

9. If the membrane patch (N) becomes blocked with contaminants then record how much oil / ether mix had passed through before blockage. (By %)
10. With suction pump (D) still creating a vacuum, rinse the membrane (N) with a small amount of neat petroleum ether to remove any oil residue.
11. Separate the funnel from the patch support (G) and rinse the outer edge of membrane with a small amount of petroleum ether to remove oil residue.
12. Using the tweezers (T) if needed, remove and then allow the membrane patch (N) to dry.
13. Place the membrane patch on a patch card (S). Write details such as date, oil type, volume, machine description, quantity of oil passed through membrane (i.e. 100% etc.) on the front or back of the card (S) and cover with a laminating plastic pouch (U).
14. Using a heated Laminator, if available, seal the patch and card support.

CONTENTS EXAMINATION.

Estimate the overall contaminants in mg. dirt / 100ml oil by viewing the discoloration with the naked eye and comparing with the charts. Remember, you are looking at the overall density of the contaminants, not just the actual colour. (See separate sheets.)

Give an estimated ISO or NAS code by viewing under a 50/100 x pocket microscope (Q) and compare with the supplied charts (B). For reference the grid lines on the patches are 100µ micron wide. You can also identify many different contaminants using the reference charts provided (B).

Note –

Even if you use a 25mm patch and so only 25ml of oil, you still express the overall contamination level as mg. contamination / 100 ml. oil. This is because the area of the 25mm membrane actually exposed to the oil sample is roughly 25% of the area exposed for a 47mm membrane, which uses 100ml of oil as per the standard laboratory test.

CAUTION

Petroleum ether is flammable.

Always store in a cool place.

Ensure adequate ventilation.

Upon completion of sampling tests, make tight petroleum ether bottle cap.

Do not touch fluid or fluid containing bottle with solvent bottle nozzle.

FULL TRAINING ON HOW TO USE THE PORTABLE PATCH TEST KIT IS AVAILABLE UPON REQUEST



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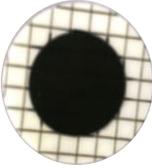
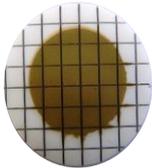
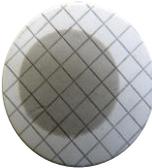
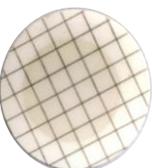
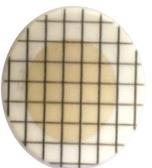
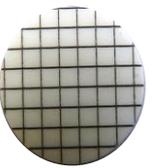
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Gravimetric patch test examples using 0.8µ x 25mm diameter membrane patches.

This involves drawing a quantity of oil through a 0.8µm membrane. This detects more contaminants than the ISO 4406 or NAS 1638 methods, including oil oxidation products which are responsible for varnish formation.

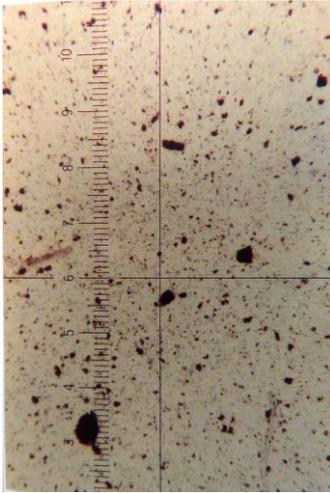
This reference chart provides a simple comparison test for field checks of the condition of hydraulic fluids.

Conventional Hydraulics Patch Test Examples		<p>>10mg /100ml of oil contamination An example of high contamination level that is critical to hydraulic equipment. Warning Level- Extreme</p>
		<p>>4mg /100ml of oil contamination An example of high contamination level that requires immediate cleaning or filtering. Warning Level- Bad</p>
		<p>>2mg /100ml of oil contamination An example of contamination level that could benefit from cleaning or filtering. Warning Level- Marginal</p>
		<p><1mg /100ml of oil contamination An example of oil contamination level to which the oil has to be cleaned or filtered. Warning Level- Good</p>
Servo Valve Controls		<p>>2mg /100ml of oil contamination An example of high contamination level that requires immediate cleaning or filtering. Warning Level- Bad</p>
		<p>0.5mg /100ml of oil contamination An example of oil contamination level to which the oil has to be cleaned or filtered. Warning Level- Good</p>

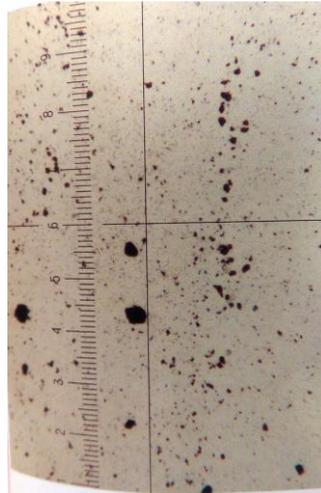
For reference, the grid lines in the membrane patches are approx. 100µ wide

Recommended Oil Cleanliness Level		NAS Grade	ISO Code	Condition
Application	Oil Cleanliness required in accordance with ISO 4406	4	15/13/10	Good
		5	16/14/11	Good
Systems with high dirt sensitivity and high availability requirements such as servo valve technology	< 18/13/10	6	17/15/12	Good
		7	18/16/13	Acceptable
Systems with proportional valves and pressure >160 bar	< 19/14/11	8	19/17/14	Marginal
		9	20/18/15	Bad
Vane pumps, piston pumps, piston engines	< 18/16/13	10	21/19/16	Bad
		11	22/20/17	Extreme
Modern industrial hydraulic systems, directional valves, pressure valves	< 20/16/13	12	23/21/18	Extreme
		Contamination levels mg / 100 ml oil		Condition
Industrial hydraulic systems with large tolerances and low dirt sensitivity	< 21/17/14	<1.5 mg / 100 ml oil		Good
		>2- <4 mg /100 ml oil		Warning
		>4-<6 mg / 100 ml oil		Bad
		>6 mg / 100 ml oil		Extreme

