Horizontal flask moulding line

The DISA FLEX is a horizontal flask turn-style moulding machine, designed for foundries wanting a flexible solution for production of high quality, medium and heavy near net shape castings.

Unique mould compaction

DISA FLEX is a Swiss proven technology that combines the unique DISA high pressure, double-blow and hydraulic squeeze moulding technique with a rigid machine design, giving the best conditions for the profitable production of high quality castings.

Application

With DISA FLEX bentonite-bonded moulding sand can be used for the production of grey iron, nodular iron, malleable iron, steel, aluminium and other non-ferrous metals. Patterns made of plastic, wood and metal can be used.

Improved productivity and quality

Compared to the conventional jolt squeeze moulding technique, the DISA FLEX offers:

- Optimum casting quality due to high pressure, uniform mould compaction
- Near net shape castings for less cleaning
- Constant and lower casting weight
- Full utilisation of the pattern plate due to better compaction of pattern areas located close to the flask wall
- Enhanced working environment due to pattern spray and closed sand filing funnel

DISA double-blow/squeeze mould compaction

Features that make the difference

Unique mould compaction

The DISA double-blow/squeeze system is designed to ensure uniform mould compaction throughout the mould. By combining a double-blow mould compaction system (giving an inverse mould hardness profile with highest values on the pattern which decreases towards the back of the mould), with a mechanical squeeze (that has the opposite effect), the advantages of both methods are obtained.

To optimize the squeeze process, the DISA FLEX machine also has a specially designed FLEXIPAD. The pad automatically adapts the squeeze pressure to the patterns, ensuring a uniform mould hardness.

Due to the high compaction in the mould, exothermic sleeves, downgate inserts and iron chills can be moulded in.

Double-blow pre-compaction

The pressure impulse is divided into two phases. The first wave is a pre-compaction air pressure (0.5 bar), followed by a second wave of higher pressure gradient compaction (5 bar). This ensures a perfect mould filling in critical pattern areas and effective pre-compaction.

Hydraulic FLEXIPAD squeeze

Final compaction by hydraulic squeezing with the FLEXIPAD (10 bar) ensures uniform compaction all over the mould and minimum maintenance.

The FLEXIPAD is very hard-wearing, it has a long service life and is very easy to maintain.
The complete mould handling line is controlled by a Siemens PLC control system. With very advanced programming developed by DISA over many years, the PLC system ensures that all movements are coordinated with excellent movement control to avoid jerks and vibrations of the mould.

The control system can restart the complete line after shutdown and power failure. The system automatically corrects the line units, so all movements are set for starting up the line.

With new operators or in case of production stop the control system will guide the operator step by step, indicating what to check and what to do to bring the line back into production as quickly as possible.

The DISA control system is an important function to help foundry management to get the optimum performance from of the equipment.

The DISA FLEX line

Mould Handling System (MHS)
The DISA MHS protects the mould integrity through perfect synchronisation with the DISA FLEX machine.

The system consists of a moulding line for automatic sprue drilling and core setting, rollover devices, closer with clamping devices, transfer cars and a cleaning station in addition to cooling lines, a punch-out station and an automatic flask separator.

The separating unit
The DISA FLEX moulding line starts with a separating unit setting the cope and drag flask on the moulding line. The emptied flask pair along with pattern plate will be transferred to mould conveyor and lifted up, to separate it from pallet. Meanwhile, gripper unit moves up/downwards to separate the cope & drag flask and transfer to the moulding machine.

Unit cleaner
Before the flasks move into the moulding machine, the cope & drag flask are cleaned. The flask top surface, pin, bushes and checks the flask top surface for melt pearls burnt to the top surface. This feature ensures the smooth operation of the line and helps improve mould quality.

After the moulding machine, the excess sand on the mould back side is removed by a heavy duty sand cutter.

Rollover devices
The rollover devices are specially designed to avoid sand spill on the mould. The motor drive is on the top of the station for easy service access.

Drilling station
DISA offers both a low cost pouring cup drilling station, where the position is set manually by the operator or an automatic drilling station where the pouring cup position is set automatically by data from the control system.

