### **BUREAU OF INDIAN STANDARDS**

### **Program of Work**

## ETD 44 : Safety Of Machinery- Electrotechnical Aspects

Scope:

Standardization in the field of the application of electro-technical equipment and systems to machinery (including a group of machines working together in a coordinated manner, excluding higher-level systems aspects) not portable by hand while working, but which may include mobile equipment. The equipment covered commences at the point of connection of the electrical supply to the machinery. Standardization of interfaces (excluding local area networks and field-bus) between control equipment and the electro-technical equipment of machinery. Standardization of electro-technical equipment and systems elating to the safeguarding of persons from hazards of the machinery, its associated equipment and the environment. To coordinate with ISO/IEC on all matters concerning the safety of machinery."

Liaison: **IEC TC-44 (P):** Safety of machinery - Electrotechnical aspects

## **Published Standards**

S.No	IS No.	TITLE	Reaffirm M-Y	No. of Amds	Eqv.
1	IS 16501 : 2023	Safety of Machinery - Functional		-	Identical under dual
	IEC 62061 : 2005	Safety of Safety-Related Control			numbering
	IEC 62061:2021	Systems (First Revision)			
2	IS 16501 (Part 1):	Guidance on the Application of IS		-	Identical under dual
	2020	16810 (Part 1)/ISO 13849-1 and IS			numbering
	IEC TR 62061-1:	16501/IEC 62061 in the Design of			
	2010	Safety-Related Control Systems for			
	IEC TR 62061-1:	Machinery			
	2010				
3	IS 16502 (Part 1):	Safety of Machinery -		-	Identical under dual
	2023	ElectroSensitive Protective			numbering
	IEC 61496-1:2020	Equipment Part 1 General			
	IEC 61496-1:2020	Requirements and Tests			
4	IS 16502 (Part 2):	Safety of Machinery -		-	Identical under dual
	2023	ElectroSensitive Protective			numbering
	IEC 61496-2:2020	Equipment Part 2 Particular			
	IEC 61496-2:2020	Requirements for Equipment			
		Using Active Opto-Electronic			
		Protective Devices (AOPDs) (First			
		Revision)			
5	IS/ISO 16502-3:	Safety of Machinery -		-	Identical under dual
	2020	ElectroSensitive Protective			numbering
	IEC 61496-3 : 2018	Equipment Part 3 Particular			
	IEC 61496-3: 2018	Requirements for Active Opto-			
		electronic Protective Devices			
		Responsive to Diffuse Reflection (			
		AOPDDR )			
6	IS 16502 (Part 4):	Safety of Machinery - Electro-		-	Identical under dual

