



OILCLEANER

TRIPLE R BYPASS OIL CLEANERS

Solutions for lean production
and sustainable oil management

TRIPLE R

Triple R is a leading manufacturer of bypass and off-line “Oil Cleaning” systems.



- 🔊 For over **40 years** industrial customers throughout the world use Triple R products.
- 🔊 With a qualified team of sales representatives and engineers we have **a solution** for almost **every oil related application**.
- 🔊 We are dedicated to bring **the best products** and **services** for making sure that our customers oil systems can run smoothly and at their maximum output capacity.
- 🔊 The bottom line is assuring **constantly clean oil** for saving on maintenance expenses and increasing production output.



TRIPLE R WORLDWIDE



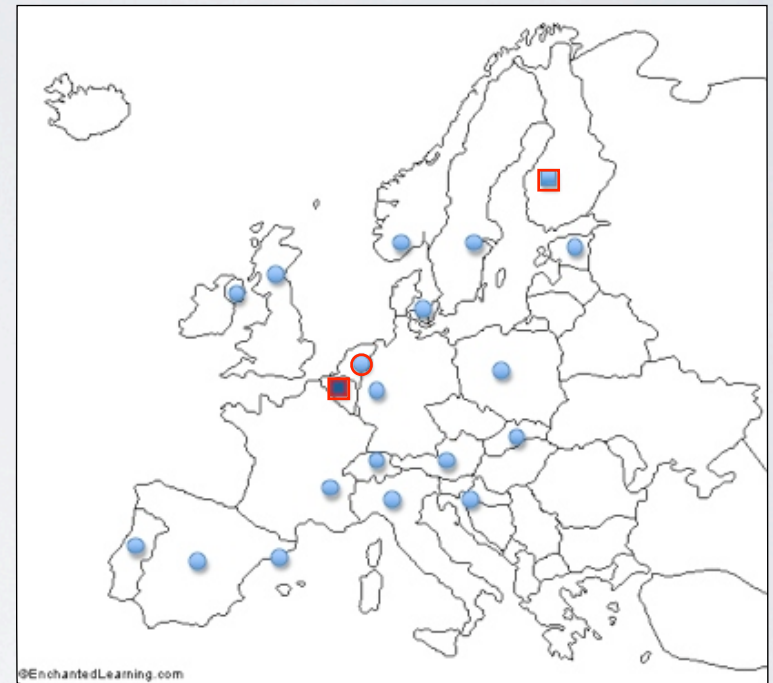
Triple R Europe N.V.

www.triple-r-europe.com

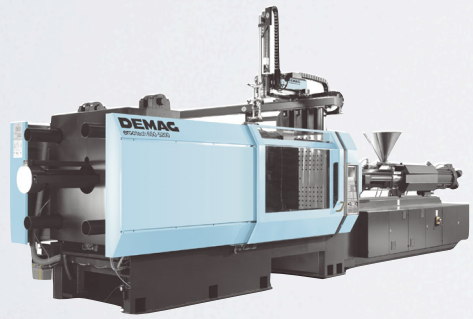
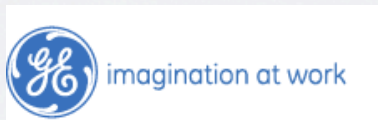
TRIPLE R EUROPE

Triple R Europe NV

- ▶ European head office at Antwerp-B.
- ▶ European Training & Technology Centre in Hengelo-NL.
- ▶ Strategic warehouse location.
- ▶ Distributors in every country.



OEM COOPERATION



TRIPLE R

During its 40 years of activity, Triple R covered a large variety of industries, and developed a wide range of filtration systems that are all aimed to provide solutions for **sustainable oil management**.

All Triple R systems are designed to achieve the essentials:

- To Reduce.
- To Reuse.
- To Recycle.



