

GLOW-WIRE TEST

to determine the fire resistance by the fire hazard test
 in accordance with **IEC 60695 Part 2** Section 1 / 1994-03

and further standards and regulations listed in the STANDARDS SCHEDULE T 03e

The test procedure is used to examine the fire resisting properties of products if, during the application or in the case of a fault, heated or glowing parts could be considered as a short-time ignition source. Loose connections or bad contacts cause punctually high temperatures on electrical articles, their components and their parts. Attention should also be paid to the fire risk in connection with textile seat coverings, tablecloths, or curtains, e.g. after coming into contact with a lighted cigarette. For this reason, prototypes of all articles which could be a source of danger if they contact with ignition sources should be subjected to the Glow-wire Test.

Test Apparatus

The ignition source is imitated by an electrically heated wire loop against which the sample is pressed with a constant force. A miniature jacket thermocouple serves as a sensor for the loop temperature.

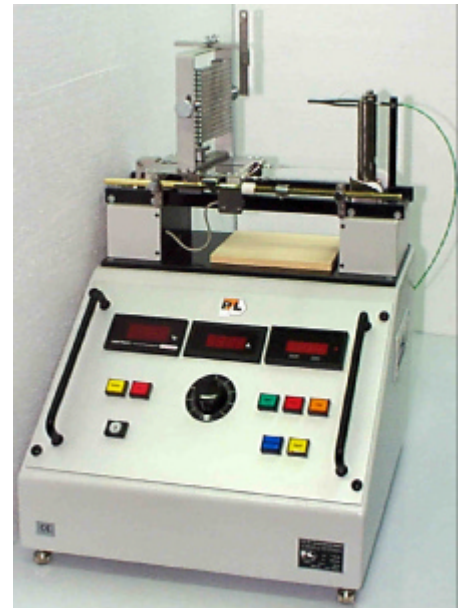


Fig. 1
 Model T-03.35

The sample has to be fastened to a carriage on which, by means of a tensioning cord, a weight with a force of 1 N is effective in the direction of the wire loop. Scales enable the reading of the flame height and the depth of penetration. Approx. 200 mm below the wire loop a board of pine wood, covered with a layer of tissue paper, is mounted. This device enables to judge the danger of a fire spreading through burning drops or glowing parts falling from the sample.

Test Method

The specimen and, if necessary, a base shall be attached relative to the wire loop in such a way to represent the most unfavourable practical case. The scales of the measuring device shall be adjusted and the penetration depth of the loop shall be limited by the adjustable stop. After returning and covering the specimen the loop shall be heated up to the specified temperature.

When the loop has maintained the testing temperature for at least 60 seconds, the specimen can be briskly led up to the loop. From the moment of contact, an operation time of exactly 30 seconds must be kept. Then the penetration depth is read and the specimen is slowly returned to its starting position. During and after the operation the burning behaviour of the specimen and the tissue paper on the wooden board has to be observed.

PTL GLOW-WIRE TEST APPARATUS T 03.14

The basic model T 03.14 is a complete operative test apparatus. The calibration is done with silver foil. When the foil melts, the temperature measuring instrument must indicate a temperature of 960 °C. All types contain a cardanic holding device for the specimens which allows an easy adjustment of the point of contact for the loop.

Standard outfit:

- 1 wire loop of nickel-chromium, with clamping mechanism,
- 1 carriage with Cardanic holding device for the specimen, five-fold adjustable,
- 1 rail system with ground running surfaces,
- 1 fine rope pull mechanism with weights for loads of $1 \pm 0,2$ N,
- 1 indicating device for the depth of penetration, with maximum pointer and stop,
- 1 scale to measure the flame height, multiple adjustable,
- 1 high current isolating transformer to heat the wire loop, with series connected variable ratio transformer, to set the temperature up to 960 °C,
- 1 miniature jacket thermocouple Chromel-Alumel, with plug almost free from thermoelectric voltage and with compensating lead,
- 1 temperature indicating instrument to indicate the temperature of the glow-wire loop, with digital display, measuring range 0...1000 °C, class 0,5, built-in operable, see Fig. 1 and 3, can be recalibrated, with compensation of the ambient temperature.
- 1 housing, desk shaped, with all necessary electrical components, with safety switch and 2 keys.