For high production lines DISA offers fully automated vent hole drilling stations and core setting stations.

Flask closer
The flask closer is a very important unit. The cope flask is set on the drag with high precision, due to heavy guide rods and active position units of both cope and drag flasks. This ensures that the mould halves go together without distortion of sand and cores.

Transfer station
The finished moulds are handled by transfer stations with reliable frequency inverter drives which ensure good motion control and a long service life.

Cooling lines
The cooling lines are equipped with robust hydraulic push and breaking cylinders for good control of acceleration and de-acceleration to ensure the safe handling of moulds.

Punch out
A very robust mould punch out completes the system. The mould is punched out from the lower side, so the mould is pushed up. This gives a safe handling of the castings on their way to the shake-out. By lifting up the moulds the shake-out can be positioned on floor level for easy operator access to the castings.
### Performance enhancing features

**Optimum sand filling**

The DISA FLEX has a unique sand filling system that ensures even distribution of the sand into the flask.

The batch hopper is mounted with load cells, which stop the sand feed as soon as a pre-programmed weight has reached. Flaps below batch hopper open up and uniform distribution will be ensured by VFD. Flask area is accessible for placement of chills and risers, pattern spray nozzles are provided to create the separating medium from pattern to sand.

 Provision of facing and backing sand is also available with the use of screening drum.

**External pattern changer**

Automatic pattern change station enables complete pattern sets to be changed within the cycle time. A lifting table lifts the previously used pattern set off the turntable or lowers the new set in the position. Driven roller ways take the pattern sets to and from the station.

**Cope transfer and drag lifter/lower device**

Cope transfer and drag lifter/lower device is specially designed to transfer cope mould to cope conveyor and drag mould to drag conveyor which helps to facilitate more number of core setting places and more number of vent hole drilling stations/sprue cup cutting stations with the utilization of optimum area.

**Pattern heating system offline**

The optional device allows pre-heating of the pattern at low temperature conditions which helps to easy stripping of the pattern after squeeze.

### Technical data

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flask size:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height of cope/drag flask, min-max</td>
<td>mm</td>
<td>inches</td>
<td>200-325</td>
<td>7.9-11.8</td>
<td>200-325</td>
<td>7.9-11.8</td>
<td>250-350</td>
<td>9.8-13.8</td>
</tr>
<tr>
<td>Width min-max</td>
<td>mm</td>
<td>inches</td>
<td>700</td>
<td>27.6</td>
<td>700</td>
<td>27.6</td>
<td>800</td>
<td>31.5</td>
</tr>
<tr>
<td>Length min-max</td>
<td>mm</td>
<td>inches</td>
<td>800-1000</td>
<td>31.5-39.4</td>
<td>800-1000</td>
<td>31.5-39.4</td>
<td>900-1050</td>
<td>35.4-41.3</td>
</tr>
<tr>
<td><strong>Machine output in complete moulds:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>hour</td>
<td>50-90</td>
<td>60-120</td>
<td>60-120</td>
<td>40-100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Squeeze pressure max:</strong></td>
<td>kg/cm²</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sand consumption:</strong></td>
<td>tonnes/h</td>
<td>tons/h</td>
<td>20-76</td>
<td>22-84</td>
<td>25-102</td>
<td>28-112</td>
<td>40-132</td>
<td>44-145</td>
</tr>
<tr>
<td><strong>Power consumption:</strong></td>
<td>kW</td>
<td>40</td>
<td>75</td>
<td>75</td>
<td>85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Air consumption at 5 bar:</strong></td>
<td>m³/hr</td>
<td>cuft/hr</td>
<td>300-540</td>
<td>10994-20016</td>
<td>360-720</td>
<td>12713-25427</td>
<td>360-720</td>
<td>12713-25427</td>
</tr>
<tr>
<td><strong>Water consumption:</strong></td>
<td>L/min</td>
<td>gallons/min</td>
<td>70-90</td>
<td>18.5-24</td>
<td>140</td>
<td>37</td>
<td>140</td>
<td>37</td>
</tr>
</tbody>
</table>

Above data is preliminary and indicative.

*DISA FLEX 90 is only available upon request.
CMF modules are available on request.