

# ISO Codes

TECHNICAL BULLETIN



What is the difference between the old ISO Code (ISO 4406-1987) and the new ISO code (ISO 4406-1999)?

The primary difference is in the way the particle size is specified and measured. ISO 4406-1999 uses particle counter calibrated to ISO 11171, whereas ISO 4406-1987 used ISO 4402 counter calibration. ISO 4402 measured a particle for its long chord dimension, but the new ISO 11171 measures a particle by an actual equivalent diameter as measured by Scanning Electron Microscope (SEM). This new calibration caused a slight change in the evaluation of the particle.

Since it is more accurate and verifiable, some of the particle sizes have been corrected (see Table 1). In addition, ISO 11171 specifies ISO Medium Test Dust (ISO MTD), replacing the previously used AC Fine Test Dust (ACFTD). The advantage of ISO 11171 is that the ISO MTD calibration material is National Institute of Standards and Technology (NIST) traceable, which further provides for more accurate and verifiable particle counts.

TABLE 1: Particle Size Classification Comparison

ISO 4402 (ACFTD)	ISO 11171 (ISO MTD)
<1.0 μ	4.0 μ
1.0 μ	4.2 μ
2 μ	4.6 μ
3 μ	5.1 μ
5 μ	6.4 μ
10 μ	9.8 μ
15 μ	13.6 μ
20 μ	17.5 μ
25 μ	21.2 μ
OLD SIZE (ISO 4402)	NEW SIZE (ISO 11171)

TABLE 2: ISO 4406 Chart

Range Number	Number of particles per ml	
	More than	Up to and including
24	80,000	160,000
23	40,000	80,000
22	20,000	40,000
21	10,000	20,000
20	5,000	10,000
19	2,500	5,000
18	1,300	2,500
17	640	1,300
16	320	640
15	160	320
14	80	160
13	40	80
12	20	40
11	10	20
10	5	10
9	2.5	5

## Is the ISO Cleanliness Code affected?

The old ISO 4406-1987 Code reported the 5 micron & 15 micron particles which established a “two-number” ISO Cleanliness Code. For example, the TURBO-TOC states it will maintain a level of ISO 16/13. The new ISO 4406-1999 code establishes a “three-number” code, which counts the 4<sub>(c)</sub>, 6<sub>(c)</sub>, and 14<sub>(c)</sub> micrometer particles. Using ISO 4406-1999, this changes the TURBO-TOC to an ISO 18/16/13.

## Does this affect an element β rating?

The new multi-pass method for evaluating filtration performance of a filter element is ISO 16889. Using 16889 compared to the old ISO 4572 will classify the β ratio slightly different. For example, the Kaydon KM6036-3 is now written as:

**ISO 4572 Code (old)**  
 $\beta_{10} = 75, \beta_{12} = 200$

Using ISO 16889 with ISO 4406 for particle size coding, the new rating will be written as:

**ISO 16889 Code (new)**  
 $\beta_{10} = 75 \{ \beta_{9,8(c)} = 75 \}, \beta_{12} = 200 \{ \beta_{11,2(c)} = 200 \}$

(c) = Designates (NIST traceable) per the ISO 11171 Code



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