



# IKT 2014 – INFRASTRUCTURE KNOWLEDGE AND TECHNOLOGY

## TECHNICAL INNOVATION AND ECONOMIC BENEFITS

*IKT 20 Years Celebration*

**Session I: Water Supply Networks**

September 16-18, 2014

# FRIATEC AG



## FRIATEC AG - Mannheim

- Founded in 1863
- 350.000 qm area
- approx. 1.100 employees
- Ca. 166,8 Mio € sales in 2013
- Specialised in corrosion and wear resistant materials
- Modern Congress Center and fully equipped Training Center



## FRIATEC AG

### Wiesbaden

Division Rheinhütte Pumps

# DIVISION TECHNICAL PLASTICS



**FRIALEN®** Safety Fittings

**FRIALEN®-XL** Large pipe joining up to d1200

**FRIAFIT®** Sewage System

**FRIATOOLS®** Devices and Tools, Service





# The past....

Roman aqueduct



Pompeji

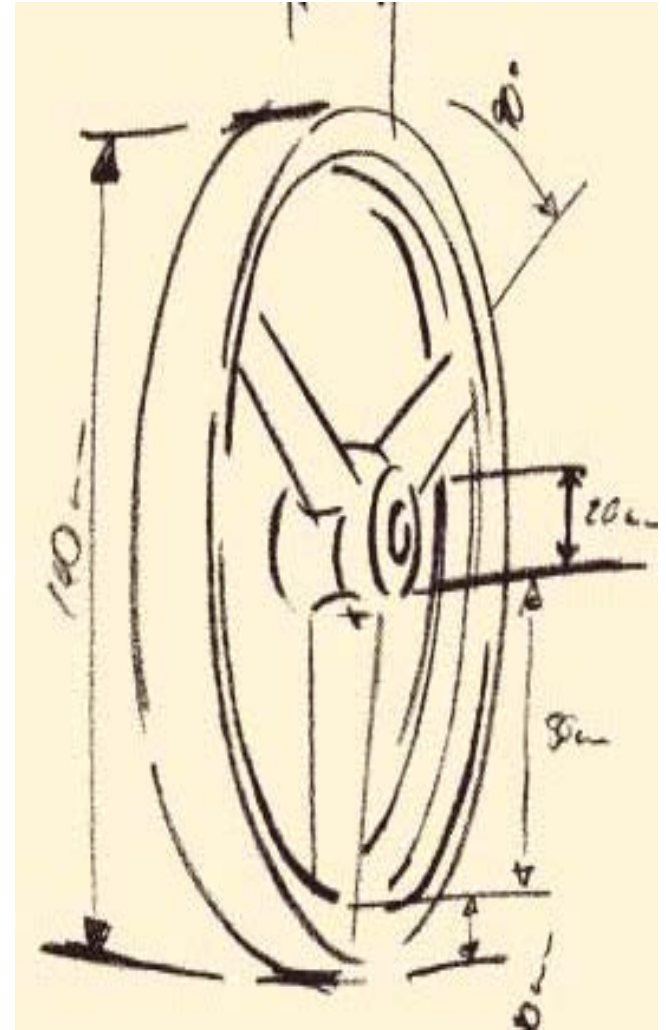


Kurpfälzisches Museum  
Heidelberg:  
2000 years of pipes history



1980:  
Rohr: Wavin – Muffe: FRIALEN