TRIPLE R

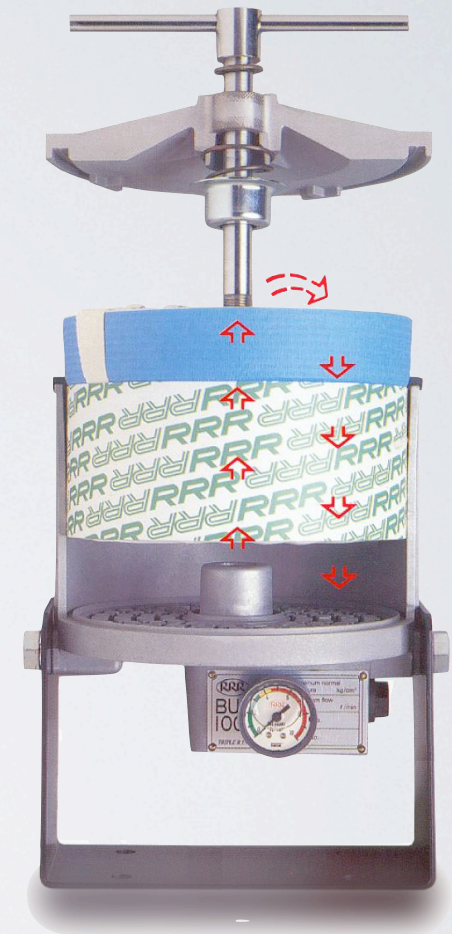
Triple R delivers a wide variety of “**bypass**” and “**off-line**” oil cleaning systems, always ensuring clean oil, no matter if the system contains **5 lit or 100.000 lit.**

Triple R' product offers industry a “**global solution**” to solve almost every fluid contamination issue.

From standard bypass oil cleaning systems...

- ▶ Bypass and off-line micro filtration systems for industrial applications.
- ▶ Bypass micro filters for engines and lube systems.

See www.triple-r-europe.com

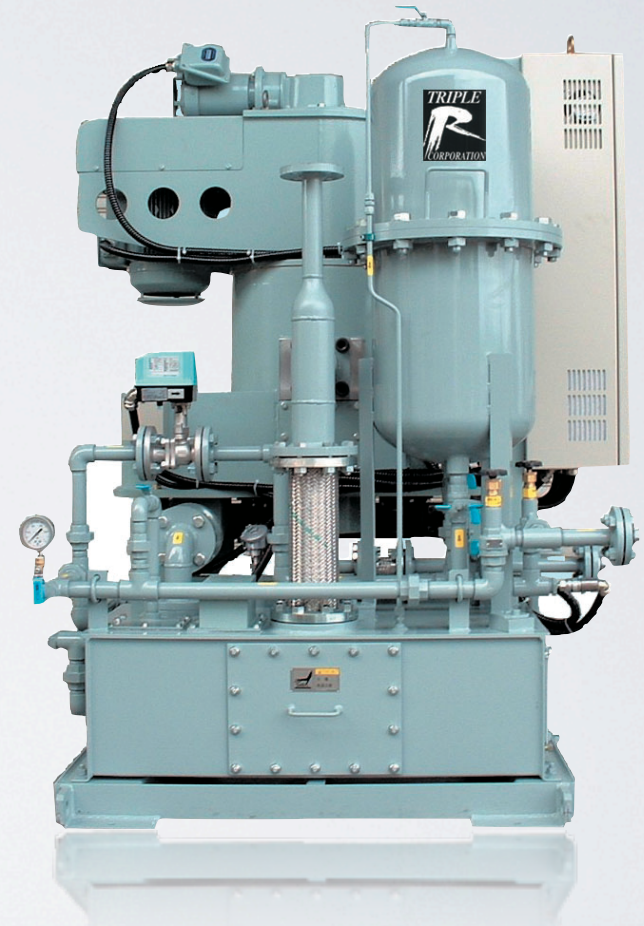


Bypass filter setup

TRIPLE R

... to specialized systems and custom made solutions.

