

Textile
Environmental
Medical
섬유환경의료

TC동향보고서

TC 94

Technical Committee
Trend Report

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1. 분야정의

- 개인보호장구(PPE, personal protective equipment)란 개인의 부상 및 감염 등의 외부 위해로부터 보호하기 위해 착용하는 보호구를 의미한다. 보호장구는 물리적, 전기적, 열, 화학물질, 방사능, 생물학적 위험 및 공기 중 미립자 등의 위험 요소로부터 신체를 보호한다.
- 의복 형태의 보호복 및 방호복을 포함하여, 머리·눈·얼굴 보호구, 호흡 보호구, 안전장갑, 안전화 등으로 구성된다. PPE는 건설, 제조, 석유 및 가스, 의료용, 소방용, 광업, 식품 분야 등 다양한 산업분야 및 의료·재난 대응 현장에서 사용되고 있다.



[그림 1] 개인보호장구의 제품 종류

○ 주요 개인보호장구 분류



◆ 머리 보호구(안전모)

- 산업현장에서 발생할 수 있는 낙하·추락 및 여타 위험요인으로 인한 피해를 방지 혹은 저감시켜 주는 역할을 수행하는 PPE로 안전모가 가장 대표적이다. 한국산업안전보건공단의 경우, 안전모를 낙하 방지용, 낙하·추락 방지용, 낙하·감전 방지용, 다목적용으로 용도별 분류하고 있다.



◆ 얼굴 보호구(안면 보호구)

- 다양한 화학적 위험이나 유해광선으로부터 눈을 포함한 얼굴 전체를 보호하는 용도로 보호면이라는 명칭이 자주 사용된다. 조선소 등의 용접작업장, 제철소나 주물공장 등의 용융금속 취급 작업장, 각종 화학물질이 안면에 튀어 상처를 입힐 염려가 있거나 피부로 흡수될 가능성이 있는 작업장이 보호면의 주된 이용처라고 할 수 있다. 또한 레이저 기계를 다루는 의료 산업에서도 사용된다.



◆ 눈 보호구

- 먼지나 이물질로부터 눈과 인근 부위를 보호하기 위하여 착용하는 보호구로 적외선, 가시광선, 자외선 등의 유해광선이 문제시되는 작업장이나 용해, 주조, 용접 작업장, 산·알칼리 등 화학물질 취급 작업장 등에서 이용한다. 눈 보호구는 먼지나 화학물질과 같은 이물질로부터 눈을 보호해주는 보안경과 유해광선을 차단해주는 차광안경 등으로 나뉘며, 후자의 경우 유해광선의 대역(파장)에 적합해야 의미가 있다.



◆ 청각 보호구

- 소음이 심한 작업장에서 청각보호용으로 착용하는 것으로 일반적으로 소음 수준이 80데시벨(dB)을 초과하는 경우 청력 보호구를 사용한다. 일반적으로 귀마개(earplug), 귀덮개(earmuff)와 같은 제품을 포함한다.



◆ 보호복

- 날카로운 가장자리, 중금속 또는 유해화학물질, 방사선, 고열과 같은 위험요소로부터 피부를 보호하기 위한 목적으로 착용된다. 방열복은 제철소 또는 유리 가공업체에서 금속 또는 유리 등을 제련하거나 용해하는 과정에서 발생하는 고열로부터 화상 또는 열충격을 예방하기 위한 용도로 이용된다. 또한 사업현장에서 발생하는 분진, 미스트, 가스 또한 피부를 통하여 흡수되거나 피부에 상해를 초래할 수 있으므로, 유해물질로부터 피부를 보호하기 위하여 화학적 보호성능을 갖는 보호복을 필요로 하게 된다. 보호복은 이외에도 잠수나 바이크 운전자 보호용 등의 용도로도 개발되어 이용되고 있다.



◆ 호흡용 보호구

- 호흡용 보호구는 불충분한 산소 환경, 유해한 먼지, 담배 연기, 부연 가스 등으로 부터 보호를 제공한다. 호흡용 보호구는 작업현장에서 발생 가능한 공기중 유해물질이 호흡기를 통하여 체내로 유입되는 것을 차단하는 용도로 마스크가 가장 대중적으로 잘 알려져 있다.



◆ 안전화

- 발의 보호를 위한 보호구로 작업의 일상 업무로 인해 발에 심각한 부상을 입을 수 있는 경우 안전화가 필요하다. 발 부상은 굴리거나 떨어지는 물체가 있는 부위, 발바닥을 관통하는 물체 또는 발이 전기적 위험에 노출된 부위를 포함한다. 안전화는 낙하 및 충격이나 화학약품 등으로부터 발을 보호하기 위한 용도로 이용된다. 안전화는 낙하 및 충격이나 날카로운 사물로 인한 자상을 방지하기 위한 용도와, 방수 및 내화학성용, 정전기 및 인체대전 방지 용도별로 상이한 소재가 사용된다.



◆ 안전장갑

- 유해물질의 피부 흡수, 화학적 또는 열화상, 전기적 위험, 명, 찰과상, 절단, 골절 등으로 인한 위험을 방지하는 목적으로 이용된다. 감전 대책은 보통 고무계의 절연 소재를 사용하는 것이 일반적이며, 이때 보통 내수성, 내화학성을 추가로 부여하는 경우가 대부분이다.

2. 중요성

- 보호구는 기본적으로 분진, 소음, 유해가스, 유해광선 등의 유해요인으로부터 개인 작업자를 격리하는 것이 목적이므로 만약 보호구 자체의 성능에 이상이 생겼거나 또는 착용 방법이 잘못된 경우 보호구의 목적 자체가 아예 불가능해지며, 이는 역으로 보호가 아닌 위험을 초래할 수 있다.
- 따라서 보호구의 성능 충족 여부는 장비의 상업성과 더불어 기본 기능성에 대한 선결요건이자 필요조건이라는 측면에서 중요성이 강조되고 있다.
- 최근 보호복 시장은 기존에 잘 알려진 보호복 이외에도 특수한 상황에서 작업자를 보호하기 위한 다양한 보호복이 개발되고 있으며, smart 기술을 도입한 보호복을 선보이고 있는 추세이다.
- 하지만 아직은 전자 제품으로 인한 전기 안정성 및 표면 온도, 배터리 안전성, 전자기장(EMP)의 영향 및 전자 기적 호환성(EMC) 등 제품 성능에 대한 추가적인 연구가 필요한 단계이며, 스마트 PPE 제품의 품질 안전성이 확보된다면 작업자에게 안전을 보장하고, 더 높은 수준의 보호를 제공할 수 있을 것으로 예상된다.

			
S-AIRBAG 낙하 방지 조끼	양봉용 보호복	방사선 보호복	스마트 PPE

[그림 2] 특수 개인보호장구 예시

1. 시장 및 산업동향

가. 국내 시장 및 동향

- 국내 개인보호장구 시장은 2019년 산업정책분석원 보고서에 따르면, 2018년 5.9억 달러 규모임. 또한 2018년에서 2022년까지 6.2%의 연평균 성장률을 기록할 것으로 예측하고 있으며, 2022년에는 약 8억 달러(약 1조원)에 이를 것으로 전망하고 있다.

[표 1] 국내 안전보호 산업시장 전망

(단위 : USD million)

구분	2018	2019	2020	2021	2022	CAGR (2018~2022)
Revenue	598.8	644.4	694.2	748.4	807.6	6.2%

출처 : 첨단 섬유산업의 시장분석과 탄소/나노소재 기술개발 동향 (2019, 산업정책분석원)

- 국내 보호복 시장은 2018년 1.2억 달러 규모임. 또한 2018년에서 2022년까지 6.4%의 연평균 성장률을 기록할 것으로 예측하고 있으며, 2022년에는 약 1.7억 달러(약 2250억원)에 이를 것으로 전망하고 있다.

[표 2] 국내 보호복 산업시장 전망

(단위 : USD million)

구분	2018	2019	2020	2021	2022	CAGR (2018~2022)
보호복	129.6	139.8	150.9	163.1	176.4	6.4%

출처 : 첨단 섬유산업의 시장분석과 탄소/나노소재 기술개발 동향 (2019, 산업정책분석원)

- 우리나라는 안전 보호 섬유제품과 관련하여 고성능 섬유소재, 직편물, 염가공, 디자인·봉제에 대한 기술경쟁력은 갖추고 있으나 안전보호 제도와 시험평가 및 인증 인프라는 선진국에 비해 미흡한 실정이다. 하지만 안전의식 제고와 정부의 안전규제 강화에 따라 PPE 제품에 대한 수요가 증가하는 추세이다.
- COVID-19 사태 종식 불가한 전망 보도 등으로 인하여 의료용 가운 및 방역용 보호복을 비롯한 의료용 의류 시장의 지속적 확대가 예견되어 일반 의류 업체도 보호복 및 마스크 생산으로 사업 범위를 확대하고 있는 상황이다. 2020년 상반기에는 국산 보호복 수출이 컸던 루마니아와 더불어 중간 가공생산기지 역할을 하는 베트남, 인도, 홍콩, UAE, 태국 등 인근 아시아 지역으로의 수출이 증가했다. 특히 의료용 PPE는 COVID-19 진단검사의 확대로 북미, 유럽지역에서 지속적으로 수요가 발생하고 있다.

나. 해외 시장 및 동향

- 세계 개인보호장구 시장은 <PPE Market Report(2020, Global Market Insights, Inc.)>에 따르면, 2021년에서 2027년까지 9.5%의 연평균 성장률을 기록할 것으로 예측하고 있으며, 2027년에는 약 1200억 달러(약 159조원)에 이를 것으로 전망하고 있다.

[표 3] 글로벌 개인보호장구 시장 수익

(단위 : USD million)

Year	2021	2022	2023	2024	2025	2026	2027	CAGR (2021~27)
USD Million	69,674.9	76,642.4	83,693.5	91,451.9	99,993.5	109,442.9	120,026.1	9.5%

출처 : Personal Protective Equipment (PPE) Market Report, Global Market Insights, 2020.

- 세계 개인보호장구 시장을 보호대상(또는 생산품) 별로 살펴보면 보호복(protective clothing)이 2023년 기준 197억 달러로 가장 크며, 다음으로 손보호 장비, 호흡기 장비 순으로 차지하고 있다. 2021년에서 2027년까지 보호복은 9.5%, 손보호, 발보호, 추락방지 장비 등은 10% 이상의 높은 연평균 성장률을 나타낼 것으로 전망된다.

