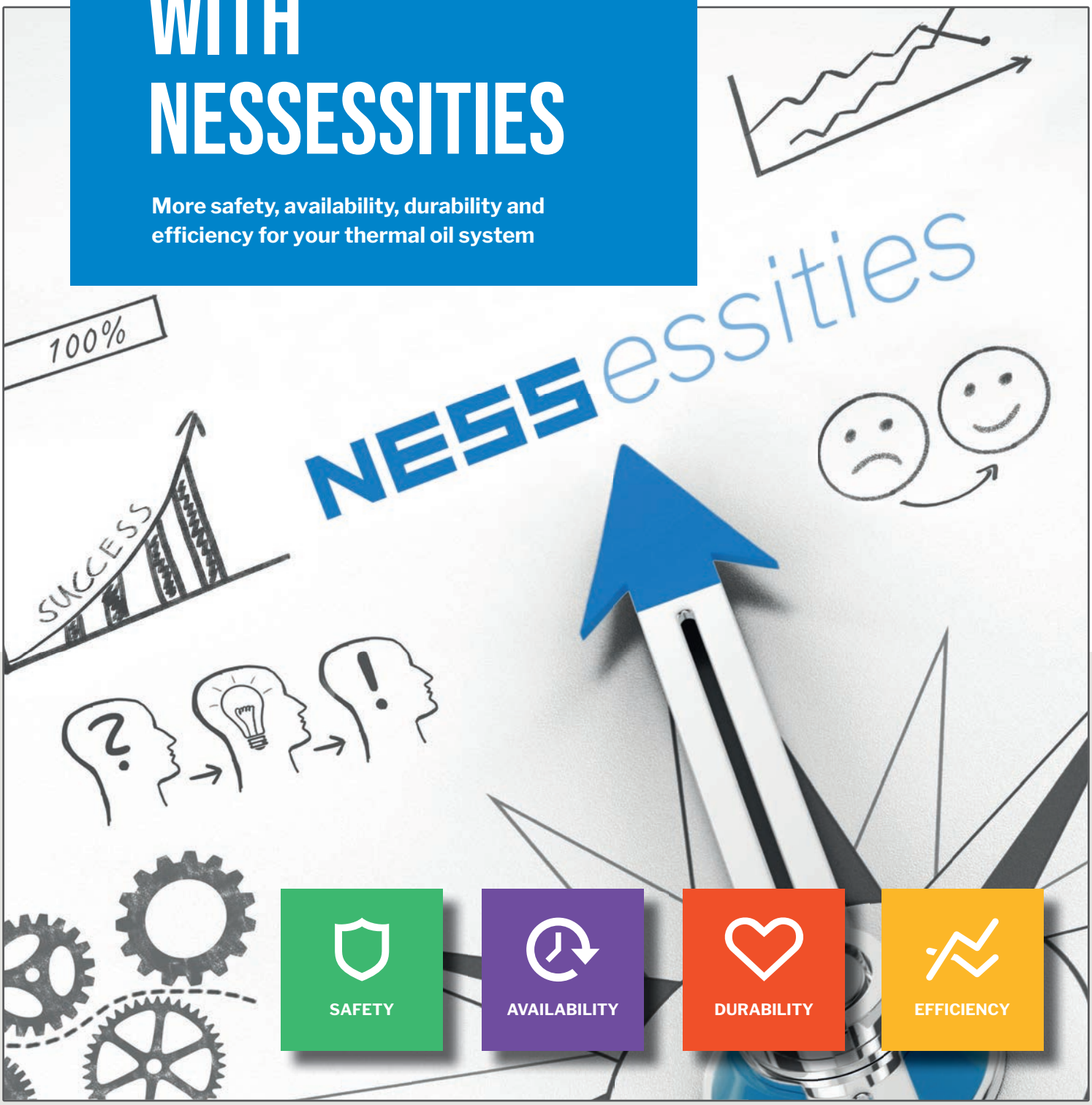
# EVEN MORE SUCCESSFUL WITH NESSESSITIES

NESS
The Process Heat Company

**More safety, availability, durability and efficiency for your thermal oil system**

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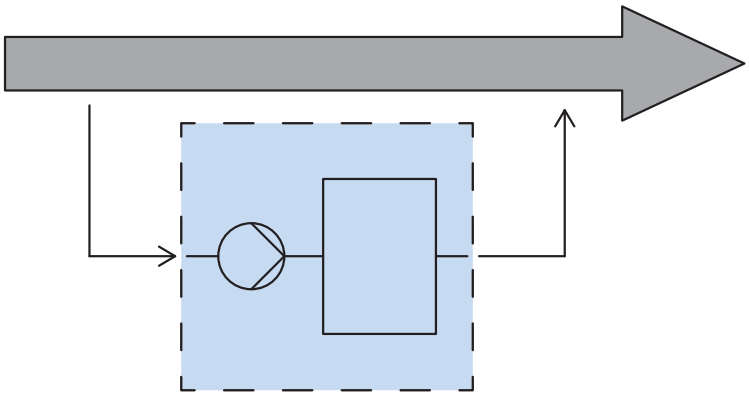
NESSESSITIES BROCHURE

Permanent increase of
**safety, availability, durability and efficiency**
of your thermal oil system

# THE MODULAR CONCEPT FOR YOUR SUCCESS

## MODULAR AND NEED-BASED SOLUTIONS FOR YOUR THERMAL OIL SYSTEM



NESSessities

Each of our NESSessities was developed in close cooperation with our customers and is therefore very practice-oriented.