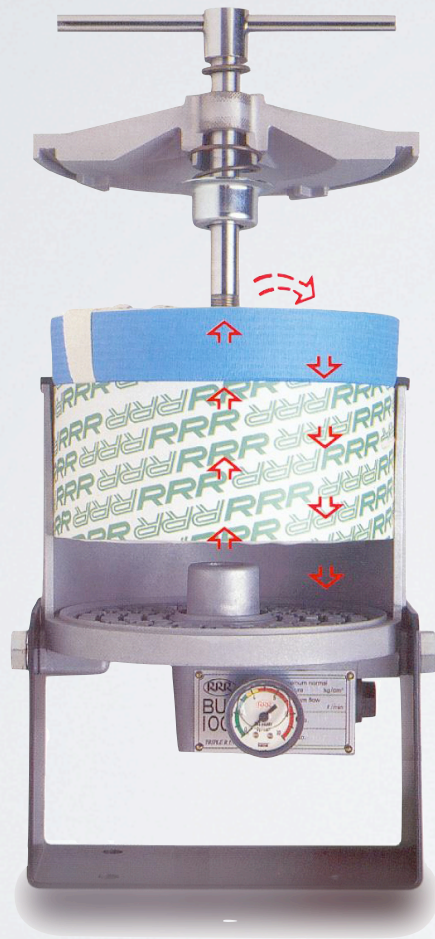
- ▶ Centrifuges and backwashing filters.
- ▶ Water separators
- ▶ Vacuum dehydrators
- ▶ Oil separators.
- ▶ Air separation with Quicktoron.



