Dry-mix shotcrete machine AC-1

Solutions for mining, tunnelling, building, reconstruction, slope protection and refractory application
**Applications**

- repair of concrete and reinforced concrete structures
- construction of tanks and containers
- slope protection in tunneling and mining construction
- application of refractory materials in metallurgy, chemical, glass, cement and other industries associated with high-temperature processes
- soil stabilisation (pits and storage facilities, strengthening of the slopes at the construction of interchanges, bridges and so on.)
- conveying of loose materials (sand, gravel, etc.)
- as a sandblasting equipment
- sprayable membranes application
- house building incl. EVG 3d panel

**Method advantages:**

The advantages of dry shotcrete method lead to its versatility. Dry shotcrete is a traditional world-known method of applying sprayed concrete and characterized by:

- improved characteristics of mechanical strength, higher concrete density, better frost-resistance and water resistance
- high initial strength of the sprayed concrete layer
- high level of adhesion to different surfaces
- possibility of conveying mixtures to long distances (up to 400 m.)
- ability to work in the "start-stop" mode
- pre-mixing is not necessary
- easy equipment cleaning
- rare hose blockage
- the independence from concrete suppliers (the possibility of preparing dry mix on building site)

**Working principle**

Dry mix (aggregates, additives, astringent e.g. cement) is loaded into a hopper, where it falls into the rotary dosing drum. Then followed by compressed air, dry mix is fed into the spraying nozzle. In the nozzle, the material is mixed with the water or with an aqueous solution of additives and entrains on the surface by the compressed air. Upon impact with the surface, significant concrete consolidation is achieved.
**Overview**

TORNADO AC-1 dry shotcrete machine is based on widespread rotary principle and furthermore simplified due to one-sided dosing drum design, which allows significantly reduce size and weight of machine. Robust design and reliable hardware assure market’s lowest maintaining costs and easiest handling. Versatility of AC-1 allows to adapt the usage for most types of dry shotcrete works. AC-1 machines used for more than 15 years at numerous building sites in the former USSR and European countries, and in that time have proven their reliability and maintainability in harsh environment.

**Features and benefits**

1. **Mobility and compactness.** Pneumatic large-diameter wheels ensure easy movement and transportation. Small size allows the closest to application site stationing. The machine can easily be moved by one person.

2. **Simple and robust design** with installed world’s leading drive gears (production of Italy and Germany) provides the long-term operation life.

3. **Variable speed geared motor** allows to change the output of the machine smoothly in full range, and instantly adapt the machine to the building site needs.

4. **Operating costs decreased by 30%** due to the design with only one sealing plate. **Refacing of sealing plate** can significantly reduce the operating costs. Assembly and disassembly of the machine can be done in seconds. **Fast cleaning** and easy access to wear parts minimize downtime.

5. **Capacious feeding hopper located at a height of less than 1 m.** and simplifies filling machine both manually and mechanically. Simple and reliable mechanism of the pneumatical vibrator provides the necessary force to mixture passage.

6. **The protective apron** protects the elements of the machine from damage and contamination.

7. **Quick connection couplings** are used. Construction site relocation takes a few minutes.

8. **The constant uniform flow of concrete without pulsations** that provides a constant water-cement ratio. Easy adjustment by only one air valve.
Technical specifications

<table>
<thead>
<tr>
<th></th>
<th>AC-1 Variable Electrical drive</th>
<th>AC-1-P Pneumatic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical output</td>
<td>0.5 – 3 m³/hr</td>
<td>0.4 – 2.2 m³/hr</td>
</tr>
<tr>
<td>Available diameter of</td>
<td>up to 32 mm</td>
<td>up to 50 mm</td>
</tr>
<tr>
<td>material hose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum particle size of</td>
<td>up to 8 mm sizes 32 mm</td>
<td>up to 16 sizes 50 mm</td>
</tr>
<tr>
<td>the conveyed material</td>
<td></td>
<td></td>
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<tr>
<td>Horizontal transport</td>
<td>up to 200 m</td>
<td></td>
</tr>
<tr>
<td>distance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical transport</td>
<td>up to 100 m</td>
<td></td>
</tr>
<tr>
<td>distance</td>
<td></td>
<td></td>
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<tr>
<td>Required air pressure</td>
<td>0.4 – 0.5 mPa</td>
<td>6 – 9 mPa</td>
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<tr>
<td>Air consumption for</td>
<td>3 – 5 m³/min, not less than</td>
<td></td>
</tr>
<tr>
<td>transporting the dry</td>
<td>3 – 5 m³/min, not less than</td>
<td></td>
</tr>
<tr>
<td>mixture to a distance of</td>
<td>3 – 5 m³/min, not less than</td>
<td></td>
</tr>
<tr>
<td>40 m</td>
<td>3 – 5 m³/min, not less than</td>
<td></td>
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<tr>
<td>Engine</td>
<td></td>
<td></td>
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<tr>
<td>Main dimensions:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Length</td>
<td>1100 mm</td>
<td></td>
</tr>
<tr>
<td>- Width</td>
<td>800 mm</td>
<td></td>
</tr>
<tr>
<td>- Height with sieve</td>
<td>1000 mm</td>
<td></td>
</tr>
<tr>
<td>Weight (without accessories)</td>
<td>271 kg</td>
<td></td>
</tr>
</tbody>
</table>

Recommended assembly:
- AC-1 dry shotcrete machine (incl. feeding hopper, sieve, vibrator) on pneumatical tyres
- Abrasion resistant hose, 20 meters, diameter 32 mm
- Assembled nozzle, diameter 32 mm
- 1 spare nozzle tip
- 1 spare sealing plate
- Air hose, 20 meters
- Water hose, 20 meters

Available for order: hoses of various diameters, remote control, nozzles for different materials, explosion-proof electric motor, skids, rail platform, automatic lubrication system.

For the operation of the AC-1 machine required:
- the water supply pressure not less than 2 atm, the compressed air at least 4 m³/min, 3 kW electricity
TORNADO specialized in dry and wet shotcrete works and structures strengthening for more than 25 years. This unique work experience allows us to provide full-cycle services for shotcrete contractors. We strive to consider on-site conditions to get the best result for our Client.

Wearing parts are always available for shipment.

Free onsite nozzlemaster training for wet and dry processes.

Special equipment editions on demand: alternative versions of the drives, remote control, extra consumables, types of material hoses and nozzles.

Full customer support.

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