SHOT BLAST TURBINES

UCT 300 - 500

Ümit Döküm

About us

Umit Dokum (establishment 1992) produces wear resistant spare parts for shot blast machines. Our products having AQA ISO 9001 : 2008 quality certificates have been approved by our domestic and international customers who are their sector leaders.

Main advantages of our turbines,

- High durability by means of housing made up of Mn Steel.
- Reduction in the maintenance costs because of easy replacement of parts.
- Long service life by means of spares parts that are produced by high technology
- Easy and fast spare part delivery from stock under Umit Dokum assurance.

In this booklet, you will find other advantages of our turbines.

Best regards,
Selim OZAVAR

Managing Director

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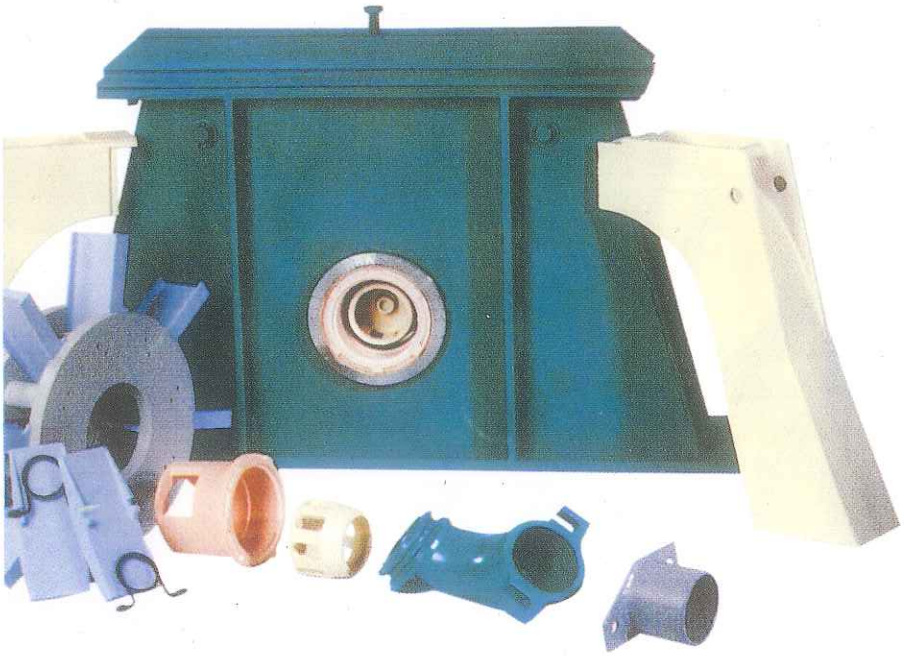
1.1 THE IMPORTANT ADVANTAGES

