three-phase AC motors with Variable Frequency Drive

Web Width	Drive motors	Winder Motor	Heating Load	Synchronous Motors 25 W	Lights
75 CM	3 HP two Nos	0.5 HP Torque Motor two Nos	2 KW 6 Nos	7 Nos	400 W
90 CM	5 HP two Nos	1 HP Torque Motor two Nos	3 KW 6 Nos	7 Nos	400 W
105 CM	5 HP two Nos	2 HP Motor two Nos	4 KW 6 Nos	7 Nos	800 W
120 CM	5 HP two Nos	2 HP Motor two Nos	4 KW 6 Nos	7 Nos	800 W

## Optional Accessories

- 1. Web Tension Controller** : Micro processor controlled Web Tension Controller is typical attachment for accurate maintenance of print registration. Irrespective of the the feed roll size the tension of the web will be maintained uniformly through out printing session using electronic tension sensors. Micro computer based electronic system assure the accuracy of the operation.
- 2. Web Aligner** : The attachment can be mounted at the feed section and/or at the winding section. If attached at the feed section, it will assure the alignment of the feed rolls even if the feed roll is slipped or is not properly wound for use in printing machines. One edge of the feed film is sensed by air sensors (pneumatically) or by electronic light sensors and the feed roll is aligned and adjusted to the main web line. If it is fitted to the winding section, it will assure the perfect wound rolls in the out put, even if the feed rolls are defective in winding, or if some operational mistake occurred so that it may vitiates the proper winding. It will help the subsequent use of the printed rolls in automatic packing machines.
- 3 Additional Cylinder Cartridge** : It will help to increase the production by saving job changing time. Since the ink and cylinder are provided in the Cartridge, pre-loaded Cartridge will reduce the change over time considerably.
- 4. Additional Feed Trolley** : It will help to increase the production by saving feed roll changing time. The feed rolls can be pre-loaded on the Trolley and quick change over of Trolley will reduce the changing time considerably.

5. **Digital Variable Speed Controls for motors:** DC motors with brush fitting inside may cause wear and tear on long run. To eliminate the same the DC motors can be substituted with AC motors with Digital Variable Speed controls, which assure trouble free very long run.
6. **Micro processor Controlled Automatic Register Controls** are available as optional accessory. This eliminates the viewing error at high speed printing and assures the accurate register of all colours resulting very high quality print out put.

## **Optional Attachments**

### **1) Slitting Attachment**

To slit feed roll or printed roll into smaller rolls. Can be attach to the winding station of the printing machine.

### **2) Lamination attachment**

To laminate two or three layers of film, foil or paper together using suitable adhesive. For coating adhesive the printing unit is used and separate nipping and queering attachments are made into the machine to make the operation possible. This reduces the factory space and cost considerably if separate machines are provided for printing and lamination.

### **3) Sheeting attachment**

The roll format is cut into length into sheets in this attachment.

### **4) Coding attachment**

Electronic ink jet coding machine can be attach to the printing machine for bar coding serial numbering etc. of the printed format while the printing operation is going on.

Different attachment can be mounted on Thaimadam Printing Machine for specific purposes. These attachments reduce the total cost when compared to separate machines provided for that purposes. Similarly these attachments reduces the factory spaces also if separate machines are provided for that special purposes.