IEC TS 61496-42: 2022   Fart 4 Particular Requirements for Expensive Protective Devices (YBPD)		2021	sensitive Protective Equipment		1	numbering
			<u> </u>			
Section 2 Additional requirements when using reference pattern   sechniques (YBPDP)						
when using reference pattern   cochingues (VBPDP)		61496-4-2:2022				
Techniques (VBPDP)   Section   Service   Sensitive Protective Equipment   Sensitive Protective   Sensitive   Sensitive Protective   Sensitive   Sensitive Protective   Sensitive Protec			<u> </u>			
7   SI 16502 (Part 4/Sec   2) (2024   61496-4-2:2022   61496-4-2:2022   Part 4 Particular Requirements for Equipment Using Vision Based Protective Devices (VBPD) Section 2 Additional Requirements   Van Using Reference Pattern Techniques (VBPDPP) (First Revision)   Safety of Machinery - Particular Requirements   Particular   Pa						
2): 2024   Sensitive Protective Equipment   For Certive Devices (VBPD)	<u> </u>	70.1.570.0				
61496-4-2:2022   Part 4 Particular Requirements for Equipment Using Vision Based Protective Devices (VBPD)   Section 2 Additional Requirements   When Using Reference Pattern   Techniques (VBPDPP) (First Revision)	7	,	, ,		-	
Section 2 Additional Requirements   Section 3 Additional Require		· · · · · · · · · · · · · · · · · · ·	1 1			numbering
Protective Devices (VBPD)   Section 2 Additional Requirements When Using Reference Pattern Techniques (VBPDPP) (First Revision)						
Section 2 Additional Requirements   When Using Reference Pattern Techniques (VBPDPP) (First Revision )   Safety of Machinery - Electro-Sensitive Protective   Equipment   Particular   Requirements for Equipment   Using Vision Based Protective   Equipment   Safety of Machinery   Electro-Sensitive Protective   Using Vision Resequirements when Using Stereo   Vision Techniques (VBPDST )		61496-4-2:2022				
When Using Reference Pattern Techniques (VBPDP) (First Revision)						
Techniques (VBPDP)   First Revision			-			
Revision   Safety of Machinery - Electro-Sensitive Protective   Equipment   Particular   Requirements for Equipment   Capital   Capita						
S   IS   16502 (Part 11)						
Description   Color		IC 16502 (D. + 11)	,			T1 .' 1 1 1 1
IEC TS 61496-4-3	8	` '			-	
2015   Requirements for Equipment   Using Vision Based Protective Devices (VBPDST )						numbering
Sing Vision Based Protective Devices (VBPD)			* *			
Devices (VBPD) - Additional Requirements When Using Stereo Vision Techniques (VBPDST)						
Requirements when Using Stereo Vision Techniques (VBPDST)   Safety of Machinery 4e <sup>Th</sup> Electrosensitive Protective Equipment Using Vision Based Protective Devices (VBPD)   Section 3 Additional Requirements for Equipment Using Vision Based Protective Devices (VBPD)   Section 3 Additional Requirements When Using Stereo Vision Techniques (VBPDST) (First Revision)   Te		01490-4-3:2022	_			
Vision Techniques ( VBPDST )   Safety of Machinery - Indication,			` ′			
S   16502 (Part 4/Sec   3) : 2024   61496-4-3:2022   EC 61496-4-3:2022   EC 61496-4-3:2022   EC 61310-2 : 2007   Reviewed In : 2022   EC 61310-3 : 2007   Safety of Machinery - Indication, Marking and Actuation Part 3   Ec 61310-3 : 2007   Requirements for the Location and Reviewed In : 2024   EC 61310-3 : 2007   Safety of Machinery - Indication, Marking and Actuation Part 1   EC 61310-3 : 2007   Safety of Machinery - Indication, Marking and Actuation Part 2   Requirements for Visual, Acoustic and Tactile Signals   EC 61310-1 : 2007   Reviewed In : 2022   Requirements for Wisual, Acoustic and Tactile Signals   Safety of Machinery - Indication, Marking and Actuation Part 2   Requirements for Marking   Requirements for the Location and Reviewed In : 2022   EC 61310-3 : 2007   Requirements for the Location and Reviewed In : 2024   EC 61310-3 : 2007   Requirements for the Location and Reviewed In : 2024   EC 61310-3 : 2007   Requirements for the Location and Reviewed In : 2024   EC 6130-3 : 2007   Requirements for the Location and Reviewed In : 2024   EC 60204-1 : 2016   General Requirements (First Reviewed In : 2024   Revision )   EG 60204-1 : 2018   Requirements for Requirements for Requirements for Reviewed In : 2024   Requirements for Requirements			_			
3): 2024   Sensitive Protective Equipment   Part 4 Particular Requirements for Equipment Using Vision Based   Protective Devices (VBPD)   Section 3 Additional Requirements   When Using Stereo Vision   Techniques (VBPDST) (First Revision)	0	IS 16502 (Part 4/Sec			_	Identical under dual
61496-4-3:2022   Part 4 Particular Requirements for Equipment Using Vision Based Protective Devices (VBPD)   Section 3 Additional Requirements When Using Stereo Vision Techniques (VBPDST) (First Revision)		· ·				
Equipment Using Vision Based Protective Devices (VBPD)   Section 3 Additional Requirements When Using Stereo Vision Techniques (VBPDST) (First Revision)		, and the second				namoering
Protective Devices (VBPD)   Section 3 Additional Requirements   When Using Stereo Vision   Techniques (VBPDST) (First Revision)			-			
Section 3 Additional Requirements   When Using Stereo Vision   Techniques (VBPDST) (First Revision)		01190 1 3.2022				
When Using Stereo Vision Techniques (VBPDST) (First Revision)   Techniques (VBPDST) (First Revision)						
Techniques (VBPDST) (First Revision)						