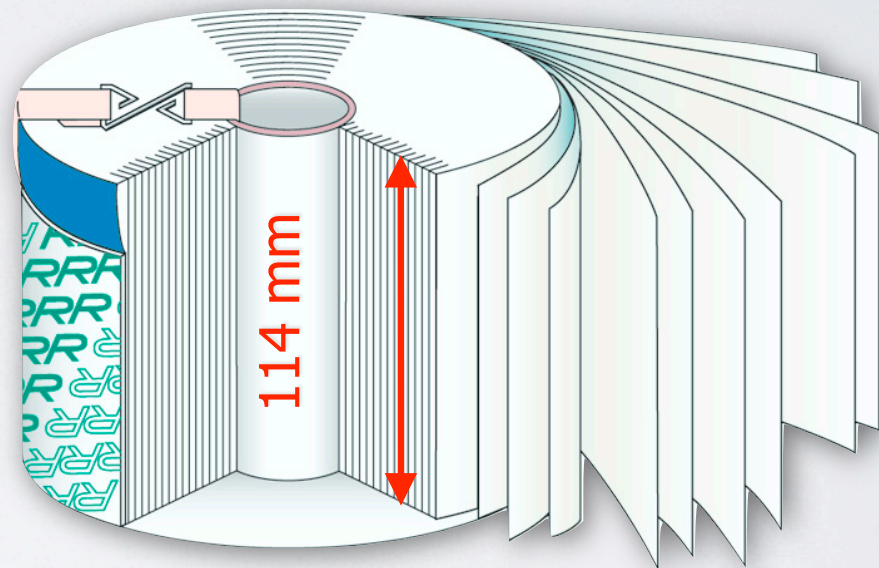
See www.triple-r-europe.com



AN UNMATCHED CONCEPT



Triple R = 3-stage depth filtration



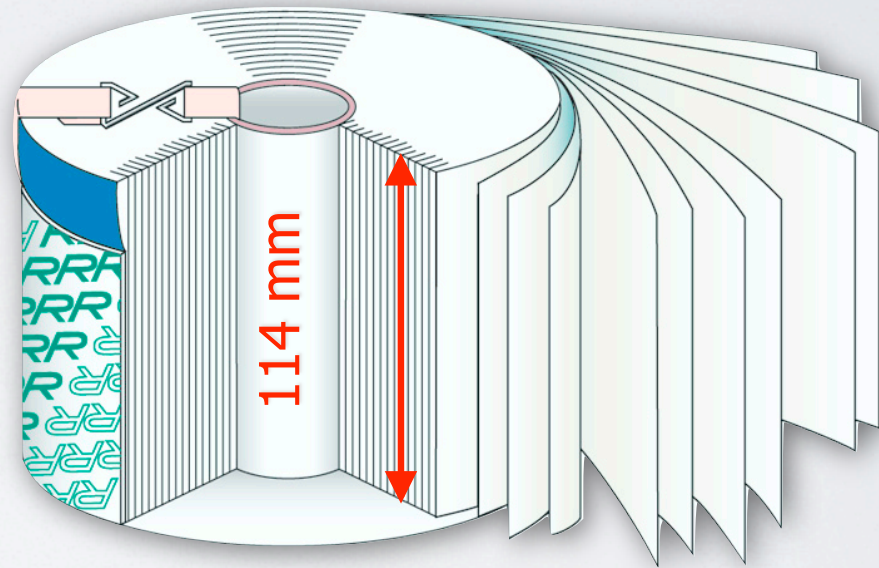
AN UNMATCHED CONCEPT

- High flow,
- High pressure,
- Lots of pulsations
- Very thin filter layer



Standard full flow filter

- Low flow,
- Low pressure,
- No pulsations
- 114 mm filter thickness



Triple R 3-stage depth filtration



CAUSE & CONSEQUENCE

Maintenance is the largest single controllable expense in a manufacturing plant. With as many as **80%** of all machine failures related to contamination in the oil, Triple R's **pro-active** systems are saving industries considerable costs.

Any machine using oil for power transmission & lubrication will be affected by the condition of the oil. Oil contamination should therefore be considered as the most important.

Oil contamination is anything that shouldn't be in the oil and that affects oil life and component life. The main oil contaminants are:

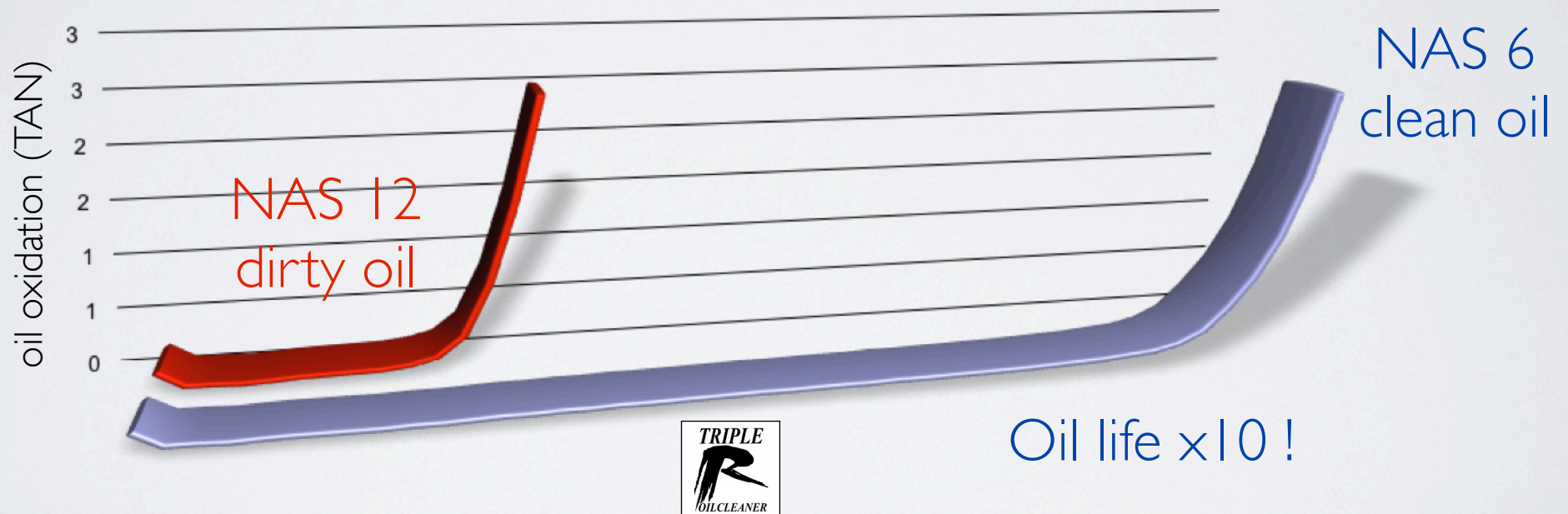
- Solid particles
- ✱ Water
- Oil degradation products or soft contaminants
- 🌀 Air & gases

