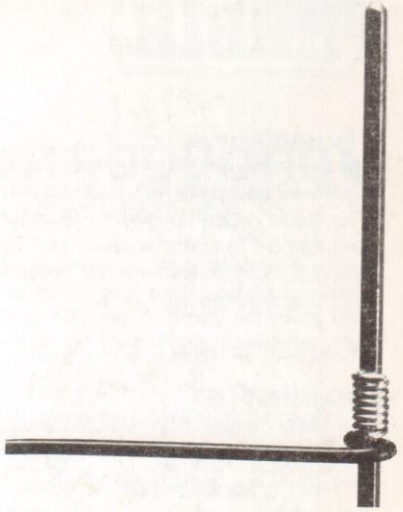
HABIA

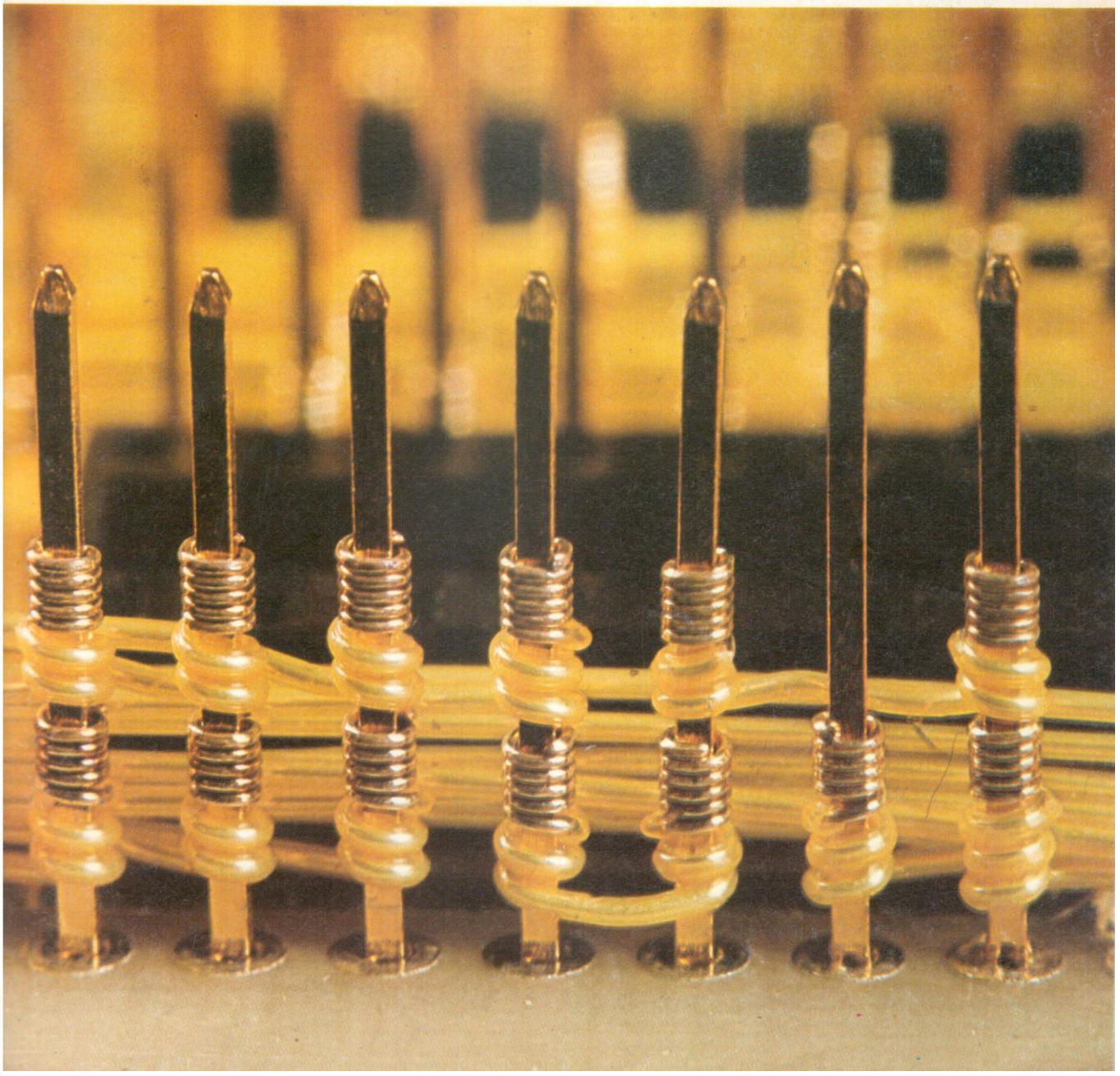
TEFLON*

* Du Pont's registered trade mark



WIRE-WRAP WIRES

TEFLON* TEFZEL* KAPTON* INSULATED WIRES



INTRODUCTION

The trend to smaller constructions in the computor industry and electronic telephone exchanges gave the Wire-Wrap technique a favourable place. The Wire-Wrap is an economical, easy and durable connection.
A Wire-Wrap you are able to make manually, semi-automatically and fully automatically. The Wire-Wrap technique gives a simple, compact and a reliable connection.
HABIA, specialized in high performance wires and cables, has developed a program of wires for Wire-Wrap technique. HABIA manufactures wires generally according to MIL-W-81822 and DIN 57881 specifications and has many national approvals like UL, SEMKO, VDE, NF etc.

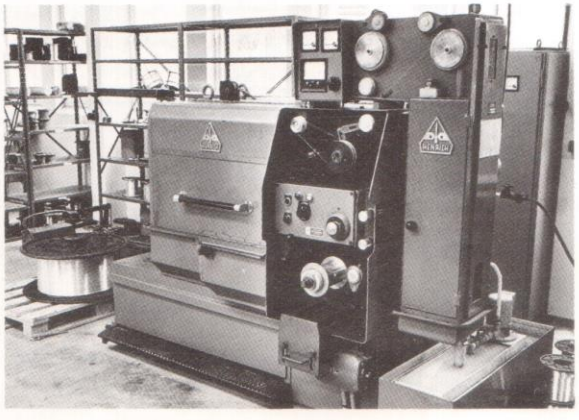
Conductor

A Wire-Wrap connection consists of 2 parts, the insulated wire and the pin. It is therefore important that the conductor has the right proporties.
For Mini Wire-Wrap AWG 30, the most popular type of conductor is a soft silverplated OFHC (oxygen free high conductivity) copper.
