



HOSE LINING OF WATERMAINS ON LARGE SCALE

The 'case' of Bosa Watermain, Sardinia, Italy

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HOSE LINING Definition:

System keypoints:



Stand-Alone Flexible Liner



Patent Connectors

HOSE LINING The Liner:

External layer

Outer layer made of polyethylene (PE) for protection from external effects during transport and installation



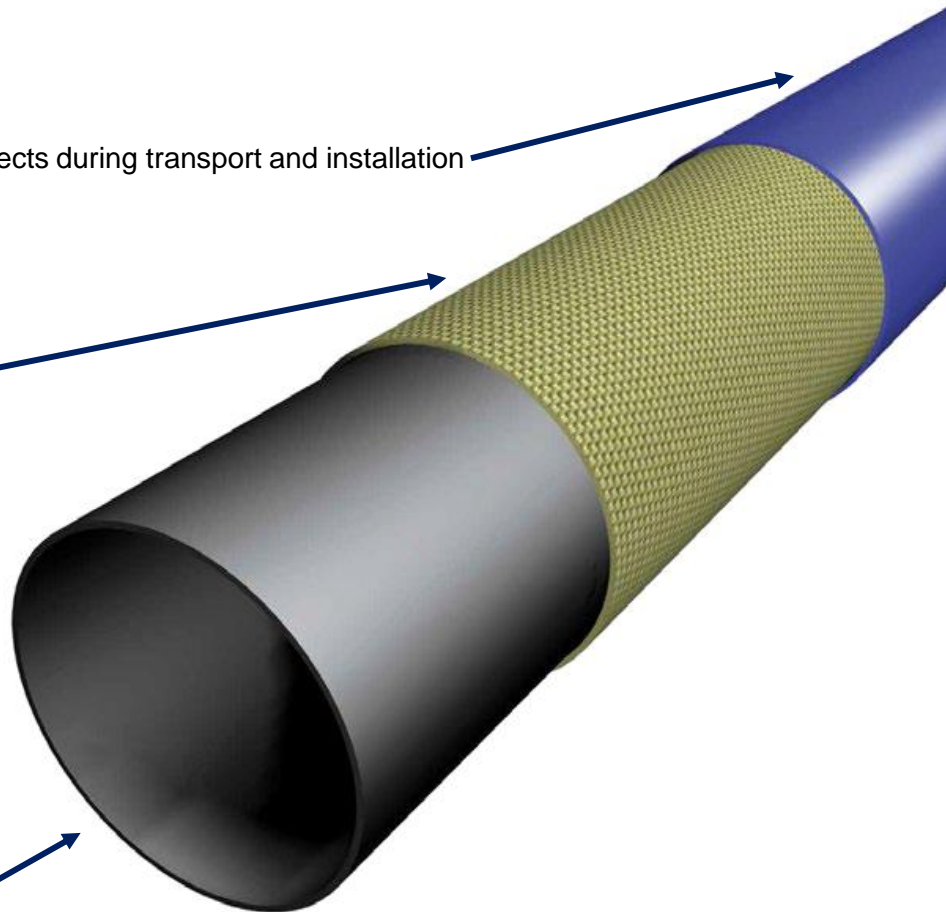
Kevlar.

Reinforcement layer

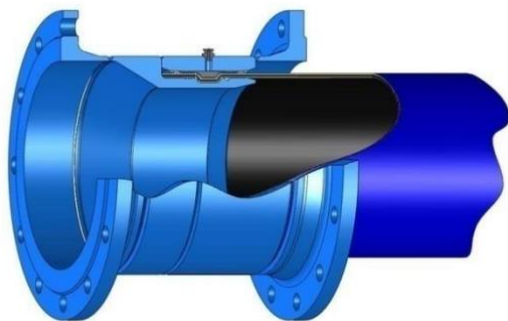
Reinforcement made of one- or two-layered aramid fabric, depending on the required pressure rating

Inner Layer

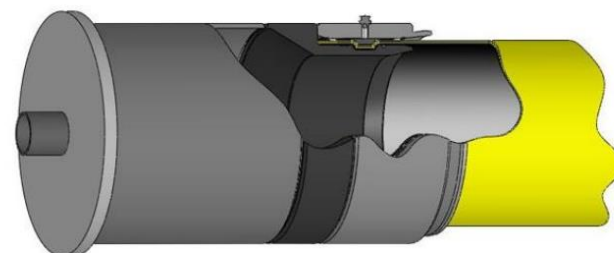
Inner layer made of polyethylene (PE) or thermoplastic polyurethane (TPU), dependent on the medium