As a result, the systems are easily and modularly retrofittable. Existing processes are not affected, since NESSessities run in a sidestream.

**Our systems are in use worldwide and suitable for almost every thermal oil system.**

## NESSESSITIES WORK INDEPENDENTLY IN A SIDE STREAM OF THE SYSTEM

Your framework conditions are in focus!

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NESSessities

# NESSessities

**Products for a permanent increase of safety, availability, durability and efficiency in thermal oil systems**

## SAFETY

**More safety for employees and operations plant**

## AVAILABILITY

**Intelligent solutions protect against unwanted downtime of the system**

## DURABILITY

**Permanently prolongs the life of thermal oil and system components**

## EFFICIENCY

**Increases the efficiency of system components and reduces operating costs**

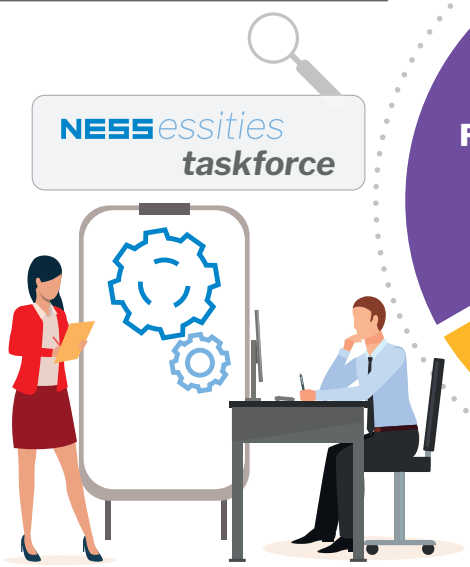
Benefit from our expertise:
**Thanks to decades of experience, we see the whole picture**

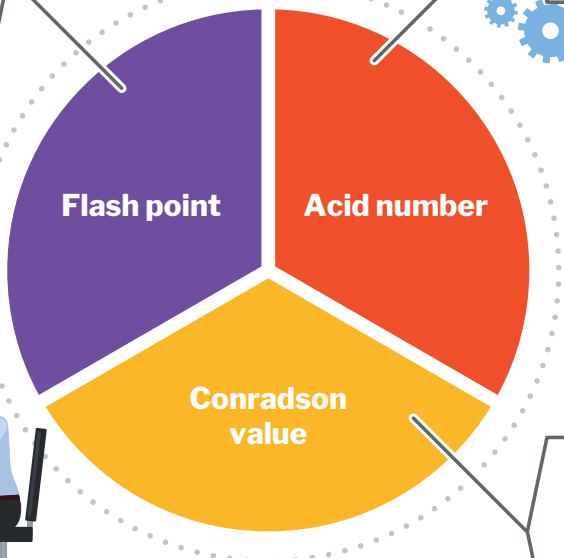
# HOW WE PROCEED TOGETHER

## ANALYSIS OF THREE KEY OIL PARMETERS - DETERMINING REQUIRED ACTIONS - AVOID UNNECCESSARY OIL CHANGES!

Light-ends are formed due to thermal stress on the oil and lower the flash point. **A low flash point increases the risk of fire.**

Through reaction with oxygen, the oil becomes increasingly acidic. **The acid number indicates the degree of oxidation.**




Carbon-like residues (Conradson analysis) are formed due the thermal stress on the oil. **The carbon value gives information about deposits in the system.**

