POLYURETHANE MATERIAL FOR APPLICATIONS AROUND THE GLOBE

NEW POLYURETHANE GENERATION 94 AU 30000 MAKES POSSIBLE LONGER OPERATING TIMES UNDER EXTREME CONDITIONS
NEW POLYURETHANE GENERATION
FOR MOBILE MACHINERY

NEW HIGH-PERFORMANCE MATERIAL IS VERSATILE AND INCREASES
OPERATING LIFE AND RESISTANCE TO WEAR

Initial situation
Hydraulic systems in mobile machinery often operate under
extreme temperatures around the world. Seals made of
appropriate materials are incorporated to guarantee reliab-
le functioning, whatever the conditions. The characteristics
of a low-temperature seal differ from those of a seal devised
specifically for use in the tropics.

But even seals adapted to these requirements wear out
simply due to strong temperature swings and inadqua-
te maintenance. Difficulties also arise because operators
of mobile machinery are increasingly turning to leased
equipment in the heavy-duty segment. This not only me-
ans much longer operating times per year. The maximum
capacity of the equipment is more frequently exceeded as
well. The results are malfunctions, delays in the completion
of projects, and high follow-up costs.

As a result, new materials are in demand that meet more
stringent requirements and make longer operating times
possible, increasing availability. Manufacturers of mobile
machinery also expect more universal sealing solutions.
They are expected to cover a broader range of applications
than they have in the past, reducing the warehousing of
different kinds of seals.

The Freudenberg solution
More than 40 years ago, Freudenberg introduced a material
made of polyurethane for high-performance seals, setting
new standards in the process. Today, with the 94 AU 30000
polyurethane generation, it has succeeded in developing
and manufacturing a new, outstanding basic material for
seals. The company's core competencies include the de-
velopment of its own materials.

Designed for a broader range of applications, the new
94 AU 30000 material displays a much longer operating
life as well as greater resistance to water and the impact of
moisture than a standard PU seal. It even functions reliab-
ly at a temperature of +120 °C. This was achieved with the
targeted modification of precisely the PU components that
are responsible for temperature characteristics – without
compromising the remaining features. Key parameters such
as hardness and tensile strength are thus comparable to
Freudenberg’s proven polyurethane materials.

The visco-elastic behavior of the new material has been
fine-tuned so that the flexibility of the soft segments per-
sists despite wide ranges of temperatures. That means that
seals made of the new polyurethane generation are still
sufficiently flexible at low temperatures and satisfactorily
stable at high temperatures. In this way, they expand the
options for use in pressure and temperature ranges that
have only been feasible with special seals until now.
New polyurethane generation expands the boundaries of use

Polyurethane 94 AU 30000 is superior to all standard, commercial polyurethanes. In comparison tests under extreme conditions, seals made of the new material show no appreciable sign of wear while conventional seals fail prematurely. At 120 MPa, tear resistance, which is important for wear performance, is about 30% higher than the values for comparable polyurethanes.

Other outstanding features include applications in mineral hydraulic fluids at up to +120 °C and high resistance to electrolysis even in hot water, at temperatures as high as +80 °C. In this way, the new seals fulfill their designated functions over a much longer timeframe than the current standard solutions and thus increase the equipment’s availability for use.

In addition, extrusion stability, that is, resistance to damage from high pressures, has been greatly improved. This ensures that damage from peak pressures in heavy-duty equipment is avoided. It also adds to the operating life of the seals. Due to the cited characteristics, the new polyurethane generation achieves much better results than materials on the market to this point, based on all the relevant criteria.

### ALL THE BENEFITS OF THE NEW POLYURETHANE MATERIAL GENERATION AT A GLANCE

- **Ability to withstand stress**
  - High extrusion stability allows operating pressures up to 50 MPa
  - High tear resistance boosts operating life and resistance to wear
  - Stability in temperatures from -35 to +120 °C
  - Outstandingly suited to mineral and biodegradable hydraulic fluids
- **Versatility**
  - Mobile machinery (agricultural/construction equipment, materials-handling technology)
  - General hydraulics applications for use around the world

<table>
<thead>
<tr>
<th>FLUIDS</th>
<th>94 AU 30000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulic oil HL, HLP</td>
<td>-35 °C to +120 °C</td>
</tr>
<tr>
<td>HFA fluids</td>
<td>+5 °C to +60 °C</td>
</tr>
<tr>
<td>HFB fluids</td>
<td>+5 °C to +60 °C</td>
</tr>
<tr>
<td>HFC fluids</td>
<td>-35 °C to +60 °C</td>
</tr>
<tr>
<td>HFD fluids</td>
<td>upon request</td>
</tr>
<tr>
<td>Water</td>
<td>+5 °C to +80 °C</td>
</tr>
<tr>
<td>HETG (rapeseed oil)</td>
<td>-35 °C to +70 °C</td>
</tr>
<tr>
<td>HEES (synthetic ester)</td>
<td>-35 °C to +90 °C</td>
</tr>
<tr>
<td>HEPG (glycol)</td>
<td>-35 °C to +60 °C</td>
</tr>
<tr>
<td>Mineral greases</td>
<td>-35 °C to +120 °C</td>
</tr>
</tbody>
</table>

Compatibility with fluid groups
About Freudenberg Sealing Technologies

Freudenberg Sealing Technologies is a longstanding technology expert and market leader for sophisticated and novel applications in sealing technology and electric mobility solutions worldwide. With its unique materials and technology expertise, the company is a proven supplier for demanding products and applications, as well as a development and service partner to customers in the automotive industries and in general industries. In 2020, Freudenberg Sealing Technologies generated sales of about 2 billion euros and employed approximately 13,000 people. More information at www.fst.com.

The company is part of the global Freudenberg Group which has four business areas: Seals and Vibration Control Technology, Nonwovens and Filtration, Household Products as well as Specialties and Others. In 2020, the Group generated sales of approximately 8.8 billion euros and employed more than 48,000 associates in around 60 countries. More information is available at www.freudenberg.com.