# REINVENTING THE WHEEL?



# REINVENTING THE WHEEL?

**Israeli farmer has developed a next-generation wheel that has its own inner-suspension system for shock absorption.**

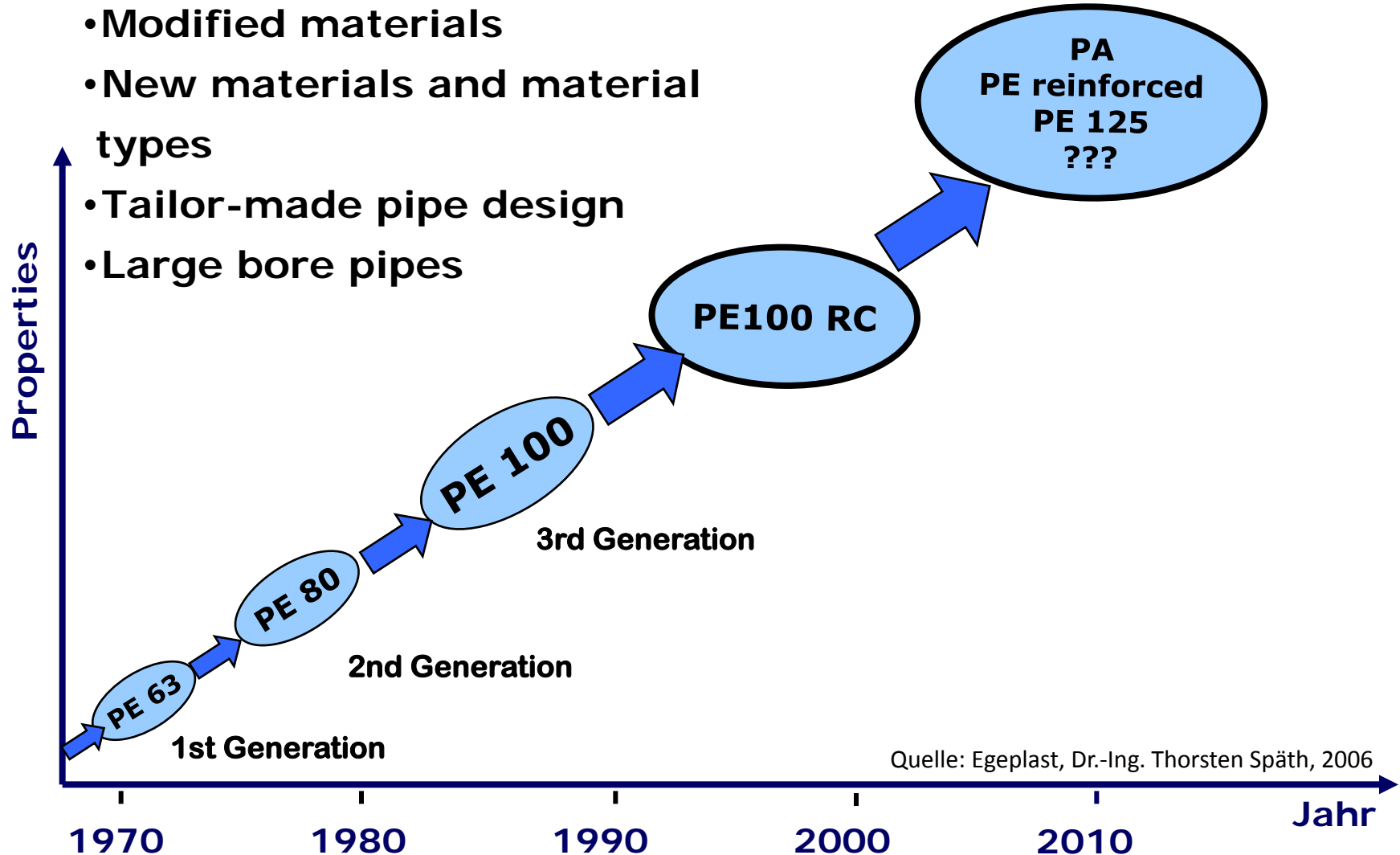
**“Four years ago, I broke my pelvis. When I was wheeled to the synagogue one day, I was in agony when we went over some Ackerstein stones (a traditional stone used for sidewalks in Israel, which has many grooves).**

**I work with tractors and I noticed that tractors have a simple and ingenious airbag-based shock-absorbing construct. So I put two and two together: I built a wheelchair and combined a similar construct for each wheel. It made the wheelchair experience completely different. I took the idea and started to roll with it”**



# The future....

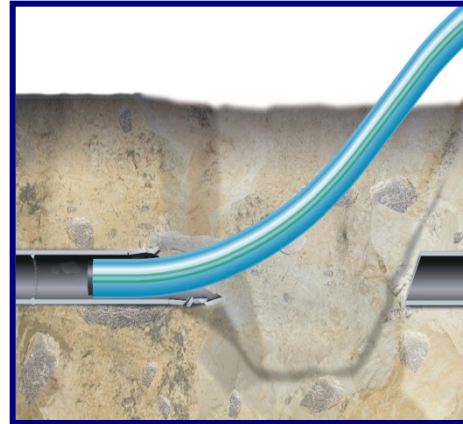
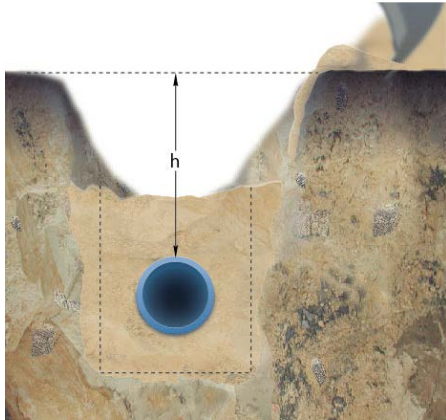
# Development of Materials and Pipe Design



