

The logo features the letters 'BNL' in a bold, blue, sans-serif font. To the right of the letters is a cluster of seven white circles of varying sizes, arranged in a roughly circular pattern. The background consists of overlapping teal and purple circular shapes.

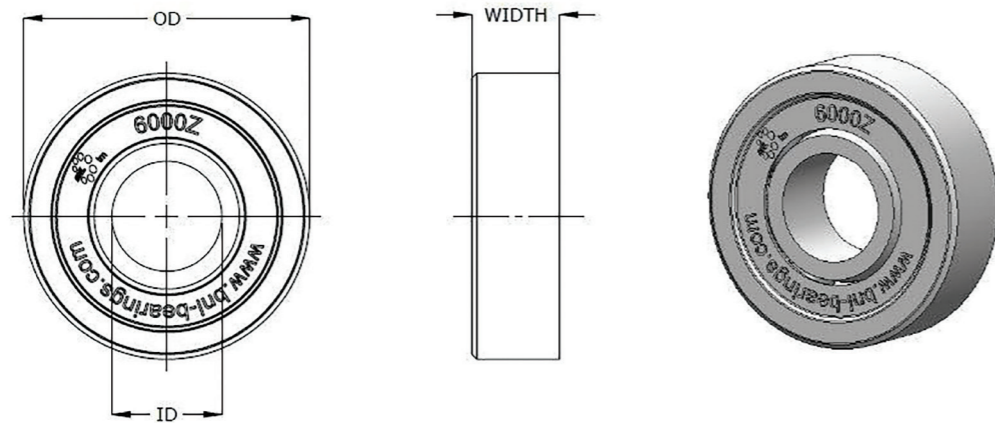
**BNL**

Engineered Innovation

High Performance & Longer Life

Industry Standard Bearings

BNL's range of industry standard bearings are specially designed and manufactured for improved load carrying, wear rates and feel – giving an overall 80% increase in performance over standard machined bearings.

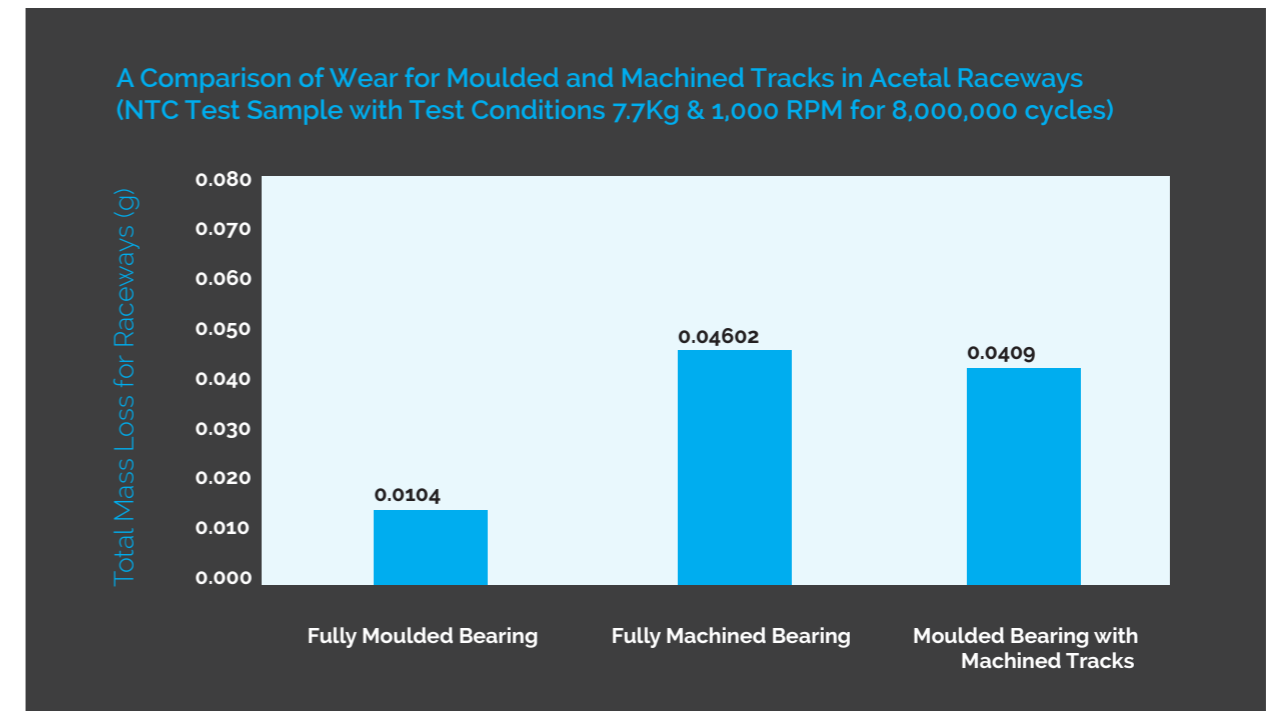
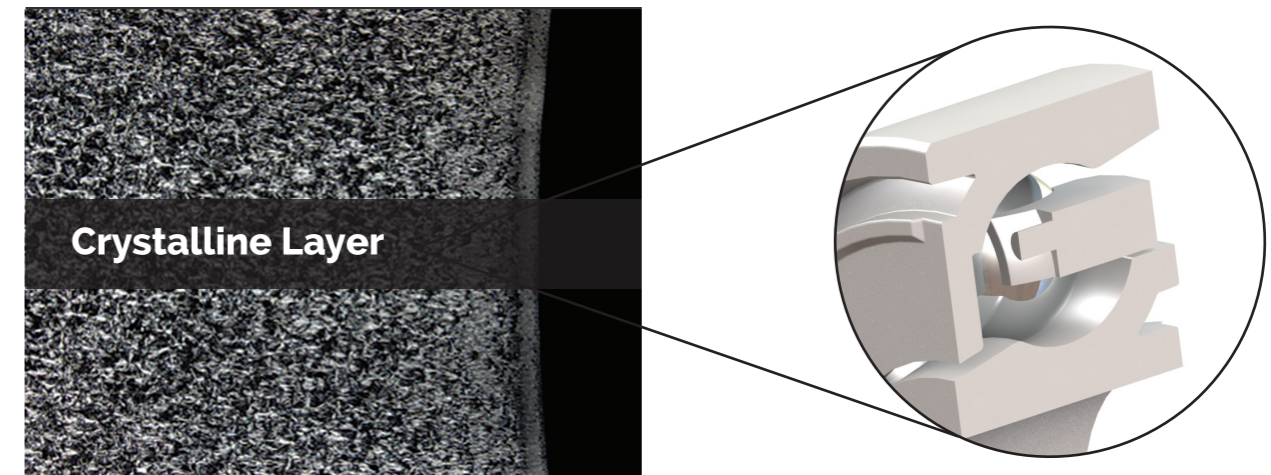