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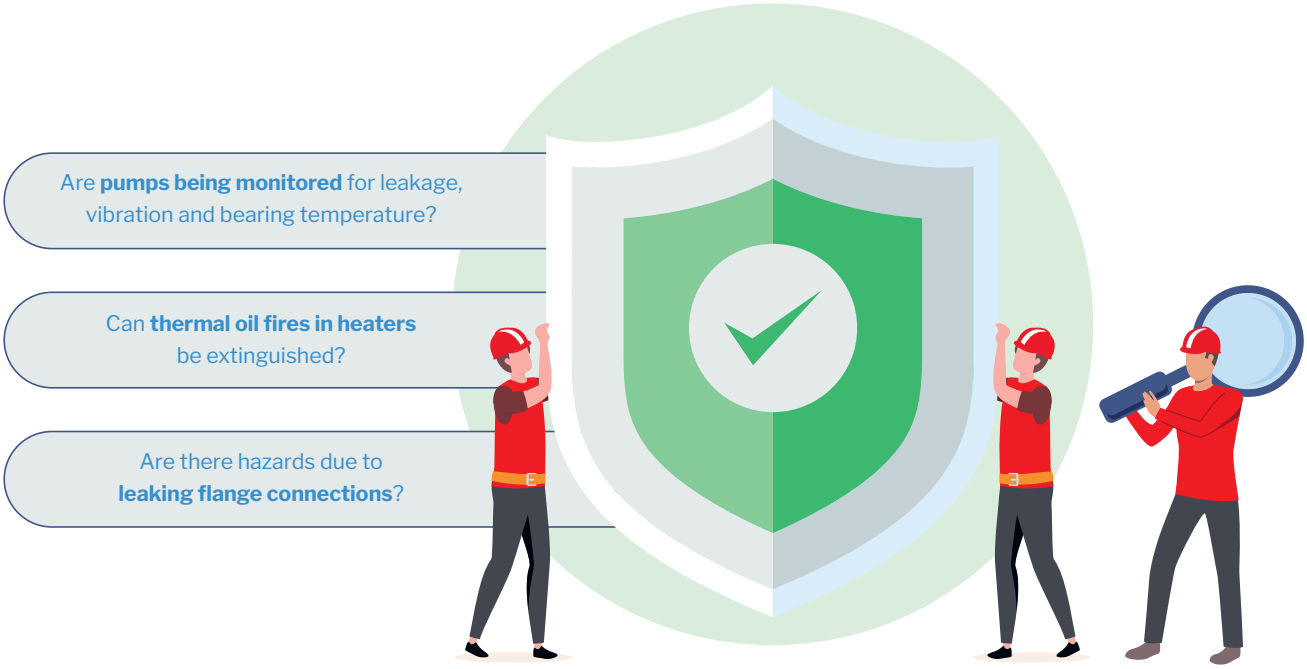
# CHECKS FOR ADDITIONAL SAFETY HAZARDS - FURTHER INCREASE OF PLANT SAFETY




# REQUIREMENT FOR THE OIL ANALYSIS: PROFESSIONAL AND SOUND SAMPLING

Knowing the condition of the fluid enables you to make the right decisions.

If hot oil is sampled, light-ends may escape and the sample is meaningless. Therefore, the sample must be cooled during extraction.

**The NESS Sample cooler NPK40 cools the sample liquid with cooling water and helps to take exact samples.**

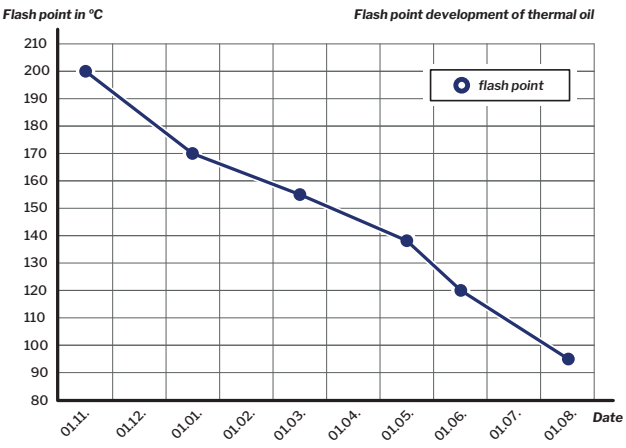
#1 PROFESSIONAL SAMPLING LEADS TO AN EXACT STATUS DETERMINATION
#2 A DETAILED ANALYSIS ENABLES TARGETED DECISIONS

Remove light-ends from the oil:
**Massively reduce fire hazard and lower cavitation risk in pumps**

# INCREASE THE FLASH POINT PERMANENTLY

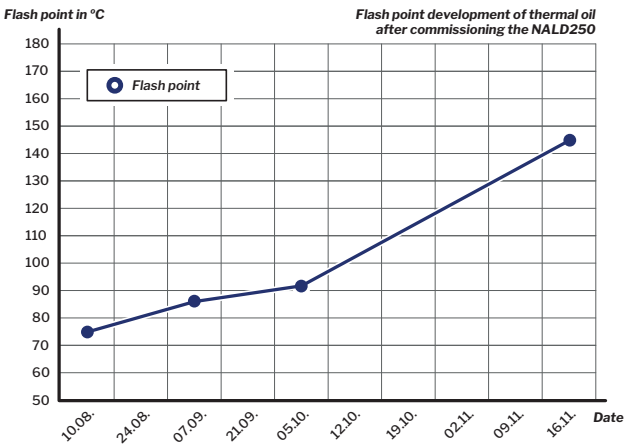
## A LOW FLASHPOINT IS A SAFETY RISK - WE OFFER YOU A LASTING AND EFFICIENT SOLUTION

### WITHOUT LIGHT-ENDS REMOVAL




Thermal oil: BP Transcal N / Volume of the plant: 50.000 l

### WITH LIGHT-ENDS REMOVAL




Thermal oil: Sasol Marlotherm SH / Volume of the plant: 30.000 l

**Your system works more effectively and safely with a permanently high flash point.**
**A constantly high flash point means less downtime.**

