



NSAI

ANNUAL REPORT 2020

NSAI TECHNICAL COMMITTEE
NSAI/TC 49/SC 02 – ADDITIVE
MANUFACTURING

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1 Chairman's Statement

In 2020 Dr Noel Harris was appointed as Chairman of this Committee by NSAI. Dr Harris is a Mechanical Engineering Lecturer at NUI Galway with teaching and research interests in Advanced Manufacturing and Materials (including Additive Manufacturing) and he is also a Funded Investigator in I-Form (SFI Advanced Manufacturing Research Centre).

2 Introduction

The ISO Standards Technical Committee [ISO/TC 261](#) was created in 2011 following an agreement with the American Industrial Standards Organisation (ASTM), and the European Standards Organisation (CEN), to have one global suite of AM Standards. [ISO/TC 261](#) and the [ASTM F42](#) work in parallel to produce the AM Standards. The Secretariat of [ISO/TC 261](#) is held by the German National Standards Body (DIN).



These are first ever Standards to be developed for Additive Manufacturing

The Standards being developed at present are the first generation of Standards for Additive Manufacturing.

3 Scope of TC

Standardization in the field of Additive Manufacturing (AM) concerning their processes, terms and definitions, process chains (Hard and Software), test procedures, quality parameters, supply agreements and all kind of fundamentals.

This committee will not produce indigenous Irish Standards. The national committee will participate in the development of International Standards at an ISO level.

The International Standards published by ISO will be adopted as European Standards. NSAI will adopt these European Standards as Irish Standards.

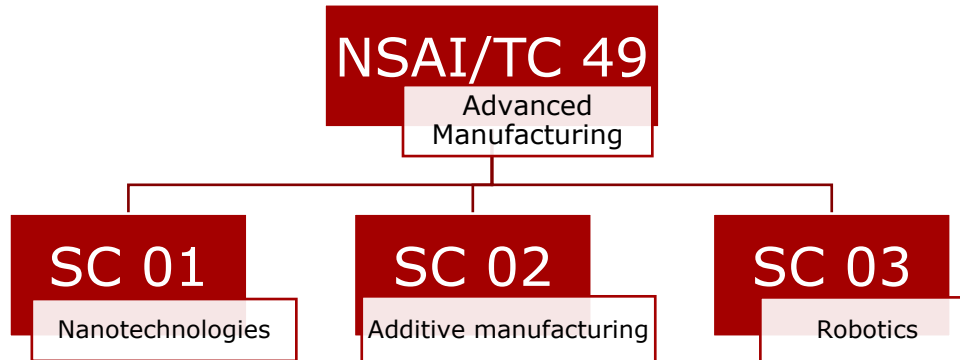
The committee mirrors the following international committees:

Committee Name	Committee Title
ISO/TC 261	Additive Manufacturing
ISO/TC 261/WG 1	Terminology
ISO/TC 261/WG 2	Processes, systems and materials
ISO/TC 261/WG 3	Test methods and quality specifications
ISO/TC 261/WG 4	Data and Design
ISO/TC 261/WG 6	Environment, health and safety
ISO/TC 261/JWG 10	Joint ISO/TC 261 - ISO/TC 44/SC 14 WG Additive manufacturing in aerospace applications
ISO/TC 261/JWG 11	Joint ISO/TC 261 - ISO/TC 61/SC 9 WG, Additive manufacturing for plastics
ISO/IEC JTC 1/WG 12	3D Printing and Scanning

4 Structure and Membership

4.1 Structure

The Figure below illustrates the structure of the National Committee:



4.2 Members

The list below are the members for the year 2020:

Organisation	Role
NSAI	Secretary Support
NSAI	Secretary
National University of Galway	Chairman
Confirm	Committee member
Nammo Ireland	Committee member
HPRA	Committee member
Dublin City University	Committee member
Technological University Dublin	Committee Member
Trinity College Dublin	Committee member
Stryker	Committee member
University College Dublin	Committee member
SteriPack Contract Manufacturing	Committee member
Domone Engineering	Committee member
IT Sligo	Committee member
Neratek	Committee member
Stryker	Committee member
NSAI NML	Committee member
Irish Manufacturing Research	Committee member
Johnson & Johnson	Committee member
University College Dublin	Committee member
Irish Manufacturing Research	Committee member
St James Hospital	Committee member
Trinity College Dublin	Committee member
HP	Committee member
Irish Manufacturing Research	Committee member
Irish Manufacturing Research	Committee member
Johnson & Johnson	Committee member
Boston Scientific	Committee member
Irish Manufacturing Research	Committee member
NSAI	Committee member
National University of Galway	Committee member
IT Waterford	Committee member

I-Form	Committee member
dePuy Synthetics	Committee member
IT Waterford	Committee member
Trinity College Dublin	Committee member
Trinity College Dublin	Committee member
Laser Prototype Europe (LPE)	Committee member

5 Summary of 2020 Activities

5.1 National

5.1.1 Meetings

The meetings were conducted via web-conferencing meeting facilities due to the restrictions caused by Covid-19. Committee members attended the following national meetings as follows:

Meeting No.	Date	Minutes Reference ** optional**
1	10 th September 2020	N 126

5.1.2 National Work

The Standards Committees will not draft any National Standards. All of the ISO/TC 261 Standards are being adopted as European Standards and will therefore be published as Irish Standards.