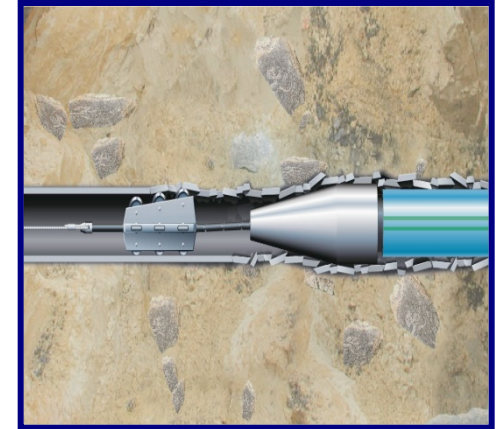


# Pipe Installation Methods

**Sand embedding**



**Relining**

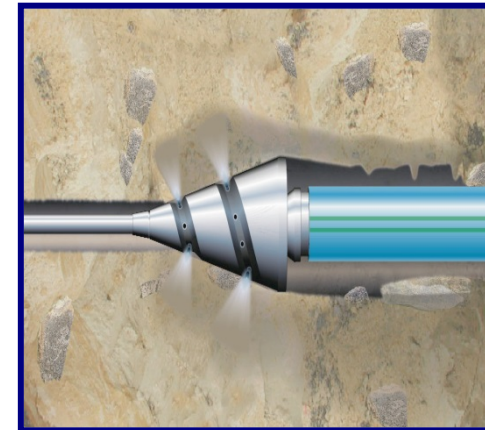


**Burstlining**

**Embedding  
without sand**



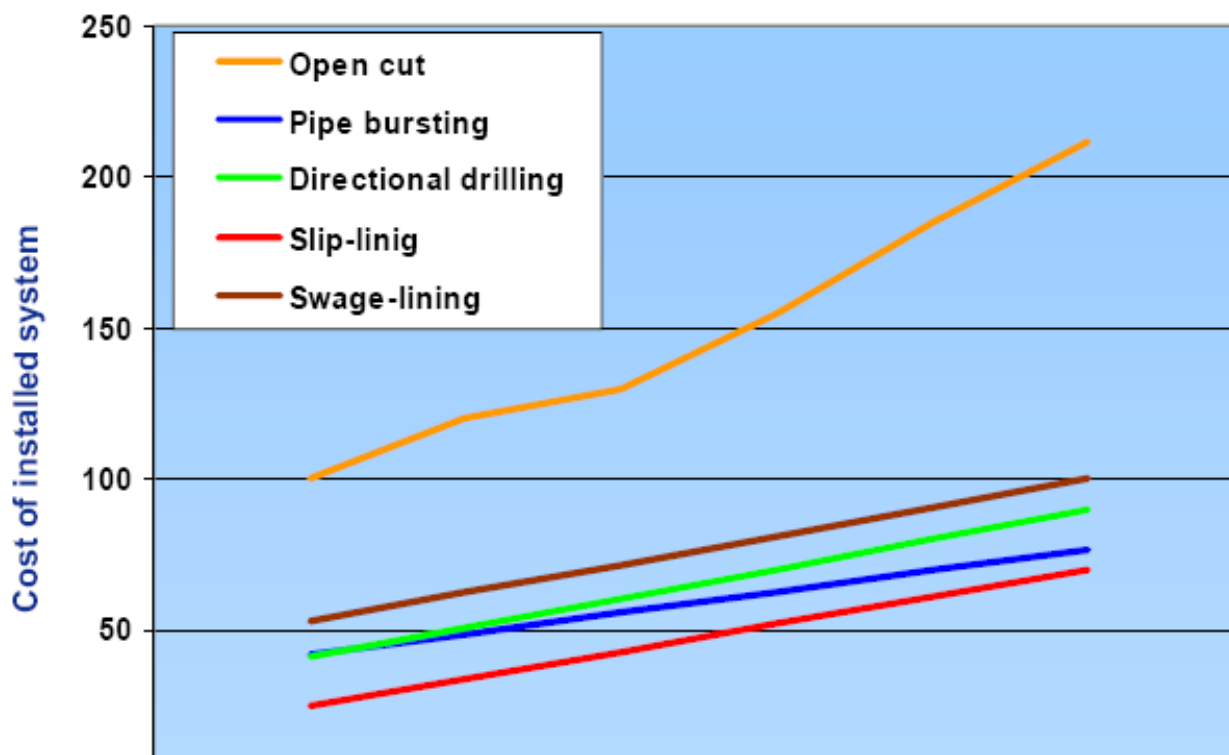
**Horizontal direct  
drilling (HDD)**



# Installation Costs

With respect to installation methods

A significant reduction of installation costs can be achieved using renovation and trenchless pipe laying methods.



