



International
Electrotechnical
Commission

Standardization activities of IEC/TC124/WG2 “E-Textiles”

Co-convenor

MANCHESTER
1824

The University of Manchester

Henry Yi Li / University of Manchester



Satoshi Maeda / University of Tokyo and TOYOBO MC Co., Ltd.

TOYOBO
Beyond Horizons

Our position

TC 124 Wearable electronic devices and technologies

Scope **Structure** Projects / Publications Documents Votes Meetings Collaboration Platform

Membership Officers Liaisons Subcommittee(s) and/or Working Group(s)

TC 124 Subcommittee(s) and/or Working Group(s)

Label	Title
Working Group	
WG 1	Terminology
WG 2	E-textiles
WG 3	Materials
WG 4	Devices and Systems
WG 8	Wearable communications and interfaces technologies
Joint Working Groups	
JWG 6	Test methods of wearable heating e-textile products linked to ISO/TC 38
Advisory Group	
AG 1	Advisory Group on Strategy and Coordination

IEC/TC124/WG2
E-Textiles

ISO/IEC JTC1 SC41
IoT

Heating
Garment

ISO/TC38
Textiles

Task:
To develop measuring and evaluating methods for textile materials, devices, and systems with electrotechnical functionality

Title & Task

WG 2

E-textiles

To develop measuring and evaluating methods for textile materials, devices, and systems with electrotechnical functionality