Revision   Revision   Revision   May, 2024   - Identical under dual numbering   IEC 61310-1 : 2007   Requirements for Visual, Acoustic and Tactile Signals   IEC 61310-1 : 2007   Requirements for Marking and Actuation Part 2   IEC 61310-2 : 2007   Reviewed In : 2022   IEC 61310-2 : 2007   Requirements for Marking and Actuation Part 2   IEC 61310-2 : 2007   Requirements for Marking   Requirements for Marking   May, 2024   - Identical under dual numbering   IEC 61310-3 : 2007   Requirements for Marking and Actuation Part 3   IEC 61310-3 : 2007   Requirements for the Location and Reviewed In : 2024   IEC 60304-1 : 2016   Reviewed In : 2024   IEC 60204-1 : 2016   Reviewed In : 2018   Requirements for Equipment of Machines Part 1   General Requirements (First Revision )   IEC 60204-1 : 2016   Requirements for Equipment of Machines Part 1   IEC 60204-1 : 2016   Requirements for Equipment for IEC 60204-1 : 2018   Requirements for Equipment for IEC 60204-1 : 2016   Requirements for Equipment for						
10			=			
IEC 61310-1 : 2007   Reviewed In : 2024   IEC 61310-2 : 2007   Reviewed In : 2022   IEC 61310-3 : 2007   Safety of Machinery - Indication, Marking and Actuation Part 2   Requirements for Marking   Requirements for Marking   Requirements for Marking   May, 2024   - Identical under dual numbering   IEC 61310-3 : 2007   Reviewed In : 2024   IEC 61310-3 : 2007   Reviewed In : 2024   IEC 61310-3 : 2007   IEC 60204-1 : 2016   Reviewed In : 2024   IEC 60204-1 : 2016   Requirements for Equipment for University   IEC 60204-1 : 2018   Requirements for Equipment for University   IEC 60204-1 : 2018   IEC 60204-1 : 2018   Soft of Machinery - Electrical   IEC 60204-1 : 2018   IEC 60204-1 : 2018   Soft of Machinery - Electrical   IEC 60204-1 : 2018   IEC 60204-1 : 2018   Soft of Machinery - Electrical   IEC 60204-1 : 2018   IEC 60204-1 : 2018   Soft of Machinery - Electrical   IEC 60204-1 : 2018   IEC 60204-1 :	10	IS 16503 (Part 1):		May, 2024	-	Identical under dual
Reviewed In : 2024   IEC 61310-1 : 2007   Safety of Machinery - Indication, Marking and Actuation Part 2   Requirements for Marking   Reviewed In : 2022   IEC 61310-2 : 2007   Reviewed In : 2022   IEC 61310-3 : 2007   Reviewed In : 2024   IEC 61310-3 : 2007   Reviewed In : 2024   IEC 60204-1 : 2016   Reviewed In : 2024   IEC 60204-11 : 2018   IEC 60204-11 : 2018   Requirements for Machinery - Electrical   Equipment of Machines Part 1   IEC 60204-11 : 2018   Requirements for Equipment for Voltages above 1 000 V AC or 1   2018   Safety of Voltages above 1 000 V AC or 1   2018   Safety of Machiner Part 1   Suffers of Machinery - Electrical   IEC 60204-11 : 2018   Requirements for Equipment for Voltages above 1 000 V AC or 1   2018   Suffers of Machines Part 1   2018   Suffers			-			numbering
IEC 61310-1 : 2007			÷			
11			and Tactile Signals			
2017   Marking and Actuation Part 2   Requirements for Marking				Y 2022		*
IEC 61310-2 : 2007   Requirements for Marking   Requirements for Marking	11	· · · · · · · · · · · · · · · · · · ·		January, 2022	=	
Reviewed In : 2022   IEC 61310-2 : 2007			_			numbering
IEC 61310-2 : 2007   12   IS 16503 (Part 3) :			Requirements for Marking			
12   IS 16503 (Part 3) :   Safety of Machinery - Indication,   Marking and Actuation Part 3   IEC 61310-3 : 2007   Reviewed In : 2024   IEC 61310-3 : 2007     Safety of Machinery — Electrical   Equipment of Machines Part 1   General Requirements (First Reviewed In : 2024   IEC 60204-1 : 2016   Reviewed In : 2024   IEC 60204-1 : 2016   Tec 60204-1 : 2016   Iec 60204-1 : 2016   Iec 60204-1 : 2016   Iec 60204-1 : 2016   Iec 60204-1 : 2018   Iec 60204-1 : 2018   Iec 60204-1 : 2018   Tec 60						
2017	12		Safety of Machinery - Indication	May 2024	_	Identical under dual
IEC 61310-3 : 2007   Requirements for the Location and   Operation of Actuators	12		1	1,1uy, 2027		
Reviewed In : 2024   Operation of Actuators			-			
IEC 61310-3 : 2007   Safety of Machinery — Electrical			=			
IS 16504 (Part 1): Safety of Machinery — Electrical Equipment of Machines Part 1 Safety of Machines Part 1 General Requirements (First Reviewed In: 2024 Revision)  IS 16504 (Part 11): Safety of Machinery - Electrical Part 1 Safety of Machinery - Electrical Equipment of Machines Part 11 Safety of Machines Part 11 Safety of Machines Part 11 Requirements for Equipment of Machines Part 11 Safety of M			- F			
2019   Equipment of Machines Part 1   General Requirements (First Reviewed In : 2024   IEC 60204-1 : 2016	13		Safety of Machinery — Electrical	May, 2024	-	Identical under dual
IEC 60204-1 : 2016   General Requirements ( First Reviewed In : 2024   Revision )		· · · · · · · · · · · · · · · · · · ·		•		numbering
IEC 60204-1 : 2016         14       IS 16504 (Part 11) : Safety of Machinery - Electrical 2020 Equipment of Machines Part 11       - Identical under dual numbering         IEC 60204-11 : 2018 IEC 60204-11 : 2018 2018		IEC 60204-1:2016				
14 IS 16504 (Part 11): Safety of Machinery - Electrical Equipment of Machines Part 11  IEC 60204-11: 2018 Requirements for Equipment for Voltages above 1 000 V AC or 1  2018 500 V DC and not Exceeding 36			Revision )			
2020 Equipment of Machines Part 11 IEC 60204-11 : 2018 Requirements for Equipment for Voltages above 1 000 V AC or 1 2018 500 V DC and not Exceeding 36						
IEC 60204-11 : 2018 Requirements for Equipment for Voltages above 1 000 V AC or 1 500 V DC and not Exceeding 36	14				-	
IEC 60204-11 : Voltages above 1 000 V AC or 1 500 V DC and not Exceeding 36			± ±			numbering
2018 500 V DC and not Exceeding 36			1 1 1			
			_			
KV		2018				
	<u> </u>		KV		+	