| Industry Ref | BNL Part Number  | ID (mm) | OD (mm) | Width (mm) | Static Load (kg) | Dynamic Load (kg) | Weight (g) |
|--------------|------------------|---------|---------|------------|------------------|-------------------|------------|
| 604Z         | AC604Z-ISB/4N/D  | 4       | 12      | 4          | 4                | 6                 | 0.65       |
| 605Z         | AC605Z-ISB/4N/D  | 5       | 14      | 5          | 5                | 7                 | 1.10       |
| 606Z         | AC606Z-ISB/4N/D  | 6       | 17      | 6          | 7                | 9                 | 2.11       |
| 607Z         | AC607Z-ISB/4N/D  | 7       | 19      | 6          | 8                | 10                | 2.57       |
| 608Z         | AC608Z-ISB/4N/D  | 8       | 22      | 7          | 12               | 16                | 4.12       |
| 609Z         | AC609Z-ISB/4N/D  | 9       | 24      | 7          | 13               | 18                | 4.84       |
| 6000Z        | AC6000Z-ISB/4N/D | 10      | 26      | 8          | 15               | 22                | 7.03       |
| 6001Z        | AC6001Z-ISB/4N/D | 12      | 28      | 8          | 15               | 22                | 7.45       |
| 6002Z        | AC6002Z-ISB/4N/D | 15      | 32      | 9          | 20               | 28                | 11.48      |
| 6003Z        | AC6003Z-ISB/4N/D | 17      | 35      | 10         | 23               | 32                | 13.47      |
| 6004Z        | AC6004Z-ISB/4N/D | 20      | 42      | 12         | 27               | 37                | 24.48      |
| 6005Z        | AC6005Z-ISB/4N/D | 25      | 47      | 12         | 30               | 41                | 29.09      |
| 6200Z        | AC6200Z-ISB/4N/D | 10      | 30      | 9          | 19               | 28                | 11.52      |
| 6201Z        | AC6201Z-ISB/4N/D | 12      | 32      | 10         | 23               | 32                | 14.69      |
| 6202Z        | AC6202Z-ISB/4N/D | 15      | 35      | 11         | 25               | 37                | 17.36      |
| 6203Z        | AC6203Z-ISB/4N/D | 17      | 40      | 12         | 27               | 38                | 24.26      |
| 6204Z        | AC6204Z-ISB/4N/D | 20      | 47      | 14         | 30               | 42                | 36.05      |
| 6205Z        | AC6205Z-ISB/4N/D | 25      | 52      | 15         | 34               | 46                | 43.74      |
| 6300Z        | AC6300Z-ISB/4N/D | 10      | 35      | 11         | 25               | 35                | 17.70      |
| 6301Z        | AC6301Z-ISB/4N/D | 12      | 37      | 12         | 26               | 37                | 23.98      |
| 6302Z        | AC6302Z-ISB/4N/D | 15      | 42      | 13         | 28               | 39                | 30.20      |
| 6303Z        | AC6303Z-ISB/4N/D | 17      | 47      | 14         | 30               | 39                | 45.81      |
| 6304Z        | AC6304Z-ISB/4N/D | 20      | 52      | 15         | 40               | 52                | 55.20      |
| 6305Z        | AC6305Z-ISB/4N/D | 25      | 62      | 17         | 50               | 60                | 86.78      |
| 6800Z        | AC6800Z-ISB/4N/D | 10      | 19      | 5          | 6                | 8                 | 1.54       |
| 6801Z        | AC6801Z-ISB/4N/D | 12      | 21      | 5          | 7                | 10                | 1.77       |
| 6802Z        | AC6802Z-ISB/4N/D | 15      | 24      | 5          | 8                | 11                | 2.07       |