5.2 International/Regional

5.2.1 Meetings

Committee members attended international meetings as follows:

Committee Name	Location	Date	No. of Attendees
ISO/TC 261	El Paso, USA	10-14 th February 2020	0
ISO/TC 261	Online	14-18 th September 2020	6
ISO/IEC JTC 1/WG 12	New York, Ireland	03-05 th March 2020	1

Covid-19 disrupted Irish delegates travelling to the ISO/TC 261 meetings in 2020.

5.2.2 International/Regional Work

Ireland is committed to following and inputting into the development of the AM ISO/ASTM Standards. The National Committee reviews, comments and votes on each of the public comment drafts circulated by ISO/TC 261.

Ireland has seven experts participating in the Working Groups that are drafting the Standards.

Within the International Joint Technical Committee for Information Technology, [ISO/IEC JTC 1](#), there is a Working Group, WG 12 focused on 3D printing and Scanning. Ireland is represented with direct participation.

5.2.3 International/Regional Standards Reviewed

ISO/ASTM 52903-1:2020 *Additive manufacturing — Material extrusion-based additive manufacturing of plastic materials — Part 1: Feedstock materials*

ISO/ASTM 52903-2:2020, *Additive manufacturing — Material extrusion-based additive manufacturing of plastic materials — Part 2: Process equipment*

ISO/ASTM TR 52912:2020, *Additive manufacturing — Design — Functionally graded additive manufacturing*

ISO/ASTM 52915:2020, *Specification for additive manufacturing file format (AMF) Version 1.2*

ISO/ASTM 52941:2020 *Additive manufacturing — System performance and reliability — Acceptance tests for laser metal powder-bed fusion machines for metallic materials for aerospace application*

ISO/ASTM 52942:2020 *Additive manufacturing — Qualification principles — Qualifying machine operators of laser metal powder bed fusion machines and equipment used in aerospace applications*

ISO/ASTM FDIS 52903-1, *Additive manufacturing — Material extrusion-based additive manufacturing of plastic materials — Part 1: Feedstock materials*

ISO/ASTM PWI 52930, *Guideline for Installation — Operation — Performance Qualification (IQ/OQ/PQ) of laser-beam powder bed fusion equipment for production manufacturing*

ISO/ASTM CD 52931, *Additive manufacturing — Environmental health and safety — Standard guideline for use of metallic materials*

ISO/ASTM DIS 52924, *Additive manufacturing — Qualification principles — Classification of part properties for additive manufacturing of polymer parts*

ISO/ASTM FDIS 52942, *Additive manufacturing — Qualification principles — Qualifying machine operators of laser metal powder bed fusion machines and equipment used in aerospace applications*

ISO/ASTM CD 52936-1, *Additive manufacturing -- Qualification principles -- Laser-based powder bed fusion of polymers -- Part 1: General principles, preparation of test specimens*

ISO/ASTM CD 52916, *Additive manufacturing – Data formats – Standard specification for optimized medical image data*

ISO/ASTM PWI 52908, *Additive manufacturing — Post-processing methods — Quality assurance and post processing of powder bed fusion of metallic parts*

ISO/ASTM CD 52920, *Additive manufacturing — Qualification principles — Quality requirements for industrial additive manufacturing sites*

ISO/ASTM PWI 52928, *Additive Manufacturing of Metals — Feedstock Materials — Powder Life Cycle Management*

5.2.4 International/Regional Voting Results

The committee voted on thirty out of the seventy-eight international votes in 2020.

5.3 Regulatory Development/Update

There are no European Regulations applicable to the current suite of Standards being developed.

6 Irish Publications/Reviews

6.1 Publications

National Standards will not be produced by this committee as the International Standards will be published as European Standards adopted as Irish Standards.

