



Technology
for Pipelines
Corrosion Prevention

Trade Information

The DENSOLEN® logo features the word "DENSOLEN" in a large, bold, blue, sans-serif font, followed by a registered trademark symbol (®). A thin blue horizontal line is positioned directly beneath the text.

DENSOLEN®

Polyethylene - Butyl-Rubber Composite Tapes and Tape Systems for the Reliable Corrosion Protective Coating of Buried Steel Pipes, Bends, Joints and Fittings.

History

DENSOLEN-Tapes and Tape-Systems have been used for more than 40 years for the reliable corrosion protection of buried pipes, joints, bends and fittings.

The trend-setting development of DENSOLEN-Tapes started in 1971 with the DENSO invention of the first three-ply composite tape (DENSOLEN-Tape S40), which was later improved by development of asymmetrical three-ply tapes,

which are preferably used today.



Since 1980 such tapes have been successfully employed in construction of cross country and distribution pipelines as well as in pipeline rehabilitation. By permanent further development, including new high performance polyethylene compounds, DENSOLEN-Tape Systems still represent the state of the art in corrosion prevention tape technology.

Fields of Application



DENSOLEN-Tape systems are used for versatile fields of application in construction and rehabilitation of buried metal pipelines. In particular, this covers the wrapping of



- welded joints
- full pipe lengths
- bends
- reducers
- branches
- fittings

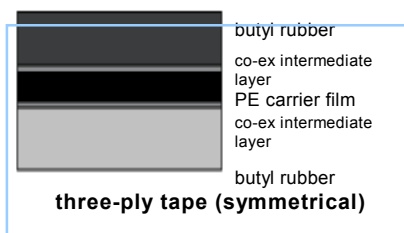
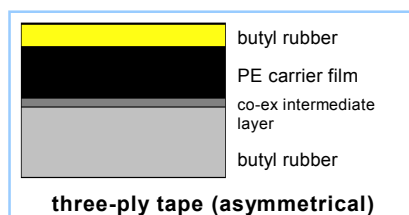


DENSOLEN Tapes can effectively be used on all pipe diameters by employment of adjusted tape widths and suitable DENSOMAT wrapping machines.

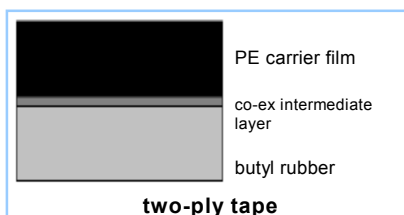
Range of Tapes

The DENSOLEN-Tape family can be classified according DIN 30672 and DIN EN 12068 as follows:

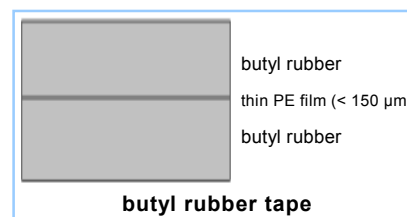
DENSOLEN three-ply tapes are symmetrically or asymmetrically structured plastic tapes with stabilised polyethylene carrier film and butyl rubber adhesive layers on both sides. They are used as innerwrap and outerwrap in DENSOLEN one- and two-tape systems.












DENSOLEN two-ply tapes consist of a stabilised polyethylene carrier film with a butyl rubber adhesive layer on one side. Tapes of this type are generally used as outerwrap in DENSOLEN two-tape systems.



By their thin incorporated PE film, **butyl rubber tapes** represent the most flexible type of all DENSOLEN-Tapes. Such tapes are particularly easy to apply. In special tape systems, butyl rubber innerwrap tapes are combined with mechanically protecting two-ply outerwrap tapes.