## Unique Design & Manufacture

BNL's industry standard bearings harness the material properties of thermoplastics and combine them with expert design and manufacturing techniques to provide high performance, long-lasting bearings.

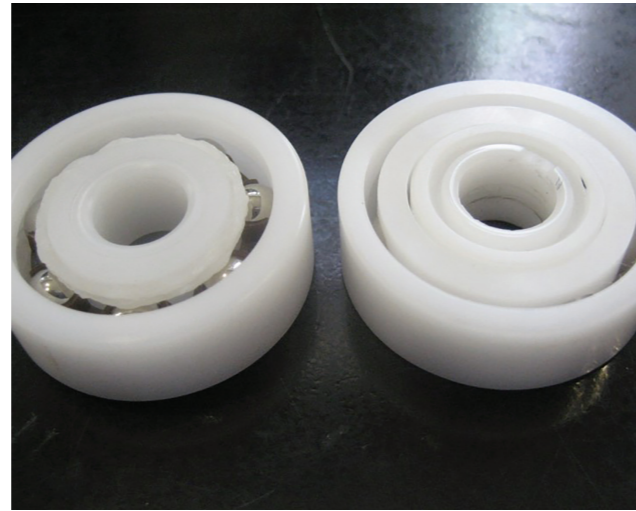
Our specialised manufacturing process allows us to equip each bearing with a hardened crystalline layer, improving wear rates and life expectancy. Our industry standard bearings have also benefitted from a redesign that has improved load carrying capability and overall performance.



Measuring the mass lost in operation of moulded bearings versus moulded bearings with machined raceways, demonstrates how the crystalline layer gives the fully moulded BNL bearing a much better wear rate than those manufactured using machining methods.

# Superior Moulded Plastic Bearings

We use our unique moulding techniques, careful material selection, decades of product knowledge and design expertise to manufacture bearings that outperform other plastic bearings on the market today.