[표 4] 품목별 글로벌 개인보호장구 시장 수익

(단위 : USD million)

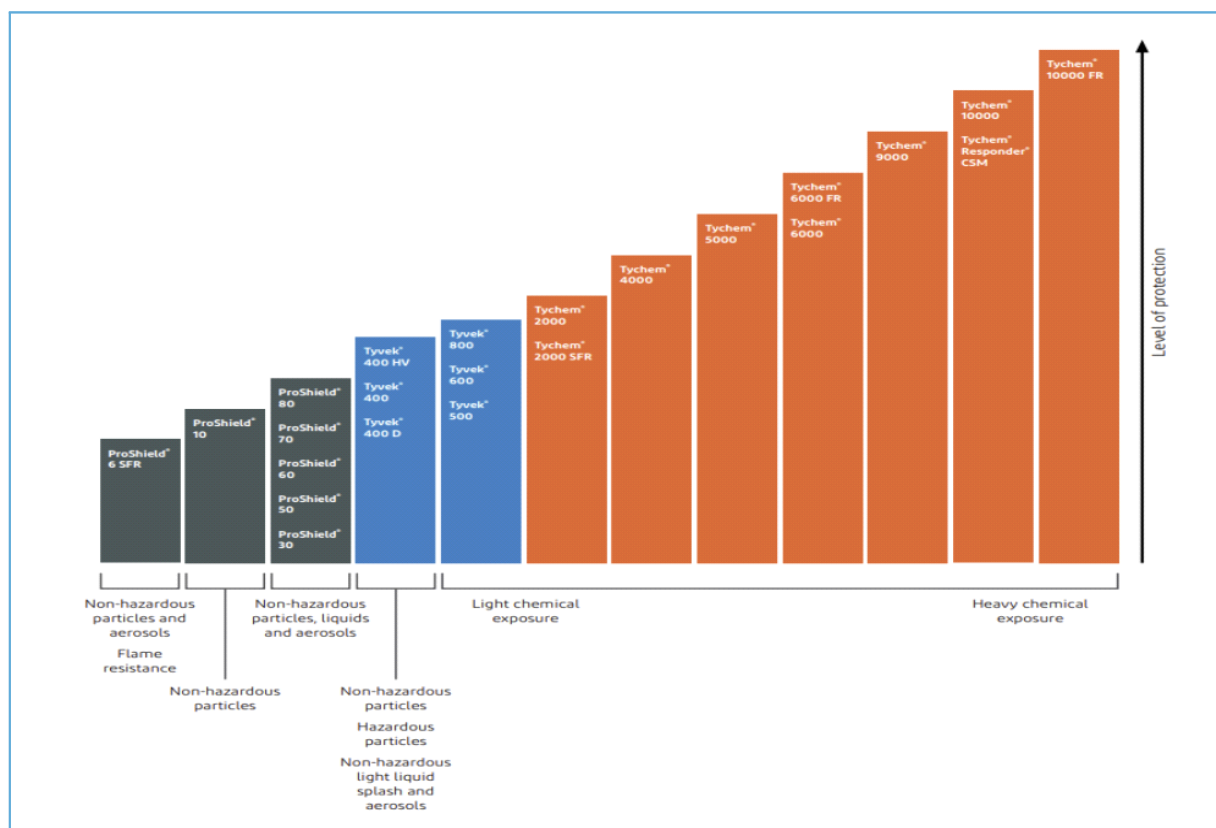
Product	2021	2022	2023	2024	2025	2026	2027	CAGR (2021~27)
Head Protection	2,383.6	2,618.6	2,855.6	3,116.1	3,402.4	3,718.7	4,072.4	9.3%
Eye and Face Protection	6,676.9	7,347.7	8,027.0	8,774.6	9,597.8	10,508.7	11,528.9	9.5%
Hearing Protection	1,836.7	1,989.4	2,138.5	2,299.6	2,473.9	2,663.3	25,874.1	7.7%
Protective Clothing	16,336.5	18,000.4	19,689.3	21,550.1	23,601.6	25,874.1	15,502.6	9.7%
Respiratory Protection	9,649.6	10,663.0	11,696.8	12,838.8	14,101.0	15,502.6	17,077.3	10.0%
Protective Footwear	7,712.3	8,393.2	9,034.8	9,800.8	10,659.4	20,051.1	22,090.0	10.0%
Fall Protection	3,996.0	4,425.2	4,864.7	5,351.3	5,890.2	6,489.8	7,164.8	10.2%
Hand Protection	15,707.9	17,153.5	18,595.4	20,170.8	21,893.1	23,785.7	25,893.0	8.7%
Others	615.5	660.5	703.2	748.7	797.2	849.0	905.4	6.6%
Total	69,674.9	76,642.4	83,693.5	91,451.9	99,993.5	109,442.9	120,026.1	9.5%

출처 : Personal Protective Equipment (PPE) Market Report, Global Market Insights, 2020.

- 산업안전의 중요성이 대두됨에 따라 건축, 오일&가스, 화학물질, 제약, 운송, 중공업 분야에서 개인안전장비 시장규모가 확대되고 있으며, 유럽과 북미를 위주로 산업안전규범에 관한 강한 규제 지침이 선제적으로 도입됨에 따라 시장에서의 수요 또한 증가하고 있다.
- 중국과 인도의 다양한 노동집약적 산업의 가속화가 Asia Pacific 지역의 높은 경제 성장률을 이끌고 있다. 특히, 건설 산업의 성장과 동반된 오일&가스, 운송, 화학, 제조업 성장이 관련 지역 안전장비 수요를 확대시키고 있으며, 이와 연계된 육상, 해상 운송물량 및 사고 발생 건수의 증가로 파생되는 보상비용 증가 역시 이 지역 안전장비 수요를 증가시키고 있다.

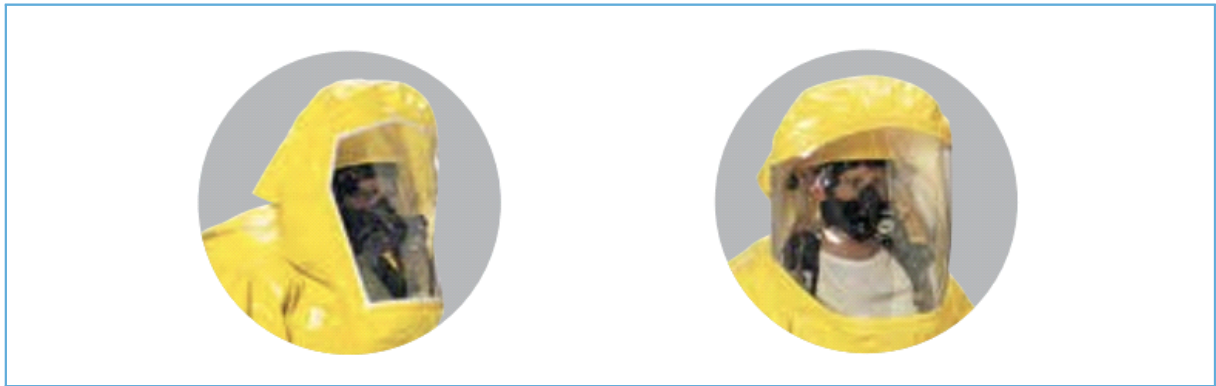
2. 기술 발전 동향

- 글로벌 개인보호구(PPE) 관련 주요 업체는 DuPont, 3M, Honeywell 및 Ansell과 같은 회사들이 있으며, 독특하고 혁신적인 기술을 활용하여 다양한 산업에 제품을 설계하고 공급하고 있다. 주요 제조업체들은 환경 및 안전 규정을 준수하고 제품 비용을 줄일 수 있는 제품 포트폴리오를 개발하는 데 중점을 두고 있다.
- 유해하지 않은 입자, 분무, 액체로부터 신체를 보호하는 보호복 제품으로 Proshield® 계열이 있으며, 유해 입자 또는 낮은 수준의 화학물질로부터 보호하는 제품군으로 Tyvek®이 있고, 높은 수준의 화학물질을 보호하는 보호복은 Tychem®이 있다.



[그림 3] Dupont 화학보호복용 브랜드 종류 및 보호성능

- 얼굴 보호면 역시 표준형과 확장형으로 나눌 수 있다. 확장형의 경우 착용자가 다루는 대상을 더 많이 볼 수 있도록 시야를 확대시켰으며, 잘못된 동작을 줄이고 더 자연스러운 움직임과 더 나은 아이컨택(eye contact)이 가능해졌다.
- Tychem® 10000 및 Tychem® 9000 레벨 A 의복의 EX(Extra-Wide) 얼굴 보호면 옵션은 마스크 마운트 레귤레이터에 충분한 공간을 제공하는 랩 어라운드 디자인이 특징이며, 이 얼굴 보호면은 더 넓고 길어서 주변 및 수직 시야가 가능하다.



[그림 4] 표준형(좌) 및 확장형(EX, extra-wide)(우) 얼굴보호면

- 국내 방열복은 한컴라이프케어, 진양에스앤피, 성광테크 등의 업체에서 산업용 및 소방용 방열복을 생산하고 있다. 대부분 아라미드 원단 또는 아라미드 복합소재를 기저원단으로 사용하고, 외피에 알루미늄 금속 증착, 내피쪽에는 열전달을 완충할 수 있는 내열소재 편물 또는 부직포 원단 등으로 구성하고 있으며, 산업용 방열복은 구성은 유사하나 아라미드 대신 모다크릴 소재를 사용하기도 한다.
- 소방 방화복의 경우는 주된 역할이 화재 현장에서 소방대원의 신체를 보호하는 것이므로 방화 특성을 반영함에 따라 방화복 자체가 4kg 이상으로 무거웠으나, 최근 소방대원들의 불편함을 개선하기 위해 방염/내열 특성은 유지하면서도 경량화하는 연구 또는 인체공학적 설계로 활동성을 개선하는 연구들이 진행되고 있다.

1. 개인보호장구 분야 표준화 활동 현황

가. ISO/TC 94 조직 구성

- ISO/TC94는 개인보호장구(Personal protective equipment)에 관한 국제표준을 제정하는 기술위원회로 안전화, 눈 및 안면 보호, 보호복, 소방관용 개인 장비, 호흡 보호 장치 등 개인 보호를 위한 보호장구 분야의 표준을 담당한다. 5개의 SC와 하위 그룹 CAG, 3개의 WG으로 구성되어 있다.