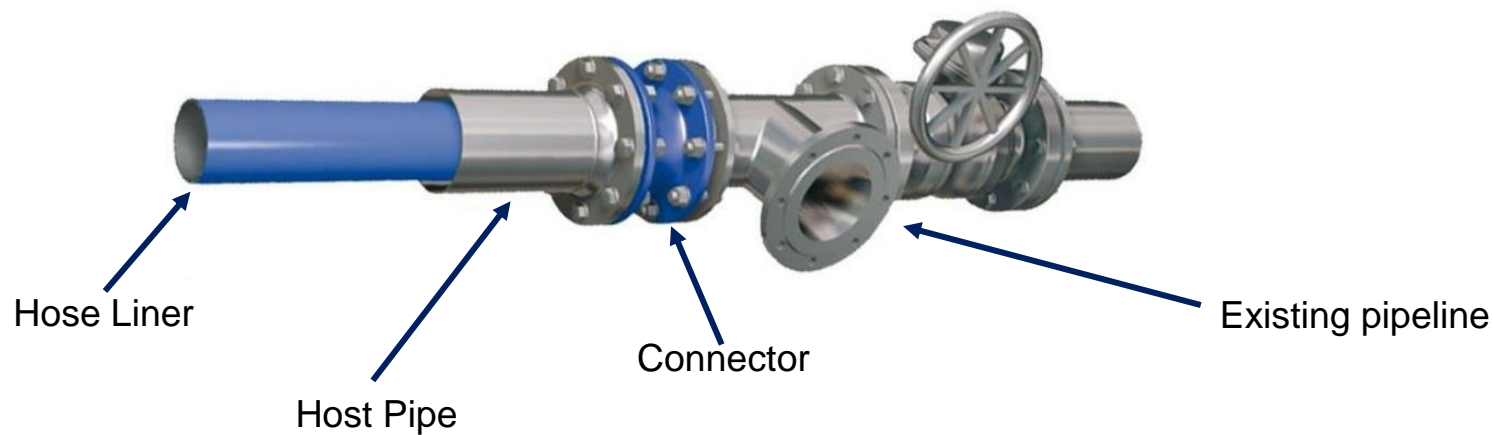
HOSE LINING The Connectors:



Flanged type



Welded type

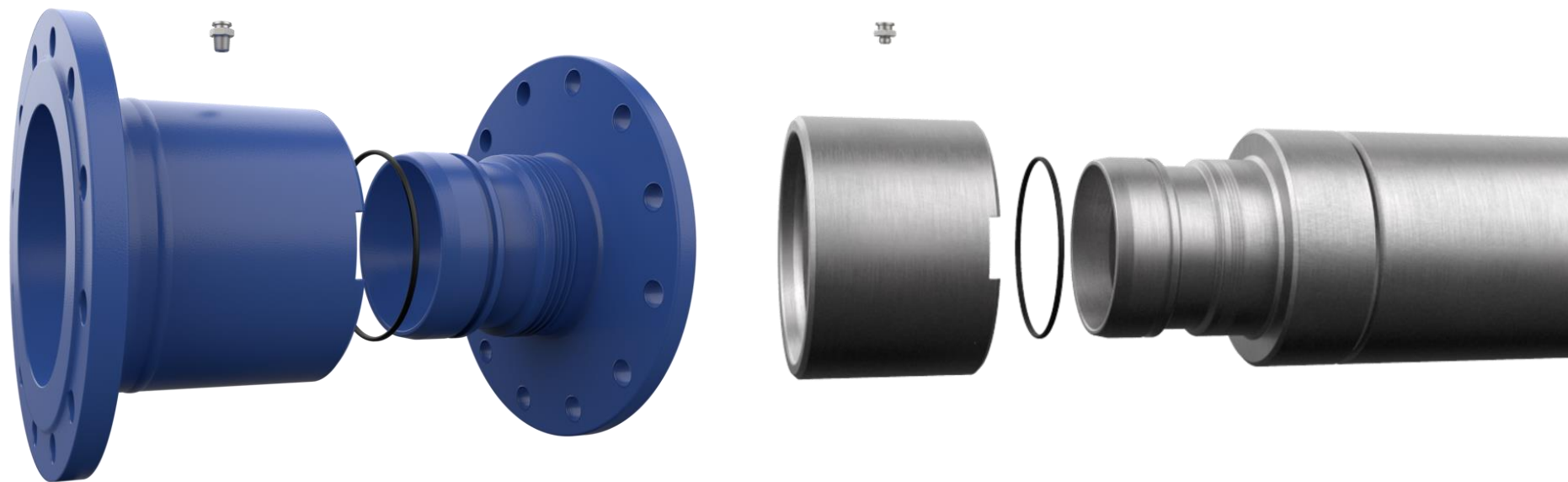


HOSE LINING The Connectors:



