Application Spotlight

Inspection of engine components for blowholes

vögtlin instruments

Ensuring consistent quality

Air flow control of injection molded parts

Quality assurance for injection molded parts. In order to maintain consistent quality in the production of injection molded parts for engine construction, it must be ensured that there is perfect flow through the channels.

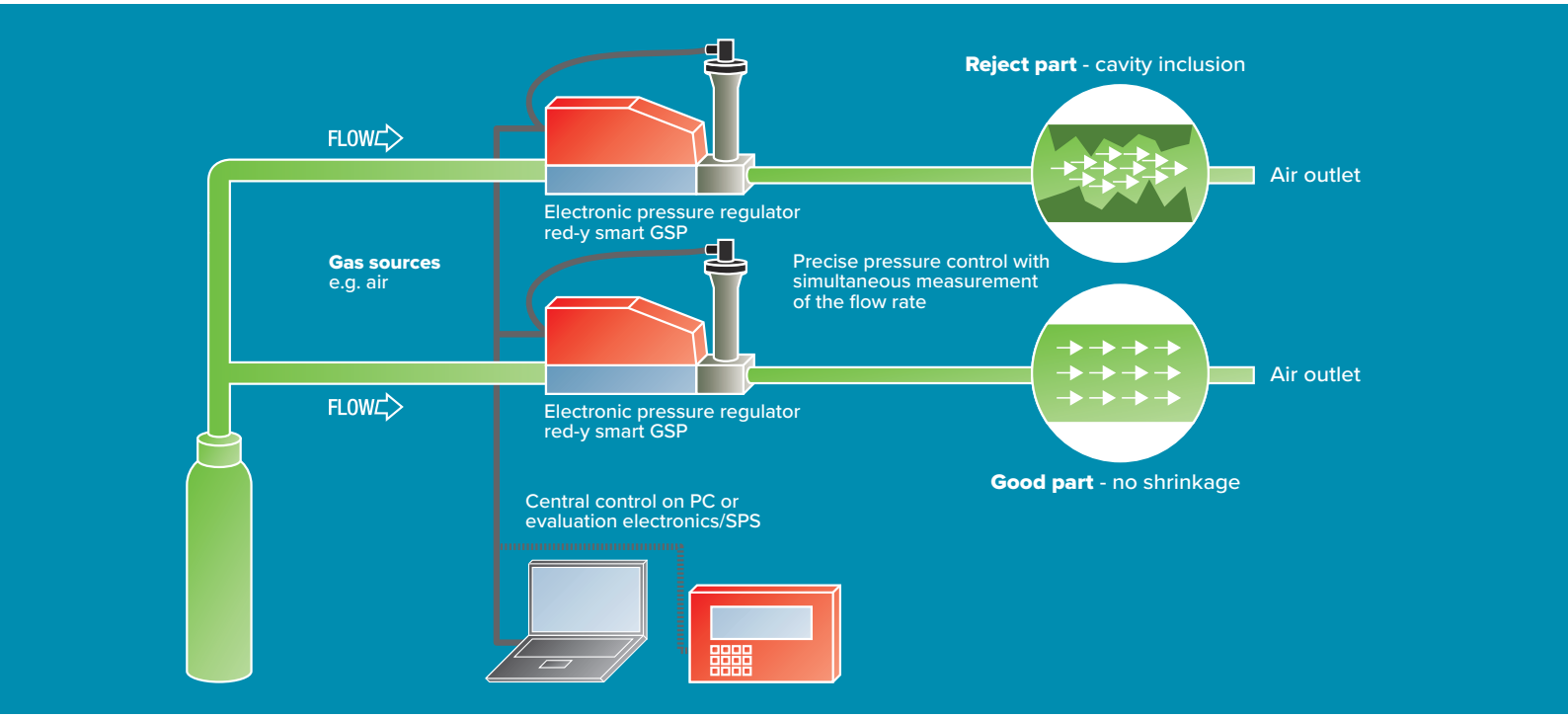


Fig. 1 **Functional process scheme on the inspection of engine components for blowholes**

Fig. 2 **The production of equivalent quality engine components requires perfect flow through the ducts. The red-y smart pressure controller precisely controls the pressure while measuring the flow rate.**

Application

During the production of engine components by injection molding, blowhole inclusions can occur in concealed channels. These cause a narrowing of the channel and can lead to partial or complete blockage. A proper flow of the corresponding medium is no longer guaranteed.