Learn more about our light-ends removal systems and other solutions on our NESS Youtube channel

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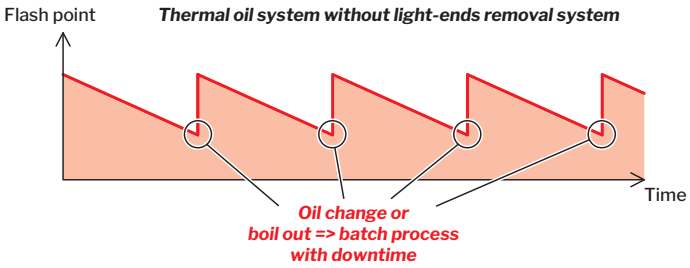
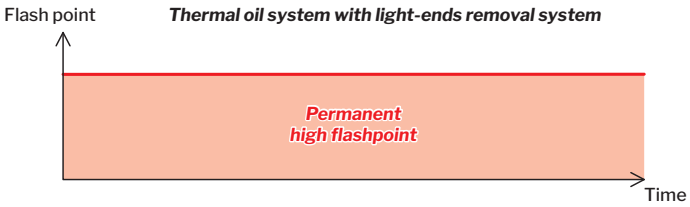
# UP TO 120 LITERS OF LIGHT-ENDS REMOVED PER DAY

Light-ends are continuously generated in thermal oil systems depending on the operating temperature.

**Basically: The higher the operating temperature, the more light-ends are formed. If the light-ends content increases, the flashpoint of the thermal oil decreases.**

The NESS light-ends removal systems remove them and the flash point is constantly maintained on a high level. This improves plant safety and reduces cavitation risk in pumps.




#1 A PERMANENTLY HIGH FLASH POINT IS SAFETY RELEVANT
#2 LESS LIGHT-ENDS MEANS LESS DOWNTIME

Remove dirt particles from thermal oil:
**Against deposits in pipes and heat exchangers**

# OIL FILTRATION AGAINST DEPOSITS

## DEPOSITS IN THE HEATER AND SYSTEM REDUCE SAFETY AND EFFICIENCY - FILTERING THE OIL PREVENTS THESE NEGATIVE CONSEQUENCES

### DEPOSITS IN PIPES

### DEPOSITS IN HEAT EXCHANGERS

**Dirt particles settle in your system over time and cause lasting damage to safety and efficiency. By permanent filtration, these problems are counteracted.**

Learn more about our fine filter station
and other solutions on our NESS Youtube channel

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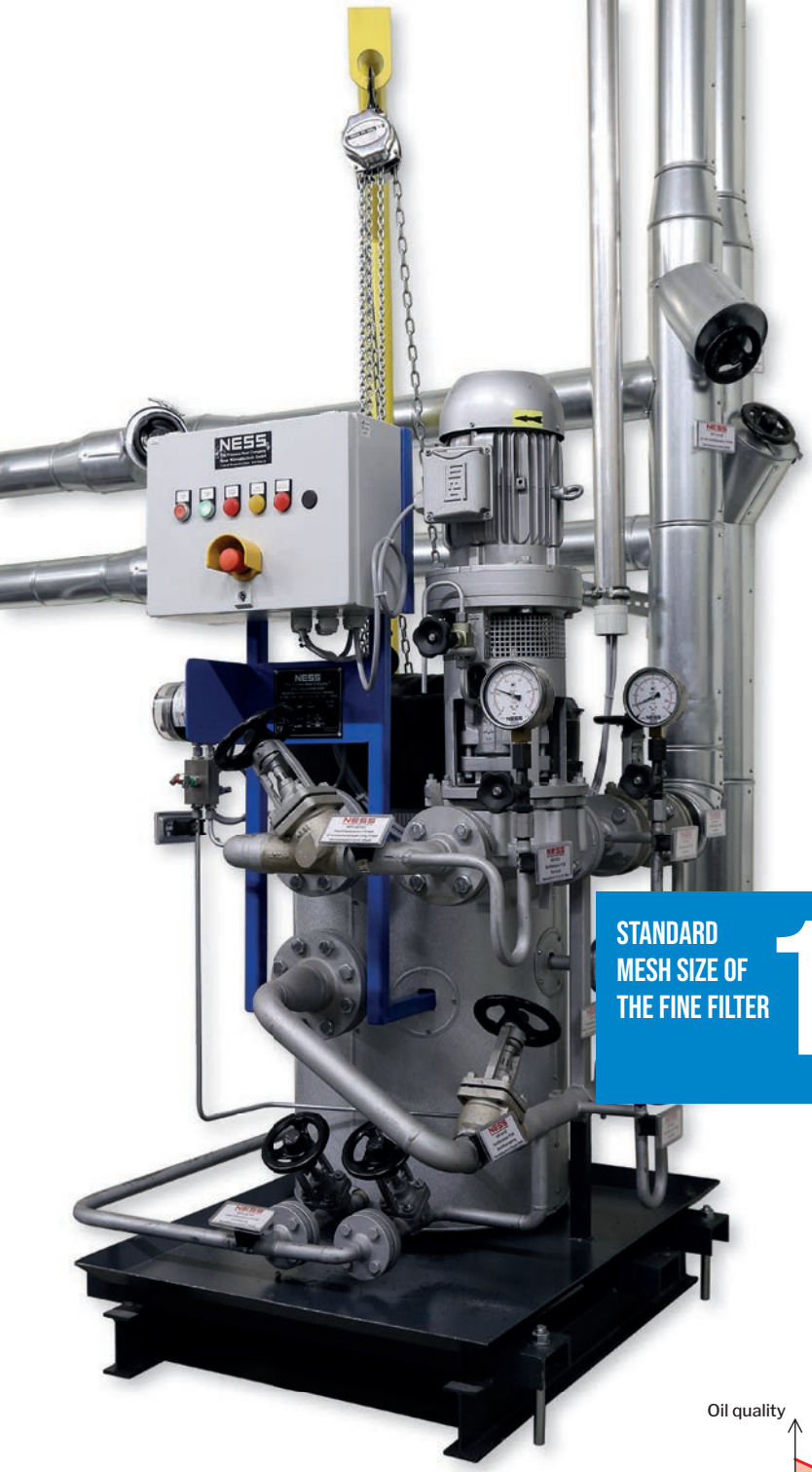
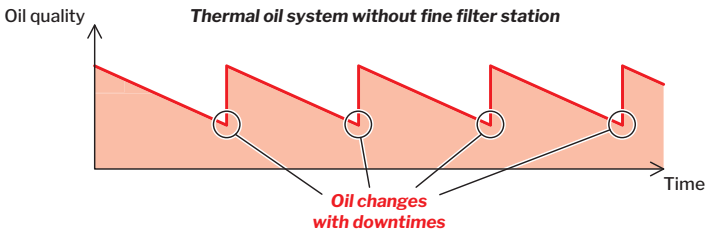