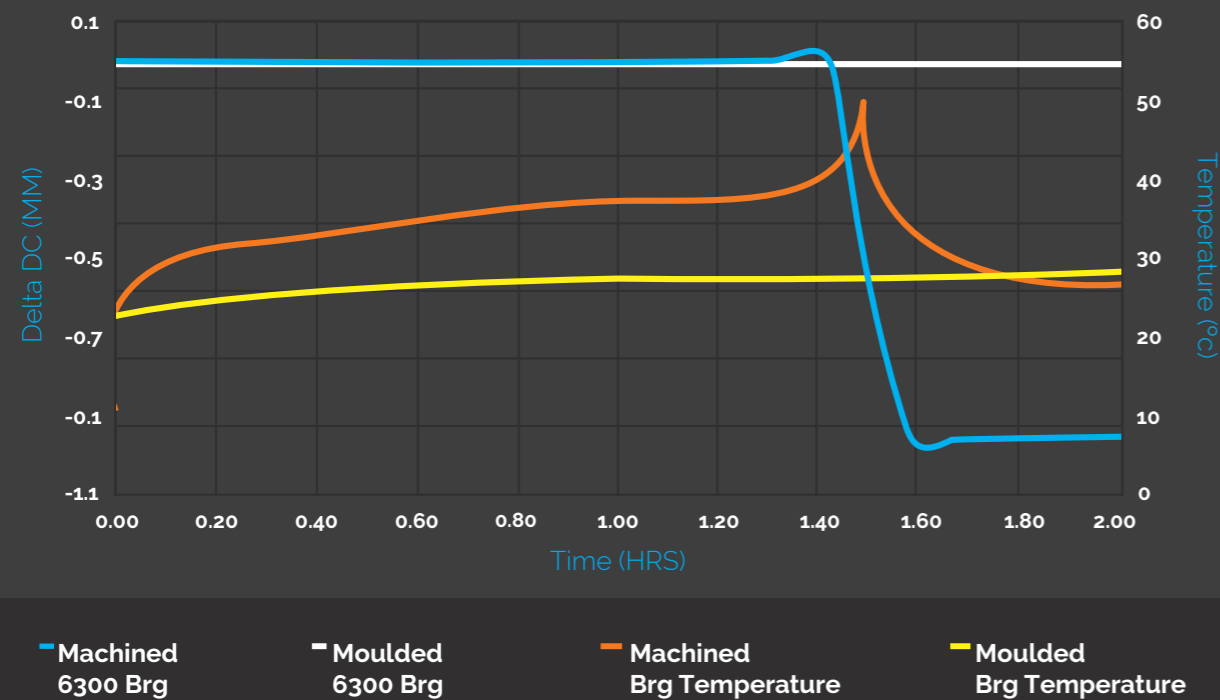


We tested our moulded bearings against a popular machined bearing currently on the market. A machined 6300 series bearing was tested under the same conditions as a BNL fully moulded 6300 series bearing. BNL's moulded bearing remained at a constant temperature and DC but the

machined bearing began to wear much faster, generating more heat. After 1.5 hours and 90,000 revolutions the inner raceway of the machined plastic bearing melted and the bearing failed. BNL's bearing completed the test.

## Machined vs Moulded ISB6300 Bearing Comparison

A machined 6300 series bearing was tested under the same conditions as a BNL fully moulded 6300 series bearing.