D e s i g n : testing device as **Fig. 2**, mounted on housing of sheet steel, papyrus-white structure varnished, plan dimensions approx. 400 mm x 400 mm, total height approx. 570 mm, carriage and specimen holding device of corrosion-protected material, including 2 cm² foil of fine silver 99,8 %, 0,06 mm thick, for calibration of the temperature indicating instrument, board of pine wood, 10 mm thick, wrapping tissue and mains connection cord set, for connection to A.C. 230 V, 50 to 60 Hz,

other voltages or frequencies: on request

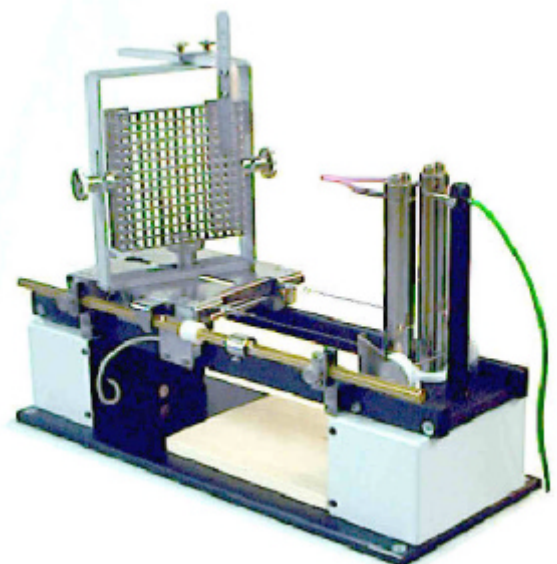


Fig. 2
Testing device (Model T-03.35)

PTL GLOW-WIRE TEST APPARATUS T 03.35

The model **T 03.35** is equal to the basic model T 03.14, however it is fitted with the following additional outfit:

PULSE TIMER WITH TIME DISPLAY

to give an optical and a disengageable sound signal after 30 seconds each, and to indicate the testing time

The pulse timer is started by a push button at the same time as the specimen contacts the loop. By that, the indication of the time begins to run. The minutes and the seconds appear on the display in numerals which are good to read. At the first signal, the specimen has to be returned. At each following signal, the flame height has to be observed. The pulse timer can be switched off by pressing the button "STOP". By means of a switch it is possible to preselect, if the glow-wire heating shall be automatically interrupted at the first signal. See **Fig. 1 and 3**.

MOTOR DRIVE

for slowly moving up the specimen to the wire loop, and for returning to the starting position at a constant speed

As soon as the specimen contacts the loop, a coupling releases the carriage. After an operation time of exactly 30 seconds, the carriage is automatically returned. The test results are better reproducible, and the laboratory technician's attention is not diverted during the testing procedure by having to do various operation tasks. He can fully concentrate on the observation of the specimen.

WIRE LOOP CURRENT INDICATOR

for measuring the current of the glow-wire, with digital display

measuring range 0...160 A, class 1, built-in operable, see **Fig. 3**, with a current transformer



Fig. 3
Model T 03.35

PTL GLOW-WIRE TEST APPARATUS

to determine the fire resistance by the fire hazard test

Outfit:

Temperature-indicating-instrument	Pulse timer with time display min : sec	Motor drive for the carriage with the specimen	Wire loop current indicator	Article No.
X				T 03.14
X	X	X	X	T 03.35

Spare parts:

The articles T 03.81 to T 03.93 are wearing parts and have no guarantee

		Article-No.
Glow-wire loop 0,5	of nickel-chromium, NiCr 8020, Material No. 2.4869, with hole Ø 0,6 mm for the thermocouple	T 03.81
Glow-wire loop 1,0	of nickel-chromium, NiCr 8020, Material No. 2.4869, with hole Ø 1,1 mm for the thermocouple	T 03.82
Miniature-jacket-thermocouple 1,0	Chromel-Alumel, outer Ø 1,0 mm, length approx. 100 mm, with plug almost free from thermoelectric voltage and with compensation lead 500 mm long	T 03.84
Miniature-jacket-thermocouple 0,5	Chromel-Alumel, outer Ø 0,5 mm, length approx. 100 mm, with plug almost free from thermoelectric voltage and with compensation lead 500 mm long	T 03.86
Silver foil, 2 cm²	0,06 mm thick, fine silver at least 99,8 %, for calibration of the temperature indicating instrument	T 03.89
Wrapping Tissue	20 g/qm, set of 10 sheets	T 03.89
Fine Wire Brush	for cleaning glow wire loop	T 03.89
Board of Pine Wood	10 mm thick	T 03.89