Triple R calls "OIL CLEANING" the ability to remove ALL contaminants.



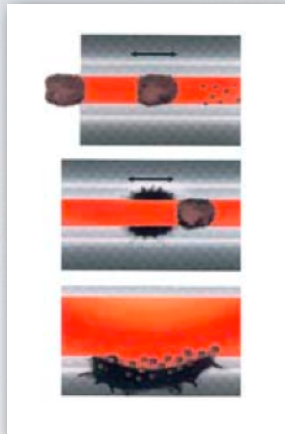
SOLID PARTICLES

- Solid particles typically cause 50% of all failures and multiply by destroying the surface of even very hard metal.
- Solid particles act as catalyst and increase oil oxidation, additive depletion and shorten oil life.



WATER

Spalding

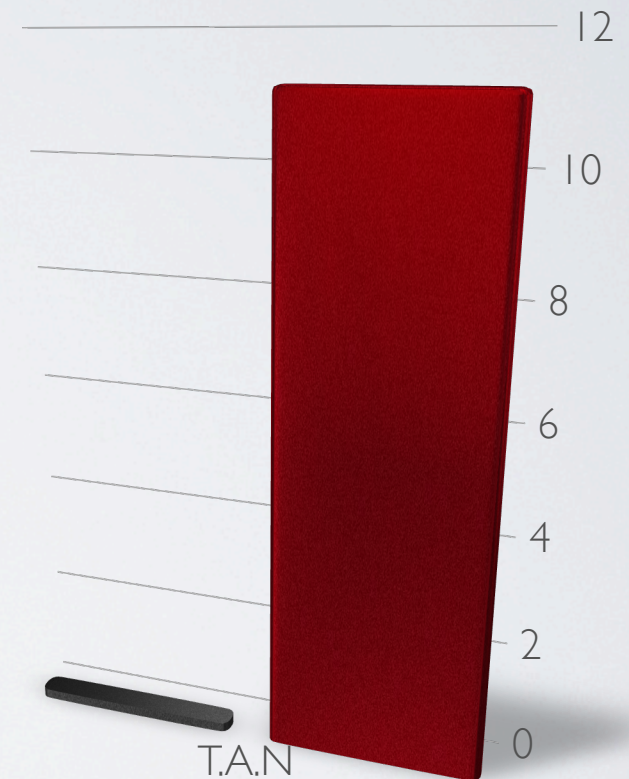


- ✱ Water typically accounts for 20% of mechanical failures.
- ✱ It reduces the lubricity of the oil and results in corrosion and erosion leading to spalding (fig 1).
- ✱ Furthermore, it acts as a catalyst in the oxidation of the oil, accelerating oil oxidation tremendously (fig 2).



Oil oxidation

- No water, no metal - T.A.N. after 3500 hrs
- Water + metals - T.A.N. after 100 hrs



OIL DEGRADATION

Oil degrading is a common problem both in lubrication and hydraulic systems.

The main causes of this are typically oxidation (oxygen), hydrolysis (water) and thermal degradation (high temperature). Oil degradation will result in:

- Increase in oil viscosity.
- Formation of acid compounds
- Decreased additive performance
- Varnish formation



Varnish deposits can cause valves to stick and fail.