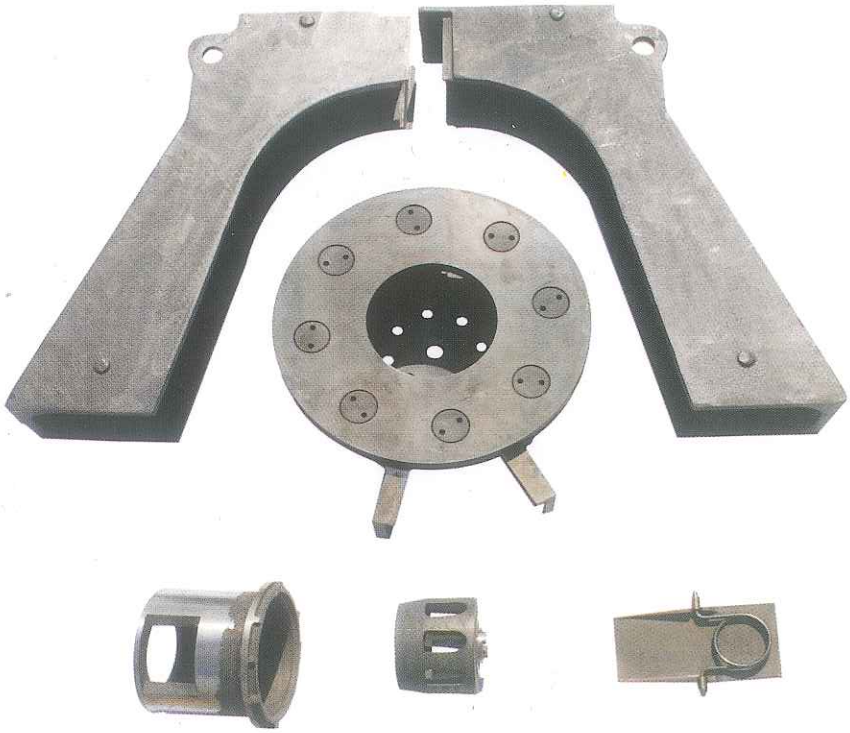
- long life time by means of utilization of manganese and other high wear resistant materials.
- short shot blasting times by means of powerful performance and big reserves.
- highly economical because of interchangeability of all parts.
- small storage area by means of wide range of similar parts for all turbine sizes.
- minimal maintenance times because of simple blade change and hand driven replacement of body armors.
- easy upgrade by means of simple, cost effective modernization of existing machine.
- left and right rotation possibility by means of symmetrical structure of wheel discs



1.2 CONSTRUCTION

Turbine Unit UCT 300 - 500

The Umit Dokum UCT turbines are a concept of two components. The turbine body mainly consisted of parts of both side covers which are joined together by means of bolts. For all turbine sizes dimensions of wheel discs are the same. Different turbine sizes are achieved by means of using different blade lengths. Eight blades are placed into both side conical slots and fastened by of spring elements. Overall symmetrical design of blade fastening enables the possibility of right and left rotation of wheel disc.



A compact and generous construction of turbine makes the utilization of same bearing type for all turbine sizes.

Mn Steel manufacturing of turbine cover and related armor adds additional value to shortening of maintenance and instant stops together with simple and fast replacement of blades and armor. In case blast rooms which are accessible from inside, blades can be changed from inside of blast room. High alloyed Chromium Nickel cast armor is placed through cover and fixed to top cover. Complete turbine is fixed to blast cabin by means of 6 fixing bolts.

1.3 WORKING PRINCIPLE

Necessary blast media flow rate is adjusted automatically by means of valve. Opening and closing of valve is done by a pneumatic cylinder.

The blast media enters into center of rotating wheel disc through feed spout. The impeller which rotates with the same speed accelerates blast media. Than blast media comes on the throw surface of blades through exit window of control cage and leaves the turbine with a pre adjusted throw speed. Adjusted rotation speed and turbine diameter determines the throw speed of blast media.

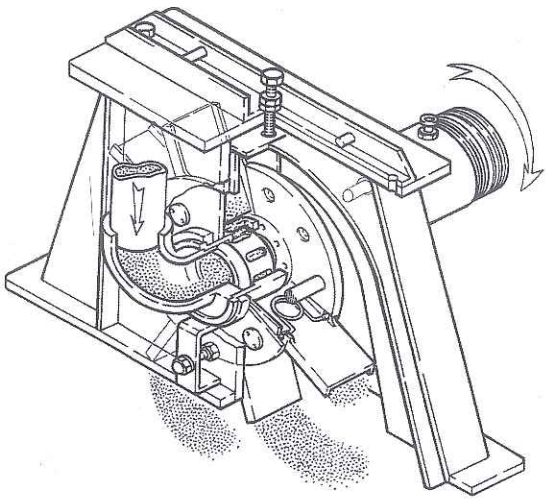
Depending on the shot blasting purpose and requested blasting efficiency there are 4 different turbine sizes between 300 and 500 mm diameter with speed between 60 and 90 m/s. Shot blast flow rate changes from 100 to 400 kg/min.