15	IS 16504 (Part 31): 2019 IEC 60204-31: 2013 Reviewed In: 2024 IEC 60204-31: 2013 IS 16504 (Part 32): 2017	Equipment of Machines Part 31 Particular Safety and EMC Requirements for Sewing	May, 2024 May, 2024	-	Identical under dual numbering  Identical under dual numbering
	IEC 60204-32 : 2008 Reviewed In : 2024 IEC 60204-32 : 2008	Requirements for Hoisting Machines			, and the second
17	IS 16504 (Part 33): 2019  Reviewed In: 2024 IEC 60204-33: 2009	Safety of Machinery - Electrical Equipment of Machines Part 33 Requirements for Semiconductor Fabrication Equipment	May, 2024	-	Identical under dual numbering
18	IS 16504 (Part 34): 2019 IEC TS 60204-34: 2016 Reviewed In: 2024 IEC 60204-34: 2016		May, 2024	-	Identical under dual numbering
19	IS 16936 : 2018 IEC TR 62513 : 2008 Reviewed In : 2024 IEC TR 62513 : 2008	Safety of Machinery - Guidelines for the Use of Communication Systems in Safety Related Applications	May, 2024	-	Identical under dual numbering
20	IS 17332 : 2020 IEC 62046 : 2018 IEC 62046 : 2018	Safety of Machinery - Application of Protective Equipment to Detect the Presence of Persons		-	Identical under dual numbering
21	IS 17519 : 2021 IEC 62745:2017 IEC 62745:2017	Safety of machinery - Requirements for cableless control systems of machinery		-	Identical under dual numbering
22	IS 17520 : 2021 IEC TS 62998-1 : 2019 IEC TS 62998-1 : 2019	Safety of Machinery - Safety- related Sensors Used for the Protection of Persons		-	Identical under dual numbering
23	IS 17521 : 2021 IEC TR 63074 : 2019 IEC TR 63074 : 2019	Safety of Machinery - Security Aspects Related to Functional Safety of Safety Related Control Systems		-	Identical under dual numbering

