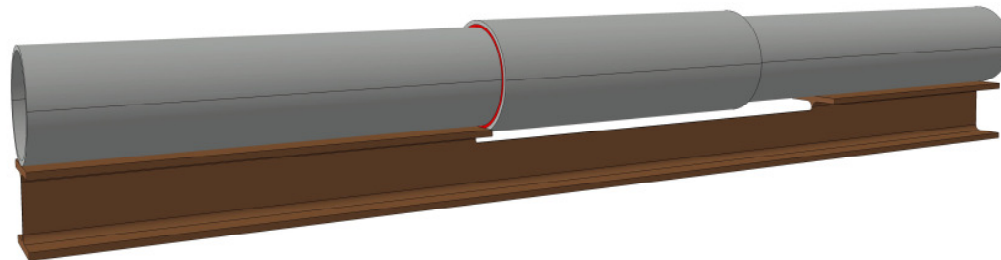


# **Project „JoinTec“**

## **Application of the polyurethane solution adhesive**

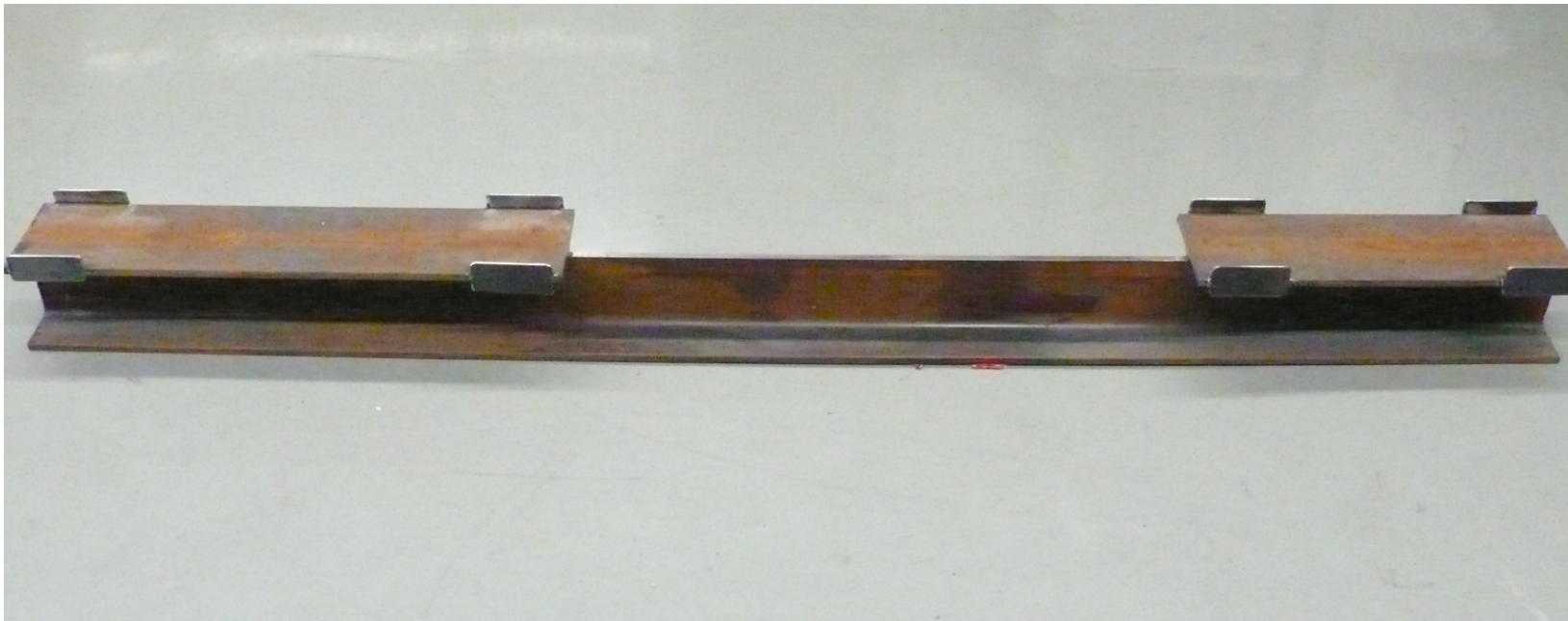


**Dr.-Ing. Wilko Flügge**

**, den ?. Juni 2009**

## Construction for fixing the pipes

- I-beam (140x140x2000mm) as basis
- Block out (790mm) for the sleeve
- 4 straight plates on each side



## Preparing of the sleeve

- Pipes with 168,3 mm in diameter as basis
- Cutted to 550 mm length
- Diameter enlarged to 178,3 mm



- Two filling ports in M10x1.0
- Two filling tubes fixed by hose clamps
- Opposite side one bleeding hole

## Application of SikaForce Primer HE NEU

- Surfaces grinded mechanical and cleaned with acetone
- 2-component adhesive mixed by weight rating (88:12)
- Applied by painting brush
- Drying time: 4 hours



## Bonding and fixing of the Pipes

- Sleeve shifted over the pipe
- Pipes bonded face on face by SikaFlex 252
- Pipes fixed on I-beam by screw clamps



