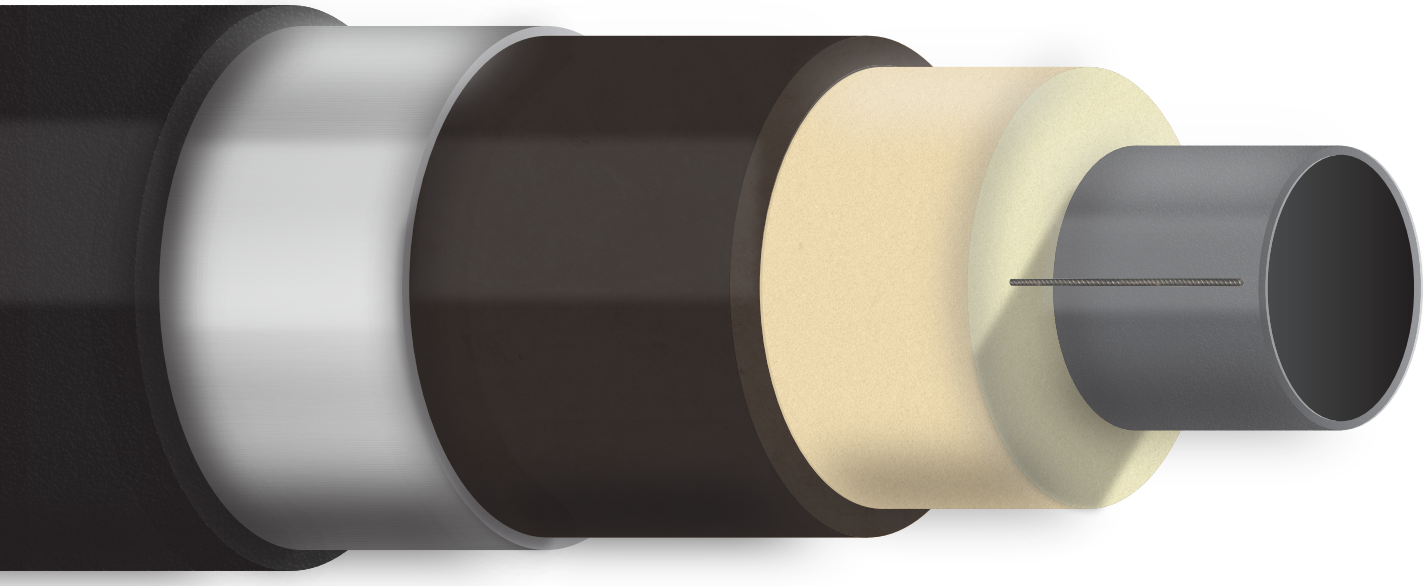
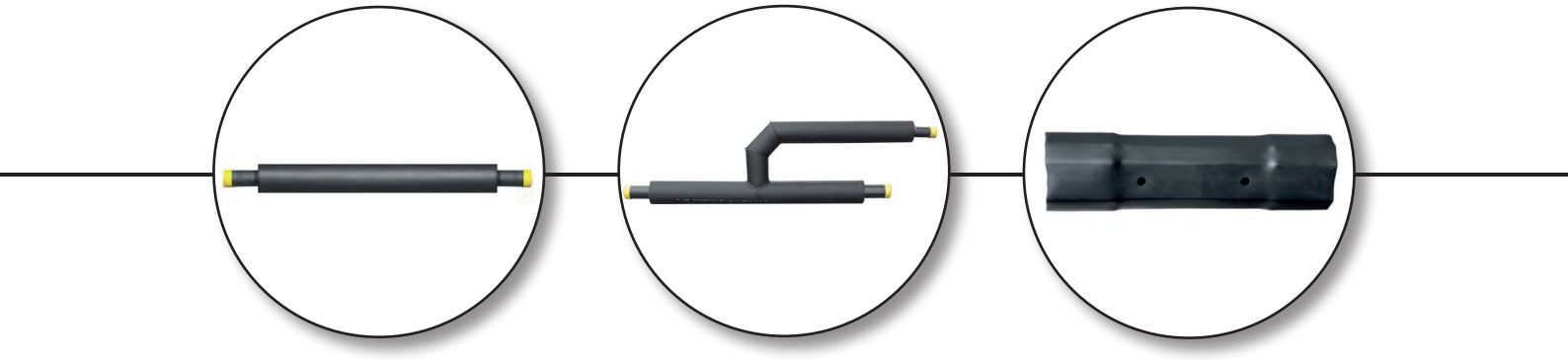
RADPOL

COMPLETE SYSTEM WITH DIFFUSION BARRIER

Pre-insulated system with diffusion barrier





Pre-insulated pipes | Fittings | Radially cross-linked couplers

RADPOL offers an unique solution: full antidiffusion system. Thanks to this solution the **reduction of heat transfer loss equals even 15% within the period of the first 10 years of pipeline working**. The application of RADPOL's technology influences significantly the diminishing of heating pipe exploitation costs within the working lifetime of a system.