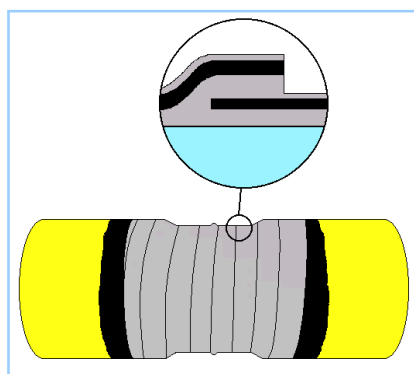
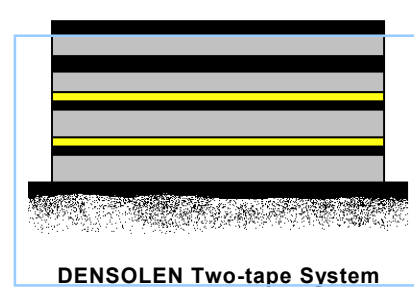
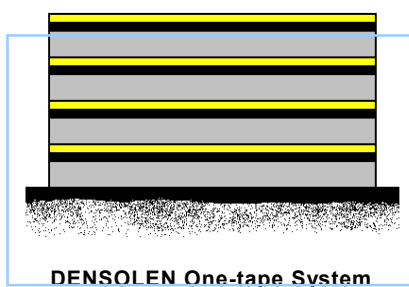


DENSOLEN-Tapes

DENSOLEN-Tape	AS40 Plus	AS39P	AS50	E10	ET100
Cross section					
Type	Three-ply tape	Three-ply tape	Three-ply tape	Butyl rubber tape	Butyl rubber tape
Tape thickness	0,8 mm	0,8 mm	1,0 mm	1,0 mm	1,0 mm
Thickness carrier film (app.)	0,28 mm	0,28 mm	0,28 mm	25 µm	25 µm
Colour outer layer	yellow or black	black	black	black	black
Colour inner layer	grey	grey	grey	black	black
DENSOLEN-Tape	N60	PE3	S10	S20	R20HT
Cross section					
Type	Butyl rubber tape / three-ply tape	Two-ply tape	Butyl rubber tape / Three-ply tape	Butyl rubber tape / three-ply tape /	Two-ply tape
Tape thickness	1,2 mm	0,4 mm	0,8 mm	0,5 mm	0,5 mm
Thickness carrier film (app.)	0,14 mm	0,18 mm	0,15 mm	0,28 mm	0,3 mm
Colour outer layer	black	yellow or black	black	black	black or white
Colour inner layer	grey	black	grey	grey	black

Tape Systems

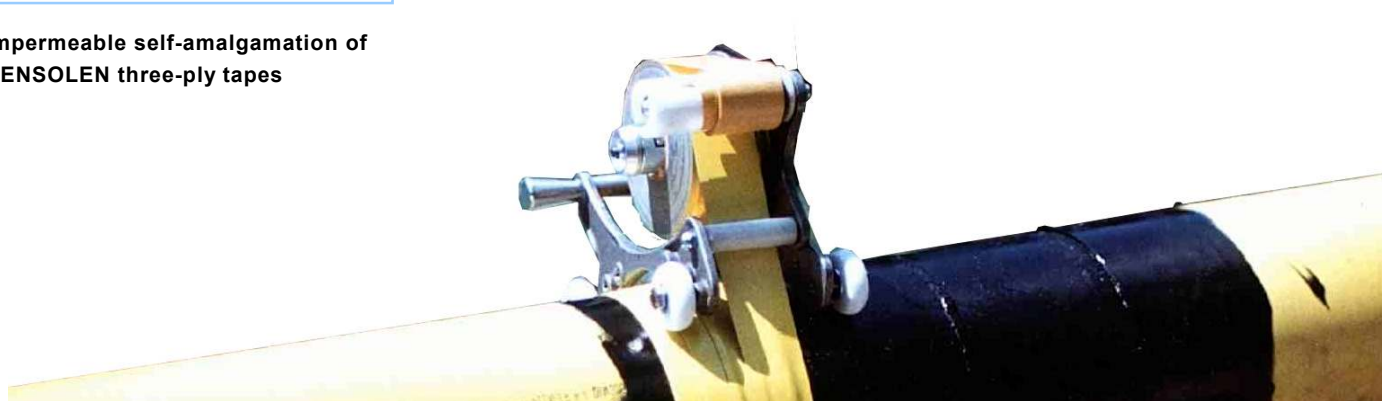
DENSOLEN-Tapes can be combined into tape systems in different ways. All systems have in common, that a three-ply tape or a butyl rubber tape are used for the innerwrap. Only tapes of these types self-amalgamate in the overlap areas, forming a sleeve-type coating, which is impermeable to water vapour and oxygen.



