

High-Performance ND Tandem Double-Blow Cold Former for the production of long blanks up to 300 mm – Mature technology restarted

The model ND tandem double-blow forming cold formers have been designed for the production of blanks for drywall screws, wood screws, sheet-metal screws (DIN 7970) and similar parts in wire from 2.2 up to 5.2 mm dia. (.087" - .205").

This very well-proven technology has been used on the world market for many years. With respect to the above wire range, this type of machine is the fastest on the market.

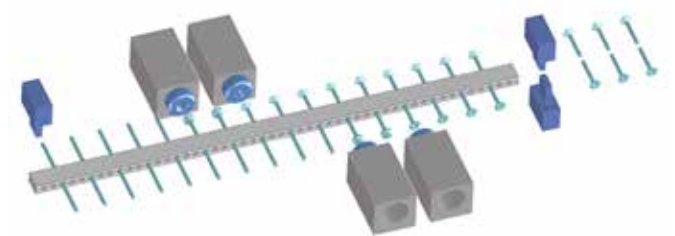
WAFIOS Umformtechnik GmbH in Wuppertal took over the ND Tandem Double-Blow Cold Formers from WAFIOS AG Reutlingen efficiently.

In the first quarter of 2019, WAFIOS Umformtechnik successfully delivered 2 machines of type ND 91 to a well-known German customer.

Technology

Common double-blow machines are generally limited to the production of short screws, ranging from 25 to 50 mm (.985" - 1.970") and outputs between 400 - 600 pieces/min.

The tandem principle allows output numbers up to 1,400 pcs/min for 70 mm (2.758") blanks and 700 pcs/min for lengths up to 170 mm (6.698").



Working principle (Fig. 1):

- Direct transport of the wire pins and the resulting blanks to the work stations by a gripper belt system (Fig. 2).
- Separate preform and finish punching of the head shape on both sides of the blank.
- Short stroke punching; the travel of the punch slide is only as long as the wire length necessary for the forming operation.
- Symmetrical and asymmetrical cutting of the "Janus Blank" is possible. E.g., the production of 90 mm (3.546") blanks and 30 mm (1.182") blanks at the same time can be realized. Different head shapes can be produced.
- Bright wire instead of phosphated material can be used. Thus, the cost of wire is less and the washing of the blanks is eliminated.



Fig. 2: Positioning of the pins in the transport belts. First and second punching stations

Compact design

- Straightening unit, infinitely variable infeed, cut-off bushing with open cutter and transfer of the pins to the gripper belt system.
- Positioning of the pins, preform and finish punching at the first and second stations.
- Positioning of the blanks with one head, preforming and finishing at the third and fourth stations.
- Separation of the double headed blanks. For the production of longer blanks (e.g. above 100 mm/3.94") one side is deactivated. If only long blanks are to be manufactured, the purchase of the S-version with only the first and second stations is recommended. Model ND 91 SL for wire diameters of 2.8 - 5.2 mm (.110" - .205") and lengths up to 305 mm (12.017") is available as a special design with a rotary spinner.

Example

The ND 90 produces 1,400 pieces/min with a wire diameter of 2.2 - 3.7 mm (.087" - .146"), equivalent to standard screw sizes between 3 - 5 mm (.118"-.197"). In addition, double-head blanks with a total length of 140 mm (5.516") max. can be cut asymmetrically. The minimum blank length is 10 mm (.394") and the max. length 130 mm (5.122").

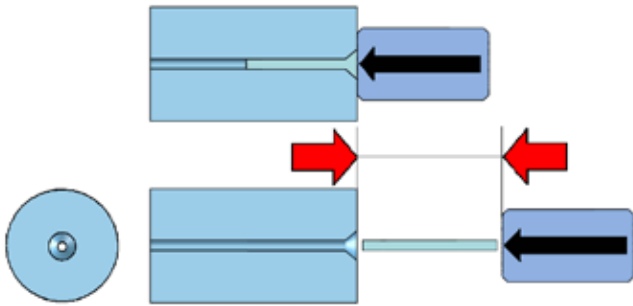


Fig. 3a: Common punch stroke

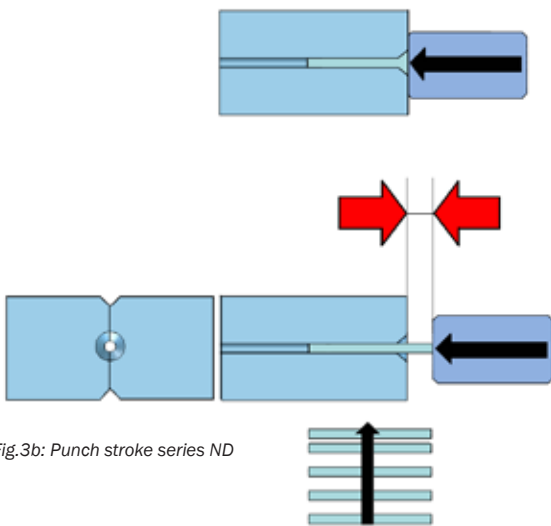


Fig.3b: Punch stroke series ND

Performance and driving system

The wire is fed from a driven pay-off into a roller straightening unit. As an option, a rotary straightening spinner is available. A steplessly adjustable sliding in-feed guides the wire into the cut-off bushing. The wire pins are positioned in the transport system. Two gripper belts lead the pins to the tandem punching stations for separate preform and finish punching. At the preform punching station the first blow forms the pin end. The finish punching station forms the final size and the head of the screw. In the last operation, the double-headed blank is separated into two single blanks.

The cam shafts for the punching and pressing tools are located on either side of the transport system. An additional cam drives the cutting system for the separation of the blanks.

Short punch stroke - long tool life

Fig. 3a + 3b show the reduced punch stroke of the ND machines in comparison to the common production principle with closed dies. Independent of the screw length, the punch stroke of the ND series is always as long as the necessary volume to form the head. With conventional cold formers the punch stroke is at least as long as the length of the pin, resulting in large size punch slides, higher wear and

problems when centering the tools.

The short-stroke principle of the ND series allows more time for the forming process itself. Tool life is increased.

Quality control

An integrated process monitoring system allows "manless" production:

- Length measurement of the wire pin in the cutting station.
- Sensor monitoring of the cutting and forming processes.
- Control of the cut in the last work station.

As an option, we prepare the machine for adaption to a common monitoring system for the product, the production, the machine as well as SPC and PC interfaces.

Quick change-over

The ND-line machines are almost maintenance free and easy to set up. For change-over to another length of blank with the same diameter, only minutes are required. Punching tool change cassettes reduce the amount of time for a changeover from one diameter to another.

Environmental aspects

The ND machines work with clean bright wire. Such material is cheaper than phosphated material and does not pollute the environment.

For the forming process, only the ends of the wire pins are mist lubricated. The reduction of oil consumption is significant. ■



Fig. 4: Multicutting unit for straight cut or for self-drilling points, diamond points etc.