## Centering of the sleeve

- ↻ Sleeve adjusted central
- ↻ Sleeve centered by three taper keys on each side
- ↻ Bonding chink covered by adhesive tape



## Application of SikaForce 7737/7020

- 1,5 litre 2-component adhesive mixed by weight rating (100:25)
- Applied by one – component cartridge pistol (two cartridges á 1l used)
- Drying time: 4 days

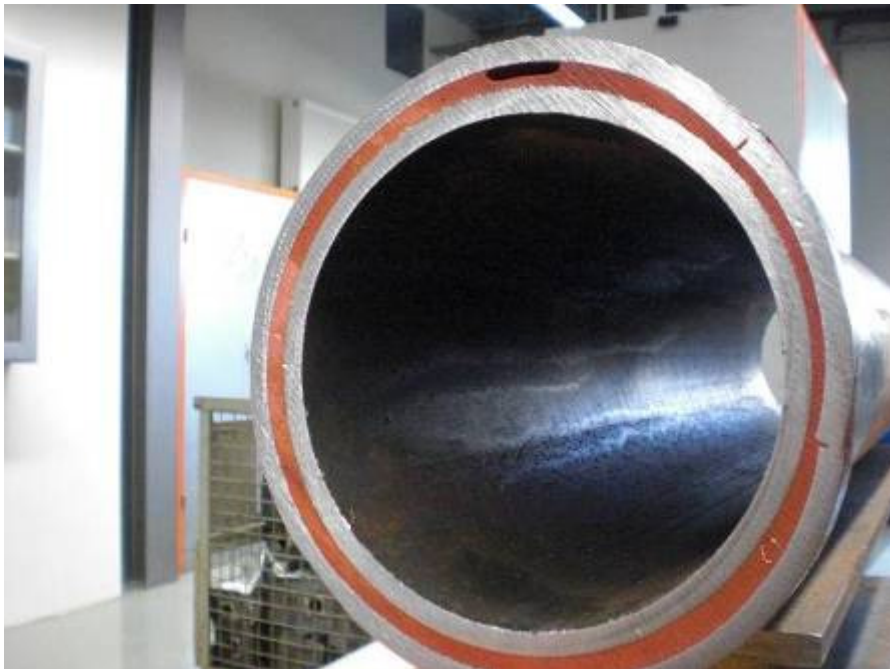


## Results pipe sample I

 **First sample cutted in four pieces**

 **Discovered defects**

- ▶ Air bubble at the top of pipe
- ▶ uncylindrical adhesive layer



 **Problem solution**

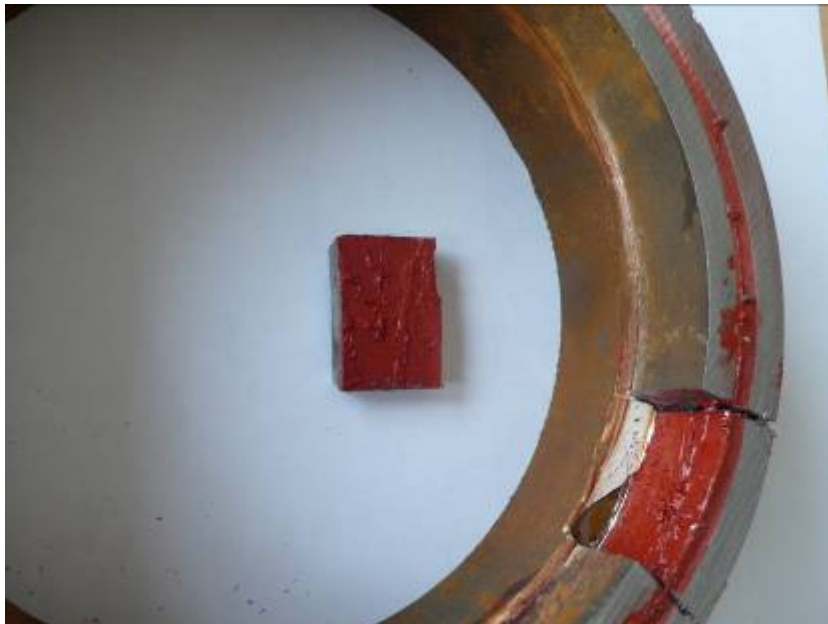
- ▶ expansion reservoir on top
- ▶ equipment for bulging / fitted pipes

## Results pipe sample II and III

### ➤ Second and third sample at first bursting test, afterwards cutted

### ➤ Discovered defects

- just 86bar(1250psi) and 60bar(870psi) collapse pressure
- not cured layer in adhesive (cause of separated resin component)



### ➤ Problem solution

- machinal mixing of resin component in canister
- machinal mixing of resin and hardener

## Pipe sample IV with failure for ultrasonic tests

### Sample for ultrasonic tests

### Simulated failure

- ▶ air bubble (diameter 40mm)
- ▶ adhesion failure on sleeve and pipe surface (à four teflon squars 10x10, 20x20, 30x30, 40x40)
- ▶ adhesion failure over weld seam (one teflonstrip 10x130)
- ▶ cohesion draft between sleeve and pipe (teflonstrip 5x90)



Project „JoinTec“ Application of SikaForce 7737/7020

**Thank you for your advertence**



 **Thank you for your advertence**