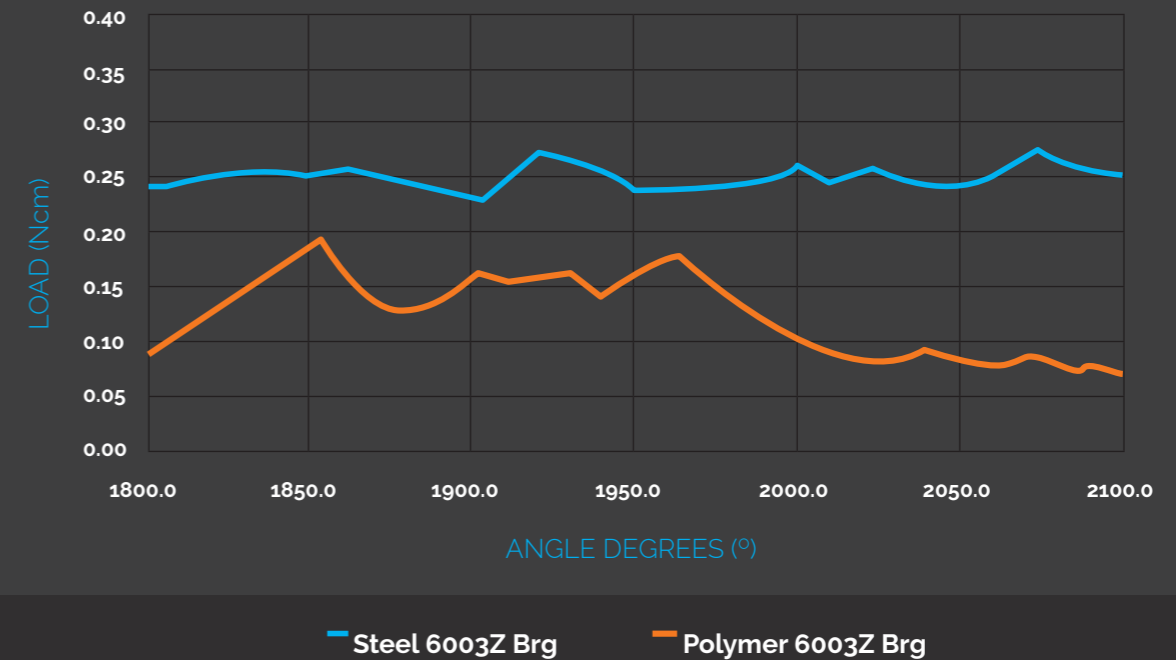


Speed 1000 rpm - Load 20Kg - Duration 1 million revolutions

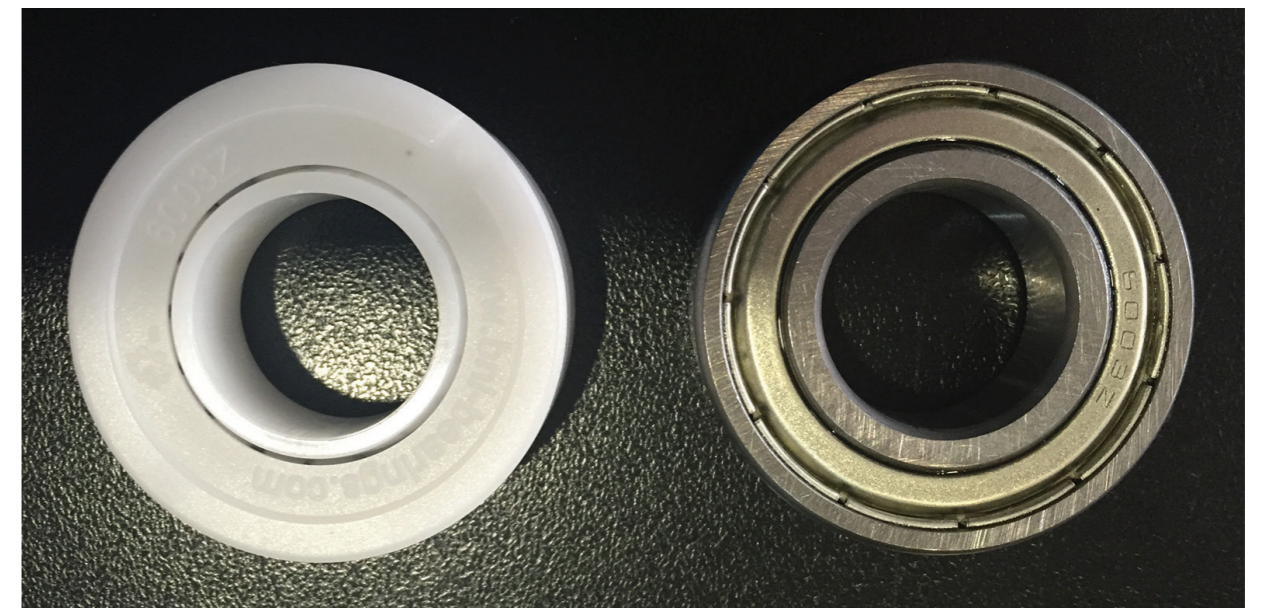
# Smooth Operation

Our plastic bearings are lightweight and require no grease to operate smoothly and efficiently, so have a lower torque to rotate than an equivalent steel bearing.

## Steel Bearings vs Polymer Bearing Torque to Turn



Our plastic 6003Z bearing has 0.15Ncm lower torque to turn than a steel 6003Z bearing.