Liaisons

Organizations Liaison Representative

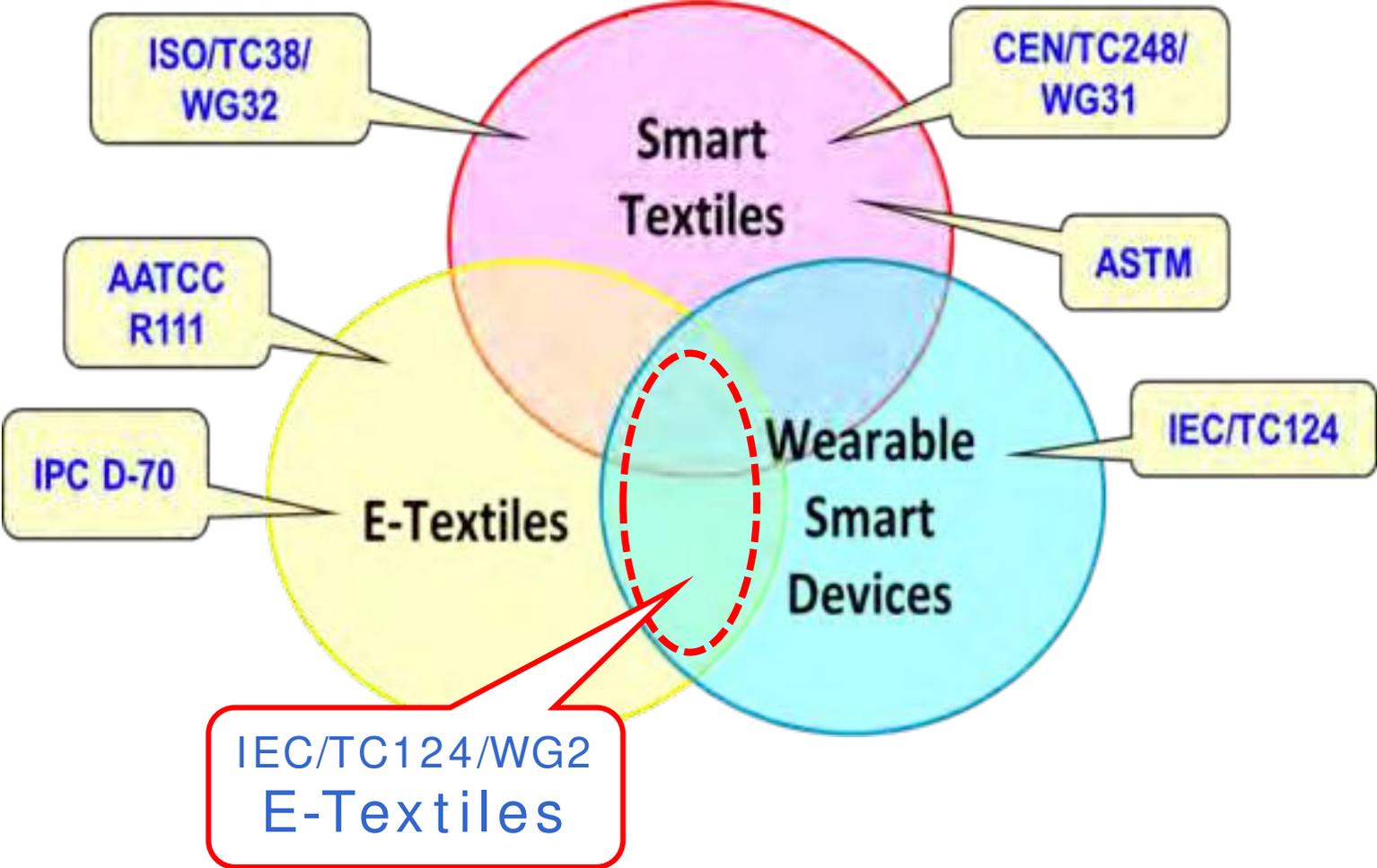
Internal IEC Liaison

ISO/IEC JTC 1/SC 41 Mrs Catherine Grant

Liaison ISO

ISO/TC 38 Ms Karin Rachel Eufinger

Our position



Standardization activities in 2016-2018

Basic terminologies

smart textile product, intelligent textile product, interactive textile product
functional textile product which interacts reversibly with its environment, or responds or adapts to changes in the environment

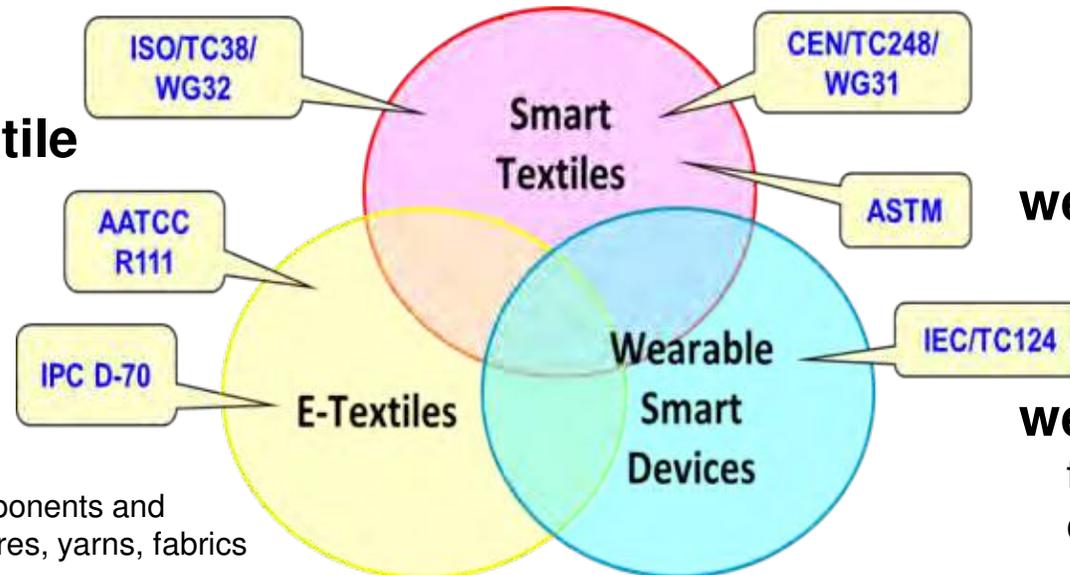
ISO/TR23382 (2020)

electronic textile, e-textile

fibre, yarn, fabric, or textile end product combined with at least one electronic component or device

Note 1 to entry: Electronic devices, components and systems can be made at the levels of fibres, yarns, fabrics and garments.