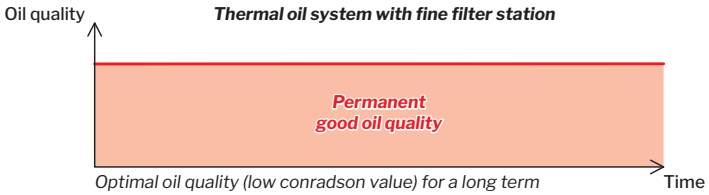
The degree of contamination can be determined with an oil analysis according to DIN 51551. In the analysis, the carbon residue (Conradson value) is measured. This is a very good indicator for the contamination of the oil and the plant with fine particles.

**Apart from carbon-like residues, production-related metal particles from the inner walls of the pipes can come loose, especially in new systems. Therefore, it is advisable to install a fine filter system from the beginning.**

STANDARD MESH SIZE OF THE FINE FILTER **15µm** COMPARISON: 1000 - 1600 µM IN A STANDARD STRAINER

**The NESS Fine filter stations continuously remove small particles in a side stream and increase the service life of the thermal oil, as well as the operational safety and effectiveness of the system.**




#1 VERY SMALL PARTICLES INCREASE WEAR, DEPOSIT IN THE SYSTEM AND IMPAIR FLOW AND FUNCTION
#2 THE HEAT TRANSFER SUFFERS MASSIVELY FROM DEPOSITS IN THE SYSTEM

Lowering the acid number in thermal oil:
**Preventing oil oxidation and reducing the risk of fire**

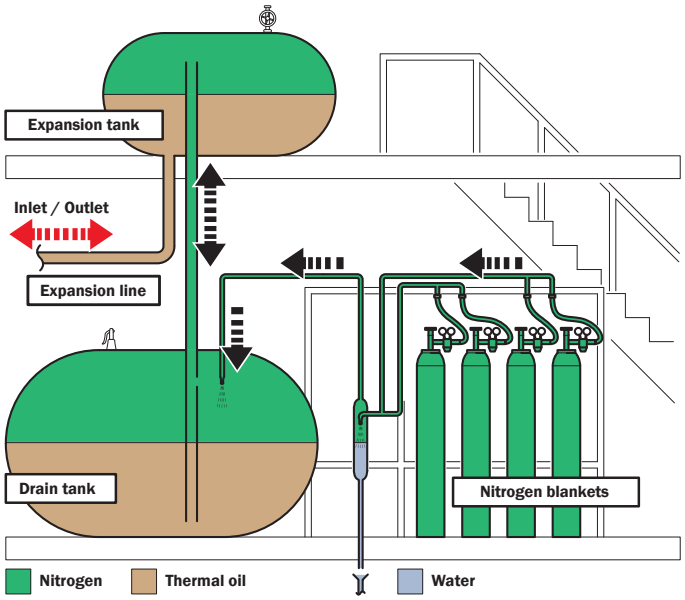
# PROTECTION AGAINST $O_2$ IN THE SYSTEM