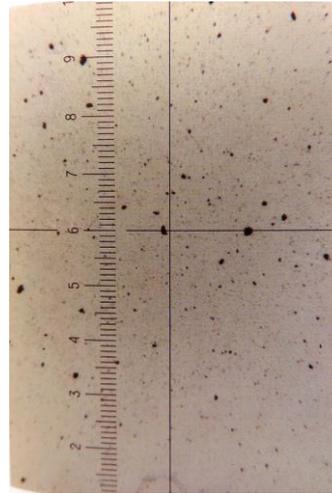
Reference Comparison Charts ISO / NAS Grades & Particle Identification guides. 100 x magnification.
Use these guides to estimate the ISO / NAS contamination grades of the oil samples.



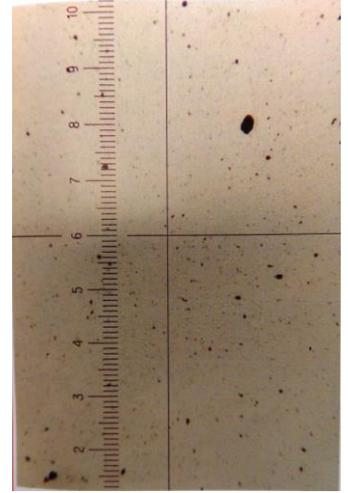
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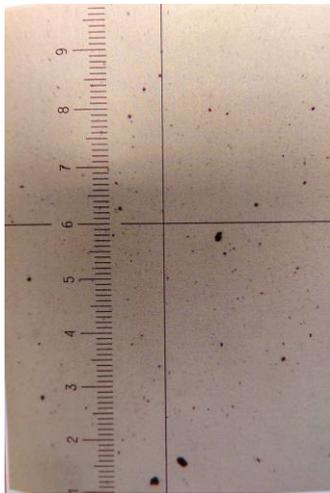
ISO 22/20/17 NAS 11



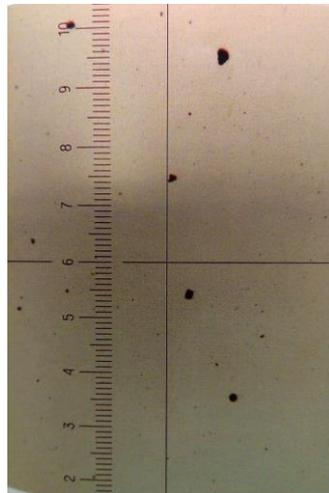
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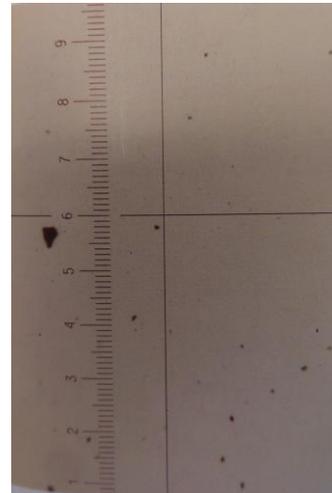
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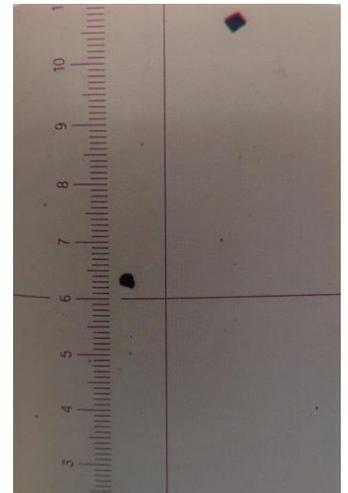
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ISO 18/16/13 NAS 7

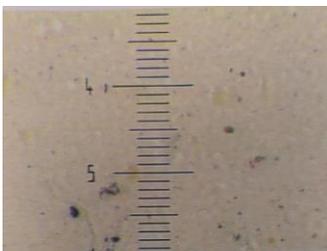


ISO 17/15/12 NAS 6



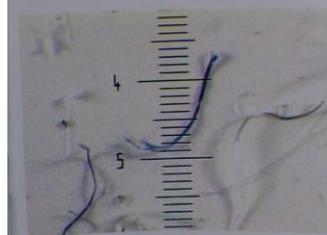
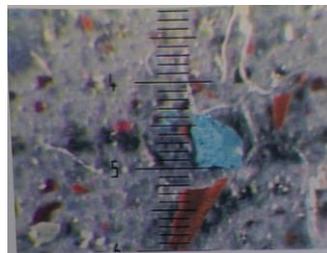
ISO 16/14/11 NAS 5

Gel residue



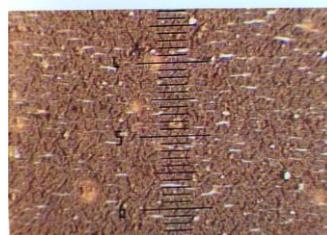
Silicates

Coloured particles



Fibres

Rust & white particles



Oil ageing Products

Metal Swarf



Bronze, brass & copper