[표 5] ISO/TC 94 조직 구성

구분	SC명		WG명	
TC 94	SC 3	Foot protection	WG 1	PPE footwear – Test methods
			WG 2	PPE footwear – Requirements
	SC 6	Eye and face protection	JWG 1	Joint ISO/TC 94/SC 6-IEC/TC 76 WG : Requirements for eye and face protection against laser radiatio
			WG 2	Test methods
			WG 3	Sunglasses and related eyewear
			WG 4	Occupational eye and face protection
			WG 5	Sports eye and face protection
	SC 13	Protective clothing	CAG	Chairman's Advisory Group
			JWG 1	Revision ISO 16602 & ISO 8194
			WG 1	General properties
			WG 2	Protective clothing against heat and flame
			WG 3	Protective clothing against chemicals agents
			WG 5	Protective clothing against mechanical action
			WG 6	Protective clothing against hazardous biological agents
			WG 8	Standardization for protective gloves
	SC 14	Firefighters' personal equipment	JWG 1	Joint ISO/TC 94/SC 14 – ISO/TC 94/SC 13 WG : Chemical, biological, radiological and nuclear (CBRN)
			WG 1	General requirements
			WG 2	Firefighting
			WG 3	Wildland firefighting
			WG 4	Hazardous materials incidents (hazmat)
	SC 15	Respiratory protective devices	WG 5	Non-fire rescue incidents (Rescue)
			WG 4	Test methods
			WG 5	Human factors
			WG 6	Selection and use
			WG 7	CBRN
			WG 23	Filtering and supplied breathable gas RPD
			CAG	Chairman's Advisory Group
			WG 1	Compatibility of PPE items
			WG 2	Head protection
			WG 3	Personal equipment for protection against falls

○ P- 멤버 : 34개국(대한민국, 미국, 벨기에, 중국, 프랑스, 독일, 인도, 이탈리아, 일본 등)

○ O- 멤버 : 28개국(핀란드, 헝가리, 뉴질랜드, 포르투갈, 우크라이나 등)

[표 6] ISO/TC 94 참여국 ('23년 10월 기준)

구분	국가명
P(primary) 멤버	호주, 오스트리아, 방글라데시, 벨기에, 브라질, 칠레, 중국, 덴마크, 프랑스, 독일, 인도, 이란, 이탈리아, 일본, 조르단, 카자흐스탄, 케냐, 대한민국, 말레이시아, 몽골리아, 네덜란드, 노르웨이, 필리핀, 폴란드, 러시아, 사우디아라비아, 남아프리카, 스페인, 스리랑카, 스웨덴, 스위스, 튀르키예, 영국, 미국 등 34개국
O(observation) 멤버	아르헨티나, 보스니아헤르체고비나, 불가리아, 콜롬비아, 쿠바, 체코, 에티오피아, 핀란드, 그리스, 중화홍콩특별행정구, 헝가리, 인도네시아, 아일랜드, 룩셈부르크, 멕시코, 뉴질랜드, 파키스탄, 포르투갈, 루마니아, 세르비아, 싱가포르, 타이, 트리니다드토바고, 튀니지, 우크라이나, 우루과이 등 28개국

나. TC/SC 의장, 간사, 컨베너 등 현황

○ ISO/TC 94는 호주에 의해서 주도되고 있다. SC별 간사국은 호주, 영국, 스위스, 독일로 이루어져 있다.

[표 7] ISO/TC 94 의장·간사 현황

구분	Title	의장	간사	간사국
TC 94	Personal safety – Personal protective equipment	Mr Russell Shephard	Ms Hilary Nobile	호주(SA)
TC 94/ SC 3	Foot protection	Mr Pete Doughty	Mr Amit Patel	영국(BSI)
TC 94/ SC 6	Eye and face protection	Mr Ronald Rabbetts	Mr Amit Patel	영국(BSI)
TC 94/ SC 13	Protective clothing	Mr Shinichiro Ikeda	Ms Ruth Schneider	스위스(SNV)
TC 94/ SC 14	Firefighters' personal equipment	Mr Robert Vickery	Ms Hilary Nobile	호주(SA)
TC 94/ SC 15	Respiratory protective devices	Mrs Dr Gabriele Tröscher	Mr Karl Wenzelowski	독일(DIN)

[표 8] ISO/TC 94 WG별 컨비너

구분		Title	Convenor
TC 94	CAG	Chairman's Advisory Group	Mr Russell Shephard
	WG 1	Compatibility of PPE items	Professor Stephen Dain
	WG 2	Head protection	Dr Andrew McIntosh
	WG 3	Personal equipment for protection against falls	Mr zhong CAI
TC 94/ SC 3	WG 1	PPE footwear – Test methods	M Jean–Claude Cannot
	WG 2	PPE footwear – Requirements	Mrs Dipl.–Ing.(FH) Liselotte Vijselaar
TC 94/ SC 6	WG 2	Test methods	Dr B. Ralph Chou
	WG 3	Sunglasses and related eyewear	Mr Graziano Marusi
	WG 4	Occupational eye and face protection	Ms Annette Hoskin
	WG 5	Sports eye and face protection	Professor Stephen Dain
TC 94/ SC 13	CAG	Chair's Advisory Group	Mr Eric van Wely
	JWG 1	Revision ISO 16602 & ISO 8194	Mr Eric van Wely
	WG 1	General properties	M Laurent Houillon
	WG 2	Protective clothing against heat and flame	Mr David Matthews
	WG 3	Protective clothing against chemicals agents	Dr Anugrah Shaw
	WG 5	Protective clothing against mechanical action	Mr Simon Courtney
	WG 6	Protective clothing against hazardous biological agents	Mr Sven Schoppe
	WG 8	Standardization for protective gloves	M Jean–Claude Cannot
TC 94/ SC 14	JWG 1	Joint ISO/TC 94/SC 14 – ISO/TC 94/SC 13 WG : Chemical, biological, radiological and nuclear (CBRN)	Mr Jeffrey Stull
	WG 1	General requirements	Mr David Matthews
	WG 2	Firefighting	Mr David Matthews
	WG 3	Wildland firefighting	Mr Rick Swan
	WG 4	Hazardous materials incidents (hazmat)	Mr Ulf Nystrom
	WG 5	Non–fire rescue incidents (Rescue)	Mr Tetsuya Kubo
TC 94/ SC 15	WG 4	Test methods	Dr Andrew Viner
	WG 5	Human factors	Mr Dan Warkander
	WG 6	Selection and use	Mr C Tracey
	WG 7	CBRN	Dr Simon J.Smith
	WG 23	Filtering and supplied breathable gas RPD	Mr Dipl.–Ing Klaus–Michael Ruck

다. 한국 국제표준 전문가 참여현황

- 한국은 ISO/TC 94 바닥재 분야 국제표준화 대응을 위하여 P-멤버 지위를 확보하고, 국제표준 전문가로 등록된 인원은 21명이다.

2. 분야별 표준개발 현황

가. 해당 ISO/TC 94 주요 표준 개발 현황

○ 2023년도 ISO/TC 94 주요 표준 개발 현황은 다음과 같다.

[표 9] ISO/TC 94 표준 개발 현황 ('23년 10월 기준)

TC	간사국	제정 국제표준 수 (Published)	개발중 국제표준 수 (Under Development)	부합화 표준 수	부합화 비율(%)
TC 94	SA	14	2	11	78.6
SC3	BSI	17	5	13	76.5
SC6	BSI	20	5	10	50.0
SC13	SNV	72	28	67	93.1
SC14	SA	35	12	31	88.6
SC15	DIN	38	1	1	2.6

○ 2023년도 ISO/TC 94에서는 '23년 10월 기준으로 총 196개의 표준이 제정되었으며, AWI 단계 11종, WD 단계 1종, CD 단계 14종, DIS 단계 18종, FDIS 단계 5종 등 현재 총 55개의 표준이 개발 추진 중이다.

[표 10] ISO/TC 94 제정 표준 196개 ('23년 10월 기준)

구분	표준번호	표준명	STAGE	ICS
TC 94	ISO 3873:1977	Industrial safety helmets	90.92	13.340.20
	ISO 10333-1:2000	Personal fall-arrest systems — Part 1 : Full-body harnesses	90.60	13.340.60
	ISO 10333-1:2000/ Amd 1:2002	Personal fall-arrest systems — Part 1 : Full-body harnesses — Amendment 1	60.60	13.340.60
	ISO 10333-2:2000	Personal fall-arrest systems — Part 2 : Lanyards and energy absorbers	90.60	13.340.60
	ISO 10333-3:2000	Personal fall-arrest systems — Part 3 : Self-retracting lifelines	90.60	13.340.60
	ISO 10333-4:2002	Personal fall-arrest systems — Part 4 : Vertical rails and vertical lifelines incorporating a sliding-type fall arrester	90.60	13.340.60
	ISO 10333-5:2001	Personal fall-arrest systems — Part 5 : Connectors with self-closing and self-locking gates	90.93	13.340.60
	ISO 10333-6:2004	Personal fall-arrest systems — Part 6 : System performance tests	90.20	13.340.60
	ISO 14567:1999	Personal protective equipment for protection against falls from a height — Single-point anchor devices	90.20	13.340.60

구분	표준번호	표준명	STAGE	ICS
	ISO 16024:2005	Personal protective equipment for protection against falls from a height — Flexible horizontal lifeline systems	90.20	13.340.60
	ISO/TS 20141:2022	Personal safety — Personal protective equipment — Guidelines on compatibility testing of PPE	90.92	13.340.01
	ISO 22159:2007	Personal equipment for protection against falls — Descending devices	90.20	13.340.60
	ISO 22846-1:2003	Personal equipment for protection against falls — Rope access systems — Part 1 : Fundamental principles for a system of work	90.20	13.340.60
	ISO 22846-2:2012	Personal equipment for protection against falls — Rope access systems — Part 2 : Code of practice	90.20	13.340.60
TC 94/ SC 3	ISO 4643:1992	Moulded plastics footwear — Lined or unlined poly(vinyl chloride) boots for general industrial use — Specification	90.93	13.340.50 83.140.99
	ISO 5423:1992	Moulded plastics footwear — Lined or unlined polyurethane boots for general industrial use — Specification	90.93	13.340.50
	ISO 13287:2019	Personal protective equipment — Footwear — Test method for slip resistance	60.60	13.340.50
	ISO 17249:2013	Safety footwear with resistance to chain saw cutting	90.92	13.340.50
	ISO/TR 18690:2012	Guidance for the selection, use and maintenance of safety and occupational footwear and other personal protective equipment offering foot and leg protection	60.60	13.340.50
	ISO 20344:2021	Personal protective equipment — Test methods for footwear	60.60	13.340.50
	ISO 20345:2021	Personal protective equipment — Safety footwear	60.60	13.340.50
	ISO 20346:2021	Personal protective equipment — Protective footwear	60.60	13.340.50
	ISO 20347:2021	Personal protective equipment — Occupational footwear	60.60	13.340.50
	ISO 20349-1:2017	Personal protective equipment — Footwear protecting against risks in foundries and welding — Part 1 : Requirements and test methods for protection against risks in foundries	90.60	13.340.50
	ISO 20349-1:2017/ Amd 1:2020	Personal protective equipment — Footwear protecting against risks in foundries and welding — Part 1 : Requirements and test methods for protection against risks in foundries — Amendment 1	60.60	13.340.50
	ISO 20349-2:2017	Personal protective equipment — Footwear protecting against risks in foundries and welding — Part 2 : Requirements and test methods for protection against risks in welding and allied processes	90.60	13.340.50

