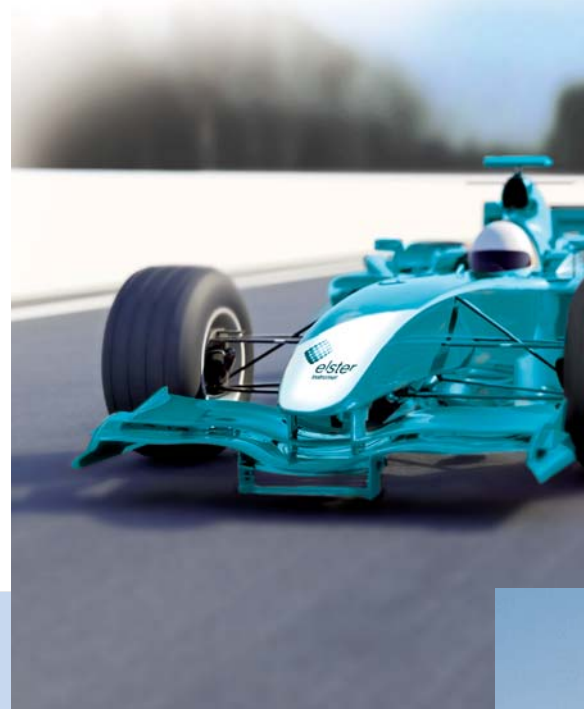


Axial Flow Valve sleeves for high pressure regulators

For more than just one turn

No one has forgotten the United States Grand Prix of June 2005 when nearly all the Formula 1 teams had to retire from the race after the warm-up lap due to tyre failure. Thanks to the development and extensive testing of new rubber grades for the sleeves of our Axial Flow Valves, we are sure that we can go the full distance.



Over the years the high pressure regulators in the Axial Flow Valve system have been continually developed in order to keep them in line with the latest state of the art technology.

The core of the system is the sleeve, which assumes the regulating function, and, due to its characteristics, has a considerable influence on the system performance. The optimal combination of flexibility, temperature characteristics, wear and tear resistance poses the biggest challenge for the developers. The non technical boundary conditions must also be observed:

There are upcoming legal changes concerning the use of certain components in the production of rubber materials. The use of Hydrin in its current form will decrease clearly in the coming years because of modified specifications within the automotive industry. Due to these changes, the availability of Hydrin as a raw material for the production of rubber will decline. To prepare ourselves for this and to meet the quality requirements of our customers, we have taken appropriate measures to change the materials used in our Axial Flow Valve sleeves. Due to the wide variety of rubber compounds available and the developments in the elastomer industry over the last 10 years, we are now able to offer sleeves from a single elastomer family, instead of from two families, as was the case hitherto.

- Class 125/300: HNBR will be used instead of Hydrin.
- Class 600: Only one type of NBR will be used instead of NBR or Hydrin.

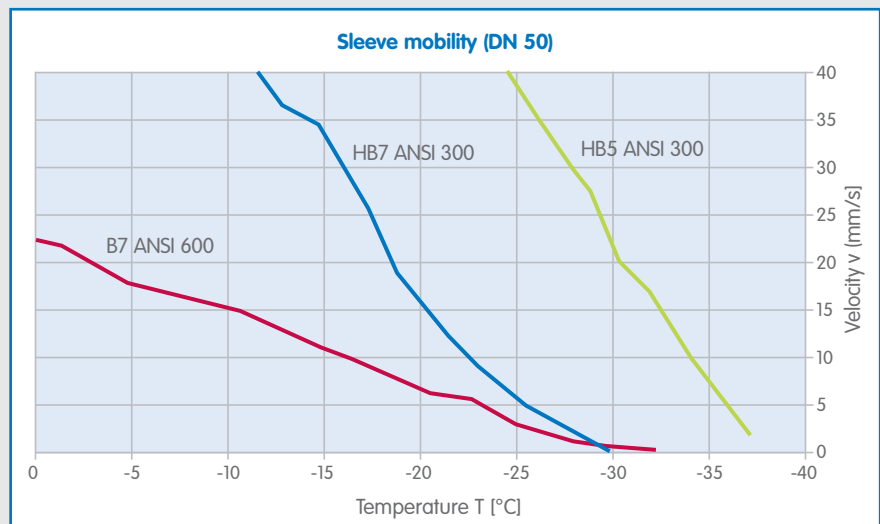
Extensive laboratory tests were carried out according to European standard EN 549, as well as a large number of additional function checks, for example opening/closing characteristic tests at temperatures of -40°C to +60°C, life cycle tests and burst tests. All tests were performed as comparative tests with the existing sleeves from current production.

The objective was to find materials whose characteristics are equal to, or better than, those of the currently used products. The new materials were approved by the DVGW test laboratory as the last stage of the process.

NBR sleeves were successfully introduced many years ago. Experience of the past few years has shown that, in general, these sleeves are characterised by a long

service life and good lock-up behaviour. While the new NBR material is defined by excellent characteristics at low temperatures, the new HNBR offers significantly higher burst pressures. On top of this, the test results show that we can expect an increased service life. (H)NBR has a lower tension set leading to improved resetting capacity and therefore better lock-up behaviour.

In the meantime, field tests on several customers' premises, e.g. in Ireland, Luxembourg and Germany, have generated very positive feedback. These tests





confirm the positive characteristics we found during the development phase. The extensive testing program together with the positive feedback from the field tests has provided the basis for the introduction of the new materials.

Once again, Elster has provided convincing results and has taken another great step forward in the continual improvement and modernisation of our well-known Axial Flow Regulator system.

Let's go the full distance.

Thomas Wenz

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