

April 1, 2021

**Annoucement of SAE AS4059F , replacement of NAS 1638**

The NAS 1638 cleanliness classification system was originally developed in 1966 by the US Aircraft Industries of America to both simplify reporting of particle count data and to control the introduction of dirt during the assembly of aircraft fluid systems during the assembly of aircraft fluid systems.

The NAS 1638 cleanliness classification system is considered as out- of -date and obsolete due to many reasons ; one of those is the ACFTD (Air Cleaner Fine Test Dust) -calibration test dust based on calibration method ISO 4402 , is no longer available (discontinued) .

The new calibration test dust particle standard is ISO Medium Test Dust (ISO MTD) based on calibration method ISO11171.

Comparison Particle Sizes of ACFTD and ISO MTD

| ACFTD Size (ISO 4402, µm) | Corresponding NIST Size (ISO 11171), µm |
|---------------------------|---|
| <1                        | 4.0                                     |
| 1.0                       | 4.2                                     |
| 2.0                       | 4.6                                     |
| 2.7                       | 5.0                                     |
| 3.0                       | 5.1                                     |
| 4.3                       | 6.0                                     |
| 5.0                       | 6.4                                     |
| 7.0                       | 7.7                                     |
| 10.0                      | 9.8                                     |
| 12.0                      | 11.3                                    |
| 15.0                      | 13.6                                    |
| 15.5                      | 14.0                                    |
| 20.0                      | 17.5                                    |
| 25.0                      | 21.2                                    |
| 30.0                      | 24.9                                    |
| 40.0                      | 31.7                                    |
| 50.0                      | 38.2                                    |
| 100.0                     | 70.0*                                   |

SAE AS 4059 which was developed in 1988 , has undergone many revisions since then.

Now , SAE AS 4059F , the replacement for NAS 1638

Refer to SAE AS4059 rev F -2020 , Table 1

TABLE 1 - MAXIMUM CONTAMINATION LIMITS FOR DIFFERENTIAL PARTICLE COUNTS (PARTICLES/100 mL) (3)

| Contamination Levels | (1) | 5, incl. to 15, incl. µm    | 15, excl. to 25, incl. µm | 25, excl. to 50, incl. µm | 50, excl. to 100, incl. µm | >100 µm   |
|----------------------|-----|-----------------------------|---------------------------|---------------------------|----------------------------|-----------|
|                      | (2) | 6, incl. to 14, incl. µm(c) | 21, incl. µm(c)           | 38, incl. µm(c)           | 70, incl. µm(c)            | >70 µm(c) |
| 00                   |     | 125                         | 22                        | 4                         | 1                          | 0         |
| 0                    |     | 250                         | 44                        | 8                         | 2                          | 0         |
| 1                    |     | 500                         | 89                        | 16                        | 3                          | 1         |
| 2                    |     | 1000                        | 178                       | 32                        | 6                          | 1         |
| 3                    |     | 2000                        | 356                       | 63                        | 11                         | 2         |
| 4                    |     | 4000                        | 712                       | 126                       | 22                         | 4         |
| 5                    |     | 8000                        | 1425                      | 253                       | 45                         | 8         |
| 6                    |     | 16 000                      | 2850                      | 506                       | 90                         | 16        |
| 7                    |     | 32 000                      | 5700                      | 1012                      | 180                        | 32        |
| 8                    |     | 64 000                      | 11 400                    | 2025                      | 360                        | 64        |
| 9                    |     | 128 000                     | 22 800                    | 4050                      | 720                        | 128       |
| 10                   |     | 256 000                     | 45 600                    | 8100                      | 1440                       | 256       |
| 11                   |     | 512 000                     | 91 200                    | 16 200                    | 2880                       | 512       |
| 12                   |     | 1 024 000                   | 182 400                   | 32 400                    | 5760                       | 1024      |

(1) Size range, microscope particle counts, based on longest dimension as measured per AS598 or ISO 4407.  
 (2) Size range, APC calibrated per ISO 11171 or an optical or electron microscope with image analysis software, based on projected area equivalent diameter.  
 (3) Contamination classes and particle count limits are identical to NAS 1638.

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Our NAS 1638 reporting will convert to or change to follow SAE AS 4059 F , Table 1

NAS 1638 classes used in current specifications can be converted directly to SAE AS4059 contamination classes.

In the simplest form, where NAS 1638 Class 6 is currently specified, SAE AS4059 Class 6 applies .