PTL - Glühdraht-Prüfgerät
PTL GLOW WIRE TEST APPARATUS

Normen und Vorschriften, nach denen mit den PTL-Glühdraht-Prüfgerät geprüft werden kann:

ACCORDING TO THE FOLLOWING STANDARDS AND PRESCRIPTIONS YOU CAN USE THE PTL GLOW WIRE TEST APPARATUS:

Norm STANDARD	Teil PART	Ausgabe ISSUE	Kapitel CLAUSE	Bild FIG.	Norm STANDARD	Teil PART	Ausgabe ISSUE	Kapitel CLAUSE	Bild FIG.
BS 1363		1984	23.2.2	25&26	IEC 60695	2-1/1	1994-03		
BS 5733		1979		1&2	IEC 60695	2-1/2	1994-03		
EN 50075		1990-07	17		IEC 60695	2-1/3	1994-03		
EN 50262		1998-09	12.2		IEC 60730	1	1993-10	21.2, An. G2	
EN 60238		1996-07	20.3		IEC 60745	1	1997-02	29.2, An. E	
EN 60309	1	1997	27.4	11a&b	IEC 60884	1	1994-06	28.1.1	
EN 60335	1	1994-09 ¹⁾	30.2.2, An. K		IEC 61058	1	1996-10	21.1, An. C	
EN 60335	2-3	1995	30.2.2		NF C 20-455		1980-04		
EN 60335	2-6	1990	30.2.2		VDE 0304	4	1986-10 ²⁾	6	1&2
EN 60669	1	1995-08	24.1.1		VDE 0471	2-1/0	1997-04		
EN 60695	2-1/0	1996			VDE 0471	2-1/1	1997-04		
EN 60695	2-1/1	1996			VDE 0471	2-1/2	1997-04		
EN 60695	2-1/2	1996			VDE 0471	2-1/3	1997-04		
EN 60695	2-1/3	1996			VDE 0551		1995-09	1, 26.2	6&7
EN 60742		1995-06	1, 26.2	6&7	VDE 0570	1	1998-07	19.2, An. E	
EN 61058	1	1992 ³⁾	21.1, An. C		VDE 0570	1	1998-07	27.2, An. E	
EN 61558	1	1997-11	19.2, An. E		VDE 0606		1976-02	26	
EN 61558	1	1997-11	27.2, An. E		VDE 0616	1	1997-03	20.3	
IEC 60238		1998-09	20.3		VDE 0619		1999-04	12.2	
IEC 60309	1	1997-08	27.4	11a&b	VDE 0620	101	1992-05	17	
IEC 60320	1	1994-06	27.1		VDE 0623	1	1998-11	27.4	11a&b
IEC 60335	1	1991-04	30.2.2, An. K		VDE 0630	1	1993-05	21.1, An. C	
IEC 60335	2-3	1993-06	30.2.2		VDE 0632	1	1996-04	24.1.1	
IEC 60598	1	1999-02	4.15		VDE 0634	1	1987-09	14	
IEC 60598	1	1999-02	13.3.2		VDE 0700	1	1995-10	30.2.2, An. K	
IEC 60670		1989-10	14	6	VDE 0700	3	1996-03	30.2.2	
IEC 60695	2-1/0	1994-03			VDE 0700	6	1992-06	30.2.2	