## PROTECTS AGAINST CORROSION AND EXPLOSIVE GASES IN THE SYSTEM - A NITROGEN BLANKET HAS SEVERAL ADVANTAGES

The NESS system covers both the drain and the expansion tank. This has the following advantages:

**The nitrogen blanket in the drain tank counteracts the formation of condensate (water) and thus corrosion. In addition, the formation of explosive gases is prevented.**

**The fully automatic NESS nitrogen blanket systems NBS protect against oxidation, can extend the service life of the thermal oil and reduce the risk of fire.**




#1 PROTECTION AGAINST CORROSION AND OXIDATION
#2 PREVENTS EXPLOSIVE MIXTURES AND THUS LOWERS THE RISK OF FIRE

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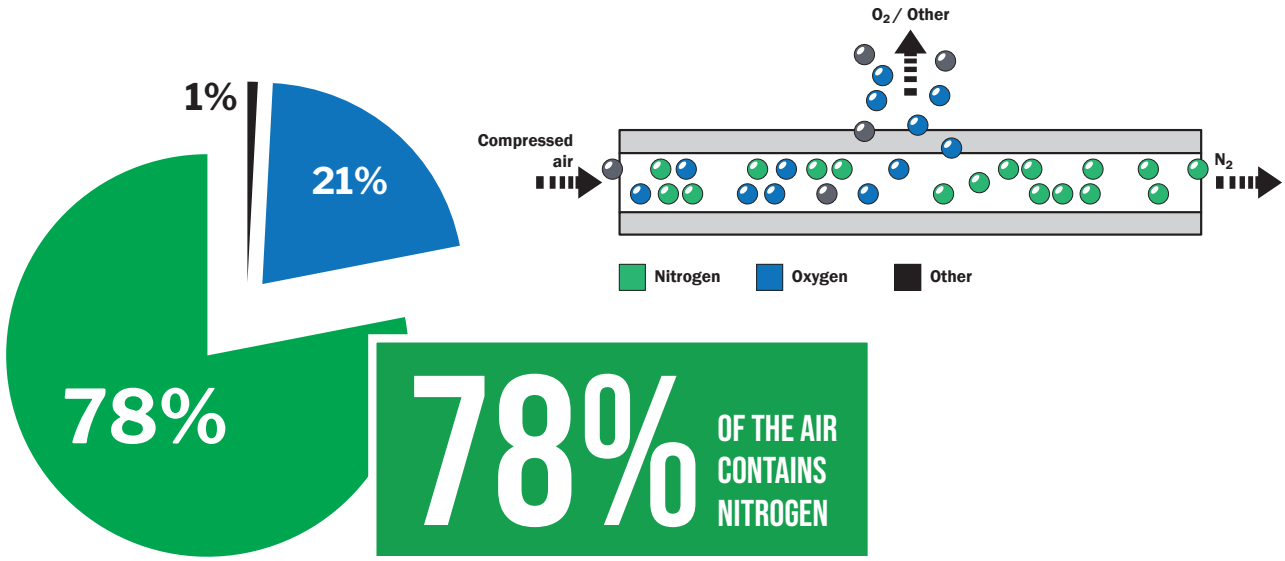
# CHEAP AND ALWAYS AVAILABLE THANKS TO MEMBRANE SEPARATION - WHY BUY NITROGEN IN BOTTLES AND NOT PRODUCE IT YOURSELF?




## A USEFUL ADDITION TO NITROGEN BLANKETS: NITROGEN GENERATOR FOR PRODUCING NITROGEN FROM COMPRESSED AIR

**The Nitrogen Generator NG300 separates oxygen from nitrogen through a longlasting and highly efficient membrane, providing nitrogen with a purity of up to 99,5% at the outlet.**

The NG300 works fully automatic and conducts self-checks continuously. The purity of the nitrogen is monitored by an advanced oxygen sensor. The nitrogen generator is equipped with an integrated control system.

**The NESS nitrogen generator NG300 produces nitrogen from compressed air and saves the purchase and supply of nitrogen bottles.**


#1 SAVES LOGISTICS, TRANSPORT AND PROCUREMENT COSTS
#2 CONTINUOUS, AUTOMATIC NITROGEN SUPPLY WITH LOW MAINTENANCE

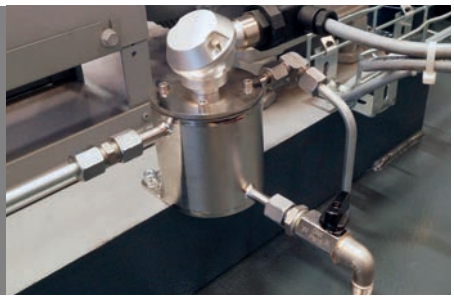
Better predictability of deviations:
**Pump operation as trouble-free as possible**

# MONITORING FOR PUMPS

## THESE 3 MONITORING SYSTEMS ARE ESSENTIAL

### LEAKAGE MONITORING (NPCL)

**Quickly detects mechanical seal leaks.**
The mechanical seals in pumps have a limited lifetime and can fail unexpectedly. If the plant operator discovers the failure of the seal too late or not at all, larger quantities of heat transfer fluid can leak.



