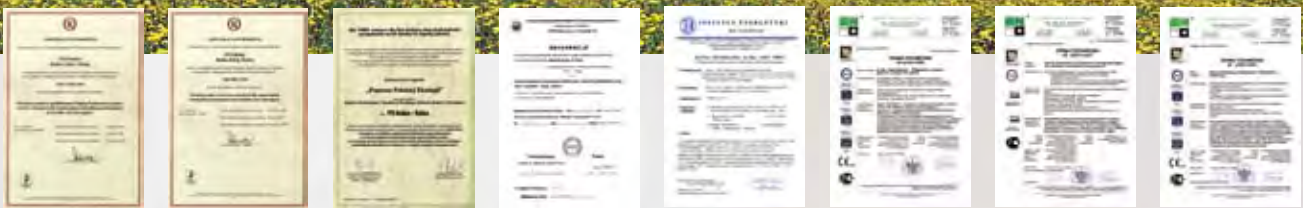




**TRADE AND PRODUCTION
COMPANY**

MANUFACTURER OF WARNING AND WARNING-DETECTION TAPES

PTS RABKA - TRADE AND PRODUCTION COMPANY



The PTS Rabka Company is a manufacturer of top quality warning and warning-detection tapes for marking telecommunication, gas, sewage and energy systems.

The PTS Rabka Company has been established in 1991. In the year 1992 the Company was the first to start manufacturing tapes with the detection element - tape of acid resistant steel - in the Polish market.

Considering continuous development requirement as well as meeting customer's expectations the Company opened in the year 1999 a new, modern production-office complex in Rokiciny Podhalafskie.

Our products meet all required standards, which have been confirmed in the year 2000 by the ISO 9002 and ISO 14001 Quality Certificate.

We have certifications and opinions of:

- Faculty of Electric affiliated to the University of Technology, Szczecin - Certificate of Conform

- Experimental Plant for Communication Building, Warsaw,
- Oil and Gas Institute of Cracow,
- Institute of Power Engineering, Warsaw,
- Centre for Research and Development of Installations and Electric Equipment, Warsaw, and many others

Our customers are:

- Telekomunikacja Polska S.A. (Polish Telecommunication)
 - Polskie Górnictwo Naftowe i Gazownictwo S.A. (Polish Oil and Gas Company)
 - Wodociągi Polskie (Polish Water Supply Plants)
 - Zakłady Energetyczne (Power Plants)
- and many manufacturing and trading companies

Our company has a network of authorised distributors all over Poland.



MARKING AND DETECTION SYSTEMS

Warning tapes, warning - detection tapes in the buried utilities marking system.

Increasing amount of projects in telecommunication, gas engineering, water supply systems, power industry and other branches causes more concentration of different utilities mainly made of plastics. It brings significant difficulties in detecting relevant cables and pipes.

Precise knowledge of the kind and location of key and sore points of the network is necessary for its failure-free work. Using warning and detection tapes along the pipelines and cables as well as additional marking in sore points such as network crossings, junctions at buildings, connections, branching boxes, watercourses, roads etc makes it possible. A layout diagram of the warning and detection tape and example galvanic method of its location is presented in the drawing.





Tape for certain network incorporation in the works should have the colour to conform to the standard (the colour must correspond with the network). The tape may have an inscription usually in black, also to conform to conditions in force (example: ATTENTION! OPTOTELECOMMUNICATION CABLE, ATTENTION! WATER MAINS, GAS, and others). The PTS Rabka Company created a marking system using warning and warning - detection tapes.

Advantages of the marking and detection marking system:

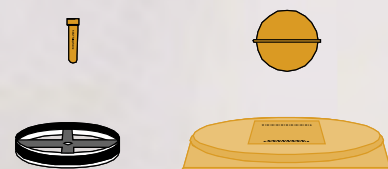
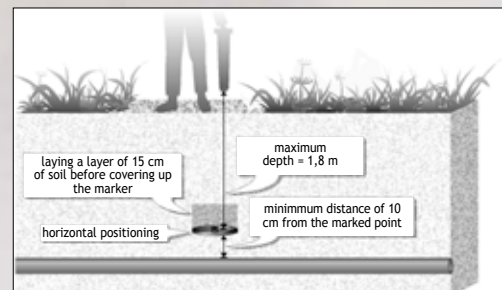
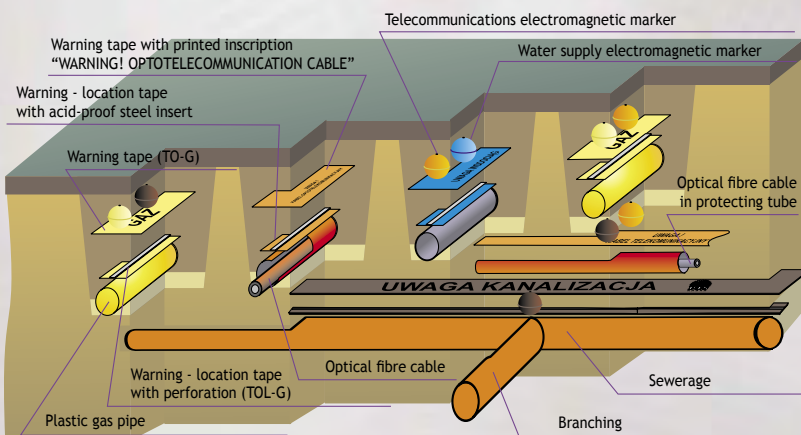
- early warning on possible mechanical damage of network during works;
- role of the detection factor - possibility of precise detection of the route and depth of the pipeline (installation);
- EMS markers - possibility of detecting sore points and crossings with other network.



EMS MARKER (TABLE OF TYPES - CATALOGUE SYMBOLS)

	UNDER SURFACE MARKER	BALL-VALVE MARKER	MINI-MARKER	UNIVERSAL MARKER	FREQUENCY [kHz]
					
Maximum depth	60 cm	150 cm	180 cm	240 cm	
GAS (yellow)	1436	1405	1259	1254	83,0
TELEPHONE (orange)	1432	1401	1255	1250	101,4
WATER (blue)	1434	1403	1257	1252	145,7
SEWAGE SYSTEM (green)	1435	1404	1258	1253	121,6
POWER (red)	1433	1402	1256	1251	169,8
CATV (black-orange)	—	1407	—	—	74,0

EXAMPLE PIPELINE MARKING END EMS MARKER



TELECOMMUNICATION

TAPES for the Telecommunication are in the colour orange and have an inscription: ATTENTION OPTOTELECOMMUNICATION CABLE OR ATTENTION TELECOMMUNICATION CABLE.

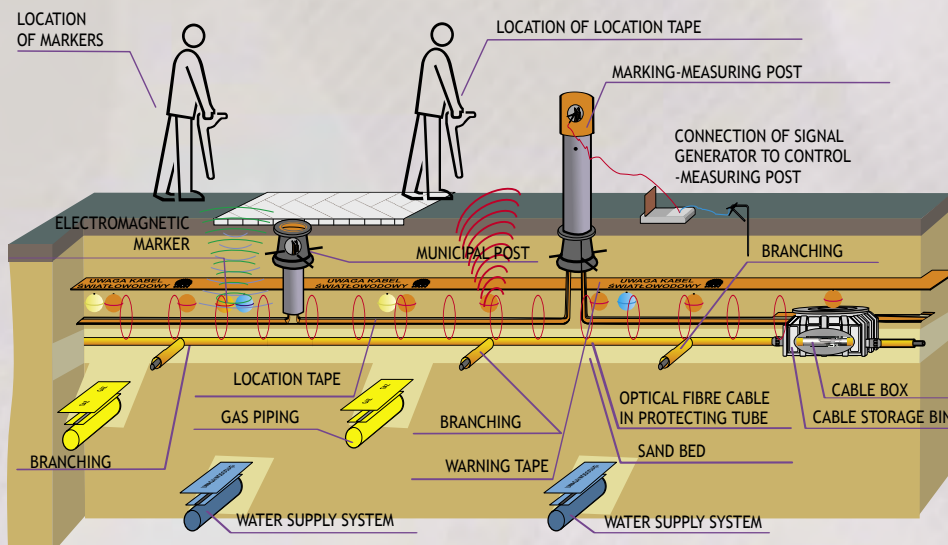
Production is based on top quality raw materials, which provide high durability and mechanical strength as well as tapes resistivity to the aggressive soil factors influence.