Mechanical Connector
(DN150-300)

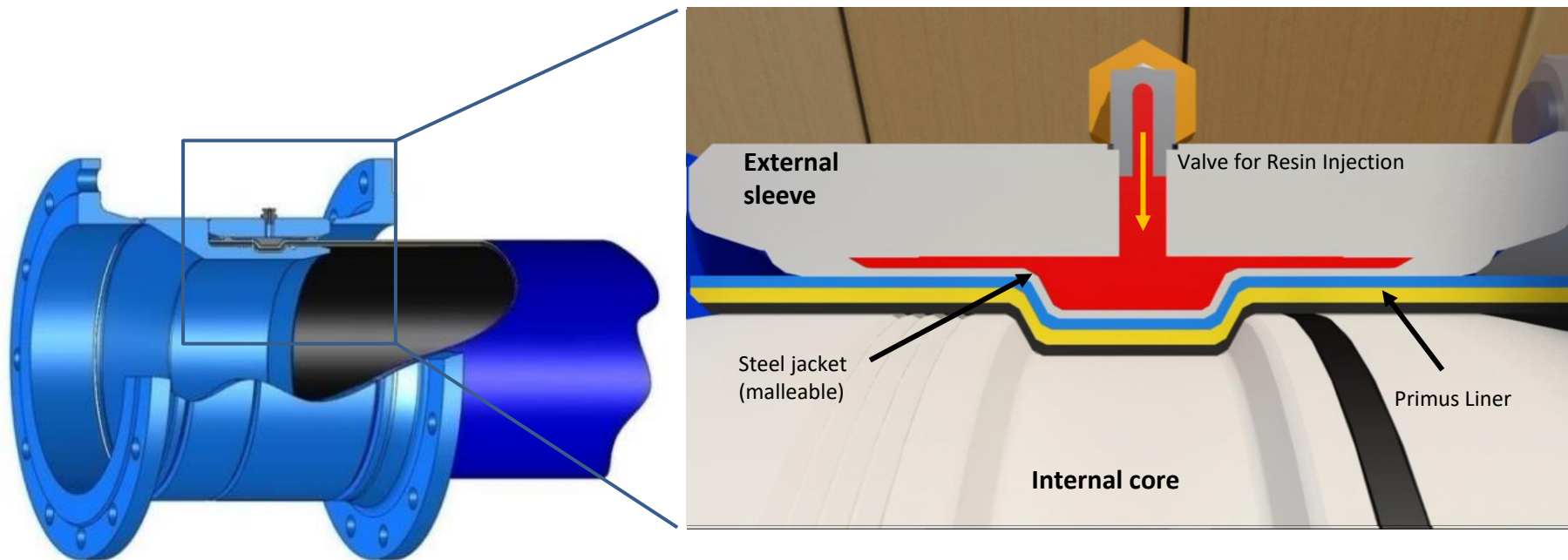
HOSE LINING The Connectors:



Resin Injection Connectors
DN150-500

HOSE LINING The Connectors:

How resin ignection works:



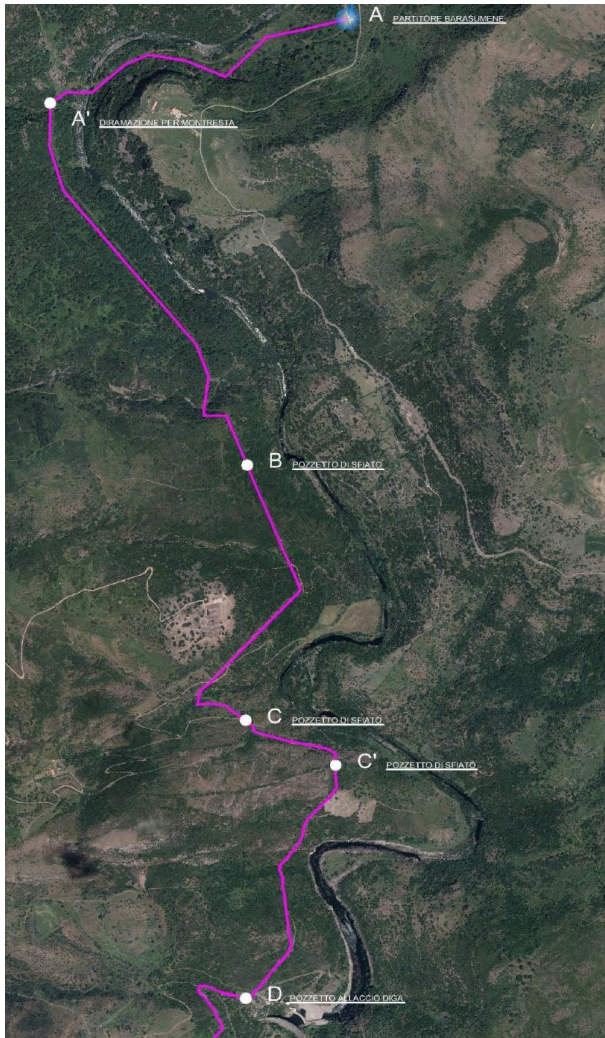
HOSE LINING The Installation:



HOSE LINING Technical Data:

	single-layer hybrid design						single-layer Kevlar® design								double-layer Kevlar® design							
	OD mm	t mm	ID mm	burst bar	MOP water bar	weight kg/m	OD mm	t mm	ID mm	burst bar	MOP water bar	weight kg/m	MOP oil & gas bar	weight kg/m	OD mm	t mm	ID mm	burst bar	MOP water bar	weight kg/m	MOP oil & gas bar	weight kg/m
DN 150	134	6.0	122	63	25	2.1	134	6.0	122	140	56	2.2	35	2.4	-	-	-	-	-	-	-	-
SD 150	150	6.0	138	54	20	2.4	150	6.0	138	120	48	2.4	30	2.7	160	8.0	144	206	82	3.3	51	3.6
DN 200	182	6.0	170	47	18	2.9	182	6.0	170	100	40	3.0	25	3.3	192	8.0	176	173	69	4.0	43	4.4
SD 203	203	6.0	191	42	16	3.3	203	6.0	191	84	33	3.4	21	3.8	-	-	-	-	-	-	-	-
DN 250	237	6.0	225	38	15	3.8	237	6.0	225	75	30	4.0	18	4.4	250	8.0	234	128	51	5.3	32	5.8
SD 261	261	6.0	249	30	12	4.2	261	6.0	249	64	25	4.4	16	4.9	-	-	-	-	-	-	-	-
DN 300	284	6.0	272	30	12	4.6	284	6.0	272	64	25	4.8	16	5.3	294	8.0	278	110	44	6.4	27	6.9
DN 350	-	-	-	-	-	-	314	6.0	302	50	20	5.2	12	5.9	-	-	-	-	-	-	-	-
DN 400	-	-	-	-	-	-	354	6.0	342	46	18	6.0	11	6.7	364	8.0	348	82	32	8.1	20	8.8
DN 400 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	364	8.0	348	100	40	8.1	25	8.8
DN 450	-	-	-	-	-	-	408	6.0	396	40	16	7.0	10	7.8	-	-	-	-	-	-	-	-
DN 500	-	-	-	-	-	-	454	6.0	442	40	16	7.7	10	8.6	-	-	-	-	-	-	-	-

HOSE LINING Case History: Bosa, Sardinia (IT)



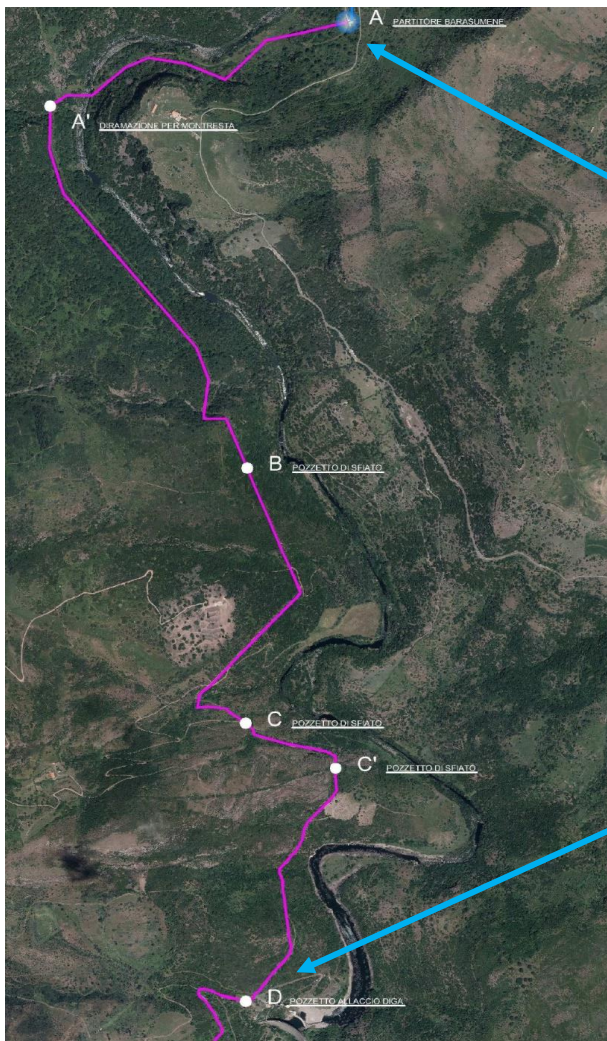
ABBANOA S.p.A.