### VIBRATION MONITORING (NPCV)

**Detects increased machine vibrations.**
Many causes of damage to pump systems lead of an increase in machine vibrations, which are measured by the sensor.

### TEMPERATURE MONITORING (NPCT)

**Detects overloads due to excessive temperature.**
In case of a defect, bearing temperatures rise and the risk of overheating crops up. A loss of performance or failure of the pump is the result.

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# FIRE SOURCE THERMAL OIL PUMP - EARLY DETECTION OF DEVIATIONS AND LEAKS

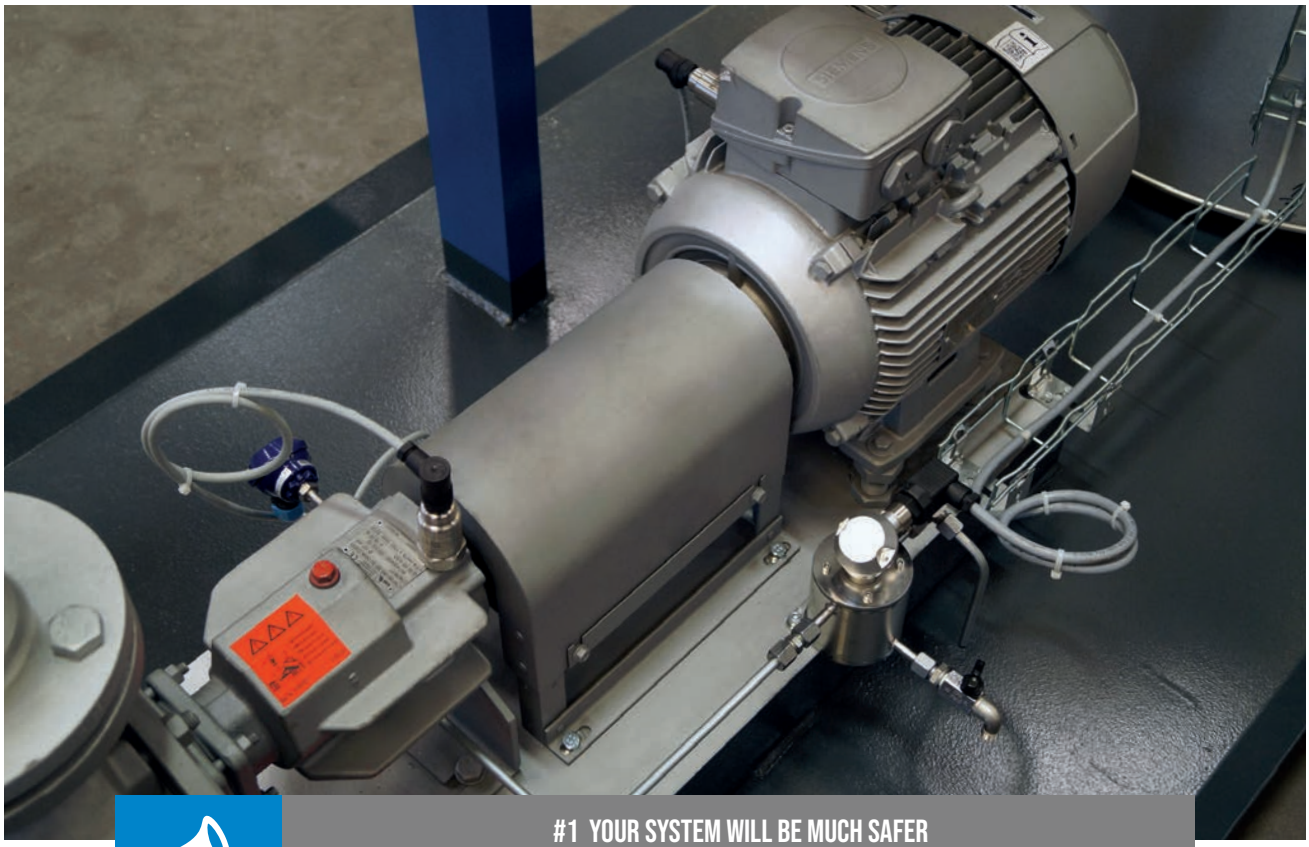
**Scenario pump fire**

After maintenance work it is reglated to fill the mechanical seal chamber - as prescribed in the operating instructions of the pump - with thermal oil before starting up.

After starting the mechanical seal fails, resulting in a strong leakage of heat transfer fluid which ignites on a hot surface.

