

QUENCHING OILS  
WATER DILUTABLE POLYMER QUENCHANTS  
SALT BATHS  
CARBURISING PROTECTIVE PASTES

# HEAT TREATMENT



**PETROFER**  
industrial oils and chemicals

## INTRODUCTION

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Quenching media are used to harden steel or cast iron after austenitising the workpiece. Depending on the material/alloy and the choice of quenching medium (for example oil, water based polymer solution and molten salt), the workpiece cools down at a specified speed and in a controlled manner.

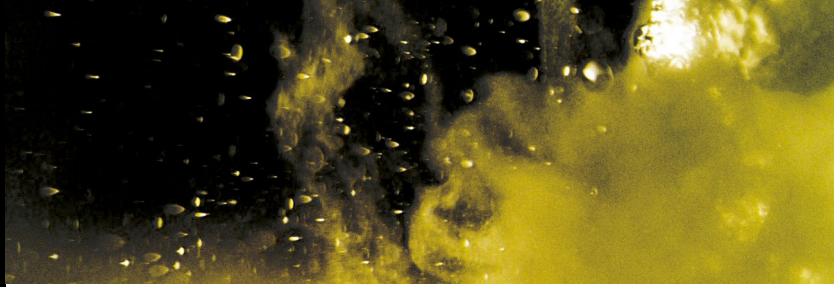
Modern heat treatment processes are constantly making new demands on quenching fluids. PETROFER's extensive development programme ensures that our product range is more than capable of meeting new industry advances. We are constantly screening new materials for their suitability for our formulations and our existing product range is continually modified and improved in our laboratories, supported by field testing in production environments to ensure that the best available technology is used.

Our customer partnership approach in heat treatment has helped our clients with:

- increased cost savings
- improved process efficiency
- application simplification
- energy saving and environmental improvements

PETROFER's product range for heat treatment provides our customers with a complete portfolio for the whole range of heat treatment processes. Advantages that benefit you and your company.

*“uniform  
and controlled”*



## OUR PRODUCT RANGE

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### QUENCHING OILS

PETROFER manufactures every type of quenching oil, from simple quenching oils for hardening highly alloyed steels all the way through to accelerated quenching oils for achieving maximum hardness depth in low alloyed or plain carbon steels. We also have water washable versions of almost all of our quench oils available, as well as specialist synthetic (mineral oil free) biodegradable quenching and tempering fluids. All of our quench oils share a common trait, they are manufactured with the best quality additives to ensure low oxidation, best resistance to ageing and minimal evaporation. With our ISOMAX, ISORAPID, MARQUENCH and VACUQUENCH series PETROFER offers a comprehensive portfolio of quenching oils – for cooling at different speeds, all types of components, every furnace design and all heat treatment process requirements. Also available are leading edge technology GTL (gas to liquid) quench fluids.

### WATER DILUTABLE POLYMER QUENCHANTS

PETROFER were the pioneer of polymer quenching technology, originally developed to provide controlled and safe quenching, which bridged the gap between properties achievable with accelerated quench oils and water quenching. The water dilutable AQUATENSID, AQUACOOOL and FERROQUENCH polymer quenching media are used for cooling components made of steel, cast iron, alloys and aluminium. Mixed polymer quenchant solutions have no fire risk and in certain heat treatment processes our products are able to replace accelerated quenching oils. In recent years PETROFER has further developed the polymer quenchant range meeting and exceeding both the latest legislation and international standards.

### SALT BATHS

Heat treatment salts have been manufactured by PETROFER for decades, and we are now one of the few remaining companies globally that still offer a wide range of products to suit most salt bath heat treatment processes. Our AQUARAPID and NEUTROSAL ranges are suitable for a wide variety of special applications – from the heat treatment for hardening steel, martensite and bainite transformation, heat transfer and rubber vulcanisation. Salt baths have many advantages including: cost effective treatment, low distortion, uniform temperature distribution and short treatment times.

### CARBURISING PROTECTIVE PASTES

Innovative water based and conventional solvent based pastes protect parts in many heat treatment processes. Our SURFATECT range includes products for protection from gas carburising, gas nitriding, plasma nitriding, vacuum heat treatment processes and brazing. After treatment is completed residues of the protective pastes are removed easily: either in aqueous cleaning solutions or mechanically.