Silverplating is HABIA-standard on Wire-Wrap wire which gives less wear on the Wire-Wrap tools and also a lower connection resistance against the pin than tinned or bare copperconductor. Tinned or bare copperconductors are available on request.
The solid conductor may be of OFHC (oxygen free high conductivity) copper, ETP (electrolytictought pitch) copper or our TF high strenght copper alloy.
The coating of the conductor can be none, silver or tin according to ASTM B 3-63, ASTM 298-64 and ASTM B 33-63.
When you require better mechanical properties for AWG 30 (strip force, vibration etc.) on your Wire-Wrap connection, a silverplated high strength high conductivity copper alloy (TF) is recommended. This copper alloy (TF) could also be used in order to reduce the number of turns on a pin, e.g. a AWG 30 with copperconductor requires 8 turns and the TF-alloy requires only 5 turns. The TF-alloy enables you to have more Wire-Wrap connections on the same pin and the conductor has a much better flexlife than the OFHC copperconductor.

Conductor material	Tensile strength kp/mm²	Elongation min.	Conductivity min.	Strip-force relation	Flexlife AWG 30
Silverplated OFHC copper	22	15%	100%	1	1
Silverplated copperalloy (TF)	38	8%	85%	2.5	11

Values below are for solid (single end) conductors as this is the case for Wire-Wrap.