**Such a scenario can - for example - be prevented with leakage monitoring.**

## PUMPS ARE NOT INFREQUENTLY THE STARTING POINT OF THERMAL OIL FIRES



#1 YOUR SYSTEM WILL BE MUCH SAFER
#2 ENABLES ON-CONDITION PUMP MAINTENANCE

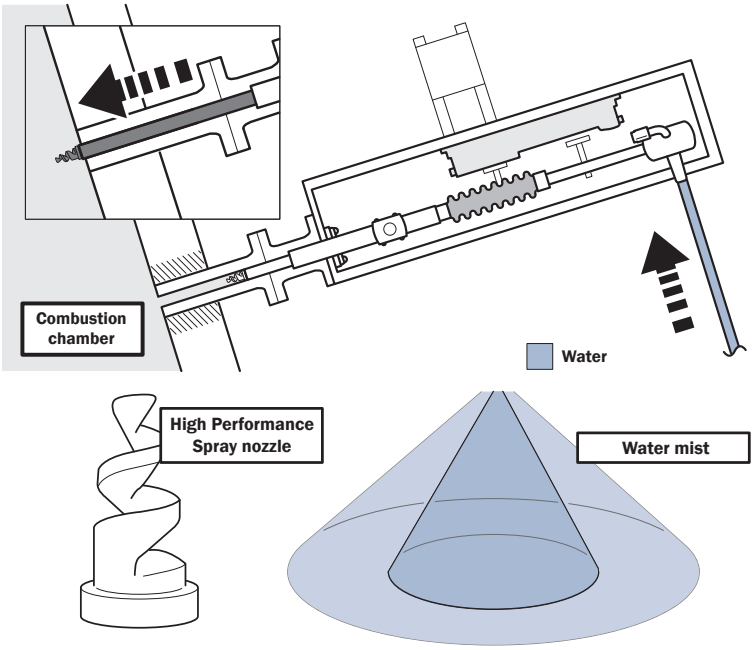
In the worst case:
**When a fire breaks out, it is advisable to be prepared**

# EXTINGUISHING AND COOLING

## OPTIMALLY PREPARED IN CASE OF A HEATER FIRE - COOLING IN ADDITION TO EXTINGUISHING

When there is a leak inside a thermal oil heater, e.g. in the coil, the thermal oil can burn. When ignited it will continue to burn even when the fuel burner is off, as long as there is enough oxygen and a continuous leakage of thermal oil.

**The NESS extinguishing and cooling system sprays a very fine water mist into the hot heater. This flushes the heater volume, reduces the oxygen concentration and at the same time cools the heater by the evaporation of the water droplets. An automatic self-test program checks the smooth functioning regularly.**




#1 COOLS THE HEATER BY EVAPORATION OF THE FINE WATER MIST
#2 AUTOMATIC SELF-TEST PROGRAM ENSURES RELIABILITY

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# OTHER IMPORTANT PROTECTIVE MEASURES - PERFECTLY FITTING PROTECTION FOR FLANGES

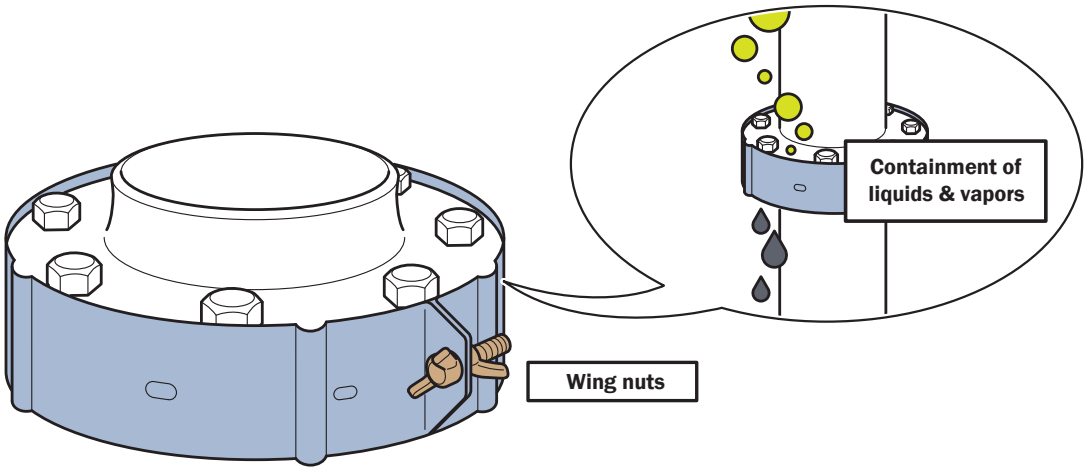
## LEAKAGE PROTECTION FOR FLANGES: SPRAY QUARD BANDS PROTECT EMPLOYEES AND PLANT

### WITHOUT SAFE-FLANGE

### WITH SAFE-FLANGE


Securing pipe systems with flammable, hot, toxic or corrosive liquids and vapor is a must, especially when they are under pressure. If leaks occur on the flange connections, liquids can splash through the room and severely endanger employees and systems.

**A spray guard band on the flange connections provides effective protection and safety to mitigate the effects of leaking fluids and vapors.**




#1 PROTECTION OF EMPLOYEES AND PLANT
#2 FOR MOST DIN AND ANSI FLANGE SIZES

# WE'RE LOOKING FORWARD TO HEARING FROM YOU


MORE BROCHURES
AND FACTSHEETS
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