구분	표준번호	표준명	STAGE	ICS
	ISO 20349-2:2017/ Amd 1:2020	Personal protective equipment — Footwear protecting against risks in foundries and welding — Part 2 : Requirements and test methods for protection against risks in welding and allied processes — Amendment 1	60.60	13.340.50
	ISO 22568-1:2019	Foot and leg protectors — Requirements and test methods for footwear components — Part 1 : Metallic toecaps	60.60	13.340.50
	ISO 22568-2:2019	Foot and leg protectors — Requirements and test methods for footwear component — Part 2 : Non-metallic toecaps	60.60	13.340.50
	ISO 22568-3:2019	Foot and leg protectors — Requirements and test methods for footwear components — Part 3 : Metallic perforation resistant inserts	60.60	13.340.50
	ISO 22568-4:2021	Foot and leg protectors — Requirements and test methods for footwear components — Part 4 : Non-metallic perforation resistant inserts	60.60	13.340.50
TC 94/ SC 6	ISO 4007:2018	Personal protective equipment — Eye and face protection — Vocabulary	60.60	01.040.13 13.340.20
	ISO 12311:2013	Personal protective equipment — Test methods for sunglasses and related eyewear	90.92	13.340.20
	ISO 12312-1:2022	Eye and face protection — Sunglasses and related eyewear — Part 1 : Sunglasses for general use	60.60	13.340.20
	ISO 12312-2:2015	Eye and face protection — Sunglasses and related eyewear — Part 2 : Filters for direct observation of the sun	90.93	13.340.20
	ISO 12312-3:2022	Eye and face protection — Sunglasses and related eyewear — Part 3 : Sunglasses for running, cycling and similar active lifestyles	60.60	13.340.20
	ISO 12609-1:2021	Eye and face protection against intense light sources used on humans and animals for cosmetic and medical applications — Part 1 : Specification for products	60.60	13.340.20
	ISO 12609-2:2013	Eyewear for protection against intense light sources used on humans and animals for cosmetic and medical applications — Part 2 : Guidance for use	90.93	13.340.20
	ISO 16321-1:2021	Eye and face protection for occupational use — Part 1 : General requirements	60.60	13.340.20
	ISO 16321-2:2021	Eye and face protection for occupational use — Part 2 : Additional requirements for protectors used during welding and related techniques	60.60	13.340.20
	ISO 16321-3:2021	Eye and face protection for occupational use — Part 3 : Additional requirements for mesh protectors	60.60	13.340.20
	ISO 18526-1:2020	Eye and face protection — Test methods — Part 1 : Geometrical optical properties	60.60	13.340.20
	ISO 18526-2:2020	Eye and face protection — Test methods — Part 2 : Physical optical properties	60.60	13.340.20
	ISO 18526-3:2020	Eye and face protection — Test methods — Part 3 : Physical and mechanical properties	60.60	13.340.20

구분	표준번호	표준명	STAGE	ICS
	ISO 18526-4:2020	Eye and face protection — Test methods — Part 4 : Headforms	60.60	13.340.20
	ISO 18527-1:2021	Eye and face protection for sports use — Part 1 : Requirements for downhill skiing and snowboarding goggles	60.60	13.340.20 97.220.20
	ISO 18527-2:2021	Eye and face protection for sports use — Part 2 : Requirements for eye protectors for squash and eye protectors for racquetball and squash 57	60.60	13.340.20 97.220.30 97.220.40
	ISO 18527-3:2020	Eye and face protection for sports use — Part 3 : Requirements and test methods for eyewear intended to be used for surface swimming	60.60	13.340.20 97.220.30 97.220.40
	ISO 19734:2021	Eye and face protection — Guidance on selection, use and maintenance	60.60	13.340.20
	ISO 19818-1:2021	Eye and face protection — Protection against laser radiation — Part 1 : Requirements and test methods	60.60	13.340.20
	ISO/TR 22463:2019	Patient and client eye protectors for use during laser or intense light source (ILS) procedures — Guidance	60.60	13.340.20
TC 94/ SC 13	ISO 374-1:2016	Protective gloves against dangerous chemicals and micro-organisms — Part 1 : Terminology and performance requirements for chemical risks	90.92	01.040.13 13.340.40
	ISO 374-1:2016/ Amd 1:2018	Protective gloves against dangerous chemicals and micro-organisms — Part 1 : Terminology and performance requirements for chemical risks — Amendment 1	60.60	01.040.13 13.340.40
	ISO 374-2:2019	Protective gloves against dangerous chemicals and micro-organisms — Part 2 : Determination of resistance to penetration	60.60	13.340.40
	ISO 374-4:2019	Protective gloves against dangerous chemicals and micro-organisms — Part 4 : Determination of resistance to degradation by chemicals	60.60	13.340.40
	ISO 374-5:2016	Protective gloves against dangerous chemicals and micro-organisms — Part 5 : Terminology and performance requirements for micro-organisms risks	90.92	01.040.13 13.340.40
	ISO/TR 2801:2007	Clothing for protection against heat and flame — General recommendations for selection, care and use of protective clothing	90.93	13.340.10
	ISO 6529:2013	Protective clothing — Protection against chemicals — Determination of resistance of protective clothing materials to permeation by liquids and gases	90.92	13.340.10
	ISO 6530:2005	Protective clothing — Protection against liquid chemicals — Test method for resistance of materials to penetration by liquids	90.92	13.340.10
	ISO 6942:2022	Protective clothing — Protection against heat and fire — Method of test : Evaluation of materials and material assemblies when exposed to a source of radiant heat	60.60	13.340.10

구분	표준번호	표준명	STAGE	ICS
	ISO/TR 8546:2022	Hand protection — Guidance for selection and use	60.60	13.340.40
	ISO 9150:1988	Protective clothing — Determination of behaviour of materials on impact of small splashes of molten metal	90.93	13.340.10
	ISO 9151:2016	Protective clothing against heat and flame — Determination of heat transmission on exposure to flame	90.93	13.340.10
	ISO 9185:2007	Protective clothing — Assessment of resistance of materials to molten metal splash	90.92	13.340.10
	ISO 11393-1:2018	Protective clothing for users of hand-held chainsaws — Part 1 : Test rig for testing resistance to cutting by a chainsaw	90.20	13.340.10
	ISO 11393-2:2018	Protective clothing for users of hand-held chainsaws — Part 2 : Performance requirements and test methods for leg protectors	60.60	13.340.10
	ISO 11393-3:2018	Protective clothing for users of hand-held chainsaws — Part 3 : Test methods for footwear	90.20	13.340.50
	ISO 11393-4:2018	Protective clothing for users of hand-held chainsaws — Part 4 : Performance requirements and test methods for protective gloves	60.60	13.340.40
	ISO 11393-5:2018	Protective clothing for users of hand-held chainsaws — Part 5 : Performance requirements and test methods for protective gaiters	60.60	13.340.10
	ISO 11393-6:2018	Protective clothing for users of hand-held chainsaws — Part 6 : Performance requirements and test methods for upper body protectors	60.60	13.340.10
	ISO/TR 11610:2004	Protective clothing — Vocabulary	60.60	01.040.13 13.340.40
	ISO 11611:2015	Protective clothing for use in welding and allied processes	90.92	13.340.10 25.160.01
	ISO 11612:2015	Protective clothing — Clothing to protect against heat and flame — Minimum performance requirements	90.92	13.340.10
	ISO 12127-1:2015	Clothing for protection against heat and flame — Determination of contact heat transmission through protective clothing or constituent materials — Part 1 : Contact heat produced by heating cylinder	90.93	13.340.10
	ISO 13506-1:2017	Protective clothing against heat and flame — Part 1 : Test method for complete garments — Measurement of transferred energy using an instrumented manikin	90.92	13.340.10
	ISO 13506-2:2017	Protective clothing against heat and flame — Part 2 : Skin burn injury prediction — Calculation requirements and test cases	90.92	13.340.10
	ISO 13688:2013	Protective clothing — General requirements	90.93	13.340.10
	ISO 13688:2013/ Amd 1:2021	Protective clothing — General requirements — Amendment 1	60.60	13.340.10

구분	표준번호	표준명	STAGE	ICS
	ISO 13982-1:2004	Protective clothing for use against solid particulates — Part 1 : Performance requirements for chemical protective clothing providing protection to the full body against airborne solid particulates (type 5 clothing)	90.60	13.340.10
	ISO 13982-1:2004/ Amd 1:2010	Protective clothing for use against solid particulates — Part 1 : Performance requirements for chemical protective clothing providing protection to the full body against airborne solid particulates (type 5 clothing) — Amendment 1	60.60	13.340.10
	ISO 13982-2:2004	Protective clothing for use against solid particulates — Part 2 : Test method of determination of inward leakage of aerosols of fine particles into suits	90.60	13.340.10
	ISO 13994:2005	Clothing for protection against liquid chemicals — Determination of the resistance of protective clothing materials to penetration by liquids under pressure	90.92	13.340.10
	ISO 13994:2005/ Cor 1:2006	Clothing for protection against liquid chemicals — Determination of the resistance of protective clothing materials to penetration by liquids under pressure — Technical Corrigendum 1	60.60	13.340.10
	ISO 13995:2000	Protective clothing — Mechanical properties — Test method for the determination of the resistance to puncture and dynamic tearing of materials	90.93	13.340.10
	ISO 13996:1999	Protective clothing — Mechanical properties — Determination of resistance to puncture	90.93	13.340.10
	ISO 13997:1999	Protective clothing — Mechanical properties — Determination of resistance to cutting by sharp objects	60.60	13.340.10
	ISO 13998:2003	Protective clothing — Aprons, trousers and vests protecting against cuts and stabs by hand knives	90.93	13.340.10
	ISO 13999-1:1999	Protective clothing — Gloves and arm guards protecting against cuts and stabs by hand knives — Part 1 : Chain-mail gloves and arm guards	90.93	13.340.40 13.340.99
	ISO 13999-2:2003	Protective clothing — Gloves and arm guards protecting against cuts and stabs by hand knives — Part 2 : Gloves and arm guards made of material other than chain mail	90.93	13.340.40 13.340.99
	ISO 13999-3:2002	Protective clothing — Gloves and arm guards protecting against cuts and stabs by hand knives — Part 3 : Impact cut test for fabric, leather and other materials	90.93	13.340.40 13.340.99
	ISO 14116:2015	Protective clothing — Protection against flame — Limited flame spread materials, material assemblies and clothing	90.92	13.340.10
	ISO 14460:1999	Protective clothing for automobile racing drivers — Protection against heat and flame — Performance requirements and test methods	90.92	13.340.10 97.220.40
	ISO 14460:1999/ Amd 1:2002	Protective clothing for automobile racing drivers — Protection against heat and flame — Performance requirements and test methods — Amendment 1 : Modified flexion test	60.60	97.220.40