¹⁾ + A11 / 1995-05

²⁾ Entwurf / DRAFT

³⁾ + A1 / 1992

Referenzen: PTL-Glühdraht-Prüfgeräte
REFERENCES: PTL GLOW-WIRE TEST APPARATUSES

ABB Stotz-Kontakt GmbH	D	Heidelberg	Kaiser GmbH & Co. Elektrotechnik	D	Schalksmühle
Addiplast	F	Saint-Pal-De-Mons	Kärcher GmbH & Co., Reinigungssysteme, Alfred	D	Winnenden
AEG Aktiengesellschaft	D	Hamel	KIMEX Import-Export GmbH	A	Vomp
AEG Hausgeräte GmbH	D	Kassel	Kirsten, Elektrotechnische Spezialfabrik, Franz	D	Bingen
AEG Kleinmotoren GmbH	D	Oldenburg	Klößner-Moeller GmbH	D	Bonn
Aisthom	F	La Rochelle	Kontavill	H	Szentos
AMP Deutschland GmbH	D	Langen	Landesamt für Arbeitsschutz und Arbeitsmedizin Thüringen	D	Suhl
AMTAC Laboratories Limited	GB	Broadheath	Langer GmbH & Co. KG., Werner, Metall- u. Kunststoffverarb.	D	Meschede-Berge
APAVE	F	Paris	Legrand	F	Antibes
APAVE de l'ouest	F	Saint Herblain	Leoni Slowakia	SK	Nova Dubnica
Arçelik A.S., Product Development Laboratories	TR	Istanbul	LG Chemical Ltd.	KS	Seoul
ARDAM	F	Revin	Liebherr-Hausgeräte GmbH	D	Ochsenhausen
Aric les Etablissements Guy d'Aric	F	Aubervilliers	Lita sa	F	Lamotte-Beuvron
AT & T Technologies	USA	Ballwin	LK AS, Laur. Knudsen	DK	Ballerup
Balay S.A.	E	Zaragoza	Luminox SA	F	Riom
Bals Elektrotechnik GmbH & Co., KG	D	Kirchhundem	Maier + Cie AG, Carl (CMC)	CH	Schaffhausen
Barelec S.A.	F	Etreux	Mannesmann Kienzle GmbH	D	Villingen-Schwenen.
Bauknecht Hausgeräte GmbH	D	Calw	Mapro Control S.L.	E	Barcelona
Bauknecht Hausgeräte GmbH	D	Neunkirchen	Marlin Lighting Limited	GB	Feltham
Bergmann, Theodor, Kunststoffwerk GmbH	D	Gaggenau	Marquardt, J. & J.	D	Rietheim
BG Berufsgenossenschaft der Feinmech. und Elektrotech.	D	Köln	May & Christe GmbH, Transformatorenwerke	D	Oberursel
BJB Bröckelmann, Jaeger und Busse GmbH & Co.	D	Arnsberg	May & Steffens GmbH & Co KG Elektrotechnische Fabrik	D	Pulheim
Blomberg-Werke GmbH Elektro Haushaltsgeräte	D	Ahlen	Mayr Kunststofftechnik GmbH	D	Weitnau
Borgers GmbH & Co KG, Johann	D	Bocholt	Melitta Haushaltsprodukte GmbH & Co. KG	D	Minden
Bosch-Siemens Hausgeräte GmbH	D	Traunreut	Merlin Gerin	D	Grenoble
BP Chemicals	F	Wingles	Metil s.a.	B	Bruxelles
Braun AG	D	Kronberg	Mex + Wonisch GmbH + Co. KG	D	Arnsberg
Braun Ireland Limited	IRL	Carlow	Miele & Cie. GmbH & Co.	D	Bielefeld
Braun, Werner, GmbH	D	Neuenstadt	Miele & Cie. GmbH & Co.	D	Lehrte
Brilliant AG	D	Gnarrenburg	Miele & Cie. GmbH & Co. (3 Prüfgeräte/APPARATUSES)	D	Gütersloh
Bromine Compounds Ltd.	IL	Beer Sheva	MIKES Product Service GmbH	D	Strasskirchen
BS Electrodomesticos, S.A.	E	Santander	MITRAS Kunststoffe GmbH	D	Weiden
COSQC Central Organ. for Standard. and Quality Control	IRQ	Baghdad	Mittermeyer E. W. GmbH	D	Hamburg
Centralne Biuro Jakosci Wyrobów	PL	Warszawa	National Institute of Technology and Quality	KS	Seoul
Century Enka Limited	IND	Bombay	Nepal Bureau of Standards	NP	Kathmandu
CEPEM Compagnie Européenne pour l'Equipement Ménager	F	St. Jean de la Ruelle	Neumann, Elektro-Apparatebau, Franz	D	Ingolstadt
CEST China Guangzhou Electrical Safety Testing Institute	TJ	Guangzhou	Niessen S.A.	E	Renteria
China Electric Manufacturing Corporation	ROC	Taoyuan	Nowa-Plast GmbH	D	Merenberg
CIAPEM Compagnie industrielle d'appareils électroménagers	F	Lyon	Nyltech Italia S.r.l.	I	Ceriano Laghetto