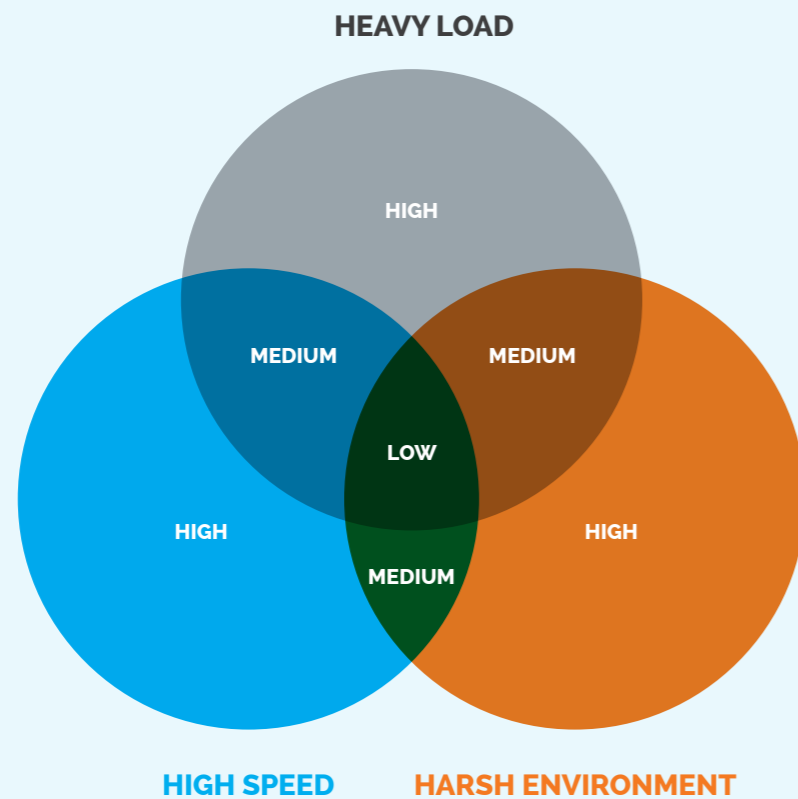
This means our bearings use less power at start up and during operation, allowing our customers to choose smaller and less expensive motors for their systems and also assisting in reducing energy use.

# Load, Speed, Environment

The life of a bearing is affected by its environment, the load it must carry, the speed it operates at, plus how much these vary across its service life. Plastic bearings are affected in different ways by these different conditions.

A plastic bearing can carry heavy loads, reach high speeds and be suitable for many specialised and severe environments. However, as shown in the diagram below, if an application is exposed to more than one of these factors, the potential life of the bearing can be affected. The diagram shows the

sustainability of plastic bearings where load, speed and environment are all factors. Each factor is shown as a coloured circle. Where they intersect, the operating conditions include more than one factor and the suitability is shown as High, Medium or Low.



## High:

The plastic bearing will operate efficiently and achieve a good life.

## Medium:

The plastic bearing will operate efficiently but wear rates will be higher and bearing life will be affected.

## Low:

This combination of factors will affect both efficiency and life of the bearing.

# Material Choice

Made of thermoplastic materials, BNL industry standard bearings are all lightweight, have low inertia, are water resistant and require no lubrication.

## Acetal / Polyoxymethylene (POM)

Most of our products are made from Acetal. This is a widely used engineering plastic that is dimensionally stable when subjected to a range of loads, fluids and temperature fluctuations. It has excellent fatigue resistance and low moisture absorption. It has a low co-efficient of friction delivering good long-term wear performance.

## Ball Materials

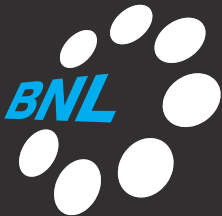
Our industry standard bearings are made with SS316 stainless steel balls as standard.

The SS316 ball has excellent corrosion resistance, withstanding acidic environments including sulphuric and nitric acid, photographic chemicals, bleach and solvents. It is non-magnetic.

For other environments we can offer alternative ball materials on request:

- SS420
- Glass (Borosilicate)
- Carbon
- Zirconium Oxide
- Polyethylene

|                             | POM   |
|-----------------------------|-------|
| <b>Temperature</b>          |       |
| Min Service Temperature     | -50°C |
| Max Service Temperature     | 90°C  |
| <b>Chemical Resistance*</b> |       |
| Petrol                      | ✓     |
| Brake Fluid                 | ✓     |
| Diesel Fuel                 | ✓     |
| Kerosene                    | ✓     |
| Mineral Oil                 | ✓     |
| Chlorine Water              | ✓     |
| Ozone                       |       |
| Hydrochloric Acid           |       |
| Hydrofluoric Acid           |       |
| Sulphuric Acid              |       |
| Ammonia                     |       |
| Sodium Hydroxide            | ✓     |
| Ammonium Hydroxide          |       |
| Methyl Alcohol (Methanol)   | ✓     |
| Ethyl Alcohol (Ethanol)     | ✓     |
| Acetone                     | ✓     |
| Formaldehyde                | ✓     |
| Methyl Ethyl Ketone         |       |
| Sea Water                   | ✓     |
| Distilled Water             | ✓     |



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