**Therefore if renovation is promoted PE pipe will be selected because it is by far the lowest cost option**

# Pressure Discharge: Installation of PE pipe d1030 via Swagelining - Germany, Berlin



# **FRIALOC PE Shut-Off Valve**

*Aliaxis*  
UTILITIES & INDUSTRY



**Shut-off mechanisms newly invented!**



**FRIALOC®**

*Aliaxis*  
UTILITIES & INDUSTRY

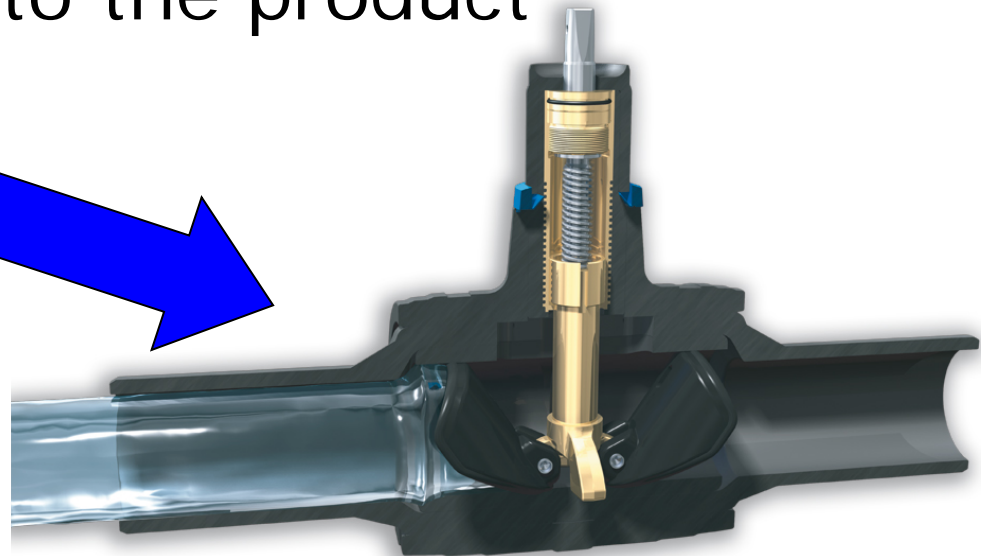
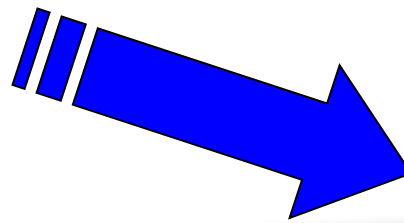
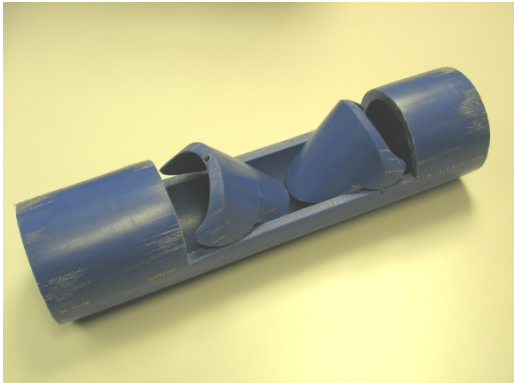
The PE shut-off valve suitable for plastics

The new shut-off mechanism

The design

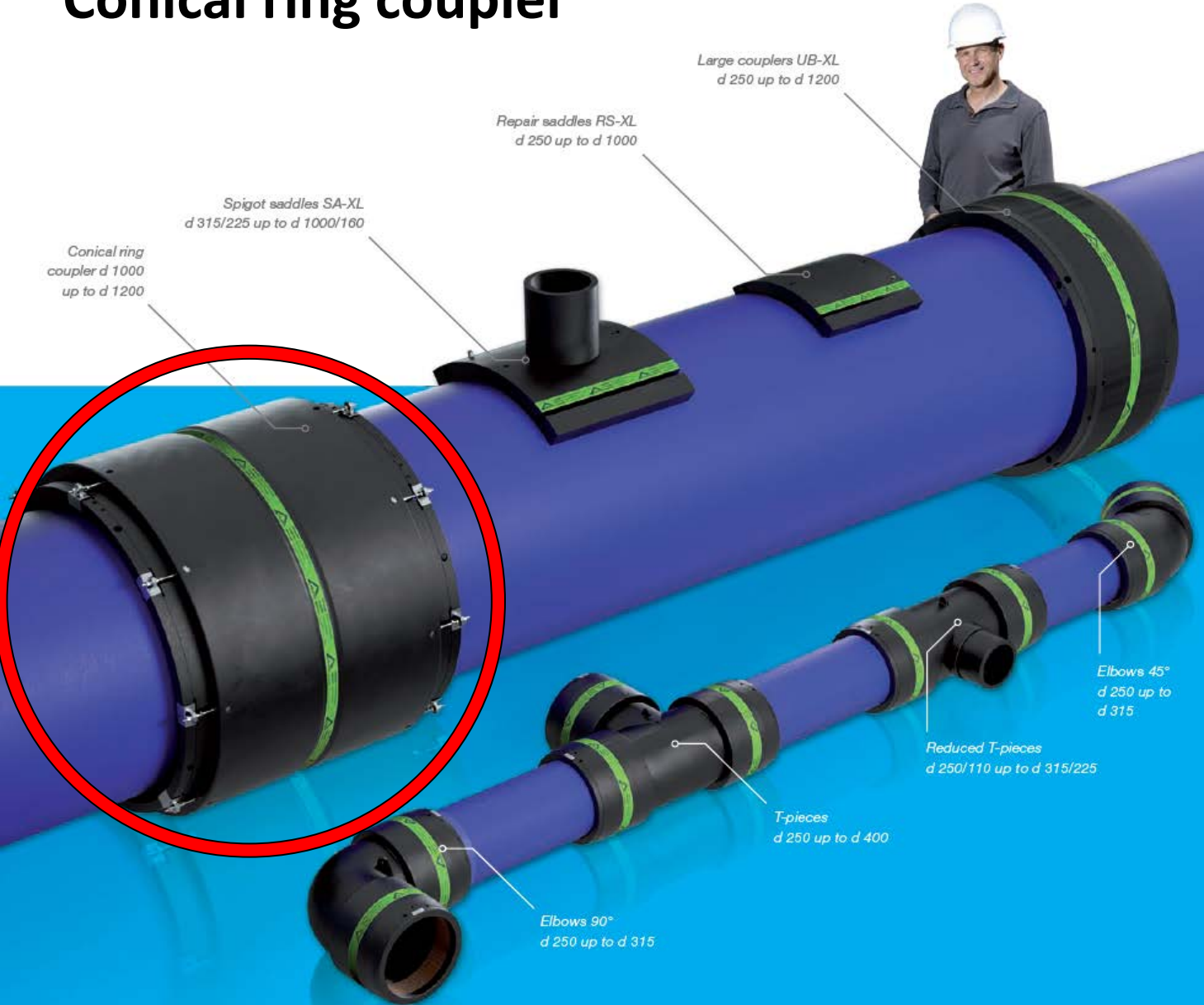
From the idea...