INCREASING savings

RADPOL innovative technology is based on anti-diffussion barier manufacturing with the use of the material based on EVOH, which is placed inside the casing pipe jacket (between two layers of modified HDPE) – this solution made possible to create a new generation of anti-diffussion systems for district heating.

FRIENDLY FOR THE ENVIRONMENT NATURAL

RADPOL's diffusion barrier keeps isolation thermal conductivity indicator at almost unchanged level during pipe exploitation.
Due to this solution the heating pipe lifespan is prolonged and exceeds minimal exploitation period which is set in the PN-EN 253 for 30 years.

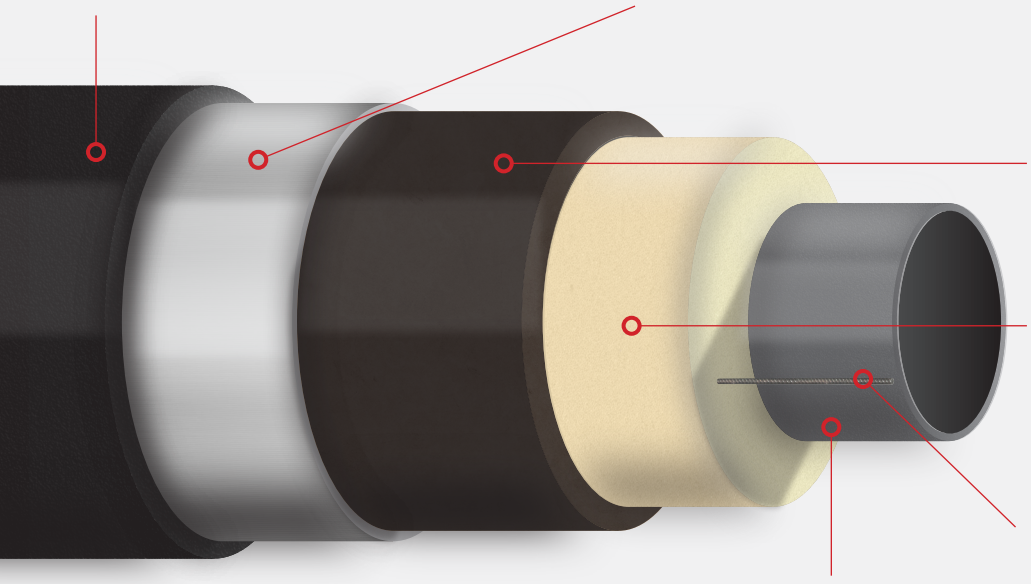
How is it possible?

The solution in which diffusion barrier is closed with EVOH between two layers of modified HDPE eliminates the barrier contact with humidity as well as protects the barrier from any mechanical damage which may happen during production and installation processes. The pre-insulated pipeline mechanical properties canting (in both axial and tangential directions) remains also unchanged.

The wall of the RADPOL's pre-insulated pipe protective jacket, equipped with diffusion barrier, is constructed of three layers.

Jacket outer layer, works as mechanical protection of pre-insulated pipe, is made of modified HDPE.

Jacket middle layer, acts as diffusion barrier, produced of EVOH.
+ Placing diffusion barrier inside the casing pipe minimizes the risk of its damage.



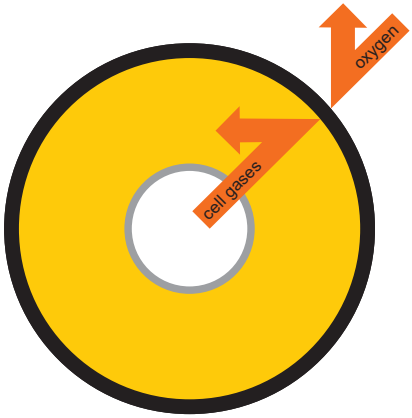
Internal layer, provides the protection for the middle antidiffusion layer, is made of modified HDPE with a crowned surface at the junction of PUR foam. + The corona treatment process applied to the surface improves the adhesion between the jacket equipped in the RADPOL's barrier and PUR foam.

PUR foam + The foam in the RADPOL's pipes is frothed up by the use of blowing agent, named cyclopentane. This agent applicated in the form of gas is environmentally friendly.