Applying the insert made of the acid resistant steel in tapes for fibre optic cable marking provides easy and reliable detection of the route.

Tapes have necessary opinions and certificates required for materials applied for telecommunication lines construction.



TAPE DESCRIPTION	INDEX	WIDTH	INSCRIPTION
Orange	TO-Tkt/10	10 cm	"ATTENTION, TELECOMMUNICATION CABLE"
	TO-Tkt/15	15 cm	
	TO-Tkt/20	20 cm	
	TO-Tkt/25	25 cm	
For fibre optic cables without steel insert	TO-Opt/10	10 cm	"ATTENTION OPTOTELECOMMUNICATION CABLE"
	TO-Opt/15	15 cm	
	TO-Opt/25	25 cm	
For fibre optic cables with steel insert	TOL-Opt/10	10 cm	"ATTENTION OPTOTELECOMMUNICATION CABLE"
	TOL-Opt/20	20 cm	
	TOL-Opt/25	25 cm	
Orange with steel insert	TOL-6/z	6 cm	—



TELECOMMUNICATION NETWORK LOCATION AND MARKING SYSTEM

GAS

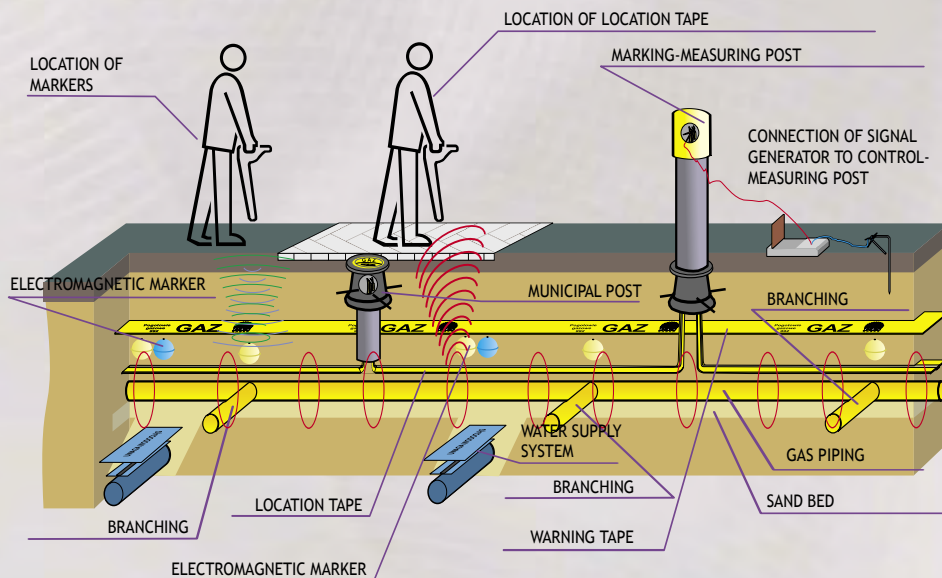
Tapes for marking gas grids by applying steel insert similar as in the case of tapes for telecommunication network provide easy and reliable detection. Yellow, clear colour of the tapes assures identification in case of digging it out by an excavator and therefore avoiding damage to the gas grid. For the sake of safety assurance the tape is perforated lengthwise which protects from liquids and gas accumulation. Both tapes for marking gas grids and telecommunication network have inscription on the tape lengthwise, which allows easy and quick identification of the network.

Marking system in conformance with ZN-G 3001: 2001 standard involves application of sets of two tapes:

- Warning tape
- Detection tape (with acid resistant insert)



TAPE DESCRIPTION	INDEX	WIDTH	INSCRIPTION
Yellow, perforated	TO-G/20	20 cm	—
	TO-G/30	30 cm	
	TO-G/40	40 cm	
Yellow, plain with inscription	TO-Gn/20	20 cm	„GAS“
	TO-Gn/30	30 cm	
	TO-Gn/40	40 cm	
Yellow, perforated with steel insert	TO-G1/20	20 cm	—
	TO-G1/30	30 cm	
	TO-G1/40	40 cm	
Yellow, perforated with steel insert	TO-Gn1/20	20 cm	„GAS“
	TO-Gn1/30	30 cm	
	TO-Gn1/40	40 cm	
Yellow, plain with steel insert	TOL-6/z	6 cm	—