구분	표준번호	표준명	STAGE	ICS
	ISO 14877:2002	Protective clothing for abrasive blasting operations using granular abrasives	90.93	13.340.10
	ISO 15025:2016	Protective clothing — Protection against flame — Method of test for limited flame spread	90.93	13.340.10
	ISO 16602:2007	Protective clothing for protection against chemicals — Classification, labelling and performance requirements	90.92	13.340.10
	ISO 16602:2007/ Amd 1:2012	Protective clothing for protection against chemicals — Classification, labelling and performance requirements — Amendment 1	60.60	13.340.10
	ISO 16603:2004	Clothing for protection against contact with blood and body fluids — Determination of the resistance of protective clothing materials to penetration by blood and body fluids — Test method using synthetic blood	90.93	13.340.10
	ISO 16604:2004	Clothing for protection against contact with blood and body fluids — Determination of resistance of protective clothing materials to penetration by blood-borne pathogens — Test method using Phi-X 174 bacteriophage	90.93	13.340.10
	ISO 17491-1:2012	Protective clothing — Test methods for clothing providing protection against chemicals — Part 1 : Determination of resistance to outward leakage of gases (internal pressure test)	90.93	13.340.10
	ISO 17491-2:2012	Protective clothing — Test methods for clothing providing protection against chemicals — Part 2 : Determination of resistance to inward leakage of aerosols and gases (inward leakage test)	90.60	13.340.10
	ISO 17491-3:2008	Protective clothing — Test methods for clothing providing protection against chemicals — Part 3 : Determination of resistance to penetration by a jet of liquid (jet test)	90.92	13.340.10
	ISO 17491-4:2008	Protective clothing — Test methods for clothing providing protection against chemicals — Part 4 : Determination of resistance to penetration by a spray of liquid (spray test)	90.92	13.340.10
	ISO 17491-4:2008/ Amd 1:2016	Protective clothing — Test methods for clothing providing protection against chemicals — Part 4 : Determination of resistance to penetration by a spray of liquid (spray test) — Amendment 1	60.60	13.340.10
	ISO 17491-5:2013	Protective clothing — Test methods for clothing providing protection against chemicals — Part 5 : Determination of resistance to penetration by a spray of liquid (manikin spray test)	90.92	13.340.10
	ISO 17492:2019	Clothing for protection against heat and flame — Determination of heat transmission on exposure to both flame and radiant heat	60.60	13.340.10
	ISO 17493:2016	Clothing and equipment for protection against heat — Test method for convective heat resistance using a hot air circulating oven	90.93	13.340.10

구분	표준번호	표준명	STAGE	ICS
	ISO 18889:2019	Protective gloves for pesticide operators and re-entry workers — Performance requirements	60.60	13.340.10
	ISO 19918:2017	Protective clothing — Protection against chemicals — Measurement of cumulative permeation of chemicals with low vapour pressure through materials	90.93	13.340.10
	ISO 19918:2017/ Amd 1:2021	Protective clothing — Protection against chemicals — Measurement of cumulative permeation of chemicals with low vapour pressure through materials — Amendment 1 : Extraction and chemical analysis	60.60	13.340.10
	ISO 20320:2020	Protective clothing for use in snowboarding — Wrist protectors — Requirements and test methods	60.60	13.340.10 97.220.20
	ISO 20471:2013	High visibility clothing — Test methods and requirements	90.60	13.340.10
	ISO 20471:2013/ Amd 1:2016	High visibility clothing — Test methods and requirements — Amendment 1	60.60	13.340.10
	ISO 21420:2020	Protective gloves — General requirements and test methods	60.60	13.340.40
	ISO 21420:2020/ Amd 1:2022	Protective gloves — General requirements and test methods — Amendment 1	60.60	13.340.40
	ISO 22608:2021	Protective clothing — Protection against liquid chemicals — Measurement of repellency, retention, and penetration of liquid pesticide formulations through protective clothing materials	60.60	13.340.10
	ISO 22609:2004	Clothing for protection against infectious agents — Medical face masks — Test method for resistance against penetration by synthetic blood (fixed volume, horizontally projected)	90.93	11.140 13.340.10
	ISO 22610:2018	Surgical drapes, gowns and clean air suits, used as medical devices, for patients, clinical staff and equipment — Test method to determine the resistance to wet bacterial penetration	90.20	11.140 13.340.10
	ISO 22612:2005	Clothing for protection against infectious agents — Test method for resistance to dry microbial penetration	90.93	13.340.10
	ISO 23388:2018	Protective gloves against mechanical risks	90.92	13.340.40
	ISO 23407:2021	Protective gloves against thermal risks (heat and/or fire)	60.60	13.340.40
	ISO 27065:2017	Protective clothing — Performance requirements for protective clothing worn by operators applying pesticides and for re-entry workers	90.92	13.340.10
	ISO 27065:2017/ Amd 1:2019	Protective clothing — Performance requirements for protective clothing worn by operators applying pesticides and for re-entry workers — Amendment 1 : Surrogate test chemical	60.60	13.340.10

구분	표준번호	표준명	STAGE	ICS
TC 94/ SC 14	ISO 11613:2017	Protective clothing for firefighter's who are engaged in support activities associated with structural fire fighting — Laboratory test methods and performance	90.93	13.340.10
	ISO 11999-1:2015	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 1 : General	90.92	13.340.10
	ISO/TS 11999-2:2015	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 2 : Compatibility	90.92	13.340.10
	ISO 11999-3:2015	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 3 : Clothing	90.92	13.340.10
	ISO 11999-4:2015	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 4 : Gloves	90.92	13.340.10
	ISO 11999-5:2015	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 5 : Helmets	90.92	13.340.10
	ISO 11999-6:2016	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 6 : Footwear	90.92	13.340.10
	ISO 11999-9:2016	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 9 : Fire hoods	90.92	13.340.10
	ISO 15384:2018	Protective clothing for firefighters — Laboratory test methods and performance requirements for wildland firefighting clothing	90.92	13.340.10
	ISO 15384	Protective clothing for firefighters — Laboratory test methods and performance requirements for wildland firefighting clothing — Amendment 1	60.60	13.340.10
	ISO 15538:2001	Protective clothing for firefighters — Laboratory test methods and performance requirements for protective clothing with a reflective outer surface	90.60	13.340.10
	ISO 16073-1:2019	Wildland firefighting personal protective equipment — Requirements and test methods — Part 1 : General	60.60	13.220.10 13.340.10
	ISO 16073-2:2019	Wildland firefighting personal protective equipment — Requirements and test methods — Part 2 : Compatibility	60.60	13.220.10 13.340.10
	ISO 16073-3:2019	Wildland firefighting personal protective equipment — Requirements and test methods — Part 3 : Clothing	60.60	13.220.10 13.340.10

구분	표준번호	표준명	STAGE	ICS
	ISO 16073-4:2019	Wildland firefighting personal protective equipment — Requirements and test methods — Part 4 : Gloves	60.60	13.220.10 13.340.10
	ISO 16073-5:2019	Wildland firefighting personal protective equipment — Requirements and test methods — Part 5 : Helmets	60.60	13.220.10 13.340.20
	ISO 16073-6:2021	Wildland firefighting personal protective equipment — Requirements and test methods — Part 6 : Footwear	60.60	13.340.50
	ISO 16073-7:2019	Wildland firefighting personal protective equipment — Requirements and test methods — Part 7 : Face and eye protection	60.60	13.220.10 13.340.20
	ISO 16073-8:2019	Wildland firefighting personal protective equipment — Requirements and test methods — Part 8 : Hearing	60.60	13.220.10 13.340.20
	ISO 16073-9:2020	Wildland firefighting personal protective equipment — Requirements and test methods — Part 9 : Firehoods	60.60	13.220.10 13.340.20
	ISO 17723-1:2019	PPE ensembles for firefighters undertaking hazardous materials response activities — Part 1 : Gas-tight, vapour-protective ensembles for emergency response teams ("type 1")	90.93	13.340.10
	ISO 18639-1:2018	PPE ensembles for firefighters undertaking specific rescue activities — Part 1 : General	90.93	13.340.01
	ISO 18639-3:2018	PPE ensembles for firefighters undertaking specific rescue activities — Part 3 : Clothing	90.60	13.340.10
	ISO 18639-4:2018	PPE ensembles for firefighters undertaking specific rescue activities — Part 4 : Gloves	60.60	13.340.40
	ISO 18639-4:2018/ Amd 1:2023	PPE ensembles for firefighters undertaking specific rescue activities — Part 4 : Gloves — Amendment 1	60.60	13.340.40
	ISO 18639-5:2018	PPE ensembles for firefighters undertaking specific rescue activities — Part 5 : Helmet	60.60	13.340.20
	ISO 18639-6:2018	PPE ensembles for firefighters undertaking specific rescue activities — Part 6 : Footwear	90.60	13.340.50
	ISO 18640-1:2018	Protective clothing for firefighters — Physiological impact — Part 1 : Measurement of coupled heat and moisture transfer with the sweating torso	90.60	13.340.10
	ISO 18640-1	Protective clothing for firefighters — Physiological impact — Part 1 : Measurement of coupled heat and moisture transfer with the sweating torso — Amendment 1	60.60	13.340.10
	ISO 18640-2:2018	Protective clothing for firefighters — Physiological impact — Part 2 : Determination of physiological heat load caused by protective clothing worn by firefighters	90.60	13.340.10
	ISO 18640-2	Protective clothing for firefighters — Physiological impact — Part 2 : Determination of physiological heat load caused by protective clothing worn by firefighters — Amendment 1	60.60	13.340.10
	ISO/TR 19591:2018	Personal protective equipment for firefighters — Standard terms and definitions	60.60	01.040.13 13.340.10

구분	표준번호	표준명	STAGE	ICS
	ISO/TR 21808:2021	Guidance on the selection, use, care and maintenance of personal protective equipment (PPE) designed to provide protection for firefighters	90.92	13.340.10
	ISO 21942:2019	Station uniform for firefighters	60.60	13.340.10
	ISO 23616:2022	Cleaning, inspection and repair of firefighters' personal protective equipment (PPE)	90.92	13.340.10
TC 94/ SC 15	ISO 16900-1:2019	Respiratory protective devices — Methods of test and test equipment — Part 1 : Determination of inward leakage	60.60	13.340.30
	ISO 16900-2:2017	Respiratory protective devices — Methods of test and test equipment — Part 2 : Determination of breathing resistance	90.60	13.340.30
	ISO 16900-3:2012	Respiratory protective devices — Methods of test and test equipment — Part 3 : Determination of particle filter penetration	90.60	13.340.30
	ISO 16900-4:2011	Respiratory protective devices — Methods of test and test equipment — Part 4 : Determination of gas filter capacity and migration, desorption and carbon monoxide dynamic testing	90.60	13.340.30
	ISO 16900-5:2016	Respiratory protective devices — Methods of test and test equipment — Part 5 : Breathing machine, metabolic simulator, RPD headforms and torso, tools and verification tools	90.60	13.340.30
	ISO 16900-5:2016/ Amd 1:2018	Respiratory protective devices — Methods of test and test equipment — Part 5 : Breathing machine, metabolic simulator, RPD headforms and torso, tools and verification tools — Amendment 1 : RPD head forms front and side view	60.60	13.340.30
	ISO 16900-6:2021	Respiratory protective devices — Methods of test and test equipment — Part 6 : Mechanical resistance/strength of components and connections	60.60	13.340.30
	ISO 16900-7:2020	Respiratory protective devices — Methods of test and test equipment — Part 7 : Practical performance test methods	60.60	13.340.30
	ISO 16900-8:2015	Respiratory protective devices — Methods of test and test equipment — Part 8 : Measurement of RPD air flow rates of assisted filtering RPD	90.93	13.340.30
	ISO 16900-9:2015	Respiratory protective devices — Methods of test and test equipment — Part 9 : Determination of carbon dioxide content of the inhaled gas	90.93	13.340.30
	ISO 16900-10:2015	Respiratory protective devices — Methods of test and test equipment — Part 10 : Resistance to ignition, flame, radiant heat and heat	90.93	13.340.30
	ISO 16900-11:2013	Respiratory protective devices — Methods of test and test equipment — Part 11 : Determination of field of vision	90.92	13.340.30
	ISO 16900-12:2016	Respiratory protective devices — Methods of test and test equipment — Part 12 : Determination of volume-averaged work of breathing and peak respiratory pressures	90.93	13.340.30