# **Standards under Development**

Projects Approved			
SI. No.	Doc No.	Title	
	No Records Found		

	Preliminary Draft Standards		
SI. No.	Doc No.	Title	
1	ETD 44 (25936) Revision	Safety of Machinery - Electrical Equipment of Machines Part 32 Requirements for Hoisting	
	of: IS 16504:2017	Machines First Revision	
2	ETD 44 (25950) Revision	Safety of Machinery Security Aspects Related to Functional Safety of Safety Related Control	
	of: IS 17521:2021	Systems First Revision	

3	ETD 44 (25966)	Safety of Machinery Electro-Sensitive Protective Equipment Part 5 Particular Requirements for
		Radar-Based Protective Devices

Drafts Standards in WC Stage		
SI. No.	Doc No.	Title
No Records Found		

		Draft Standards Completed WC Stage
SI. No.	SI. No. Doc No. Title	
No Records Found		

	Finalized Draft Indian Standard	
SI. No.	Doc No.	Title
1	ETD 44 (24766)	SAFETY OF MACHINERY PART 2 EXAMPLES OF APPLICATION
2	ETD 44 (24767)	SAFETY OF MACHINERYSAFETY-RELATED SENSORS USED FOR THE PROTECTION
		OF PERSONS PART 3 SENSOR TECHNOLOGIES AND ALGORITHMS
3	ETD 44 (24808)	SAFETY OF MACHINERY GUIDELINES ON FUNCTIONAL SAFETY OF SAFETY-
		RELATED CONTROL SYSTEM

Finalized Draft Indian Standards under Print			
SI. No.	SI. No. Doc No. Title		
	No Records Found		

## Total Published Standards:21 Total Standards Under development:6

# **Aspect Wise Report**

Product: 3
Code of Practices: 4
Methods of Test: 0
Terminology: 0
Dimensions: 0
System Standard: 0
Safety Standard: 6

Others: 8
Service Specification: 0
Process Specification: 0
Unclassified: 0

# Annexure-I :List of Indian Standards Withdrawn/Superseded

SI. No.	IS No. & Year	Title
1	IS 1356 (Part 1): 1972	Specification for electrical equipment of machine tools Part 1 electrical equipment of machines
	Reviewed In: 2021 IEC	forgeneraluse Second Revision
	Pub 204-1	
2	IS 16594 (Part 1): 2017	Safety of machinery - ElectroSensitive protective equipment Part 1 general requirements and tests
	IEC 61496-1 : 2012	
	Reviewed In: 2022 IEC	
	61496-1 : 2012	

# **Annexure-II : List of Indian Product Standards**

SI. No.	IS No. & Year	Title
1	IS 16502 (Part 1): 2023	Safety of Machinery - ElectroSensitive Protective Equipment Part 1 General Requirements and

	IEC 61496-1 : 2020	Tests
2	IS 16502 (Part 2): 2023 IEC 61496-2:2020	Safety of Machinery - ElectroSensitive Protective Equipment Part 2 Particular Requirements for Equipment Using Active Opto-Electronic Protective Devices AOPDs First Revision
3	IS 16502 (Part 4/Sec 3): 2024 61496-4-3:2022	Safety of Machinery Electro-Sensitive Protective Equipment Part 4 Particular Requirements for Equipment Using Vision Based Protective Devices VBPD Section 3 Additional Requirements When Using Stereo Vision Techniques VBPDST First Revision