## YOUR BENEFITS

### REDUCTION OF TOTAL COST OF OWNERSHIP

- high ageing resistance
- large cost savings due to extraordinarily long product life
- less plant downtime due to cleaning and refilling
- lower disposal costs

### HIGHER PROCESS EFFICIENCY AND RELIABILITY

- efficient products with excellent price performance ratio
- low thermal stresses: reduction of dimensional and shape changes, less rework
- optimal and uniform heat treatment results
- full quenching speed range from faster than water to slower than oil
- very even temperature distribution: high flexibility in the heat treatment process, short austenitisation times, avoidance of high thermal stresses
- highly stable products with long process life
- use of highly refined base oils extend life and reduce sludge formation

### IMPROVEMENT OF THE ENVIRONMENTAL BALANCE

- high evaporation resistance, low gas absorption and rapid degassing
- reduced smoke and fume emissions
- water based products: increased work safety through flame and fume avoidance and using physiologically/toxicologically harmless formulations

## APPLICATION EXPERTISE

### INDUSTRIAL SECTORS USING OUR PRODUCTS

- aerospace, defence and marine
- agricultural and construction equipment with supply chain
- automotive and components supply chain
- casting and forging
- consumer, electronics, white and brown goods
- heat treatment
- machine tool OEM's
- medical equipment
- power generation
- pressings, extrusion, hydroforming and fasteners
- public transportation

### APPLICATION EXAMPLES

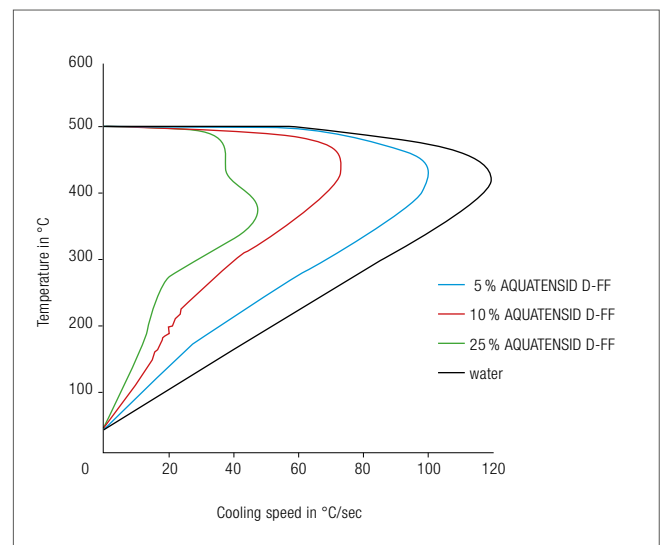
Accelerated high performance quenching oils ISORAPID and MARQUENCH are used to harden components such as gears, fasteners and bearings while modern water dilutable polymer quenchants FERQUENCH and AQUATENSID are used for hardening crankshafts, oil industry parts, forgings, shaft, bearings and many other applications.

### HIGHLIGHT PROJECT

PETROFER's water dilutable quenchants are successfully used in many applications. The water dilutable quenchant FERQUENCH 2000, as an example of technical progress, has been used as a replacement for quench oil in many tank quenching applications. This has provided users of this product an improved, safer, cleaner work environment, due to chemistry which is absolutely non-combustible, thus reducing flames and fumes.



Hot metal is quenched



Quenching characteristic of AQUATENSID

PETROFER is a system supplier and offers perfectly coordinated chemistry along the entire production process route.

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HEAT TREATMENT

2

DIE-CASTING AND FORGING

3

FIRE RESISTANT HYDRAULIC FLUIDS

4

METALWORKING FLUIDS

5

METAL FORMING LUBRICANTS

6

INDUSTRIAL LUBRICANTS

7

INDUSTRIAL CLEANERS

8

RUST PREVENTATIVES

9

PAPER CHEMICALS

10

SUPPORT

For further information please visit or contact through our website  
[www.petrofer.com](http://www.petrofer.com)



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