IEC 63203-101-1 (2021)



wearable electronic device

electronic device intended to be located near to, on, or in, a human body

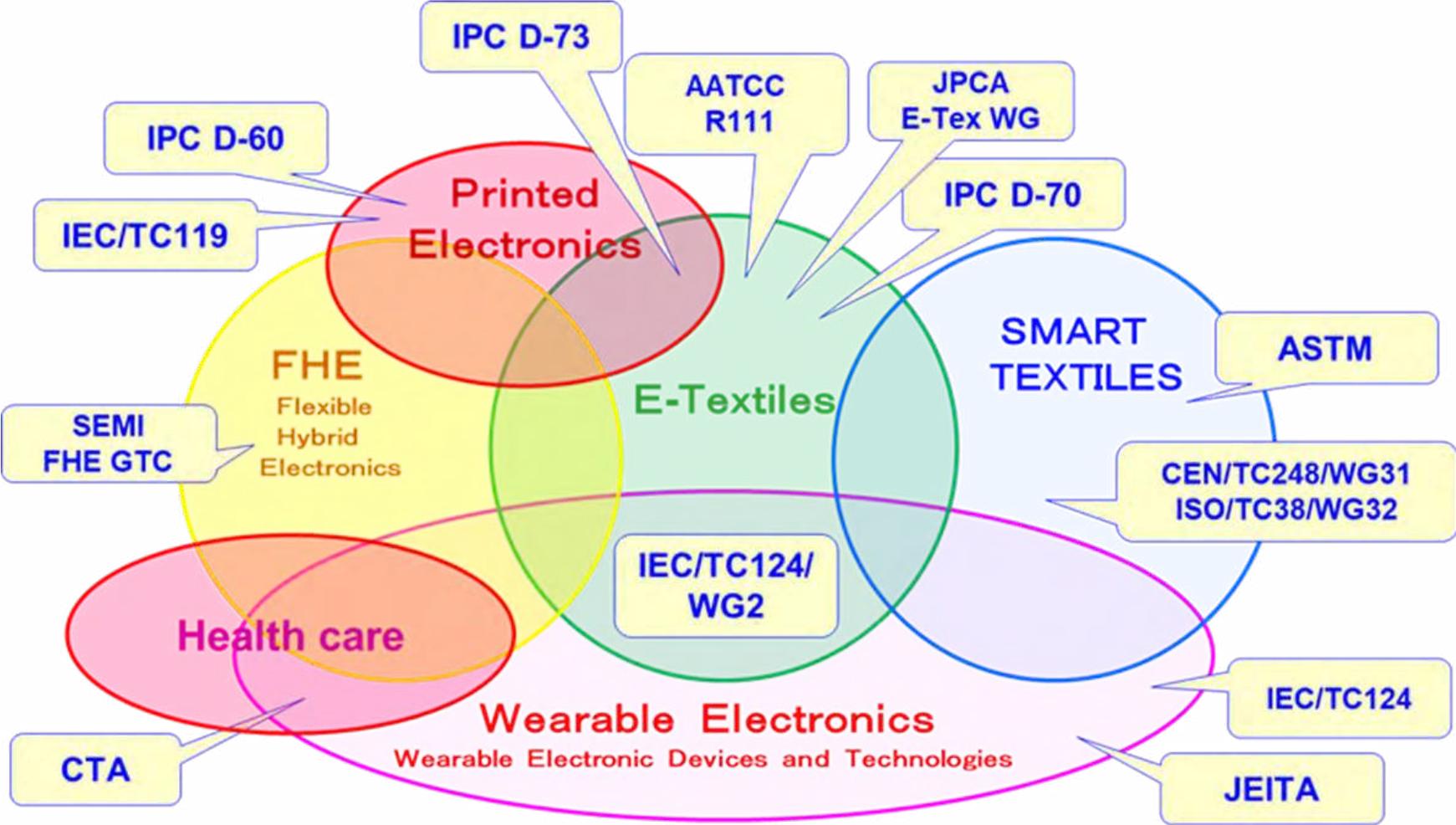
wearable electronic technology

technology related to the development of wearable electronic devices

Note 1 to entry: Examples: materials, applications, devices, components, systems or network.