구분	표준번호	표준명	STAGE	ICS
	ISO 16900-13:2015	Respiratory protective devices — Methods of test and test equipment — Part 13 : RPD using regenerated breathable gas and special application mining escape RPD : Consolidated test for gas concentration, temperature, humidity, work of breathing, breathing resistance, elastance and duration	90.93	13.340.30
	ISO 16900-14:2020	Respiratory protective devices — Methods of test and test equipment — Part 14 : Measurement of sound pressure level	60.60	13.340.30
	ISO 16972:2020	Respiratory protective devices — Vocabulary and graphical symbols	60.60	01.040.13 13.340.30
	ISO/TS 16973:2016	Respiratory protective devices — Classification for respiratory protective device (RPD), excluding RPD for underwater application	90.20	13.340.30
	ISO/TS 16975-1:2016	Respiratory protective devices — Selection, use and maintenance — Part 1 : Establishing and implementing a respiratory protective device programme	90.20	13.340.30
	ISO/TS 16975-2:2016	Respiratory protective devices — Selection, use and maintenance — Part 2 : Condensed guidance to establishing and implementing a respiratory protective device programme	90.20	13.340.30
	ISO 16975-3:2017	Respiratory protective devices — Selection, use and maintenance — Part 3 : Fit-testing procedures	90.60	13.340.30
	ISO/TS 16975-4:2022	Respiratory protective devices — Selection, use and maintenance — Part 4 : Selection and usage guideline for respiratory protective devices under pandemic/epidemic/ outbreak of infectious respiratory disease	60.60	13.340.30
	ISO 16976-1:2022	Respiratory protective devices — Human factors — Part 1 : Metabolic rates and respiratory flow rates	60.60	13.340.30
	ISO 16976-2:2022	Respiratory protective devices — Human factors — Part 2 : Anthropometrics	60.60	13.340.30
	ISO 16976-3:2022	Respiratory protective devices — Human factors — Part 3 : Physiological responses and limitations of oxygen and limitations of carbon dioxide in the breathing environment	60.60	13.340.30
	ISO 16976-4:2023	Respiratory protective devices — Human factors — Part 4 : Work of breathing and breathing resistance : physiologically based limits	60.60	13.340.30
	ISO 16976-5:2023	Respiratory protective devices — Human factors — Part 5 : Thermal effects	60.60	13.340.30
	ISO 16976-6:2023	Respiratory protective devices — Human factors — Part 6 : Psycho-physiological effects	60.60	13.340.30
	ISO 16976-7:2023	Respiratory protective devices — Human factors — Part 7 : Hearing and speech	60.60	13.340.30
	ISO 16976-8:2023	Respiratory protective devices — Human factors — Part 8 : Ergonomic factors	60.60	13.340.30

구분	표준번호	표준명	STAGE	ICS
	ISO 17420-1:2021	Respiratory protective devices — Performance requirements — Part 1 : General	60.60	13.340.30
	ISO 17420-2:2021	Respiratory protective devices — Performance requirements — Part 2 : Requirements for filtering RPD	60.60	13.340.30
	ISO 17420-3:2012	Respiratory protective devices — Performance requirements — Part 3 : Thread connection	90.60	13.340.30
	ISO 17420-4:2021	Respiratory protective devices — Performance requirements — Part 4 : Requirements for supplied breathable gas RPD	60.60	13.340.30
	ISO 17420-5:2021	Respiratory protective devices — Performance requirements — Part 5 : Special application fire and rescue services – Supplied breathable gas RPD and filtering RPD	60.60	13.340.30
	ISO 17420-6:2021	Respiratory protective devices — Performance requirements — Part 6 : Special application escape – Filtering RPD and supplied breathable gas RPD	60.60	13.340.30
	ISO 17420-7:2021	Respiratory protective devices — Performance requirements — Part 7 : Special application marine, mining, welding, and abrasive blasting – Filtering RPD and supplied breathable gas RPD	60.60	13.340.30
	ISO/TS 17420-8:2021	Respiratory protective devices — Performance requirements — Part 8 : Special application chemical, biological, radiological and nuclear (CBRN) filtering and radiological–nuclear (RN) filtering RPD	60.60	13.340.30
	ISO/TS 17420-9:2021	Respiratory protective devices — Performance requirements — Part 9 : Special application chemical, biological, radiological and nuclear (CBRN) supplied breathable RPD	60.60	13.340.30

[표 11] ISO/TC 94 개발 중인 표준 55개 ('23년 10월 기준)

구분	표준번호	표준명	STAGE	ICS
TC 94	ISO/CD 3873	Industrial safety helmets	30.60	13.340.20
	ISO/AWI TS 20141	Personal safety — Personal protective equipment — Guidelines on compatibility testing of PPE	10.99	–
TC 94/ SC 3	ISO/CD 17249	Safety footwear with resistance to chain saw cutting	30.60	13.340.50
	ISO 20344:2021/ DAmD 1	Personal protective equipment — Test methods for footwear — Amendment 1	40.60	13.340.50
	ISO 20345:2021/ DAmD 1	Personal protective equipment — Safety footwear — Amendment 1	40.60	13.340.50
	ISO 20346:2021/ DAmD 1	Personal protective equipment — Protective footwear — Amendment 1	40.60	13.340.50

구분	표준번호	표준명	STAGE	ICS
TC 94/ SC 6	ISO 20347:2021/ DAmd 1	Personal protective equipment — Occupational footwear — Amendment 1	40.60	13.340.50
	ISO/FDIS 12311	Personal protective equipment — Test methods for sunglasses and related eyewear	50.20	13.340.20
	ISO 16321-1:2021/ DAmd 1	Eye and face protection for occupational use — Part 1 : General requirements — Amendment 1	40.60	13.340.20
	ISO/DIS 16321-4	Eye and face protection for occupational use — Part 4 : Additional requirements for protection against biological hazards	40.20	13.340.20
	ISO 18527-3:2020/ AWI Amd 1	Eye and face protection for sports use — Part 3 : Requirements and test methods for eyewear intended to be used for surface swimming — Amendment 1	10.99	13.340.20 97.220.30 97.220.40
	ISO/AWI TS 19818-2	Eye and face protection — Protection against laser radiation — Part 2 : Guidance on the selection and use of laser eye and face protection related to ISO 19818-1	20.00	—
TC 94/ SC 13	ISO/FDIS 374-1	Protective gloves against dangerous chemicals and micro-organisms — Part 1 : Terminology and performance requirements for chemical risks	50.00	01.040.13 13.340.40
	ISO/FDIS 374-5	Protective gloves against dangerous chemicals and micro-organisms — Part 5 : Terminology and performance requirements for micro-organisms risks	50.00	01.040.13 13.340.40
	ISO/DIS 374-6	Protective gloves against dangerous chemicals and micro-organisms — Part 6 : Protective gloves for hairdressers	40.60	13.340.40
	ISO/CD 6529	Protective clothing — Protection against chemicals — Determination of resistance of protective clothing materials to permeation by liquids and gases	30.99	13.340.10
	ISO/AWI 6530	Protective clothing — Protection against liquid chemicals — Test method for resistance of materials to penetration by liquids	20.00	—
	ISO/CD 9185	Protective clothing — Assessment of resistance of materials to molten metal splash	30.20	13.340.10
	ISO/FDIS 11611	Protective clothing for use in welding and allied processes	50.00	13.340.10 25.160.01
	ISO/DIS 11612	Protective clothing – Clothing to protect against heat and flame – Minimum performance requirements	40.20	13.340.10
	ISO/DIS 13506-1	Protective clothing against heat and flame — Part 1 : Test method for complete garments — Measurement of transferred energy using an instrumented manikin	40.99	13.340.10
	ISO/DIS 13506-2	Protective clothing against heat and flame — Part 2 : Skin burn injury prediction — Calculation requirements and test cases	40.99	13.340.10

구분	표준번호	표준명	STAGE	ICS
	ISO/AWI 13994	Clothing for protection against liquid chemicals — Determination of the resistance of protective clothing materials to penetration by liquids under pressure	10.99	—
	ISO/DIS 14116	Protective clothing — Protection against flame — Limited flame spread materials, material assemblies and clothing	40.20	13.340.10
	ISO/DIS 14460	Protective clothing for automobile racing drivers — Protection against heat and flame — Performance requirements and test methods	40.99	13.340.10 97.220.40
	ISO/CD 16602-1.2	Protective clothing for protection against chemicals — Classification, labelling and performance requirements — Part 1 : General	30.60	13.340.10
	ISO/CD 16602-2.2	Protective clothing for protection against chemicals — Classification, labelling and performance requirements — Part 2 : Physical test methods, classification and requirements	30.60	13.340.10
	ISO/CD 16602-3.2	Protective clothing for protection against chemicals — Classification, labelling and performance requirements — Part 3 : Chemical test methods, classification and requirements	30.60	13.340.10
	ISO/CD 16602-4.2	Protective clothing for protection against chemicals — Classification, labelling and performance requirements — Part 4 : Design test methods, classification and requirements	30.60	13.340.10
	ISO/CD 16602-5.2	Protective clothing for protection against chemicals — Classification, labelling and performance requirements — Part 5 : Garment test methods, classification and requirements	30.60	13.340.10
	ISO/CD 16602-6.2	Protective clothing for protection against chemicals — Classification, labelling and performance requirements — Part 6 : Guidance for selection, use, care and maintenance	30.60	13.340.10
	ISO/AWI 17491-3	Protective clothing — Test methods for clothing providing protection against chemicals — Part 3 : Determination of resistance to penetration by a jet of liquid (jet test)	10.99	—
	ISO/DIS 17491-4	Protective clothing — Test methods for clothing providing protection against chemicals — Part 4 : Determination of resistance to penetration by a spray of liquid (spray test)	40.60	13.340.10
	ISO/DIS 17491-5	Protective clothing — Test methods for clothing providing protection against chemicals — Part 5 : Determination of resistance to penetration by a spray of liquid (manikin spray test)	40.20	13.340.10
	ISO/WD 20384	Surgical clothing and drapes — Requirements and test methods	20.20	—
	ISO/CD 22615	Protective clothing — Performance requirements and test methods for protective clothing against infective agents	30.60	13.340.10
	ISO/AWI 23388	Protective gloves against mechanical risks	10.99	—