...to the product



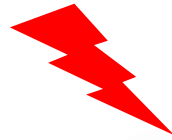
Joining technology for large PE pipes

# Conical ring coupler



# The problem: Assembly of the coupler

Large pipe tolerances



Assemblability  
Fusion quality



The solution of the  
problem:  
EF coupler  
with a flexible  
diameter!

# Conical Ring Coupler

A new generation of electrofusion

**Aliaxis**  
UTILITIES & INDUSTRY



Delivery situation:

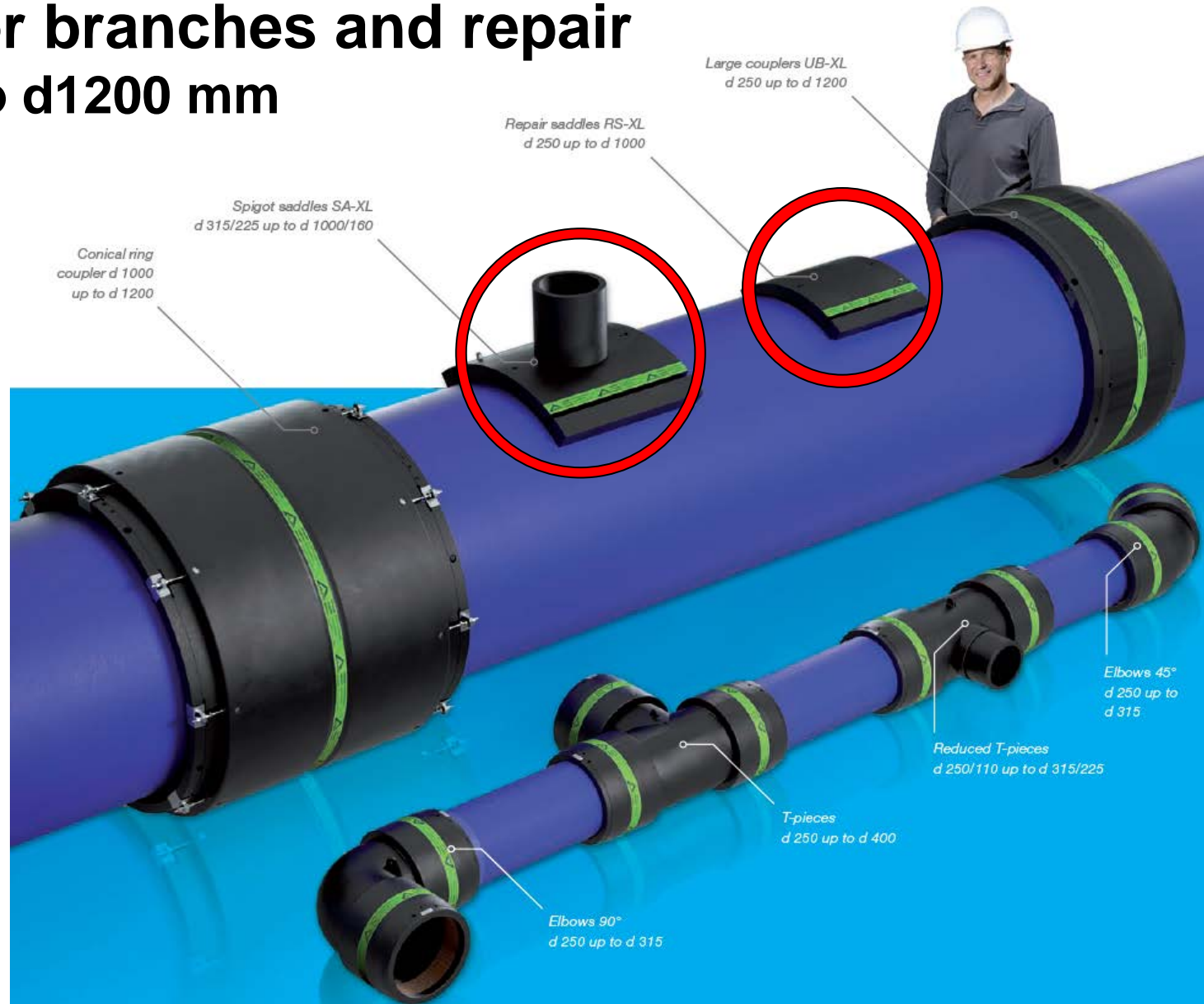
Wedge ring and coupler body pre-assembled.