Ciba Additive GmbH	D	Lampertheim	PEHA Hochköpfer GmbH & Co KG, Paul	D	Lüdenscheid
Clairant	F	Mantes la Jolie	Philips Eclairage Compagnie (Projelux)	F	Miribel
CNPP Centre National de Prévention et de Protection	F	Saint Marcel	Philips Lighting	GB	Hamilton
Coesfeld Materialtest	D	Dortmund	Phoenix Test-Lab GmbH	D	Blomberg
Consul S.A.	BR	Joinville	PIC Precision International Corporation	ROC	Taipei
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DEMKO Danmarks Elektriske Materielkontrol	DK	Herlev	Polycorn GmbH	D	Hann. Münden
Dietal S. A.	F	St-Georges-de-Mons	Popp GmbH + Co KG	D	Bad Berneck
Dow Deutschland Inc.	D	Stade	PTR Messtechnik GmbH & Co. KG	D	Werne
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E.H.P. Technical Services Limited	GB	Chessington	SABS Suid-Afrikaanse Buro vir Standaarde	ZA	Pretoria
ED & D Educated Design & Development Inc.	USA	Morrisville NC	Sarel Appareillage Electrique S.A.	F	Sarre-Union
Electronics Research & Service Organization ITRI	ROC	Chutung, Hsinchu	Sarlam SA	F	Belhomert
Elektrotechniky vyskumny	SK	Nova Dubnica	Schmitt, Ludwig, GmbH, Elektrotechnische Fabrik	D	Saarbrücken
Ems-Chemie AG	CH	Domat/Ems	Schulman A. GmbH Thermoplastische Kunststoffe	D	Kerpen
EMZ Elektromanufaktur Zangenstein Hanauer GmbH & Co.	D	Nabburg	Schupa-Elektro-GmbH + Co KG	D	Schalksmühle
Entrelec S.A.	F	Villeurbanne	SELNOR	F	Lesquin
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EXCEL Inc.	J	Tokyo	SNIA Tecnopolimeri S.P.A.	I	Pistici
Felten & Guilleaume Energietechnik AG	D	Nordenham	Stiebel Eltron GmbH & Co. KG	D	Holzwinden
Forbach GmbH, Elektrowärmegeräte-Fabrik	D	Bad Neustadt/Saale	Stocko Metallwarenfabriken	D	Hellenthal
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Gorenje Handels-Gesellschaft m.d.H.	A	Wien	Tekno Polimer	TR	Istanbul
Hager Electro GmbH	D	Saarbrücken	Teko GmbH	D	Krefeld
Hahn & Kolb (14 Prüfgeräte/APPARATUSES)	D	Stuttgart	Telematic Ltd.	GR	Athens
Haier Group	TJ	Qingdao	Thüringische Faser AG Schwarz	D	Rudolstadt
Haitai	KS	Seoul	trimax, Elektrotechnik GmbH	D	Boizenburg
Heil Otto GmbH Elektrotechnische Fabriken	D	Oberursel	TÜV Baden-Württemberg	D	Filderstadt
Hessische Landesanstalt für Umwelt	D	Kassel	TÜV Norddeutschland e. V.	D	Hamburg
Hummel Metall- und Kunststofftechnik GmbH	D	Waldkirch	TÜV Product Service GmbH	D	München
IEP Instituto Electrotécnico Português	P	Senhora da Hora	TÜV Product Service GmbH	D	Eschborn
Ilme s.p.a.	I	Milano	TÜV Wien	A	Wien
Inchcape	ROC	Taipei	UL Underwriters Laboratories Inc.	USA	Northbrook
Ingelec Company	MA	Casablanca	Vaillant, GmbH u. Co., Joh.	D	Remscheid
Intercoperation	H	Budapest	Vandentempel BV (4 Prüfgeräte/APPARATUSES/Appareils)	NL	Wezep
INTI Instituto Nacional de Tecnologia Industrial	AR	Buenos Aires	VDE Prüf- und Zertifizierungsinstitut	D	Offenbach
Iskra Emeco-Laboratorij	SI	Kranj	Velux N.V.	B	Landen
Iskra Kondenzatorji	SL	Semic	Vossloh-Schwabe GmbH	D	Lüdenscheid
ITS Intertek Testing Services	HK	Kowloon	Whirpool Southeast Asia PTE.	SGP	Singapore
Jonylon Ltd	GB	Oldham	WIK Far East Ltd.	HK	Quarry Bay
K + W Thun, Eidgenössische Konstruktionswerkstätte	CH	Thun	WISKA Hoppmann & Mulsow GmbH	D	Kaltenkirchen
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