1.4 TIPS FOR SHOT BLAST TURBINES

Worn wheel blades causes imbalance and fast wear of wheel disc and bearing. Worn control cage and impeller changes position and formation of impact zone and results in reduction of blasting performance together with increasing wear.

Replacement of blades should be done as sets. After replacement, formation of impact zone profile should be immediately taken.

If wear on body cover is observed, position and placement of armors should be controlled.

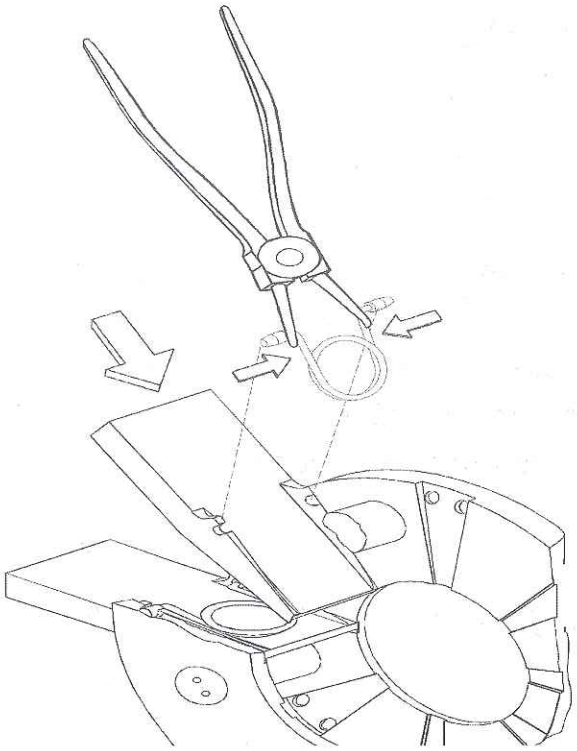


Before maintenance, shot blast machine and its moving parts should be made safe against running by mistake. This is possible by a lockable switch.

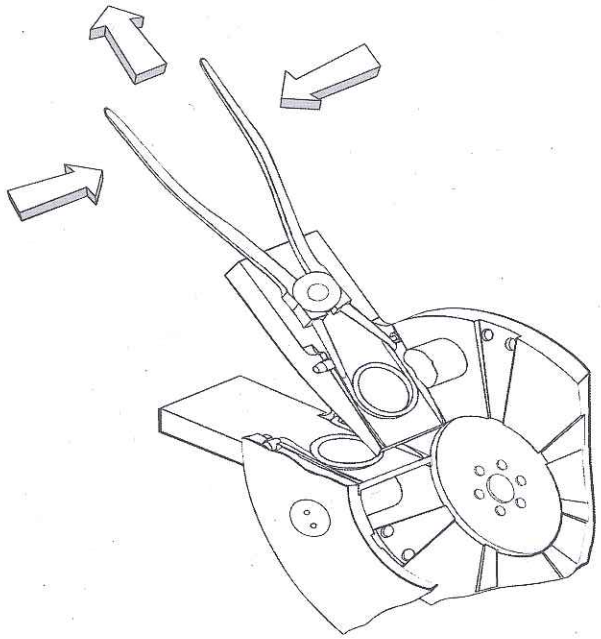
1.5 INSTALLATION OF BLADES

Feeding parts (Wheel Disc, Control Cage, Impeller) should be installed before blades. Because of the possibility of left or right rotation, rotation direction should be noticed during installation of blades. Rotation direction can be determined by means of direction of bearing. After correct direction is determined, conical side of blade is pushed through slots of wheel disc. Locking holes of blades are on the back side.

After that, fixing spring is placed by means of special pliers as shown in picture. By means of correct placement of safety bolts, these will never come out of the blades.