Factory adjusted largest possible diameter

➔ Simple slide-over!



# Saddles for branches and repair from d250 to d1200 mm (10" to 48")



# Extra Large Branches

Principe: Vacuum clamping method



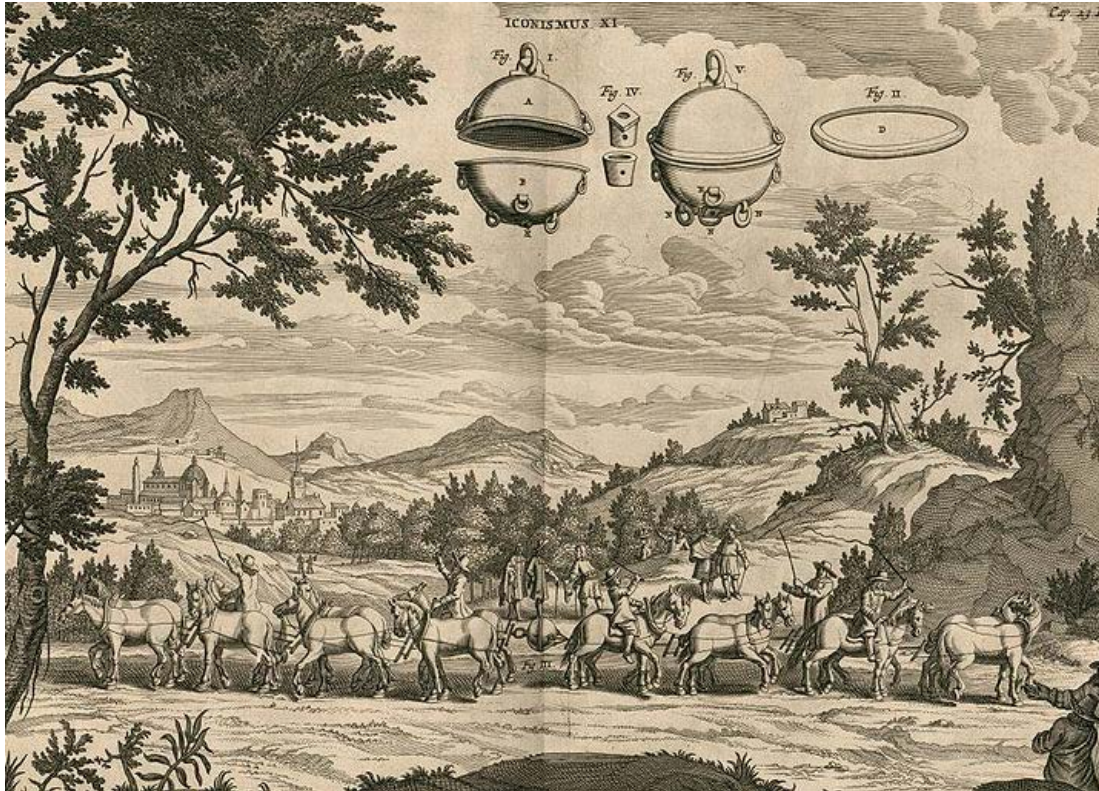
The vacuum necessary to clamp the saddle in place is generated via a Venturi nozzle using a conventional construction site compressor.

Vacuum clamping:  
Functional principle



# Magdeburg hemispheres, Otto von Guericke, 1656

From Wikipedia, the free encyclopedia



The **Magdeburg hemispheres** are a pair of large copper hemispheres, with mating rims. They were used to demonstrate the power of atmospheric pressure. When the rims were sealed with grease and the air was pumped out, the sphere contained a vacuum and could not be pulled apart by teams of horses.



# Extra Large Branches: Vacuum clamping method

Installation of 3 x SA-XL d355xd225 mm (14" x 8")

Tapping Ø 123 mm (5") via PE shut-off valve FRIALOC under PN 5 bars (70psi)





# Extra Large Branches: Vacuum clamping method

Installation of 3 x SA-XL d355xd225 mm (14" x 8")

Tapping Ø 123 mm (5") via PE shut-off valve FRIALOC under PN 5 bars (70psi)



Functional test before branches are connected to main.

# Extra Large Branches: Vacuum clamping method

Berliner Wasserbetriebe: Installation SA-XL d1030 x d160 mm (41" x 6")

The cast iron waste water pressure pipe was renovated via swagelining. Installation of branch under very narrow conditions.