- Watermain;
- Nominal Diameter: DN500;
- Material: Asbestos Cement
- Total Length: 6.143 m
- Operating Pressure: 16 bar;

Major Critical Issues:

- Environmental constraints;
- No public access roads
- Asbestos Cement Pipeline
- Out of service not possible beyond 24h

HOSE LINING Case History: Bosa, Sardinia (IT)



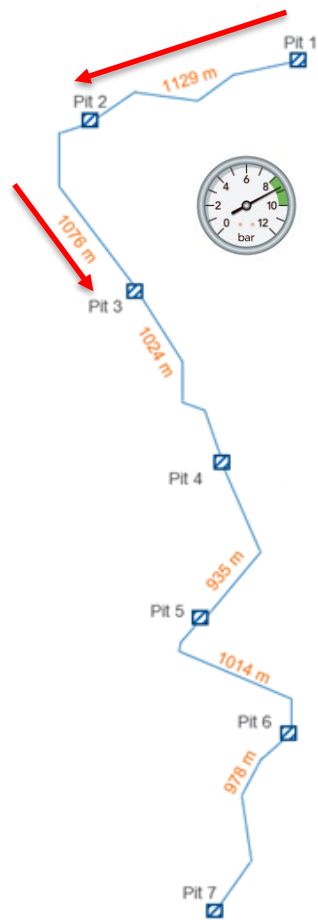
Barasumene pressure divider (starting point)



Montecrispu dam (ending point)



HOSE LINING Case History: Bosa, Sardinia (IT)



Phase 1

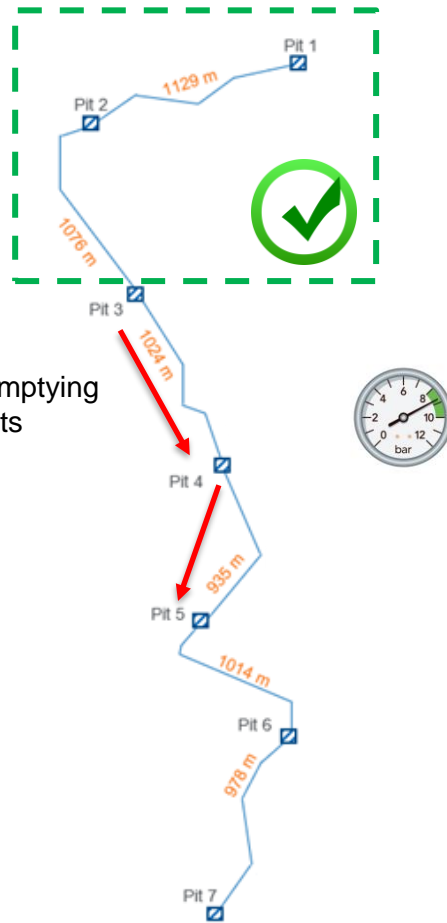
- Bypass Installation
- Out of service and line emptying
- Old pipe cutting inside pits
- Lining
- New fitting installation
- Pressure Test
- Recommisioning
- Bypass removal



HOSE LINING Case History: Bosa, Sardinia (IT)

Phase 2

- Bypass Installation
- Out of service and line emptying
- Old pipe cutting inside pits
- Lining
- New fitting installation
- Pressure Test
- Recommissioning
- Bypass removal



Phase 3

- Bypass Installation
- Out of service and line emptying
- Old pipe cutting inside pits
- Lining
- New fitting installation
- Pressure Test
- Recommissioning
- Bypass removal



Thank you for your attention