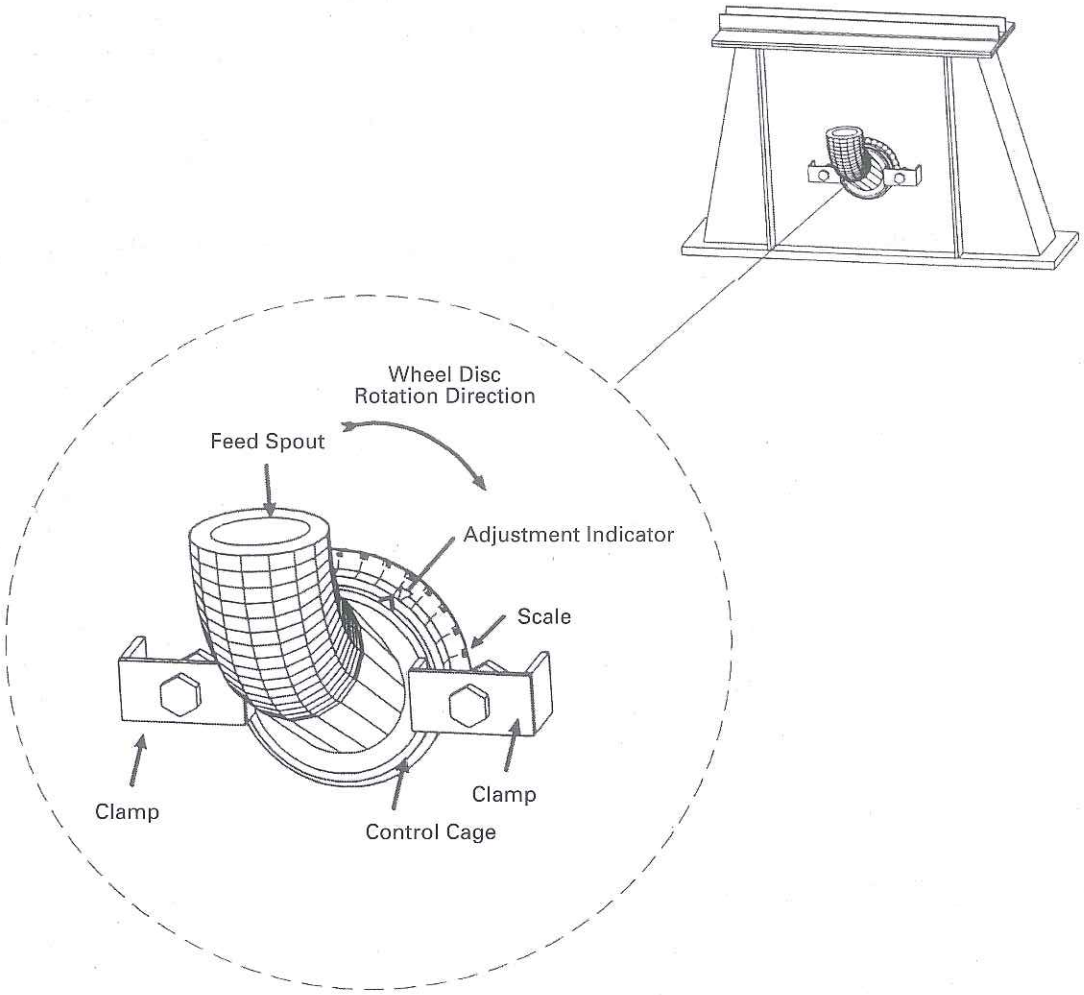
1.6 DISASSEMBLY OF BLADES



After removing of cover and armors, blades become accessible for replacement. For blast cabins in which access from inside of cabin is possible, replacement of blades is also possible from inside of cabin. Blades are removed by means of special pliers. After fixing springs removed, blades can be taken out of its conical placement.

