

# Frequently asked questions about hydraulic fluids you never had anyone to answer

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Acting as a lubricant, heat transfer medium, energy transfer medium and sealing element, hydraulic fluid is a critical component. And, given the widespread usage of hydraulic equipment in a variety of industries, it's natural that numerous concerns concerning the use of these fluids arise.



This article was written to emphasize the critical nature of correct material handling, to discuss the dangers of improper application and to address the most often asked questions about hydraulic fluids. Read on!

## What role does hydraulic fluid play in industrial equipment?

Hydraulic fluids are used in a variety of ways in industrial equipment, including the following:

- ▶ the process through which force is transferred to a hydraulic actuator
- ▶ the process of removing heat from components



- ▶ lubrication of line components such as valves and actuators

Additionally, it lubricates the components of the hydraulic pump. So much so that the pump maker specifies a large portion of the oil parameters for its equipment.

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## How do the pump manufacturer's specifications affect the fluid selection process?

Each manufacturer will mention in the operation manual for the hydraulic pump its own standard or a market standard – such as DIN, which is frequently used for this type of application. These different standards depend on their observable performance. Usually, the hydraulic system's standards are sequential.

Although there are exceptions, performance is generally progressive. DIN part 2, 51.524, for example, establishes performance standards for pour point, corrosion testing, foaming, thermal stability and pump wear, among other factors.

It's worth mentioning that a manufacturer-specific standard should also satisfy DIN's standards as well. Indeed, it may go even further, with more strict requirements. Bosch, one of the leaders in this market, has the most rigid tests covering all aspects of its products.

## What to look for and what to avoid while choosing hydraulic fluids?

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The primary error here is that, as with any commodity, one frequent motivator for the purchase of a product is exclusively its price. Due to a lack of information regarding standards, some consumers feel that any fluid can be used in equipment that requires more precise specifications.

To see how it works in practice, let us return to the DIN example, which consists of parts 1, 2, and 3.

If the fluid complies with part 3, it may be used in any equipment that complies with parts 1 and 2. Part 2 compliance, on the other hand, can be applied to any piece of equipment that requires parts 1 and 2. If it complies with part 1, it may be applied only to equipment that specifically requests compliance with part 1.

On a daily basis, clients frequently prefer to purchase fluids that only meet part 1, which means they are less expensive, but are used in applications that require part 2 or part 3. Often, this error is caused by the lack of attention to specifications.

The problem is that this failure can have a number of adverse repercussions, including cavitation.

## What are the dangers of using insufficient fluid or applying it incorrectly?

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In the absence of hydraulic fluid, the system's efficiency can deteriorate to the point that it becomes impossible to operate the equipment. Inappropriate fluid selection can result in equipment degradation, such as cavitation in pumps.

## What is the working pressure and temperature for effectiveness of a hydraulic fluid?

The operating pressure of the fluid is determined by the specification under which it is approved, as each manufacturer of equipment or hydraulic pumps states its specifications for the fluid in order for the machinery to operate properly.

As a result, the material manufacturer does not specify the fluid's operating temperature. In general, when recommending a hydraulic oil for a particular application, several factors have previously been considered, including the following:

- ▶ clearance between the pump components
- ▶ the optimal pressure at which to work
- ▶ the flow rate at which the pump should operate

The manufacturer then specifies viscosity (or range of viscosities) for the application.

## Can hydraulic fluids be combined in any way?

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In general, no combination of any form of lubricant is recommended. However, when the volume capacity of lubricant tanks is very large, compatibility testing can be performed to determine whether or not one fluid reacts unfavorably to another.



It is critical to emphasize that no assurance can be made regarding the functioning of a hydraulic oil mixture.

## What is the difference between a standard hydraulic fluid and a hydraulic fluid with a high viscosity index (HV)?

As the name implies, the primary distinction is in the viscosity index of the product.

This feature determines how the oil behaves as the temperature changes – the viscosity reduces as the temperature rises and vice versa. The fluids that have a high viscosity index have less variation.

## Is it possible to say that a high viscosity index correlates with the oil's quality?

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In fact, the right term would not be quality. Certain oils are suitable for application while others are not. When a high viscosity oil is utilized, it is because the operation is subjected to significant temperature variation or there is insufficient control over the fluid's application temperature.

So, investing in an oil with the optimal viscosity means betting on a product that is suitable for the application, taking into account the site's level of temperature variation.

## Are hydraulic oils fortified with additives to withstand extreme pressure?

Usually, no. Hydraulic oils typically contain anti-wear, anti-foaming and anti-corrosion additives. However, some multifunctional products may have extreme pressure additives.

Typically, the addition is for anti-wear properties, having a very similar function to the extreme pressure additivation.

## What are the distinctions between equipment manufacturer specifications?

Each equipment or hydraulic pump manufacturer chooses the performance levels and chemical components that the lubricant should have for the application at hand. Currently, PETRONAS has

PETRONAS Hydraulic PLUS, homologated to the market's most stringent standards

Understanding a little about hydraulic fluid allows you to make better decisions, based on the specifications of each piece of equipment and even the characteristics of the company's operation. As a result, you can combine price and quality to make the best cost-benefit decision.

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