## COMPARISON OF TEE AND SPIGOT SADDLE INSTALLATION

Installing a Tee

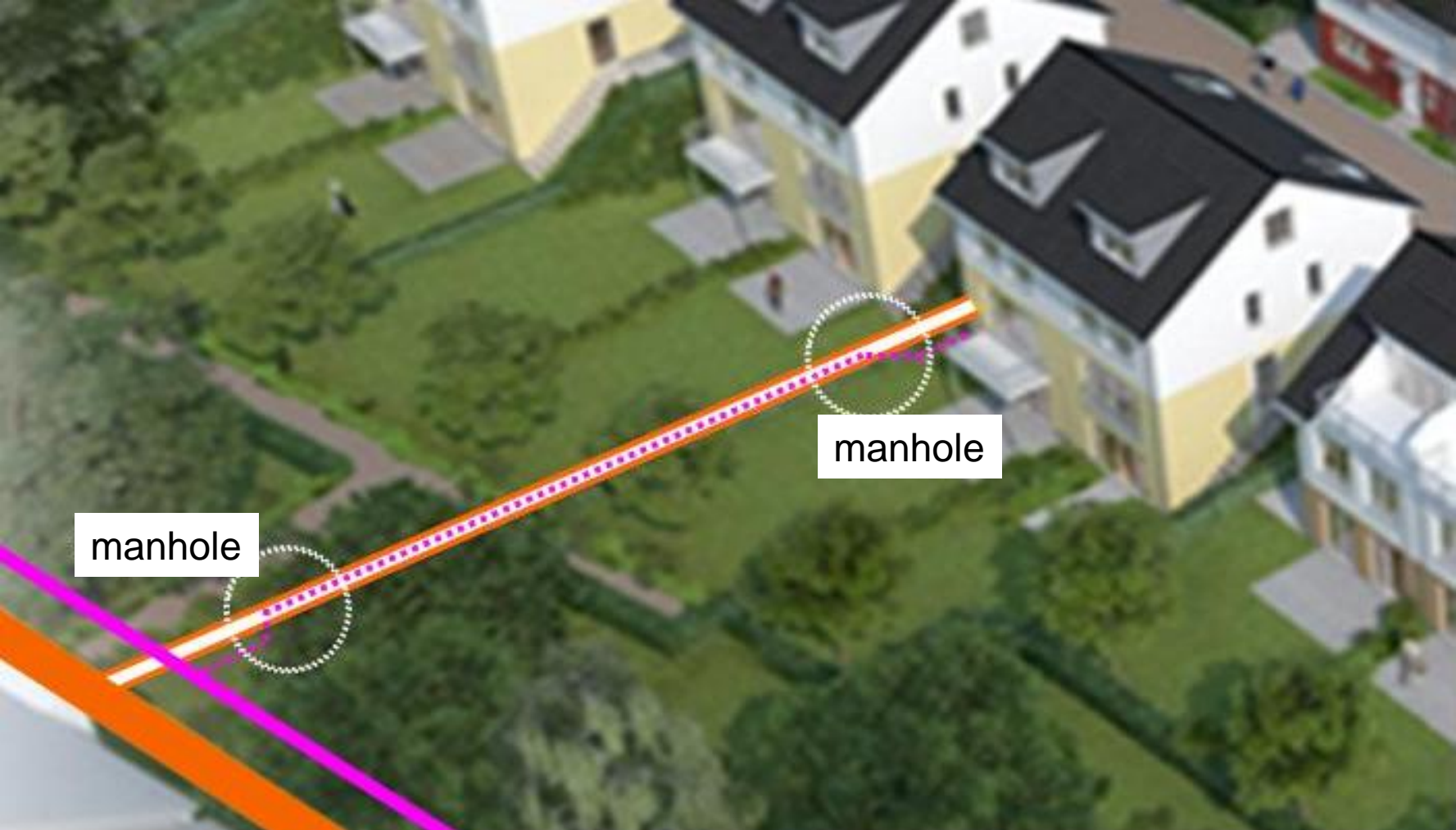


Installing a spigot saddle



- Cost saving of 50% +
- Time saving of 70% +
- No interruption of pipe operation

# FRIANET: An economical method to roll out FTTX using existing gas and water pipes





# Installation of fibre duct in gas service pipe

1 x 18m



1 x 46m



1 x 90m



# Installation of fibre duct in gas service pipe



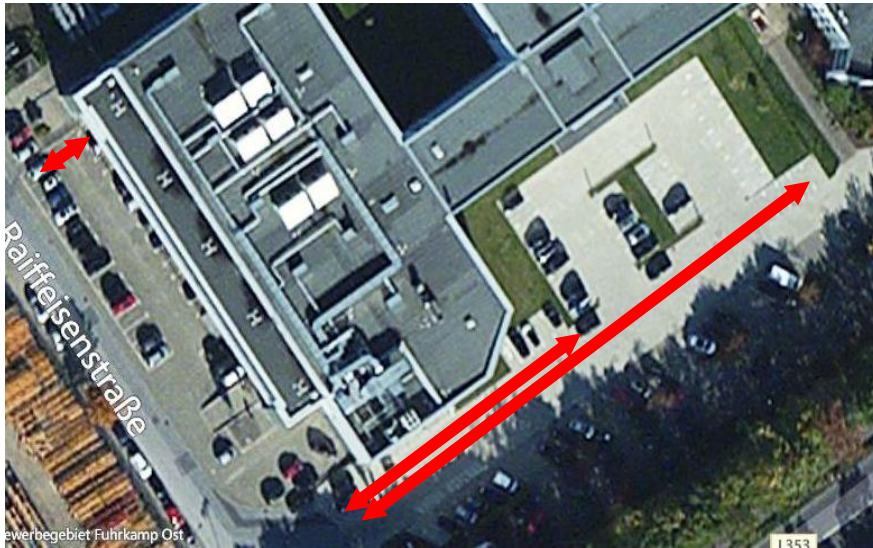
Duct d16 x 2,3mm  
per hand inserted into gas  
service pipe d63