1.7 ADJUSTMENT OF CONTROL CAGE

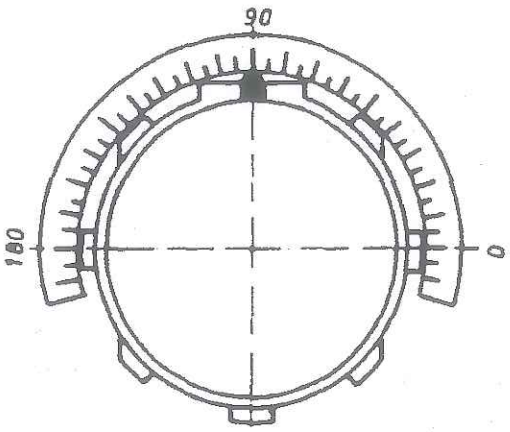
Fixing clamp is released and control cage is rotated in required direction. The arrow which is made during casting indicates the direction of throw opening. Feed spout remains unchanged in its position. ***As a general consideration: Opening of control cage is positioned to opposite side of throw angle.*** Together with this, type of blast media (grits, shots, cut wires) plays an important role as well as the grain size. Different blast media has different viscosity because of different density and wear resistance. ***It means: Never use several blast media together.*** In case of machines which use cut wire, after a successful rounding of each grain (approx. 100 working hours) the machine should be checked. Besides, after installation of a new spare, impact area formation profile should be taken to determine blast direction. Only by means of this, economical operation is guaranteed and unnecessary wear and repair costs are prevented.

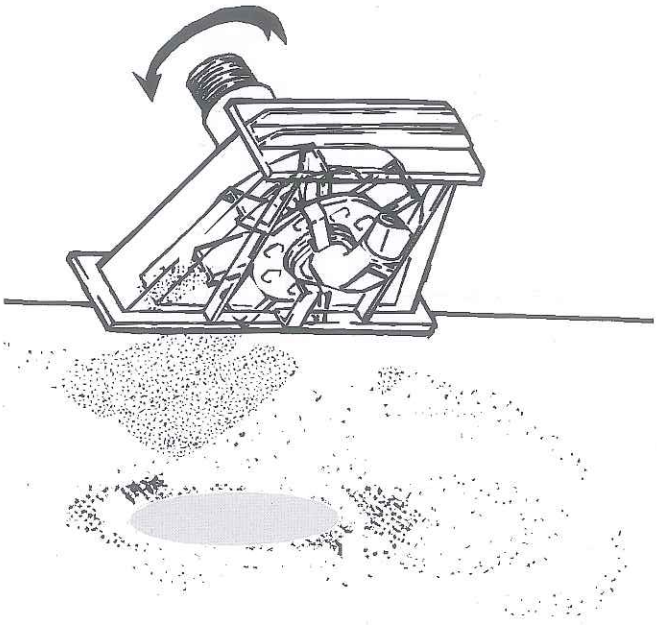


1.8 ADJUSTMENT OF IMPACT AREA

Blasting direction

After installation of shot blast machine, depending on shape of work piece to be blasted and its position in blasting area "hot spot" (centre of blasting area) for each turbine should be adjusted. It should be in the middle of blasting area. During manufacturing of turbine cover, a scale of control cage on the basis 90 degree is made on the cover.