OIL DEGRADATION

Consequences of Oil degradation:

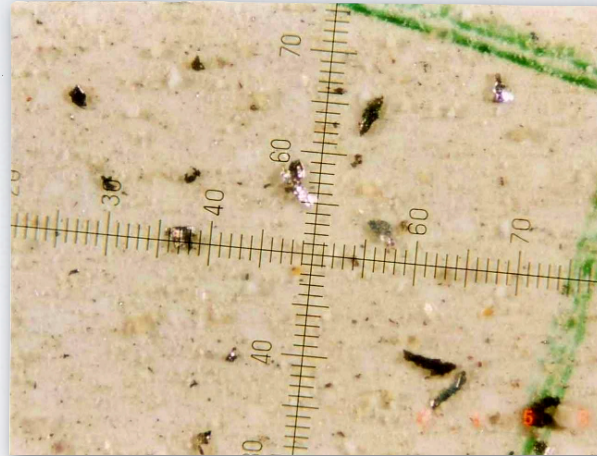
- Shorter oil life.
- Reduced oil performance : loss of lubricity, valve failures, restricted oil flow.
- Reduced productivity: slow start-ups, increased downtime, reduced machine performance.
- Higher energy consumption due to friction and wear.
- Increased maintenance cost: increased filter change and wear of components, acid corrosion in metallic components, component failures.
- Environmental pollution by greater disposal and filter changes leakages.

Varnish deposit in bearing



GUARANTEED CLEAN OIL

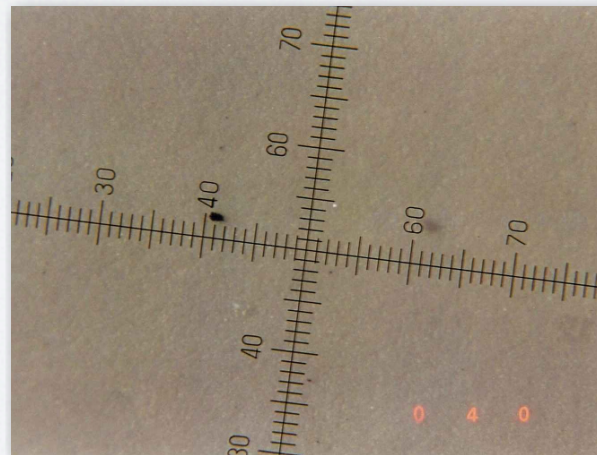
Particle size	Before RRR
5-15 μ	950.235
15-25 μ	120.670
25-50 μ	24.585
50-100 μ	1.533



FILTREX SERVICES

Klant : Triple R.E.
 Gebruiker : Opel Belgium
 Labo ref. : 1.158
 Monster nr. : 1.158
 Volume : 100 ml
 Filtratiefijnheid : 0,8 μ
 Datum : 29-1-02

Particle size	With RRR
5-15 μ	21.280
15-25 μ	1.670
25-50 μ	245
50-100 μ	13



FILTREX SERVICES

Klant : Triple R.E.
 Gebruiker : Opel Belg.
 Labo ref. : 2.040
 Monster nr. : 2040
 Volume : 100 ml
 Filtratiefijnheid : 0,8 μ
 Datum : 7-4-2002



BENEFITS OF TRIPLE R

Removing solid particles, water, and oil degradation products results in:

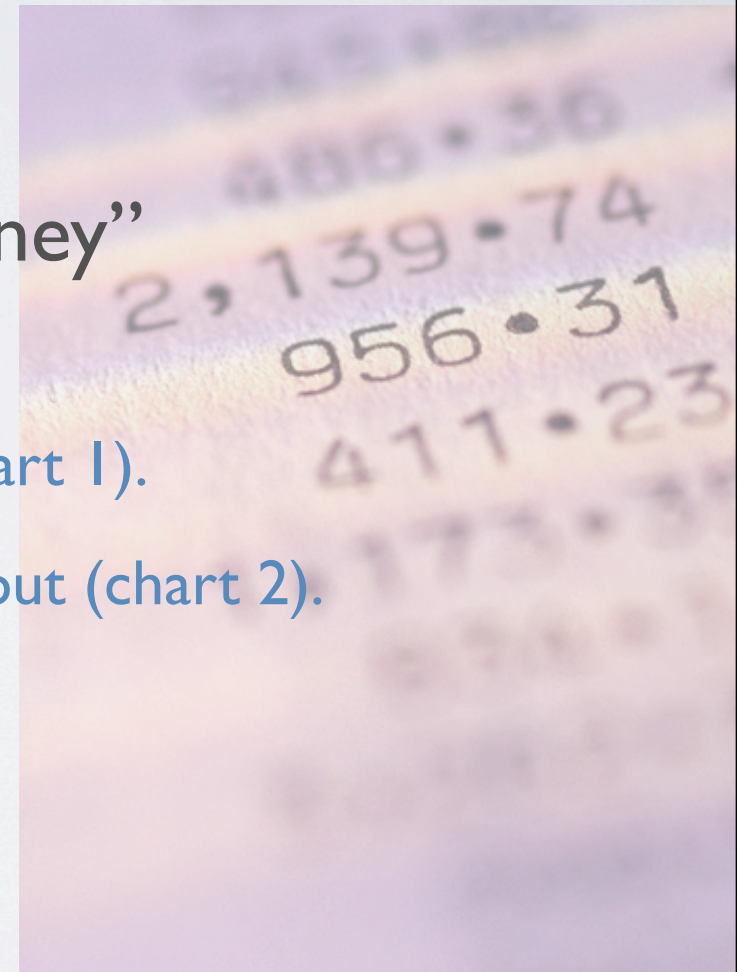
1. Increased fluid life by up to 10 years or 40,000 hrs.
 2. Reduction in erosion, corrosion and abrasive wear = an important increase of machine & component life.
 3. Increased life of the expensive inline filters.
 4. Energy savings.
- ★ All leading to a higher machine reliability, increased machine performance, and most importantly, a higher production output and capacity.



PROFITABILITY (R.O.I.)

“Clean oil saves money,
contaminated oil costs money”

1. Reduction of the maintenance expenditures (chart 1).
2. Increased machine availability & production output (chart 2).



SAVE ON MAINTENANCE

Chart 1

Example of a calculation

Ratio	Saving on:	Now	with Triple R
Oil life x 10 Remains = 10%	Oil consumption lit/year	50.000 €	5.000 €
	20.000 lit		
Component life x 5 Remains = 20%	Component breakdown/year	8.000 €	2.000 €
	2 @ 4.000€/piece		
Inline filter x 5 Remains = 20%	Filter cartridges	600 €	120 €
	1 @ 300€/piece		
Totals		58.600 €	7.120 €

INCREASE PRODUCTIVITY

Chart 2

Typical example	No. of machines		20
	Operating hours / year		5.000 h
	Machine cost / year		40 €
	Actual machine availability		90,00%
	Downtime / h	$20 \times 5.000 \text{ h} \times 40\text{€} \times 10\%$	10.000 h
Downtime cost	Downtime caused by hydraulic faults = 35%	35% of 10.000 h	3.500 h
	Of which 80% caused by contaminated	80% of 3.500 h	2.800 h
	Fluid related downtime	$2.800 \text{ h} \times 40 \text{ €}$	112.000 €
	Labor costs for repair	$2.800 \text{ h} \times 35 \text{ €}$	98.000 €
	Total downtime costs	$112.000 \text{ €} + 84.000 \text{ €}$	210.000 €
Savings	Fluid management can prevent 90% of fluid-related costs	Remains: 2.800 h -90%	280 hrs
	Remaining downtime after fluid management	$(280 \text{ h} \times 40 \text{ €}) + (280 \text{ h} \times 35 \text{ €})$	21.000 €
	Cost savings	$210.000 \text{ €} - 21.000 \text{ €}$	189.000 €
	Increased machine availability to 93,08%!	$10.000 \text{ h} - (2.800 + 280) = 6.920 \text{ h}$	93,08%