GAS NETWORK LOCATION AND MARKING SYSTEM

POWER ENGINEERING

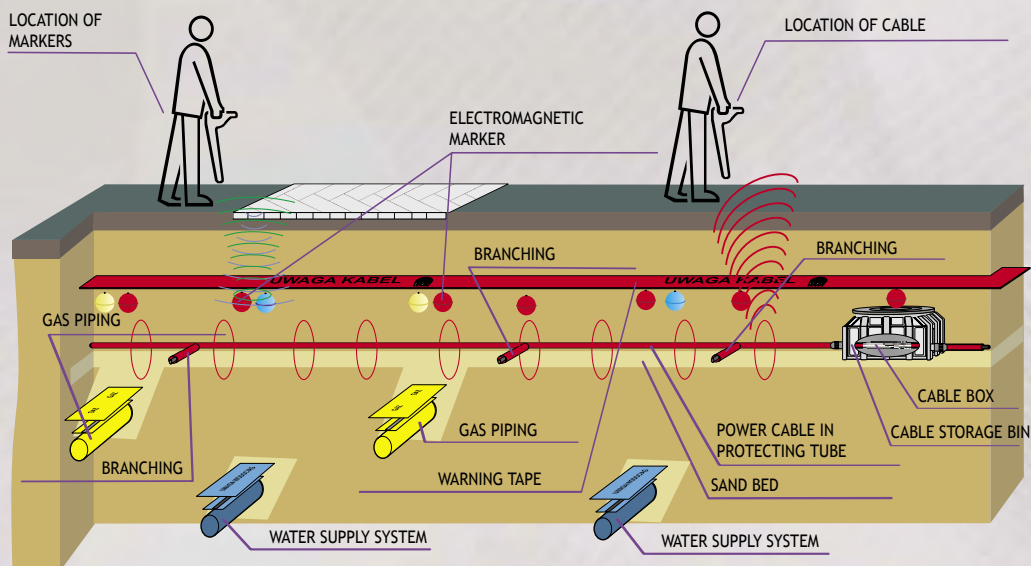
Marking the underground power networks with warning tapes is of a great importance especially for the reason of great danger to human lives in case of cables damage. Tapes for underground power systems marking are manufactured in two colours:

- BLUE for cables of voltage rating below 1 kV,
- RED for cables of voltage rating over 1 kV.

Colouring and thickness of tapes applied for marking power networks conform to standards relevant to voltage rating of the network. Raw materials and materials used for such tapes production provide top quality and resistance.



TAPE DESCRIPTION	INDEX	WIDTH	THICKNESS	INSCRIPTION
Marking tape for electrical power engineering cables of voltage rating of 1 kV and below				
blue	TO-ENN/08/20	20 cm	0,08 mm	“ATTENTION CABLE”
	TO-ENN/12/20	20 cm	0,12 mm	“ATTENTION CABLE”
	TO-ENN/16/20	20 cm	0,16 mm	“ATTENTION CABLE”
	TO-ENN/40/20	20 cm	0,40 mm	“ATTENTION CABLE”
	TO-ENN/45/20	20 cm	0,45 mm	“ATTENTION CABLE”
Marking tape for electrical power engineering cables of rating voltage over 1 kV				
red	TO-ENN/08/20	20 cm	0,08 mm	“ATTENTION CABLE”
	TO-ENN/12/20	20 cm	0,12 mm	“ATTENTION CABLE”
	TO-ENN/16/20	20 cm	0,16 mm	“ATTENTION CABLE”
	TO-ENN/40/20	20 cm	0,40 mm	“ATTENTION CABLE”