구분	표준번호	표준명	STAGE	ICS
	ISO/DIS 24231	Protective clothing — Protection against rain — Test method for ready-made garments against high-energy droplets from above	40.99	13.340.10
	ISO/DIS 24232	Protective clothing — Protection against rain	40.99	13.340.10
	ISO/AWI 27065	Protective clothing — Performance requirements for protective clothing worn by operators applying pesticides and for re-entry workers	10.99	—
TC 94/ SC 14	ISO/DIS 11999-1	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 1 : General	40.60	13.340.10
	ISO/CD 11999-2	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 2 : Compatibility	30.20	13.340.10
	ISO/DIS 11999-3	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 3 : Clothing	40.00	13.340.10
	ISO/DIS 11999-4	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 4 : Gloves	40.20	13.340.10 13.340.40
	ISO/DIS 11999-5	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 5 : Helmets	40.20	13.340.20
	ISO/DIS 11999-6	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 6 : Footwear	40.00	13.340.50
	ISO/DIS 11999-9	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 9 : Firehoods	40.60	13.340.20
	ISO/CD 11999-10	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 10 : Part 10 Respiratory Protective Device (RPD)	30.60	13.340.10 13.340.30
	ISO/AWI 15384	Protective clothing for firefighters — Laboratory test methods and performance requirements for wildland firefighting clothing	10.99	—
	ISO/DTR 21808	Best practices on the selection and use of personal protective equipment (PPE) designed to provide protection for firefighters	50.00	13.340.10

구분	표준번호	표준명	STAGE	ICS
	ISO/DIS 23616	Cleaning, inspection and repair of firefighters' personal protective equipment (PPE)	40.60	13.340.10
	ISO/FDIS 24588	Protective clothing — Personal protective ensembles for use against chemical, biological, radiological and nuclear (CBRN) agents — Classification, performance requirements and test methods	50.00	13.280 13.340.10
TC 94/ SC 15	ISO/CD 16900-11	Respiratory protective devices — Methods of test and test equipment — Part 11 : Determination of field of vision	30.99	13.340.30
	ISO/AWI 17420-8	Respiratory protective devices — Performance requirements — Part 8 : Special application chemical, biological, radiological and nuclear (CBRN) filtering and radiological-nuclear (RN) filtering RPD	10.99	-
	ISO/AWI 17420-9	Respiratory protective devices — Performance requirements — Part 9 : Special application chemical, biological, radiological and nuclear (CBRN) supplied breathable RPD	10.99	-

나. 한국 주도 국제표준 개발 현황

[표 12] ISO/TC 94 한국 주도 국제표준 개발 현황

구분	표준번호	표준명	프로젝트 리더	간사	진행단계
TC 94 /SC 13	ISO/AWI 13994	Clothing for protection against liquid chemicals – Determination of the resistance of protective clothing materials to penetration by liquids under pressure	Hye Shin Yoon	Ms Ruth Schneider	10.99

다. 해당 ISO/TC 94 주요 이슈 및 동향

○ ISO/TC 94에서 진행중인 프로젝트 리스트 현황 및 프로젝트 리더는 다음과 같다.

[표 13] ISO/TC 94 프로젝트 리스트 및 프로젝트 리더

프로젝트 리더(PL)	개발 표준	표준명
Zoltan Mester	ISO/CD 3873	Industrial safety helmets
Stephen Dai	ISO/AWI TS 20141	Personal safety — Personal protective equipment — Guidelines on compatibility testing of PPE
Ellen Waßmann	ISO/CD 17249	Safety footwear with resistance to chain saw cutting
Jean-Claude Cannot	ISO 20344:2021/DA md 1	Personal protective equipment — Test methods for footwear — Amendment 1

프로젝트 리더(PL)	개발 표준	표준명
Liselotte Vijselaar	ISO 20345:2021/DA md 1	Personal protective equipment — Safety footwear — Amendment 1
Liselotte Vijselaar	ISO 20346:2021/DA md 1	Personal protective equipment — Protective footwear — Amendment 1
Liselotte Vijselaar	ISO 20347:2021/DA md 1	Personal protective equipment — Occupational footwear — Amendment 1
B. Ralph Chou	ISO/FDIS 12311	Personal protective equipment — Test methods for sunglasses and related eyewear
Annette Hoskin	ISO 16321-1:2021/ DAmd 1	Eye and face protection for occupational use — Part 1 : General requirements — Amendment 1
Annette Hoskin	ISO/DIS 16321-4	Eye and face protection for occupational use — Part 4 : Additional requirements for protection against biological hazards
Neil McConnochie	ISO 18527-3:2020/ AWI Amd 1	Eye and face protection for sports use — Part 3 : Requirements and test methods for eyewear intended to be used for surface swimming — Amendment 1
—	ISO/AWI TS 19818-2	Eye and face protection — Protection against laser radiation — Part 2 : Guidance on the selection and use of laser eye and face protection related to ISO 19818-1
Jean-Claude Canot	ISO/FDIS 374-1	Protective gloves against dangerous chemicals and micro-organisms — Part 1 : Terminology and performance requirements for chemical risks
Jean-Claude Canot	ISO/FDIS 374-5	Protective gloves against dangerous chemicals and micro-organisms — Part 5 : Terminology and performance requirements for micro-organisms risks
Jean-Claude Canot	ISO/DIS 374-6	Protective gloves against dangerous chemicals and micro-organisms — Part 6 : Protective gloves for hairdressers
Julien Hollingshurst	ISO/CD 6529	Protective clothing — Protection against chemicals — Determination of resistance of protective clothing materials to permeation by liquids and gases
Carole Garbowski	ISO/AWI 6530	Protective clothing — Protection against liquid chemicals — Test method for resistance of materials to penetration by liquids
Mike De Vrieze	ISO/CD 9185	Protective clothing — Assessment of resistance of materials to molten metal splash
Jan Beringer	ISO/FDIS 11611	Protective clothing for use in welding and allied processes
Stephanie Edmunds	ISO/DIS 11612	Protective clothing – Clothing to protect against heat and flame – Minimum performance requirements
Martin Camenzind	ISO/DIS 13506-1	Protective clothing against heat and flame — Part 1 : Test method for complete garments — Measurement of transferred energy using an instrumented manikin

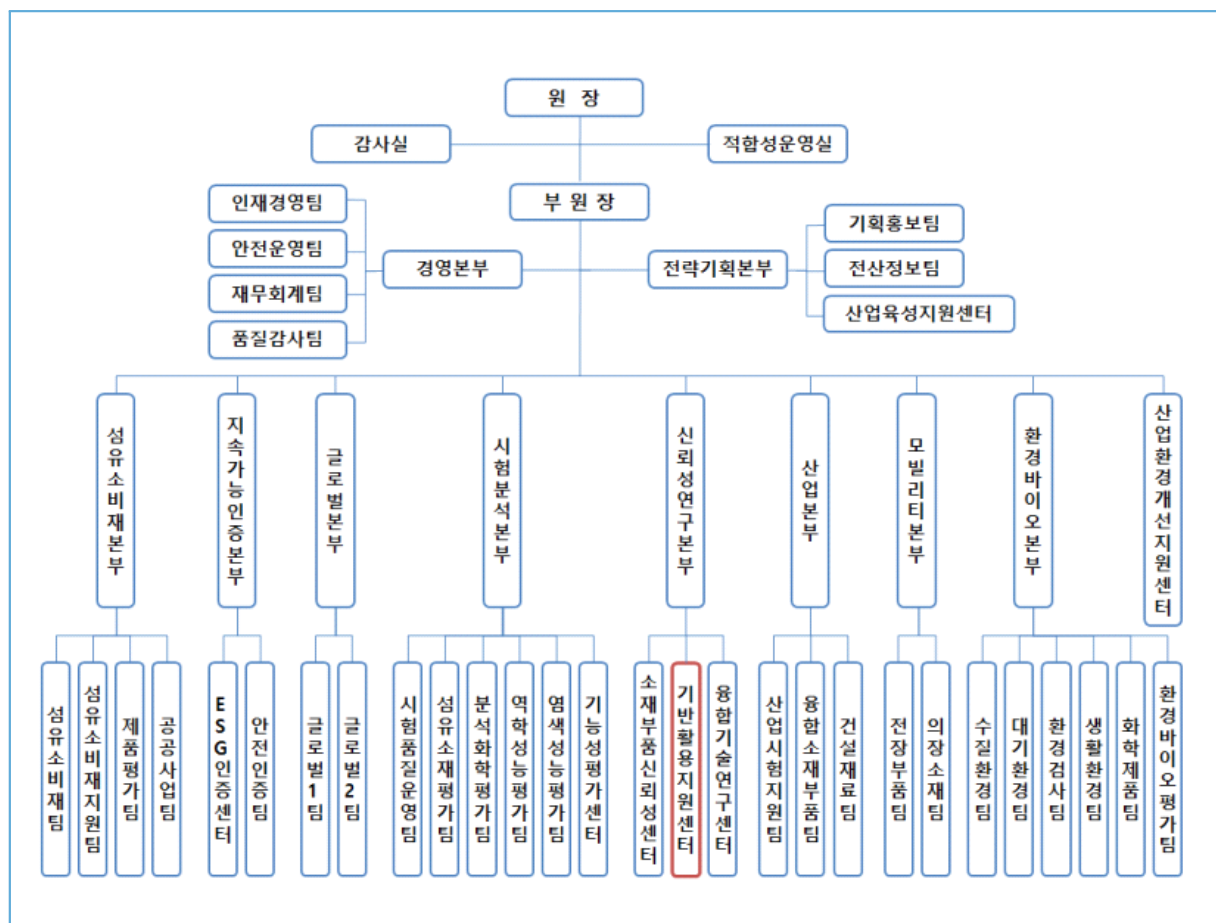
프로젝트 리더(PL)	개발 표준	표준명
Stephen Paskaluk	ISO/DIS 13506-2	Protective clothing against heat and flame — Part 2 : Skin burn injury prediction — Calculation requirements and test cases
Hye Shin Yoon	ISO/AWI 13994	Clothing for protection against liquid chemicals — Determination of the resistance of protective clothing materials to penetration by liquids under pressure
Stephanie Edmunds	ISO/DIS 14116	Protective clothing — Protection against flame — Limited flame spread materials, material assemblies and clothing
David Matthews	ISO/DIS 14460	Protective clothing for automobile racing drivers — Protection against heat and flame — Performance requirements and test methods
Eric van Wely	ISO/CD 16602-1.2	Protective clothing for protection against chemicals — Classification, labelling and performance requirements — Part 1 : General
Eric van Wely	ISO/CD 16602-2.2	Protective clothing for protection against chemicals — Classification, labelling and performance requirements — Part 2 : Physical test methods, classification and requirements
Eric van Wely	ISO/CD 16602-3.2	Protective clothing for protection against chemicals — Classification, labelling and performance requirements — Part 3 : Chemical test methods, classification and requirements
Eric van Wely	ISO/CD 16602-4.2	Protective clothing for protection against chemicals — Classification, labelling and performance requirements — Part 4 : Design test methods, classification and requirements
Eric van Wely	ISO/CD 16602-5.2	Protective clothing for protection against chemicals — Classification, labelling and performance requirements — Part 5 : Garment test methods, classification and requirements
Eric van Wely	ISO/CD 16602-6.2	Protective clothing for protection against chemicals — Classification, labelling and performance requirements — Part 6 : Guidance for selection, use, care and maintenance
Julia Nibbeling	ISO/AWI 17491-3	Protective clothing — Test methods for clothing providing protection against chemicals — Part 3 : Determination of resistance to penetration by a jet of liquid (jet test)
Stéphane Nowak	ISO/DIS 17491-4	Protective clothing — Test methods for clothing providing protection against chemicals — Part 4 : Determination of resistance to penetration by a spray of liquid (spray test)
Amanda Newsom	ISO/DIS 17491-5	Protective clothing — Test methods for clothing providing protection against chemicals — Part 5 : Determination of resistance to penetration by a spray of liquid (manikin spray test)
–	ISO/WD 20384	Surgical clothing and drapes — Requirements and test methods
Eric van Wely	ISO/CD 22615	Protective clothing — Performance requirements and test methods for protective clothing against infective agents
Guido Van Duren	ISO/AWI 23388	Protective gloves against mechanical risks
Frank Sasse	ISO/DIS 24231	Protective clothing — Protection against rain — Test method for ready-made garments against high-energy droplets from above
zhong CAI	ISO/DIS 24232	Protective clothing — Protection against rain