Impermeable self-amalgamation of DENSOLEN three-ply tapes

Mechanical protection can be provided by three-ply or two-ply tapes. Utilisation of three-ply outerwrap tapes results in self-amalgamation between all tape layers, while a smooth polyethylene finish is achieved by use of cost saving two-ply outerwrap tapes.

One-tape systems are characterised by use of only one tape for inner- and outerwrap, whereas in two-tape systems different tapes are employed for inner- and outerwrap. All DENSOLEN-Tape systems are applied onto a coat of DENSOLEN-Primer, a solution of butyl rubber and hydrocarbon resins in organic solvents. The primer facilitates and improves tape adhesion to steel surface and adjacent mill coating.



Required mechanical resistance as well as ease of application have to be considered, when combining DENSOLEN-Tapes into tape systems. Two-tape systems with highly conformable butyl rubber innerwrap tapes are particularly suitable for wrapping of irregularly

shaped installations. In case of pipes, joints and bends, the mechanically more resistant stress-class C-50 tape systems should preferably be used.

All DENSOLEN-Tapes and -Systems are subjected to a thorough quality

control according to national and international corrosion protection standards. Above that, DIN-DVGW certified tape systems are annually checked by the independent DVGW test laboratory.

DENSOLEN Tape System	N60-S20	AS40 Plus	AS39P-R20HT	AS50	E10-PE3	ET100-R20HT
Stress class according to DIN EN 12068 / DIN 30672	C-50	C-50	C-50	B-50	B-30	-
max. continuous operating temperature	+50 °C	+50 °C	+50 °C	+50 °C	+30 °C	+100 °C
One-tape system		✓		✓		
Two-tape system	✓		✓		✓	✓
DIN-DVGW Reg.-No.	NV-5180BN0071	NV-5180AL0188	NV-5180BO0176	-	-	-
Special advantages	<ul style="list-style-type: none"> thick butyl rubber inner layer self-amalgamating between all tape layers stress-class C-50 system 	<ul style="list-style-type: none"> one-tape system self-amalgamating between all tape layers stress-class C-50 system 	<ul style="list-style-type: none"> stress-class C-50 system cost saving solution self-amalgamating innerwrap 	<ul style="list-style-type: none"> one-tape system only one wrapping operation self-amalgamating 	<ul style="list-style-type: none"> flexible and easy to apply inner- and outerwrap self-amalgamating innerwrap 	<ul style="list-style-type: none"> high temperature tape system specially formulated innerwrap tape
System structure						
Primer	DENSOLEN-Primer	DENSOLEN-Primer	DENSOLEN-Primer	DENSOLEN-Primer	DENSOLEN-Primer	DENSOLEN-Primer
Innerwrap: DENSOLEN-Tape	N60	AS40 Plus	AS39P	AS50	E10	ET100
Innerwrap tape layers	2	2	2	2	2	2
Outerwrap: DENSOLEN-Tape:	S20	AS40 Plus	R20HT	-	040	R20HT
Outerwrap tape layers	2	2	2	-	1	2
Total thickness	3,4 mm	3,2 mm	2,6 mm	2,0 mm	2,4 mm	3,0 mm
Additional mechanical protection	optional, depending on soil conditions	optional, depending on soil conditions	optional, depending on soil conditions	optional, depending on soil conditions	optional, depending on soil conditions	DENSOLEN-Rockshield DRM-PP 1000 Plus

Supplementary Products



DENSOLEN-Mastic

Viscous butyl rubber mastic for filling of voids. For subsequent wrapping with DENSOLEN-Tape systems



DENSOLEN-Rockshield DRM-PP

Rot proof polypropylene fibre fleece material for the additional mechanical protection of corrosion protective coatings.



DENSOMAT-Wrapping Machines

for spiral wrapping of pipes from DN80 and bends from DN100. DENSOMAT Wrapping Machines facilitate the application of DENSOLEN-Tapes with constant tape tension and overlap.

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No 01 issue: 11/03 DENSOLEN Trade-Information