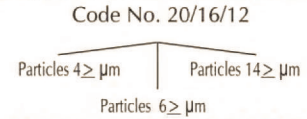


LABORATORY EVALUATION

METHOD 1 Analysis of the Contamination classes according to ISO 4406:99 in 1 ml by particle counter.

| | | | | | | | | | | | |
|-------------------|------|------|------|-------|-------|-------|-------|--------|--------|--------|-----|
| Code Number | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Qty. of Particles | 0.3 | 0.6 | 1.3 | 2.5 | 5 | 10 | 20 | 40 | 80 | 160 | 320 |
| Up to Inclusive | 0.6 | 1.3 | 2.5 | 5 | 10 | 20 | 40 | 80 | 160 | 320 | 640 |
| Code Number | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | |
| Qty. of Particles | 640 | 1300 | 2500 | 5000 | 10000 | 20000 | 40000 | 80000 | 160000 | 320000 | |
| Up to Inclusive | 1300 | 2500 | 5000 | 10000 | 20000 | 40000 | 60000 | 160000 | 320000 | 640000 | |

Contaminants specification per 1 ml of oil by particle counter For the determination of the ISO-code (contamination classes) the quantity of the particles in the size $4 \geq \mu\text{m}$, $6 \geq \mu\text{m}$, $14 \geq \mu\text{m}$ according ISO 4406 are used. The code is independent of the particle size Example for presentation :




METHOD 2 Analysis of the Contamination classes according to NAS [National Aerospace Standard] 1638 CONTAMINANTS SPECIFICATIONS (per 100ml) by particle counter


| Grade | | 00 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|-------------------|-------------------------|-----|-----|-----|-------|-------|-------|-------|--------|--------|--------|---------|---------|---------|-----------|
| Number & Sizes Of | 5 ~ 15 μm | 125 | 250 | 500 | 1,000 | 2,000 | 4,000 | 8,000 | 16,000 | 32,000 | 64,000 | 128,000 | 256,000 | 512,000 | 1,024,000 |
| | 15 ~ 25 μm | 22 | 44 | 89 | 178 | 356 | 712 | 1,425 | 2,850 | 5,700 | 11,400 | 22,800 | 45,600 | 91,200 | 182,400 |
| Contaminants | 25 ~ 50 μm | 4 | 8 | 16 | 32 | 63 | 126 | 253 | 506 | 1,012 | 2,025 | 4,050 | 8,100 | 16,200 | 32,400 |
| | 50 ~ 100 μm | 1 | 2 | 3 | 6 | 11 | 22 | 45 | 90 | 180 | 360 | 720 | 1,440 | 2,880 | 5,760 |
| | Upper 100 μm | 0 | 0 | 1 | 1 | 2 | 4 | 8 | 16 | 32 | 64 | 128 | 256 | 512 | 1,024 |

Not existing
For Missile
For NC/M/C
New Oil


METHOD 3 : Oil Testing by contamination checking Kit (CCK) by weighing method on 0.8 micron membrane.



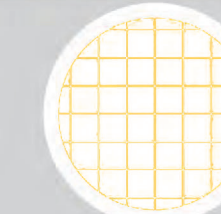
An example of very high contamination level which can critically damage hydraulic equipment (10 mg / 100 ml)
Above NAS 12




An example of contamination level which requires immediate cleaning (4 mg / 100 ml)
Above NAS 12



An example of contamination level to which the oil can be cleaned to (1 mg / 100 ml)
NAS 7-8-9



An example of contamination level which requires cleaning (2 mg / 100 ml)
NAS 10-11-12



An example of contamination level which the oil can be cleaned to (0.5 mg / 100 ml)
NAS - 6



- Weighing of membrane Size : 0.8 Micron x 25 mm Dia Say : 17Mg. (a) – approx
- Assembly the glass apparatus as shown in the above figures • Take 17 ml of oil and add 35 ml of cleaned Benzene and stir well for diluting • Switch on vacuum pump and pour this diluted oil in graduated glass cylinder • Take another 16 ml of oil and add 35 ml of cleaned Benzene and stir well for diluting Pour the same. So, total 33 ml of oil has passed through the membrane
- Now, weight the membrane. Say : 20 mg.(b) i.e. (b) – (a) = contamination / 33 ml. 20 mg – 17 mg = 3 mg / 33 ml. as per NAS 1638, Contamination level to be checked in 100 ml of oil. So, multiply by 3. i.e. 3 mg x 3 = 9 mg & 33 ml x 3 = 99 ml. (100 ml) so, contamination level is 9 mg/100ml. • Paste this patch / membrane on test report by using transparent tape.
- Match with given photographs of membrane patches in catalogue. The patch at the beginning of the cleaning cycle will be brown / brown yellow and tends to get lighter in subsequent patches. The oil is totally cleaned when the original white color of Membrane. To know the maximum size of the particle / contaminant, the patch can be observed under a microscope.