

TOX[®]-ToolCheck

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Pneumatic testing of clinching dies

The die monitoring system TOX[®]-ToolCheck, together with the process monitoring, checks the condition of the TOX[®]-Clinching Dies. This ensures that the joining process is always performed with an intact die. Any potential defects (like missing or e.g. by contamination jammed moving elements of the SKB die, as well as ruptures on either the solid TOX[®]-Die or on the fixed segments of SKB) are identified within <1 second.

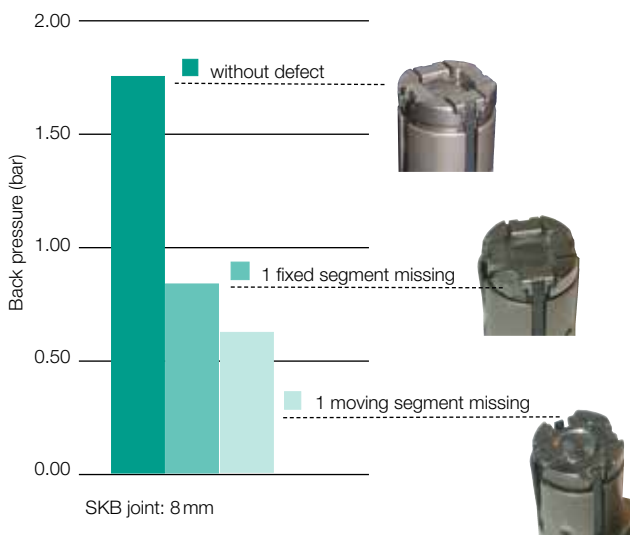
Functional principle

Every clinching die has a flow resistance characteristic dependent on its geometry when a jet of compressed air is applied. A defect in the die reduces this flow resistance and thus the back pressure of the air jet. An error signal is generated when a defined back pressure value is not reached. The system's robustness results from the significant drop of the back pressure in the defective die (as shown in the diagrams below).



TOX[®]-SKB Die

Influence of defects on back pressure



Optimum production reliability

- A cost effective, robust and compact system with a control quality which was previously not possible
- Already the first defective part can be identified
- In contrast to trend monitoring, a conclusion can be reached after only one measurement

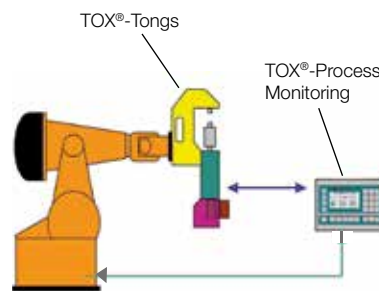
Optimum productivity

- Maximum tool life usage, since a preventive die change is no longer required

Evaluation

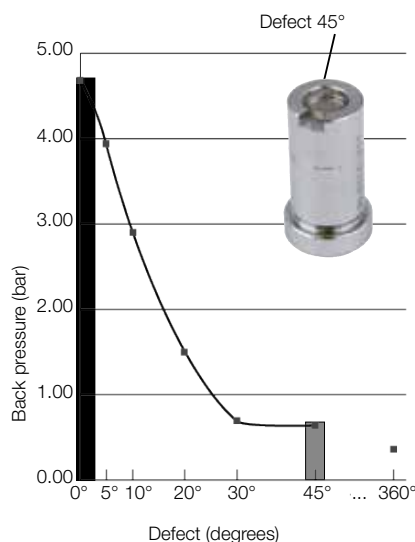
A change of the dynamic pressure is reliably detected with the TOX[®]-ToolCheck die monitoring. The measured value of the dynamic pressure is evaluated by means of the robot control, PLC or ideally with the TOX[®]-Process Monitoring.

Typically, the dies are checked after each joining of a piece part during an auxiliary process time, e.g. when changing the piece part in the appliance. This way, the process times for the die monitoring are not included in the cycle time of the actual clinching process.



Solid TOX[®]-Die

Back pressure for various defects



Mobile die check type ZCM

Application

Everywhere where TOX®-Standard Stripper can be used: at mobile or stationary C-bows, handheld or robot tongs, presses with pneumohydraulic, hydraulic or electric drive, in single- or multipoint-tooling.

Function

The dynamic pressure is applied by means of a TOX®-Stripper CSRP. The stripper is moved onto the die in a control stroke and compressed air is then applied. The dynamic pressure is measured and issued as an electric signal directly to the evaluating control, depending on the state of the die.

Advantages

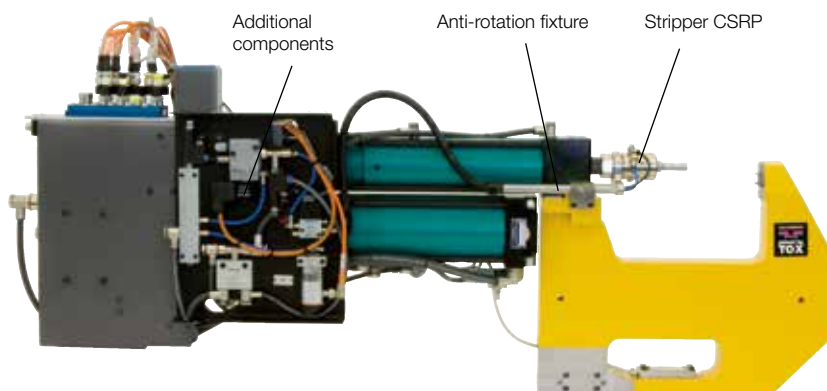
- Compact, integrated in the assembly
- Measuring cycle < 1 s possible for tongs applications
- Can be retrofitted



Mobile die monitoring ZCM on TOX®-Tongs

Ordering description: ZCM

Each die check type ZCM includes the anti-rotation fixture, additional components and the stripper required for the used application.



Stationary die check type ZCT

Application range

For applications where the mobile die monitoring ZCM cannot be used due to interference contours in the tool room.

Function

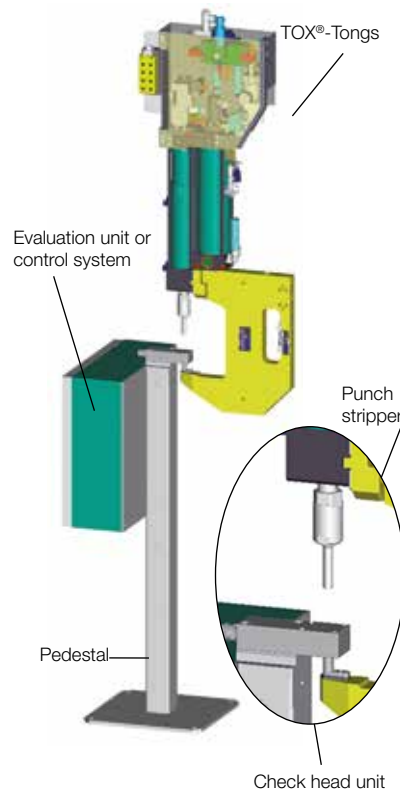
The die monitoring ZCT is installed within reach of the robot. The robot positions the TOX®-Tongs with the die on the test head unit. Compressed air is then applied to the test head. The resulting dynamic pressure is issued as an electric signal directly to the evaluating control, depending on the state of the die.

Ordering description: ZCT

Each die check type ZCT includes the pedestal, evaluation unit or integrated control system and the check head unit.

Advantages

- Several tools can be checked by one centralized check station
- Minimizes any interference with the work-piece in the tool area of the tongs



Stationary die monitoring ZCT