IEC 63203-101-1 (2021)

Our current position



Standardization activities in 2024

TC124/WG2 Structure and Achievement

IEC 63203 -			Published	Active Project	PWI	New Proposal
Part 201-X	Materials of e-textiles	Electrical conductivity and electrical insulation of Fiber, Yarn, Fabric Environmental dependency and durability of basic material properties	3 ISs 1 Cor	1 CDV		
Part 202-X	E-textile passive elements	Passive elements (or components) in e-textiles (Impedance: Inductance Capacitance, Resistance), Fundamental circuits formed by passive components (antennas, resonant circuits, etc.), and sensors devices based on changes in passive elements characteristics			3 PWIs	2 Proposals
Part 203-X	E-textile active functional elements	Active components, nonlinear components (such as diode, transistor) of E-textiles E-textiles sensor devices applied active (nonlinear) functions Power generation elements, light emitting elements, etc		2 NPs		
Part 204-X	E-textile garment type products	E-textile garment type productstest methods of functional characteristics, durability (such as washing durability)	1 IS	1 CDV		
Part 205-X	E-textile system requiments	E-textile system requiments				
Part 250-X	E-textile inter-connecting elements	Permanent direct electrical connections (such as soldering), Removable connections (connectors), non-contact electromagnetic connections, etc. in E-textiles	1 TR			

TC124/WG2 Published IS and Projects on 2024-05-30

	Reference	Date Status	Title
Published	IEC 63203-201-1:2022 ED1	2022-04-26	Wearable electronic devices and technologies - Part 201-1: Electronic textile - Measurement methods for basic properties of conductive yarns
	IEC 63203-201-2:2022 ED1	2022-04-26	Wearable electronic devices and technologies - Part 201-2: Electronic textile - Measurement methods for basic properties of conductive fabrics and insulation materials
	IEC 63203-201-2:2022/COR1:2023 ED1	2023-10-20	Corrigendum 1 - Wearable electronic devices and technologies - Part 201-2: Electronic textile - Measurement methods for basic properties of conductive fabrics and insulation materials
	IEC 63203-201-3:2021 ED1	2021-04-07	Wearable electronic devices and technologies - Part 201-3: Electronic textile - Determination of electrical resistance of conductive textiles under simulated microclimate
	IEC 63203-204-1:2023 ED2	2023-03-16	Wearable electronic devices and technologies - Part 204-1: Electronic textile - Test method for assessing washing durability of e-textile products
	IEC TR 63203-250-1:2021 ED1	2021-06-22	Wearable electronic devices and technologies - Part 250-1: Electronic textile - Snap fastener connectors between e-textiles and detachable electronic devices
Active Project	IEC 63203-201-4 ED1	124/246/CDV	Wearable electronic devices and technologies - Part 201-4: Electronic textile - Test method for determining sheet resistance of conductive fabrics after abrasion
	IEC 63203-203-1 ED1	124/224/NP	IEC 63203-203-1: Wearable electronic devices and technologies - Part 203-1: Test method for measuring performance of fabric-based triboelectric nanogenerator
	IEC 63203-203-2 ED1	124/225/NP	IEC 63203-203-2: Wearable electronic devices and technologies - Part 203-2: Test method for measuring performance of fabric-based piezoelectric nanogenerator
	IEC 63203-204-2 ED1	124/233/CDV	Wearable electronic devices and technologies - Part 204-2: Electronic textile - Test method to characterize electrical resistance change in knee and elbow bending test of e-textiles
	IEC 63517 ED1	124/275/CD on JWG6	Wearable electronic textiles - Test methods for performance of heating products - Heating temperature and power consumption
Preliminary	PWI 124-10 future 63203-202-5	PWI	Future IEC 63203-20X-X: Wearable electronic devices and technologies - Part 20X-X: Standard Test Method for Measuring Resistance-based Textile Tensile Strain Sensors (RTSS) in dry and wetted conditions
	PWI 124-14 future 63203-202-2	PWI	Future IEC 63203-2XX-X: Wearable electronic devices and technologies - Part 2XX-X: Test method to characterize inductance of e-textiles under deformation
	PWI 124-17 future 63203-202-1	PWI	Future IEC 63203-2XX-X: Wearable electronic devices and technologies - Part 2XX-X: Measurement method for impedance of E-textile
New proposals	pre PWI future 63203-202-3		Testing method to characterize e-textile humidity sensors
	pre PWI future 63203-202-4		Test methods to characterize e-textile NFC communication system

4 ISs
1 Cor
1 TR

**4(+1) active
projects**

3 PWIs

**2 New
proposals**

Let's join to standardization works

We are in the process of
an evolution of clothing,
and
E-textiles are an essential part
of that evolution.

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