6.2 Reviews

The Committee does not report to any National Steering Committee. It was agreed by ISO/TC 261 and ASTM F42, that in the event one organization starts to work on a new work item, it will invite the other to form a Joint Group. If the other organization is not interested in the work item, the standard will be developed "alone". A Coordination Group has been established (members being the ISO experts in the JGs), which meets mainly by web-conference, and which intends, among other things, to achieve a quick flow of information from one JG to the other (at least for the ISO experts in the JGs), a quick response to questions from ASTM and quick nomination of additional ISO experts to new JGs.

7 Work programme for 2021 onwards

7.1 ISO/TC 261

ISO/ASTM DIS 52900, *Additive manufacturing — General principles — Fundamentals and vocabulary*

ISO/ASTM AWI 52902, *Additive manufacturing — Test artifacts — Geometric capability assessment of additive manufacturing systems*

ISO/ASTM DTR 52905 *Additive manufacturing of metals — Non-destructive testing and evaluation — Defect detection in parts*

ISO/ASTM CD TR 52906 *Additive manufacturing — Non-destructive testing — Intentionally seeding flaws in parts*

ISO/ASTM AWI 52909 *Additive manufacturing — Finished part properties — Orientation and location dependence of mechanical properties for metal powder bed fusion*

ISO/ASTM AWI 52910, *Additive manufacturing — Design — Requirements, guidelines and recommendations*

ISO/ASTM AWI 52911-3, *Additive manufacturing — Design — Part 3: Standard Guideline for Electron-based powder bed fusion of metals*

ISO/ASTM CD 52916, *Additive manufacturing — Data formats — Standard specification for optimized medical image data*

ISO/ASTM AWI 52917, *Additive manufacturing — Round Robin Testing — Guidance for conducting Round Robin studies*

ISO/ASTM CD TR 52918, *Additive manufacturing — Data formats — File format support, ecosystem and evolution*

ISO/ASTM AWI 52919-1, *Additive manufacturing — Test method of sand mold for metalcasting — Part 1: Mechanical properties*

ISO/ASTM AWI 52919-2, *Additive manufacturing — Test method of sand mold for metalcasting — Part 2: Physical properties*

ISO/ASTM CD 52920, *Additive manufacturing — Qualification principles — Quality requirements for industrial additive manufacturing sites*

ISO/ASTM DIS 52921 *Additive manufacturing — General principles — Standard practice for part positioning, coordinates and orientation*

ISO/ASTM DIS 52924, *Additive manufacturing — Qualification principles — Classification of part properties for additive manufacturing of polymer parts*

ISO/ASTM DIS 52925, *Additive manufacturing processes — Laser-based powder bed fusion of polymer parts (PBF-LB/P) — Qualification of materials*

ISO/ASTM CD 52926-1, *Additive manufacturing of metals — Qualification principles — Part 1: General qualification of machine operators*

ISO/ASTM CD 52926-2, *Additive manufacturing of metals — Qualification principles — Part 2: Qualification of machine operators for PBF-LB*

ISO/ASTM CD 52926-3 *Additive manufacturing of metals — Qualification principles — Part 3: Qualification of machine operators for PBF-EB*

ISO/ASTM CD 52926-4, *Additive manufacturing of metals — Qualification principles — Part 4: Qualification of machine operators for DED-LB*

ISO/ASTM CD 52926-5 *Additive manufacturing of metals — Qualification principles — Part 5: Qualification of machine operators for DED-Arc*

ISO/ASTM CD TS 52930, *Additive Manufacturing — Qualification principles — Installation, operation and performance (IQ/OQ/PQ) of PBF-LB equipment*

ISO/ASTM CD 52931, *Additive manufacturing — Environmental health and safety — Standard guideline for use of metallic materials*

ISO/ASTM CD 52932, *Additive manufacturing — Environmental health and safety — Standard test method for determination of particle emission rates from desktop 3D printers using material extrusion*

ISO/ASTM WD 52933, *Additive manufacturing — Environment, health and safety — Consideration for the reduction of hazardous substances emitted during the operation of the non-industrial ME type 3D printer in workplaces, and corresponding test method*

ISO/ASTM AWI 52935, *Additive manufacturing — Qualification principles — Qualification of coordinators for metallic parts production*

ISO/ASTM CD 52936-1, *Additive manufacturing — Qualification principles — Laser-based powder bed fusion of polymers — Part 1: General principles, preparation of test specimens*

ISO/ASTM 52950, *Additive manufacturing — General principles — Overview of data processing*

7.2 ISO/IEC JTC 1/WG 12 – 3D Printing & Scanning

ISO/IEC/DIS 23510, *Information technology -- 3D Printing and Scanning -- Framework for Additive Manufacturing Service Platform (AMSP)*

8 Additional Information

Ireland was due to host ISO/IEC JTC1 between the 11th to the 15th of May 2020 however, due to Covid-19 restriction this event had to be cancelled.