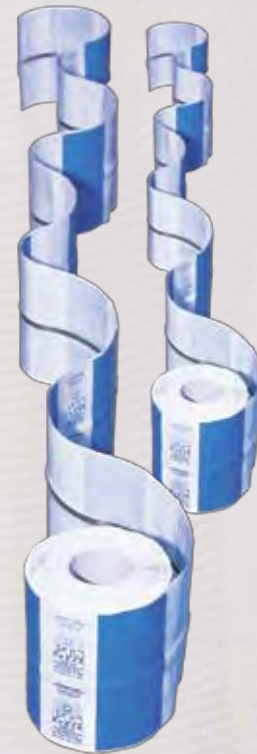


POWER ENGINEERING NETWORK LOCATION AND MARKING SYSTEM

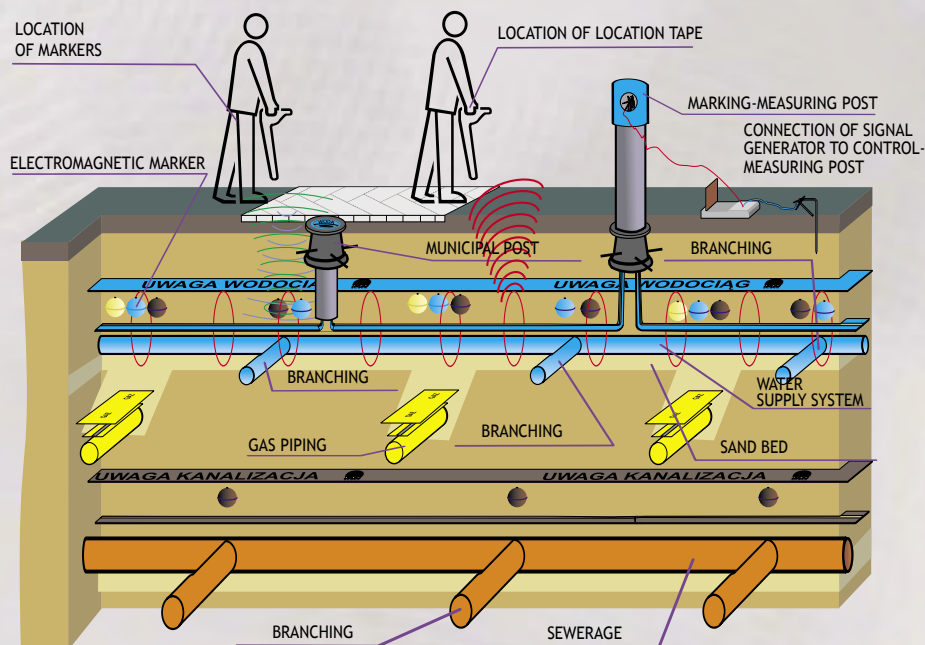
WATER SUPPLY SYSTEM AND THERMAL POWER ENGINEERING

The big concentration of water supply systems especially in urban areas makes the problem of marking its routes special significance. Warning tapes and warning - detection tapes used for water supply systems marking may be a solution here. It gives the possibility of early warning about the water supply system and therefore protect from water pipes damage. Application of acid resistant steel insert provides easy detection of the network. This solution may also be utilised for sewage and drainage systems.

Similar to the water supply systems, marking of the thermal power engineering also becomes of special importance in urban areas. In case of accidental damage of networks protection we use warning and warning-detection tapes for thermal power engineering in the colour of green-white. Easy network detection is achieved by using tapes with steel insert.



TAPE DESCRIPTION	INDEKS	WIDTH	TYP	INSCRIPTION
Blue	TO-W/20	20 cm	—	—
	TO-Wn/20	20 cm	—	“ATTENTION WATER SUPPLY PIPELINE”
	TOL-W/20	20 cm	With steel insert	—
	TOL-Wn/20	20 cm	With steel insert	“ATTENTION WATER SUPPLY PIPELINE”
Blue with steel insert	TOL-6	6 cm glued	—	—
	TOL-6z	20 cm bonded	—	—
Blue/White	TO-Wbn/20	20 cm	—	—
	TOL-Wbn/20	20 cm	With steel insert	—
Green	TO-Z/20	20 cm	—	—
	TOL-Z/20	20 cm	With steel insert	—
Green/White	TO-EC/20	20 cm	—	—
	TOL-EC/20	20 cm	With steel insert	—



WATER SUPPLY NETWORK LOCATION AND MARKING SYSTEM