AWG	DIAMETER mm min.	nom.	max.	Area mm²	Weight g/m	Resistance ohm/100 m SPC	SPC TF	TPC
32	0.190	0.203	0.210	0.032	0.29	58	68	61
30	0.245	0.254	0.260	0.051	0.45	34	42	38
28	0.310	0.320	0.325	0.080	0.72	21	27	24
26	0.395	0.405	0.410	0.128	1.14	13.5	17	15
24	0.500	0.510	0.515	0.205	1.82	8.43		9.5
22	0.630	0.644	0.650	0.325	2.90	5.31		6.4
20	0.800	0.812	0.820	0.519	4.62	3.31		4.3



Habia has drawingmachines which give us full control over the conductor standard.

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INSULATION MATERIALS

Insulation

The different types of insulations that we extrude on our wires are Tefzel ETFE, Teflon-PTFE, -PFA, -FEP and Kapton.

Tefzel EFTE is a new insulation material with the same excellent characteristics as Teflon, but with significant better mechanical properties.

Teflon PTFE, PFA and FEP are used when high dielectric properties (low loss, low dielectric constant etc.) are required.

Kapton Polyimide has the best mechanical properties which enables small outer diam.

Insulations of Teflon, Tefzel and Kapton are available in 10 basic colours (white, red, black, blue, yellow, green, orange, brown, purple and grey), as well as with one or two stripes over the above mentioned colours.

Service temperature

Teflon PTFE and PFA 260°C, Teflon FEP 200°C, Tefzel ETFE 150°C and Kapton 200°C.
The temperature range of Teflon, Tefzel and Kapton insulation is very broad and surpasses by far the requirements for a Wire-Wrap wire. The maximum service temperatures are all above 150°C and at low temperature neither Teflon, Tefzel nor Kapton become brittle even below −200°C. The high temperature properties of Teflon, Tefzel and Kapton give excellent solder iron resistance.

Overload current protection

Teflon, Tefzel and Kapton will withstand overheating due to transient current overloads. This greatly reduces the hazard of flashover in adjacent Wire-Wrap wires.

Fire protection

Insulations of Teflon, Tefzel and Kapton will not propagate flame, nor serve as fuel for fire, nor smoke at overload. Underwriter's Laboratories lists Teflon, Tefzel and Kapton as "self-extinguishing group I".

Chemical resistance

Teflon, Tefzel and Kapton insulations are unaffected by long exposure to chemicals including acids, bases, solvents, hydraulic fluids, lacquers and fuels.

Weather resistance

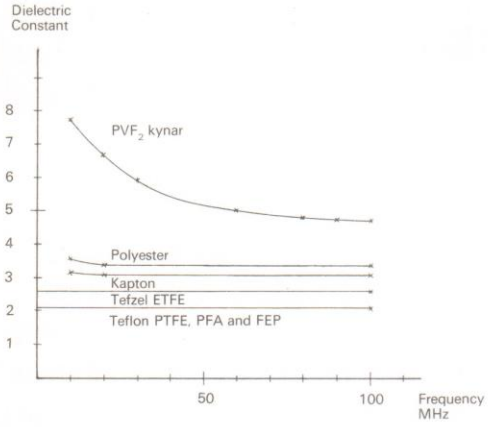
Teflon, Tefzel and Kapton will not be affected by ultra violet radiation and will have very little or no waterabsorbation.

Electrical properties

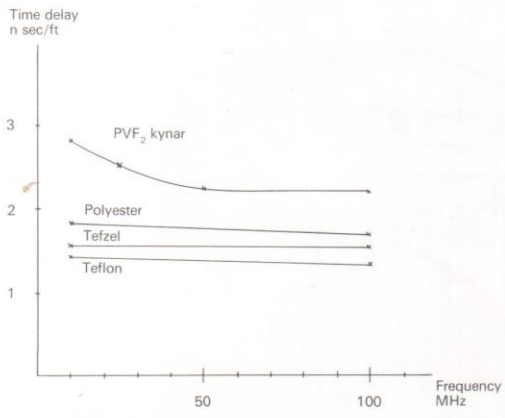
Teflon has the best dielectric properties with low dielectric constant and low dissipation factor and show minimum variations over wide temperature and frequency ranges. Tefzel and Kapton have also excellent dielectric properties.