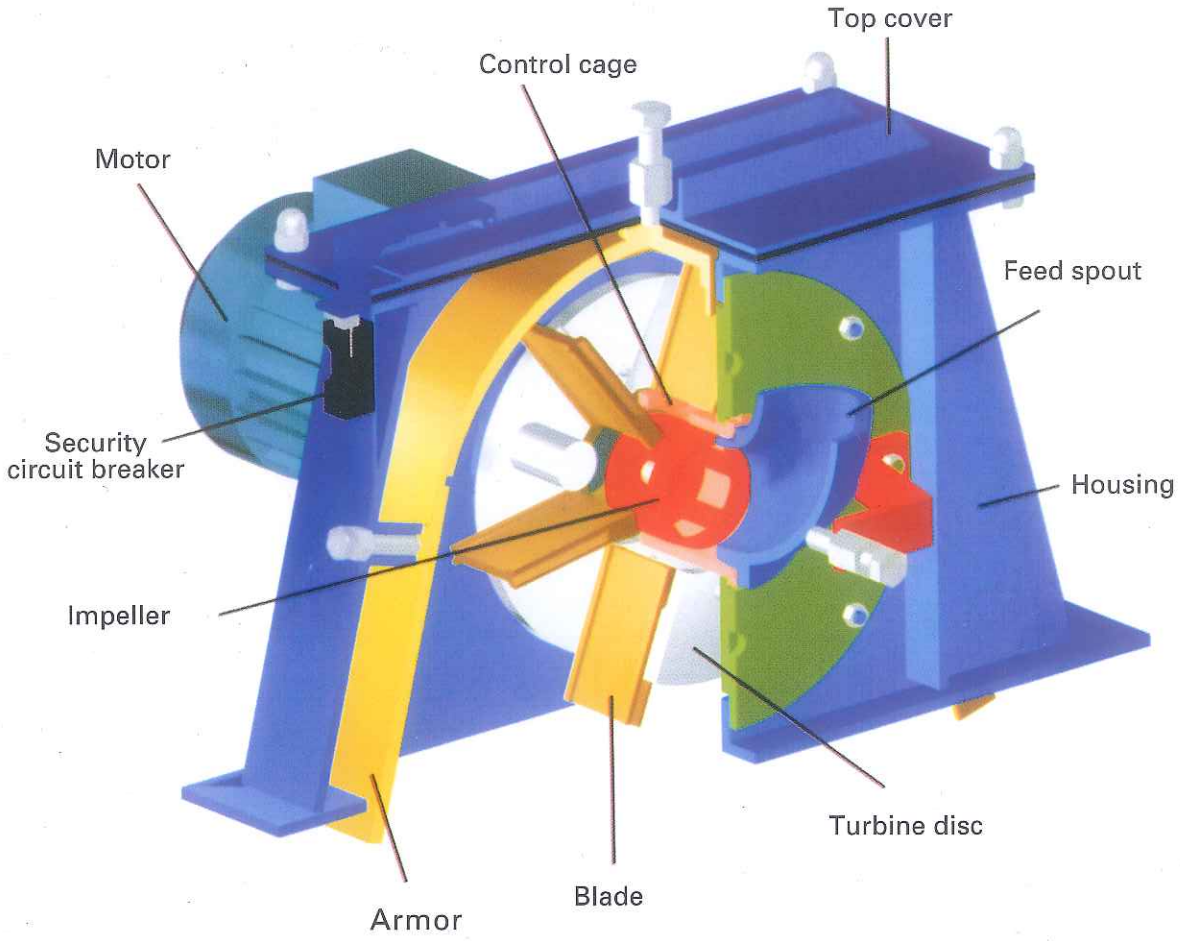
In order to detect "hot spot" of blasting area which is the center of biggest intensity of blasting, a thin metallic sheet which is placed in the position of work piece to be shot blasted. Length of metallic sheet should be minimum 1,2 m so that sheet should cover impact wall. Than a one minute blasting is done without changing the position of metallic sheet. (Rotation should be switched off) After removal of steel sheet, highly heated area "hot spot" should be noted against accidental burning.

"Hot spot" can also be by means of visual inspection, for example the intensity of metallic glazes or temper colors which occurs in "hot spot" range. Another method of determining the "hot spot" is to measure of temperature of blasting area by means of thermometer or a careful inspection by hand. In the "hot spot" range highest temperature is observed. Afterwards, correct blasting range is obtained by means of rotation of control cage. At the same time, rotation direction of wheel disc is should also be noted. To establish a correct blasting area formation, final blasting area formation should be obtained.

1.9 TURBINE SPECIFICATION

	UCT 300	UCT 400	UCT 450	UCT 500
Turbine dimension	300 mm	400 mm	450 mm	500 mm
Power	11 kW	15 kW	22 kW	30 kW
Throw rate	approx. 250 kg/min	approx. 300 kg/min	approx. 350 kg/min	approx. 400 kg/min
Throw velocity	70 m/s	80 m/s	85 m/s	90 m/s

TURBINE UNIT



CERTIFICATE OF QUALITY

CERTIFICATE OF ASSESSMENT

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