Until now, only a single-unit inspection by means of endoscopic measurement was possible. This was very time-consuming and could not be automated, taking into account short cycle times.

Challenge

To provide a measuring method that enables the component to be checked for inclusions in the shortest possible cycle times.

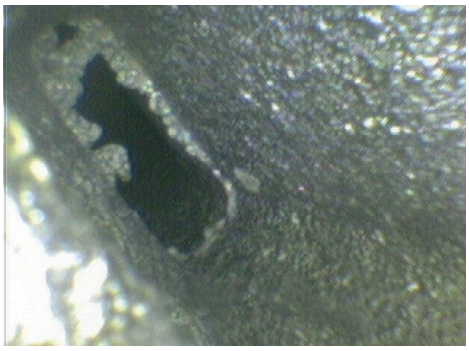
Solution

Vögtlin electronic pressure controller with pressure transmitter.

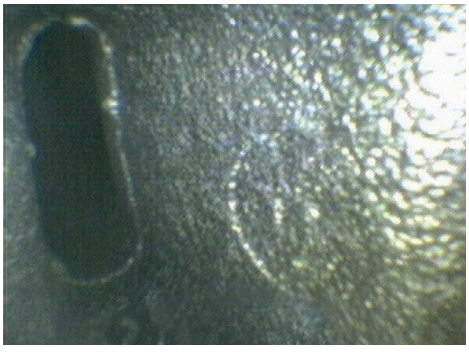
With the electronic pressure controller type Vögtlin red-y smart GSP, a given test pressure can be set with simultaneous measurement of flow rate. As a result, the user has a statement about constriction or occlusion of the component. Conform parts can therefore easily and fast be distinguished from inferior parts.

Customer first performs a leak test for the entire system. Good part is determined by endoscopic examination and designated as “master part” for the test. Now the flow rate at test pressure 30 mbar g is determined. This value is used as a guide value for the assessment of the other series parts to be tested.

Depending on the size of any shrinkage cavities that may be present, there is a small to significant drop in the flow rate at a constant test pressure. This makes it possible to reliably test cavities/channels that are difficult to access in a cost-effective and effective manner.MEMS technology insures a long-term stability without any drift as long as the gas supply is clean and dry.
Dual temperature calibration avoids error caused by ambient and gas temperature better than alternative mass flow controllers.



Bad part



Good part

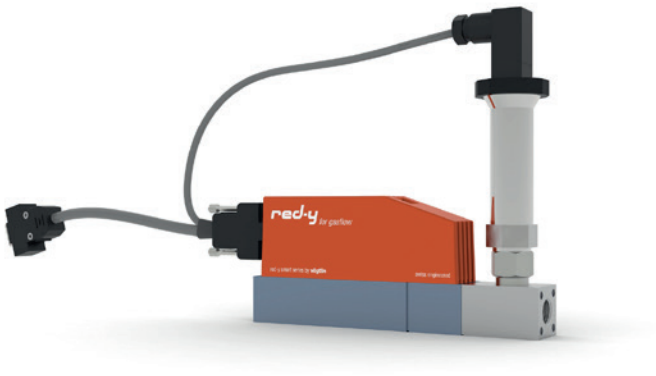


Fig. 3 **Maximum flexibility is provided by switching the function mode from pressure control to flow control during operation.**

Key Features

- Precise and fast control
- No open/close valves required thanks to tightly sealed control valves
- High repeatability
- Real gas calibration / Multiple gases per device
- High savings possible with mixed gases
- Independent of temperature and pressure
- Easy to maintain

Interfaces

- Analog
- Modbus RTU
- Profibus DP-V0/DP-V1
- Profinet
- EtherCAT
- Ethernet/IP

About Vögtlin Instruments GmbH

Vögtlin is a leading Swiss developer of precision flowmeters. Vögtlin has been part of the globally active TASI Group since 2011. The TASI Flow division focuses on high-quality solutions in flow measurement and control technology.