Dielectric constant 25°C at frequency	TEFLON	TEFZEL	KAPTON*	Dissipation factor 25°C at frequency	TEFLON	TEFZEL	KAPTON*
1 KHz	2.1	2.6	3	1 KHz	0.0003	0.0008	0.002
10 KHz	2.1	2.6	3	10 KHz	0.0005	0.005	0.006
100 KHz	2.1	2.6	3.2	100 KHz	0.0008	0.004	0.01

*) Typical data as many constructions available.



Habia high performance insulations in Teflon, Tefzel and Kapton have a low dielectric constant giving lowest loss, low attenuation and highest possible signal transmission speed.



The delay time is significant lower for Teflon and Tefzel insulated wires, than for other common used insulation material.

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TEFZEL INSULATED WIRE-WRAP WIRE

Tefzel is the most popular insulation for Wire-Wrap. Tefzel has the following good combination of properties: Economic, mechanical toughness, good electrical and non-flammable properties. Corresponding to MIL-W-81822/13.

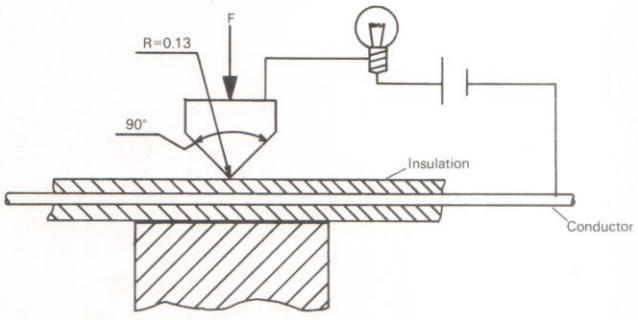
Habia Tefzel insulated wires are available in 10 basic colours and also striped.
Max. service temp. +150°C to −90°C.
Conductor: Silverplated copper.

AWG	HABIA reference	Conductor diameter*) mm	Outer diam. mm		Weight g/m	Max. service voltage volts	Recommended stripping tool
			Min.	Max.			
32	AZT 3201	0.203	0.45	0.49	0.49	250	012
30	AZT 3001	0.254	0.48	0.52	0.73	250	014
30	WZT 3001	0.254	0.52	0.58	0.82	250	014
28	WZT 2801	0.320	0.57	0.67	1.20	250	016
26	WZT 2601	0.405	0.69	0.75	1.70	250	018
26	WZ 2601	0.405	0.81	0.91	2.02	600	018
24	WZT 2401	0.510	0.76	0.86	2.45	250	025
24	WZ 2401	0.510	1.00	1.10	3.10	600	025
22	WZT 2201	0.644	0.89	0.99	3.62	250	031
22	WZ 2201	0.644	1.04	1.14	3.76	600	031
20	WZT 2001	0.812	1.06	1.16	5.50	250	037
20	WZ 2001	0.812	1.21	1.31	5.68	600	037

Habia Tefzel insulated silverplated copperalloy is used when the Wire-Wrap connection requires better mechanical properties (see page 3). Corresponding to MIL-W-81822/13 type C.

Max. service temp. +150°C to −90°C.
Conductor: Silverplated copperalloy.

AWG	HABIA reference	Conductor diameter*) mm	Outer diam. mm		Weight g/m	Max. service voltage volts	Recommended stripping tool
			Min.	Max.			
32	AZT 3201 TF	0.203	0.45	0.49	0.49	250	012
30	AZT 3001 TF	0.254	0.48	0.52	0.73	250	014
30	WZT 3001 TF	0.254	0.52	0.58	0.82	250	014
28	WZT 2801 TF	0.320	0.57	0.64	1.20	250	016
26	WZT 2601 TF	0.405	0.69	0.75	1.70	250	018



To present the mechanical properties of Tefzel a cut-through test is done, which shows that Tefzel is a very tough isolation.

*) Further conductor information on page 3.