

Recapitulation of 2019's Published Nanotechnology Standards



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154 nanotechnology-related standards were published by 21 national, regional, and international organization bodies in 2019 all over the world, where ISO, BSI, UNI, DS, CEN, and ASI contributed the highest shares, respectively.

According to StatNano, 1422 nanotechnology standards have been published by consensus and approved by 42 recognized bodies since 1992. A comparison of these standards over the past three years in Figure 1 shows a conspicuous drop in 2019 so that 154 standards were published, most of which were adopted by national organizations (ca., 77.9 %), and the rest were made available to the public by international (ca., 15.6 %) and regional (ca., 6.5 %) bodies, respectively.



Figure 1. The number of published nanotechnology standards between 2015 and 2019.

As shown in Table 1, the [UK](#), [Italy](#), [Denmark](#), [Austria](#), [Spain](#), the [Netherlands](#), [Sweden](#), [France](#), [Belgium](#), [Iran](#), [Estonia](#), [Finland](#), [Russia](#), [China](#), [Bulgaria](#), [Germany](#), [Australia](#), and [Norway](#) were the pioneering countries in nano-related standards publications in the past year, paying particular attention to nanotechnology exploitation. Accordingly, 21 organization bodies of ISO, BSI, UNI, DS, ASI, CEN, AFNOR, NEN, SIS, AENOR, NBN, ISIRI, EVS, SFS, GOSTR, SAC, BDS, DIN, SA, IEC, and SN made the highest contributions to the standardization of nanotechnology-based products, services, and systems in 2019.

Table 1. Number of nanotechnology standards published by various organizations in 2019

No.	Organization Level	Organizations	Countries	No. of Standards		
1	International	ISO	World	23		
		IEC		1		
2	Regional	CEN	European Union	10		
		BSI	UK	20		
		UNI	Italy	17		
		DS	Denmark	12		
		ASI	Austria	10		
		AFNOR	Spain	9		
		NEN	Netherlands	9		
		SIS	Sweden	8		
		AENOR	France	7		
		3	National	NBN	Belgium	5
				ISIRI	Iran	4
				EVS	Estonia	4
				SFS	Finland	4
				GOSTR	Russia	3
SAC	China			2		
BDS	Bulgaria			2		
DIN	Germany	2				
SA	Australia	1				
SN	Norway	1				

It is worth mentioning that a broad spectrum of the published national standards were an adoption of either the regional or international bodies, among which EN 17199:2019 (parts 2-5), ISO/TS 21083:2019, ISO/TS 16195:2018, CEN/TS 17273:2018, CEN/TS 17274:2018, and CEN/TS 17275:2018 received the highest shares (Table 2).

Table 2. The most common standards from which 2019's national standards were adopted

No.	Standard No.	Standard Title
1	EN 17199-2:2019	Workplace exposure - Measurement of dustiness of bulk materials that contain or release respirable NOAA or other respirable particles - Part 2: Rotating drum method

2	EN 17199-3:2019	Workplace exposure - Measurement of dustiness of bulk materials that contain or release respirable NOAA or other respirable particles - Part 3: Continuous drop method
3	EN 17199-4:2019	Workplace exposure - Measurement of dustiness of bulk materials that contain or release respirable NOAA or other respirable particles - Part 4: Small rotating drum method
4	EN 17199-5:2019	Workplace exposure - Measurement of dustiness of bulk materials that contain or release respirable NOAA or other respirable particles - Part 5: Vortex shaker method
5	ISO/TS 21083-2:2019	Test method to measure the efficiency of air filtration media against spherical nanomaterials - Part 2: Size range from 3 nm to 30 nm
6	ISO/TS 16195:2018	Nanotechnologies - Specification for developing representative test materials consisting of nano-objects in dry powder form
7	CEN/TS 17273:2018	Nanotechnologies - Guidance on detection and identification of nano-objects in complex matrices
8	CEN/TS 17274:2018	Nanotechnologies - Guidelines for determining protocols for the explosivity and flammability of powders containing nano-objects (for transport, handling and storage)
9	CEN/TS 17275:2018	Nanotechnologies - Guidelines for the management and disposal of waste from the manufacturing and processing of manufactured nano-objects
10	ISO 21083-1:2018	Test method to measure the efficiency of air filtration media against spherical nanomaterials - Part 1: Size range from 20 nm to 500 nm
11	ISO/TR 20489:2018	Nanotechnologies - Sample preparation for the characterization of metal and metal-oxide nano-objects in water samples
12	ISO/TR 12885:2018	Nanotechnologies - Health and safety practices in occupational settings
13	ISO/TR 21386:2019	Nanotechnologies - Considerations for the measurement of nano-objects and their aggregates and agglomerates (NOAA) in environmental matrices
14	CEN/TR 17222:2019	Textile products and nanotechnologies - Guidance on tests to simulate nanoparticle release - Skin exposure

These standards fell into six different categories, 48.3 % of which were included in the Test Method| Characterization| Measurement category. Specifications ranked second with around 30.9 %, and the Guide|Practice, Terminology| Vocabulary| Definition, Management System, and Classification| Categorization categories took the next places, having approximately 8.7, 6.7, 4.7, and 0.7 %, respectively, as shown in Figure 2. Most of these standards aim to ensure the risks of the workplace exposure of nano-objects (e.g., nanoparticles, nanopowders, and nanosuspensions) in the chemical industrial sector, more especially in catalysts, paints, and resins production. In addition, such carbon-based structures as carbon black, carbon nanotubes, and graphene are the most common nanomaterials discussed in these standards.



Figure 2. Number of published nanotechnology standards and organization bodies in each standard

category.

Source

[Statnano Nanotechnology Standards Database](#)