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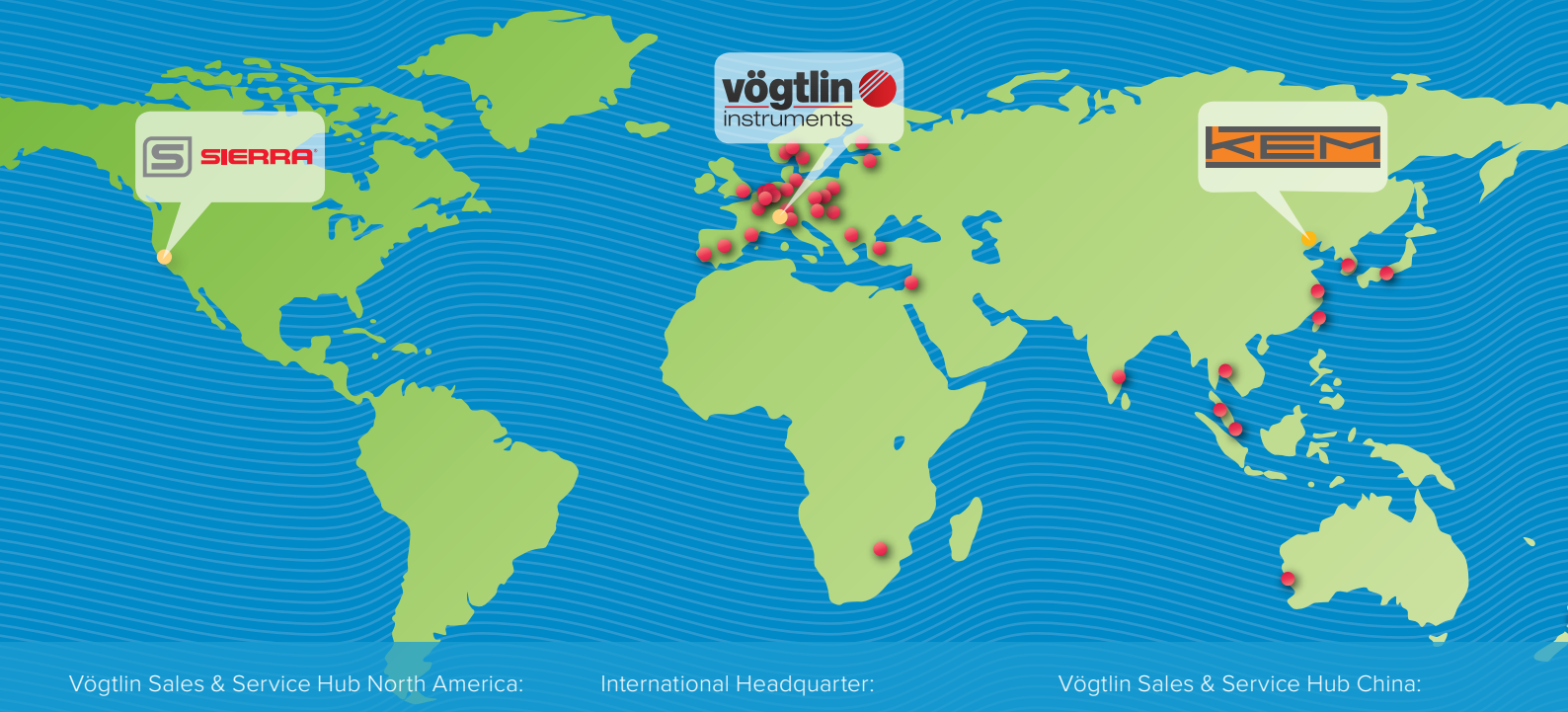
Worldwide TASi Flow Network



Vögtlin Sales & Service Hub North America:

Sierra Instruments
5 Harris Court, Building L
Monterey, CA 93940, USA

Phone +1 800 866 0200
Fax +1 831 373 4402

sales@sierrainstruments.com
www.sierrainstruments.com

International Headquarter:

Vögtlin Instruments GmbH
St. Jakob-Strasse 84
4132 Muttenz, Switzerland

Phone +41 61 756 63 00
Fax +41 61 756 63 01

info@voegtlin.com
www.voegtlin.com

Vögtlin Sales & Service Hub China:

KEM flow technology (Beijing) Co., Ltd.
Rm. 906, Block C, Ruipu Office Bldg,
No. 15, HongJunYingNan Road,
Chaoyang District, Beijing 100012, China

Phone +86 10 849 29567

info@kem-kueppers.cn
www.voegtlin.cn

Find your local Vögtlin sales partner on our website:

www.voegtlin.com

Vögtlin Instruments GmbH – gas flow technology
St. Jakob-Strasse 84 | 4132 Muttenz (Switzerland)
Phone +41 61 756 63 00 | Fax +41 61 756 63 01
www.voegtlin.com | info@voegtlin.com

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