



# Chemicals and Seeflex 040E

## OVERVIEW OF CHEMICAL RESISTANCE FOR URETHANES

Seeflex 040E, as with all urethanes will resist differing chemicals in different ways depending on a huge number of factors, from concentration levels to usage and temperature. The information provided in this document should be used as an indication only. There is no way of knowing how any urethane will react in an infinite number of chemical situations and all manufacturers of urethane products will suggest that it is best to test the urethane with the chemical involved, in working conditions.

## BFM TESTING FOR CIP (CLEAN IN PLACE) CHEMICALS

The BFM® fitting has been proven in thousands of factories and in-house tests to handle the CIP process repetitively over long periods of time. It is essential that the cuff of the connector and the spigot are wiped clear of residual chemical once the wash cycle is complete.

The percentages listed below are the maximum concentration levels that should be used during a CIP for acid and caustic. Any greater level does not provide an increased benefit in terms of cleaning the system, it is purely wasting chemicals. Excess levels will also adversely effect other parts in the system, such as seals and gaskets.

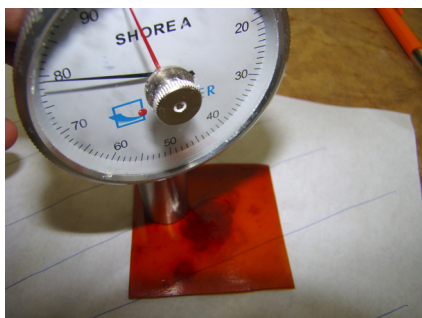
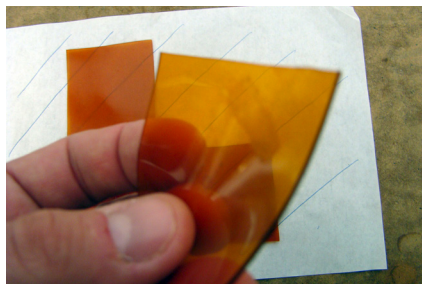
**CAUSTIC:** No more than 1.5%    **ACID:** No more than 0.8%

Below are specific results from testing on Caustic and Acid, typically the chemicals used:

### TESTING FOR CAUSTIC

Sample media tested in 2.5% caustic (DeLaval - Caustech) at 70°C for 30 hours. After 30 hours the media is still clear and strong. The media has noticeably stained a dark yellow, but there is no sign of deterioration or weakness. Shore hardness has remained the same.

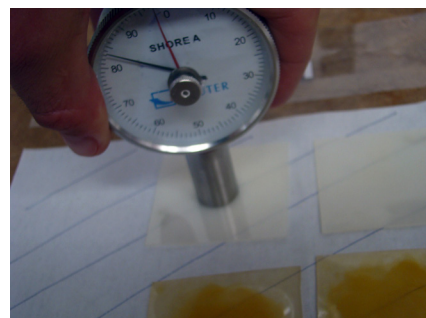
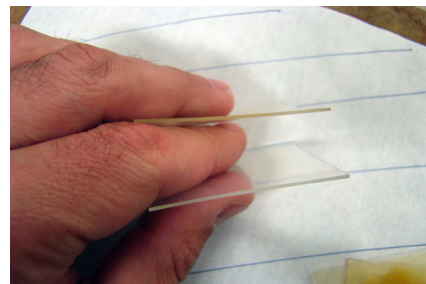
The media has thinned from 0.9mm to 0.85mm over this period of time, but there is still no visible change in the smooth surface finish, strength or integrity.



### TESTING FOR ACID

Sample media tested in 2.5% acid (DeLaval - Nitrophos) at 70°C for 30 hours. After 30 hours the media is still clear and strong. No noticeable change in colour or structure. Shore hardness decreased very slightly.

When comparing the tested media with a clear sheet you can notice there is a slight staining effect. This is only visible when directly compared, and has in no way affected the integrity of the media.



## RESULTS IN PERSPECTIVE

The above tests were done in extreme conditions; 2.5% is very a high concentration and running for 30 hours with high concentration levels at an elevated temperature of 70°C is a worse-case designed to evaluate performance limits, not in-use limits.

# Chemicals and Seeflex 040E (contd..)

## RESISTANCE TO ACIDS AND ALKALINE SOLUTIONS

Brief contact with concentrated mineral acids is possible at room temperature, providing that the point of contact is rapidly cleaned with water afterwards. Seeflex 040E displays resistance to dilute mineral acids at room temperature. Organic acids and aqueous solutions of these damage the material more rapidly than inorganic acids.

The same applies for alkaline solutions as for acids: longer contact is possible with highly diluted solutions

## RESISTANCE TO FUELS

The resistance of Seeflex 040E to fuels is determined by the composition of the fuel involved. Seeflex 040E displays good resistance when in contact with fuels of a primarily aliphatic nature – such as standard petrol, diesel oil and kerosene. In the case of fuels that contain alcohol, damage can occur after a prolonged period of contact. Aromatic fuels, such as premium-grade petrol, cause reversible swelling in Seeflex 040E. The extent of the swelling correlates with the content and nature of the aromatic ingredients that they contain.

## RESISTANCE TO OILS AND GREASES

Seeflex 040E is particularly resistant to pure mineral oils (lubricating oils) and water-free greases. Specially modified high-performance lubricants may be incompatible with Seeflex 040E (either the lubricants themselves or their additives), particularly at high temperatures. It is recommended that the effect on mechanical properties and the swelling behavior be checked before lubricants of this type are applied.

## RESISTANCE TO WATER AND NEUTRAL AQUEOUS SALINE SOLUTIONS

At normal temperatures, Seeflex 040E can remain in contact with water (including sea-water) for many years without experiencing any essential changes in its mechanical properties. Higher water temperatures cause a reduction in strength, and temperatures in excess of 80 °C lead to progressive hydrolytic degradation. Ether Urethanes swell in hot water. The resultant properties then remain constant for a long period of time.

## RESISTANCE TO SOLVENTS

Contact with solvents frequently causes the material to swell. This is normally reversible but, in the case of high temperatures and prolonged contact, degradation can result. Aromatics and polar aliphatic solvents, such as ketones, (short-chain) esters and halogenated hydrocarbons cause pronounced swelling in the material. Increased swelling goes hand in hand with a progressive reduction in strength. The swelling process and associated effect on strength are reversible.

**DISCLAIMER:** This information and our technical advice - whether verbal, in writing or by way of trials - are given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. Our advice does not release you from the obligation to verify the information currently provided - especially that contained in our safety data and technical information sheets - and to test our Seeflex 040E as to its suitability for the intended processes and uses. The application, use and processing of our Seeflex 040E and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with the current version of our General Conditions of Sale and Delivery.