Alarm system cord

Carrier pipe

Oxygen as an aggressive gas infiltrates the pre-insulated pipe structure from outside (diffusion phenomenon) and causes corrosion effects and erodes polyurethane. This in turn makes the polyurethane isolating proper-ties deterioration. The cyclopenthane contained in the polyurethane pores diffuses from the pre-insulated pipe inside causing at the same time its in-sulation parameters deterioration. RADPOL's diffusion barrier application significantly increases the system cohesion as well as protects the isolation long-term stability from deterioration. Such solution provides to the heating system much more efficient in terms of energy use.*



External pipe jacket made of modified HDPE (with EVOH layer built-in)

Polyurethane insulating foam

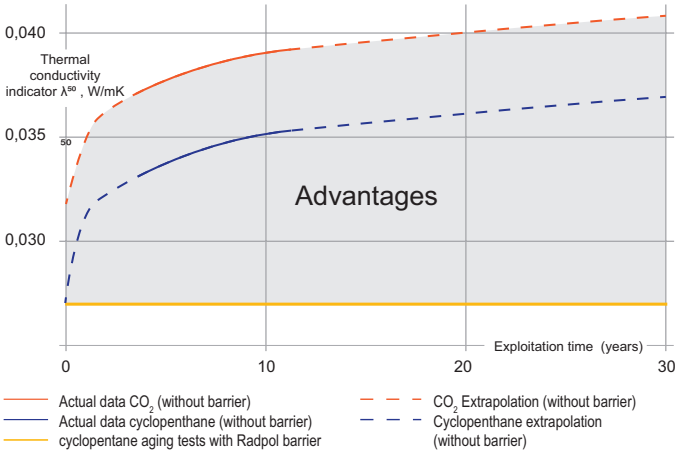
Steel carrier pipe

* sustaining the thermal conductivity factor at the same, stable level.

Yearly advantages accumulation

Heating pipe construction is a project in which the financial and environmental issues are crucial to the investor. Usually the direct costs come into fore-ground (heating pipe purchase as well as its implementation). It should be marked however, that the future costs connected with the network exploitation (its maintenance as well as repairs), together with the working pipeline heat loss costs coverage, are equally significant. Thanks to the RADPOL's diffusion barrier application, the heating pipe exploitation costs are diminished significantly. The construction of district heating networks in the RADPOL's antidiffusion technology causes the maximum reduction of heat flow loss within the whole period of its exploitation. RADPOL's system, when comparing it to the other ones, causes that the above mentioned advantages and savings are increasing from one year to another. Lower heat losses equal to less usage of primary fuel = less CO_2 emission, what in turn practically diminishes the district heating influence on the greenhouse effect making this solution more environmentally friendly.*

RADPOL system application advantages



Innovative materials applied for the production

RADPOL has developed its own polymer blend which is applied to the production of casing pipes. The solution is in turn used to the production of bar pipes, fittings as well as to antidiffusion couplers which are additionally radially cross-linked. RADPOL material after being cross-linked gets adequate mechanical properties: so called 'shape memory' as well as the homogenous, durable connection with the antidiffusion layer made on the base of EVOH. Only RADPOL's technology eliminates heat losses also at the pipes conjunctions areas.

Barrier caused by 1mm of EVOH layer for O_2, N_2, CO_2 equals to the 9 m of HDPE layer!!!

COMPARISON OF GAS TRANSMISSION				
Material	Test temperature	Gas transmission (GTR ($cm^3 \times mm/m^2 \times day \times atm.$)		
		N_2	O_2	CO_2
EVOH	25˚C	0,00034	0,00054	0,016
HDPE	22˚C	22	70	247

Advantages of RADPOL's technology with diffusion barrier

- ✓ Longer exploitation period of a district heating networks thanks to the stoppage of isolating layer degradation phenomenon
- ✓ Practically constant level of insulating properties within the whole district heating system exploitation period
- ✓ Significant diminishing of heat transfer losses, which in turn diminishes the amount of Energy needed for heat production as well as diminishing of the CO_2 emission level to the atmosphere (diminishing of greenhouse effect)
- ✓ Possibility to deliver heat with good parameters at the longer distances
- ✓ Homogeneous technology standard for all heating network elements (pipes, fittings and couplers)
- ✓ Keeping high level of endurance parameters for pipe systems in case of canting (in axial as well as tangential direction)

Antidiffussion technology developed by RADPOL is a guarantee for high level of technical parameters for products in the full range of diameters

RADPOL manufactures the full antidiffusion system, which consists of the following:

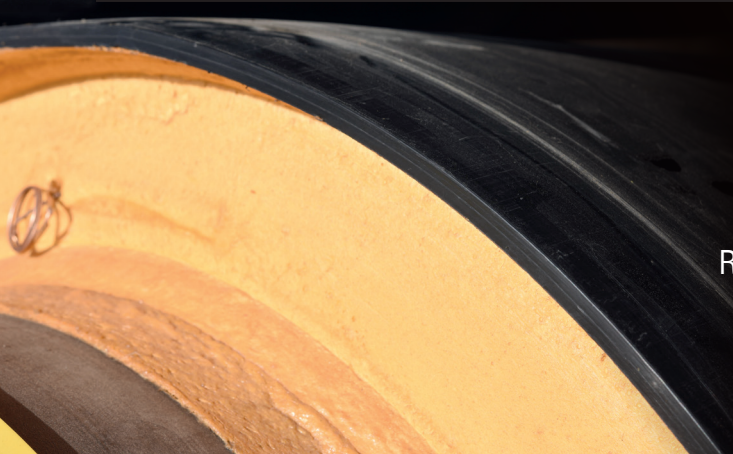
- Pre-insulated pipes with up to 16 m length and with the jacket diameter up to DN 1000 mm
- Radially cross-linked heat- shrinking couplers with diameter up to DN 630 mm
- Pre-insulated fittings (bends, tees, valves and others) with diameters up to DN 400 mm



* heat production in the most effective way shall not provide any advantages without heat loss diminishing in the process of its transmission

RADPOL'S DIFFUSSSION BARIER PRODUCTS – REFERENCE PROJECTS

Turek, ul. 650 Lecia	PGKiM Turek	Dn. <=76/140	2018
Turek, ul. Grunwaldzka	PGKiM Turek	Duo Dn. <=114/315	2018
Częstochowa ZSE	Fortum Częstochowa	Dn. <=219/315	2018
Świdnik, ul. Roweckiego	PEC Świdnik	Dn. 219/315	2018
Białystok, ul. Mickiewicza	Enea Ciepło	Dn. <=273/400	2018
Białystok, ul. Sienkiewicza	Enea Ciepło	Dn. <=139/225	2018
Białystok, ul. Warszawska	Enea Ciepło	Dn. <=168/250	2018
Białystok, ul. Wesoła	Enea Ciepło	Dn. <=168/250	2018
Białystok	Enea Ciepło	Dn. <=355/500	2018
Łomża, ul. Stacha Konwy	MPEC Łomża	Dn. <= 323/500	2018
Łomża, ul. Jemielity	MPEC Łomża	Dn. 508/710	2018
Białystok, ul. Starosielce	Enea Ciepło	Dn. <=273/400	2018
Lębork	MPEC Lębork	Dn. 355/560	2018
Gniew, ul. Konopnickiej	Eko-Tech	Dn. <=168/250	2018
Białystok, ul. Jurowiecka	Enea Ciepło	Dn. 610/800	2018
Białystok, ul. Washingtona	Enea Ciepło	Dn. 114/200	2018
Białystok, ul. Jurowiecka	Enea Ciepło	Dn. 610/800	2018
Turek, ul. Legionów	PGKiM Turek	Dn. <=114/200	2019
Gliwice, ul. Daszyńskiego	PEC Gliwice	Dn. 168/250	2019
Białystok Starosielce	Enea Ciepło	Dn. <=168/250	2019
Gliwice, ul. Kozielska	PEC Gliwice	Dn. <=168/250	2019
Lębork, ul. Pionierów	MPEC Lębork	Dn. <=323/500	2019
Gliwice, ul. Kilińskiego	PEC Gliwice	Dn. 139/225	2019
Gliwice, ul. Towarowa	PEC Gliwice	Dn. <=114/200	2019
Gliwice, ul. Kujawska	PEC Gliwice	Dn. <=139/225	2019
Gliwice, ul. Bieńka	PEC Gliwice	Dn. 48/110	2019
Gliwice, ul. Wróblewskiego	PEC Gliwice	Dn. <=76/140	2019
Gliwice, ul. Strzelców Bytomskich, Zygmuntowska	PEC Gliwice	Dn. <=1239/225	2019
Gliwice, ul. Partyzantów, Jana Śliwki	PEC Gliwice	Dn. <=139/225	2019
Turek, ul. 850 Lecia, Armii Krajowej, Matejki	PGKiM Turek	Dn. <=88/160	2019
Gliwice, ul. Opolska, Lipowa, Paulińska, Franciszkańska	PEC Gliwice	Dn. <=114/200	2019
Łomża, ul. Sikorskiego	MPEC Łomża	Dn. 406/630	2019
Konin		Dn. <=508/710	2019



RADPOL

Radpol S.A. (Zakład Rurgaz) | Prawiedniki Kolonia 57, 20-515 Lublin
+48 81 750 01 70 | radpol@radpol.com.pl | www.radpol.eu