프로젝트 리더(PL)	개발 표준	표준명
Anugrah Shaw	ISO/AWI 27065	Protective clothing — Performance requirements for protective clothing worn by operators applying pesticides and for re-entry workers
David Matthews	ISO/DIS 11999-1	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 1 : General
Izuru Sato	ISO/CD 11999-2	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 2 : Compatibility
Brett Egan-Briers	ISO/DIS 11999-3	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 3 : Clothing
Robert Vickery	ISO/DIS 11999-4	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 4 : Gloves
David Bennett	ISO/DIS 11999-5	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 5 : Helmets
Robert Vickery	ISO/DIS 11999-6	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 6 : Footwear
Eric van Wely	ISO/DIS 11999-9	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 9 : Firehoods
David Matthews	ISO/CD 11999-10	PPE for firefighters — Test methods and requirements for PPE used by firefighters who are at risk of exposure to high levels of heat and/or flame while fighting fires occurring in structures — Part 10 : Part 10 Respiratory Protective Device (RPD)
Mark Tarbett	ISO/AWI 15384	Protective clothing for firefighters — Laboratory test methods and performance requirements for wildland firefighting clothing
David Matthews	ISO/DTR 21808	Best practices on the selection and use of personal protective equipment (PPE) designed to provide protection for firefighters
Richard Ballheimer	ISO/DIS 23616	Cleaning, inspection and repair of firefighters' personal protective equipment (PPE)

IV 해당분야 국가표준 대응 활동 현황

1. COSD 조직 소개

- 표준의 개발자로서의 능력 배양 및 국내 표준화 활동의 기반 구축을 위하여 국가 표준 제·개정 및 관리, 단체표준 개발, 사실상 국제표준대응, 표준개발사업 등 표준개발협력기관(COSD)으로서 다양한 표준화 업무를 수행하고 있다.



[그림 4] ISO/TC 94 COSD 조직 구성

○ 표준화 전담부서 운영으로 인한 효율적이고 전문화된 표준 업무 수행

- 2007. 12. 21. 시험연구원 중 최초 표준화 전담부서 설치

○ 표준개발협력기관(COSD)으로 지정됨에 따라 연간계획 수립 및 체계적인 국가표준 개발 및 관리업무 수행

- 1999. 11. 23. ISO/TC38(Textiles) 국제표준화 간사기관 지정
- 2004. 03. 26. ISO/TC221(Geosynthetics) 국제표준화 간사기관 지정
- 2008. 11. 11. ISO/TC 221 산업용섬유 국가표준개발협력기관 지정
- 2009. 02. 27. ISO/TC 219 섬유바닥재 국가표준개발협력기관 지정
- 2010. 07. 21. ISO/TC 94 보호복 및 보호장구류 국가표준개발협력기관 지정
- 2019. 04. 29. ISO/TC 216/137 신발/치수, IULTCS ISO/TC 120 가죽 산업표준개발 협력기관 지정
- 2022. 03. 21. 물환경분야 표준개발 협력기관 및 국제표준화기구 기술위원회 간사기관 지정(국립환경과학원)

○ COSD 참여인력 현황

[표 14] COSD 참여인력 명단

No.	성 명	직위	전공 및 학위			표준담당분야
			학교	전공	학위	
1	안윤희	책임	연세대	토목공학	석사	총괄책임(14년)
2	주정균	본부장	건국대	섬유공학	박사	표준개발(22년)
3	신현주	선임	연세대	화학	학사	실무총괄(12년)
4	여영우	선임	송실대	섬유공학	학사	실무(9년)
5	김세열	선임	연세대	화학공학	박사	실무(3년)
6	이승진	선임	홍익대	토목공학	학사	실무(8년)
7	정수진	주임	한양대	전자통신공학	학사	실무(5년)
8	황정현	주임	상명대	고분자화학	석사	실무(5년)
9	정우엽	주임	부산대	응용화학공학	석사	실무(1년)

2. 기술위원회, 전문위원회 활동 현황

- 전문위원회의 역할은 표준안 제·개정, 폐지 및 확인에 관한 검토와 표준개발 방침에 관한 승인 업무를 수행하고 있다. 토목합성재료 분야 전문위원회 위원은 산, 학, 연 분야의 표준화 전문가 총 6명이며 위원장 1명, 위원 5명으로 구성되어 있다.

[표 15] ISO/TC 94 보호복 및 보호장구 분야 전문위원회 명단

No.	구분	성명	소속	직책
1	위원장	김해형	한국소방산업기술원	실장
2	위원	강찬영	한국임업진흥원	선임연구원
3		윤혜신	한국의류시험연구원	책임연구원
4		이민희	국방기술품질원	선임연구원
5		이승윤	에스티(ST)	책임
6		이정진	단국대학교	교수

3. COSD 활동 성과

- 주요 대표제안 개발 표준

[표 16] 주요 대표제안 개발 표준

표준번호	표준명	주요내용
KS G ISO 16321-1	산업용 눈 빛 안면 보호 — 제1부 : 일반 요구사항	<ul style="list-style-type: none"> - ISO 16321 시리즈 표준 - ○ ISO 16321 표준은 산업용 눈 및 안면 보호구의 요구사항에 대한 시리즈 표준으로 3개의 부로 구성되어 있음
KS G ISO 16321-2	산업용 눈 빛 안면 보호 — 제2부 : 용접 및 관련 작업에서 사용하는 보호구에 대한 추가 요구사항	<ul style="list-style-type: none"> ○ 눈 및 안면 보호구는 산업에서 발생하는 비산 입자 및 파편, 광 복사, 먼지, 액체 비말, 금속 용융물, 열, 불꽃, 고온 고체, 유해 가스, 증기 및 에어로졸과 같은 위험요인으로부터 사람의 눈과 얼굴을 보호하기 위한 보호구임.6
KS G ISO 16321-3	산업용 눈 빛 안면 보호 — 제3부 : 망사 보호구에 대한 추가 요구사항	<ul style="list-style-type: none"> ○ 이 표준에서는 용접 및 관련 작업에 사용되는 눈 및 안면 보호구와 망사 보호구에 대한 추가 요구사항을 규정함으로써, 관련 업계 종사자 및 작업자의 안전을 도모하는데 기여가 예상됨

4. 2023년 COSD 제안 국가표준 리스트

- FITI시험연구원에서 관리하고 있는 KS표준은 총 451종이다. 이 중 ISO/TC 94 분야 KS표준은 127종이며, 2023년도에 진행한 제·개정표준은 총 17종이다. 세부사항을 살펴보면 국제표준 부합화(IDT) 제정 6종, 국제표준의 개정에 의한 개정 2종, 5년도래 확인표준 8종, 수요조사 내용 반영에 의한 개정 1종이 있다.

[표 19] 2023년 COSD 제안 국가표준 리스트

No.	표준번호	표준명	비고
1	ISO 12312-3	Eye and face protection — Sunglasses and related eyewear — Part 3 : Sunglasses for running, cycling and similar active lifestyles	국제표준 부합화(IDT)
2	ISO 16321-1	Eye and face protection for occupational use — Part 1 : General requirements	국제표준 부합화(IDT)
3	ISO 16321-2	Eye and face protection for occupational use — Part 2 : Additional requirements for protectors used during welding and related techniques	국제표준 부합화(IDT)
4	ISO 16321-3	Eye and face protection for occupational use — Part 3 : Additional requirements for mesh protectors	국제표준 부합화(IDT)
5	ISO 18526-4	Eye and face protection — Test methods — Part 4 : Headforms	국제표준 부합화(IDT)
6	ISO 23616	Cleaning, inspection and repair of firefighters' personal protective equipment (PPE)	국제표준 부합화(IDT)
7	KS G ISO 12312-1	눈 및 안면 보호 — 선글라스 및 관련 안경류 — 제1부 : 범용 선글라스	국제표준의 개정에 따른 부합화
8	KS K ISO 19918	보호복—화학물질에대한보호—재료를통한저증기압화학물질의 누적투과측정	국제표준의 개정에 따른 부합화
9	KS A 4052	방사성 오염 방호용 고무 장갑	5년 도래 확인 표준
10	KS K ISO 9151	열 및 불꽃에 대한 보호복 — 불꽃에 노출시 열전도성 측정	5년 도래 확인 표준
11	KS K ISO/TR 11610	보호복 — 용어	5년 도래 확인 표준
12	KS K ISO 13995	보호복 — 기계적특성 — 재료의 꿰뚫림 및 동적 인열의 저항성 측정 시험방법	5년 도래 확인 표준
13	KS K ISO 13996	보호복 — 기계적특성 — 꿰뚫림 저항성 측정	5년 도래 확인 표준
14	KS K ISO 15383	소방관용 보호장갑 — 시험실 시험방법 및 요구성능	5년 도래 확인 표준
15	KS K ISO 15538	소방관용 보호복 — 재귀반사체가 부착된 소방관용 보호복의 시험실적 시험방법 및 요구 성능	5년 도래 확인 표준
16	KS K ISO 22609	감염원 차단 보호복 — 의료용 마스크 — 인공혈액(일정량, 수평주입)에 의한 침투 저항성 시험방법	5년 도래 확인 표준
17	KS K ISO 22612	감염원 차단 보호복 — 건조한 미생물 침투에 대한 저항성 시험방법	수요조사 내용 반영

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