# FRIANET GAS

## Installation of fibre duct in gas service pipe



### Facts:

#### Single duct length:

**1 x 18 m**

**1 x 46 m**

**1 x 90 m**

#### Installation time:

Approx. 1h per section

#### Material:

< 300 €/ section

#### Trench work:

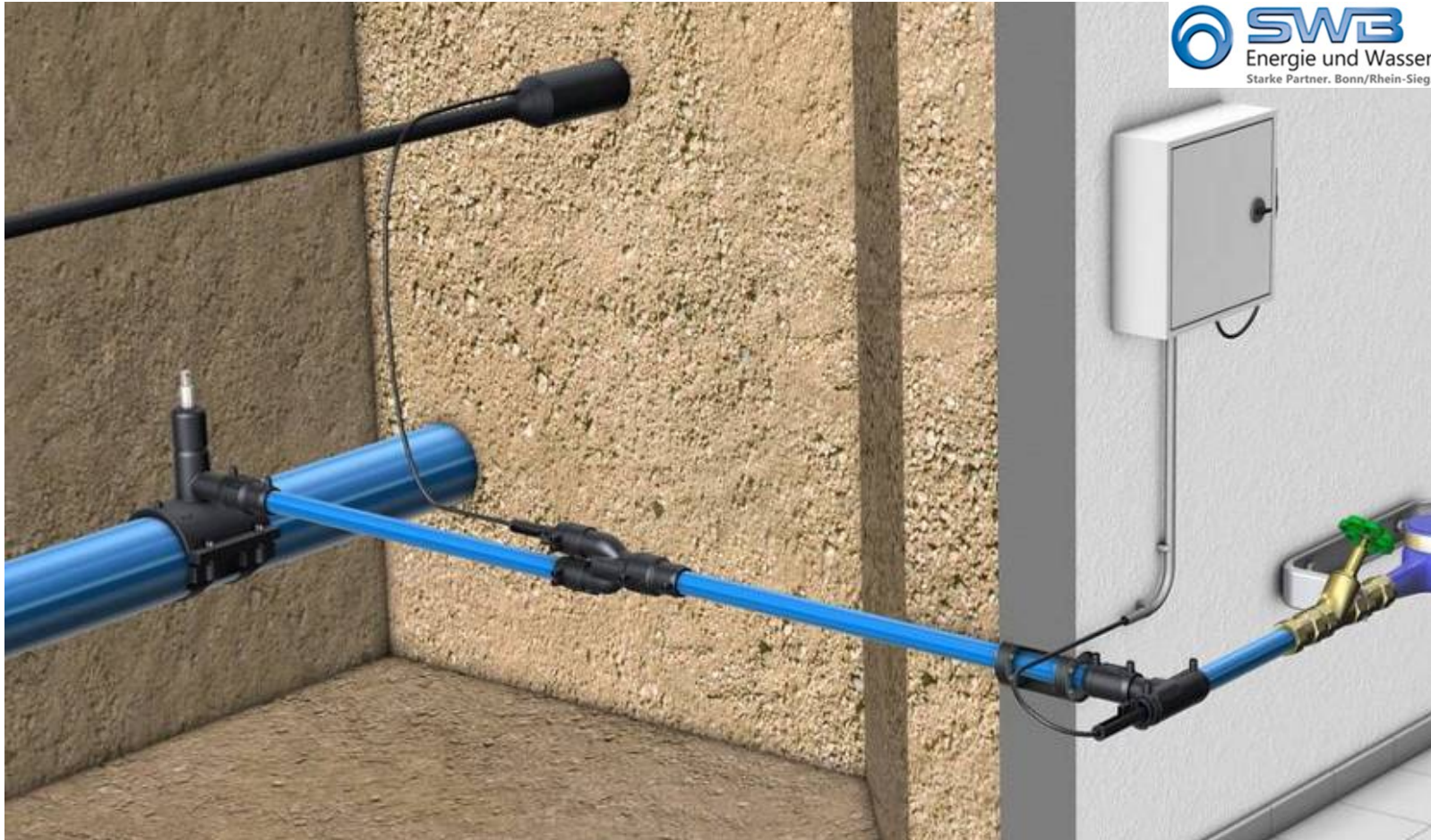
6 manholes, approx. 1,5 m x 1 m

**... instead of 154 m pipe trench!**

**No negative effects on the traffic.**

# FRIANET Water

## Installation of fibre duct in drinking water service pipe





# FRIANET Water

## Installation of fibre duct in drinking water service pipe



Interface pipe/duct:  
In the house

Interface pipe/duct:  
In the trench

Integration of  
fibre cable

Quo vadis?

 Aliaxis

**Thank you  
very much  
for your  
attention...**

**...and your  
questions!**



Coupler d2000 mm