

# International Standards for the Rehabilitation of Pipelines

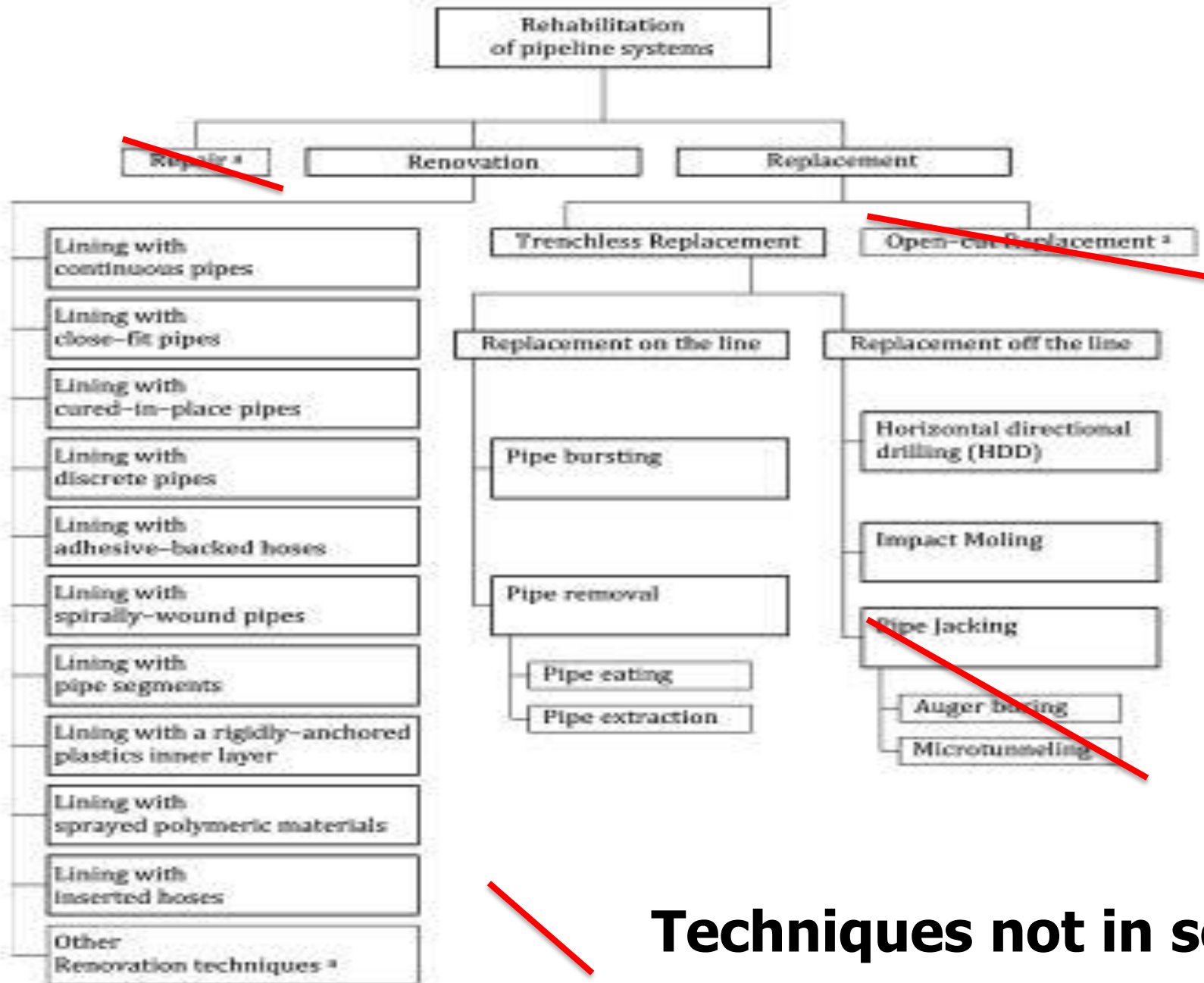


**Mike Shepherd**

# Committees making these standards

- CEN TC165 WG13 - sewers
  - Mirror committee B/505/13
- CEN TC234 WG6 – Gas
  - Mirror committee GSE/33
- ISO TC138 SC8 – plastics for rehabilitation of sewers, water and gas
  - Mirror committee PRI/88/3





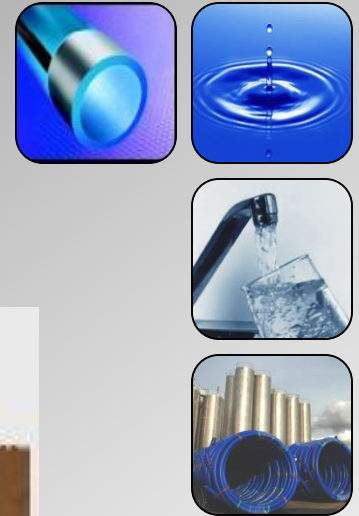
**Techniques not in scope**

# ISO TC138 SC8 Structure



- WG1 – guidance document
- WG2 – renovation of non-pressure and pressure sewers and drains
- WG3 – renovation of water supply networks
- WG4 – renovation of gas supply networks
- WG5 – trenchless replacement using on the line and off the line techniques
- WG6- Assessment of conformity

# Renovation vs Replacement



## Renovation

# Renovation vs Replacement



**Replacement**

# Renovation Techniques in scope

## Part 1 - General



Lining with continuous pipes	2
Lining with close-fit pipes	3
Lining with cured-in-place pipes	4
Lining with discrete pipes	5
Lining with adhesive-backed hoses	6

Lining with spirally-wound pipes	7
Lining with pipe segments	8
Lining with a rigidly-anchored plastics inner layer	9
Lining with sprayed polymeric materials	10
Lining with inserted hoses	11

# Structure of Renovation standards



- All the renovation standards have a common format
- This distinguishes requirements for the “as manufactured” state and the “as installed” state
- Includes installation methods and equipment
- Includes commissioning requirements
- Requires the submission of an “installation manual”



# Structure of Renovation standards



**Clause 1: Scope**

**Clause 2: Normative references**

**Clause 3: Terms and definitions**

**Clause 4: Symbols and abbreviated terms**

**Clause 5: Pipes at the "M" stage**

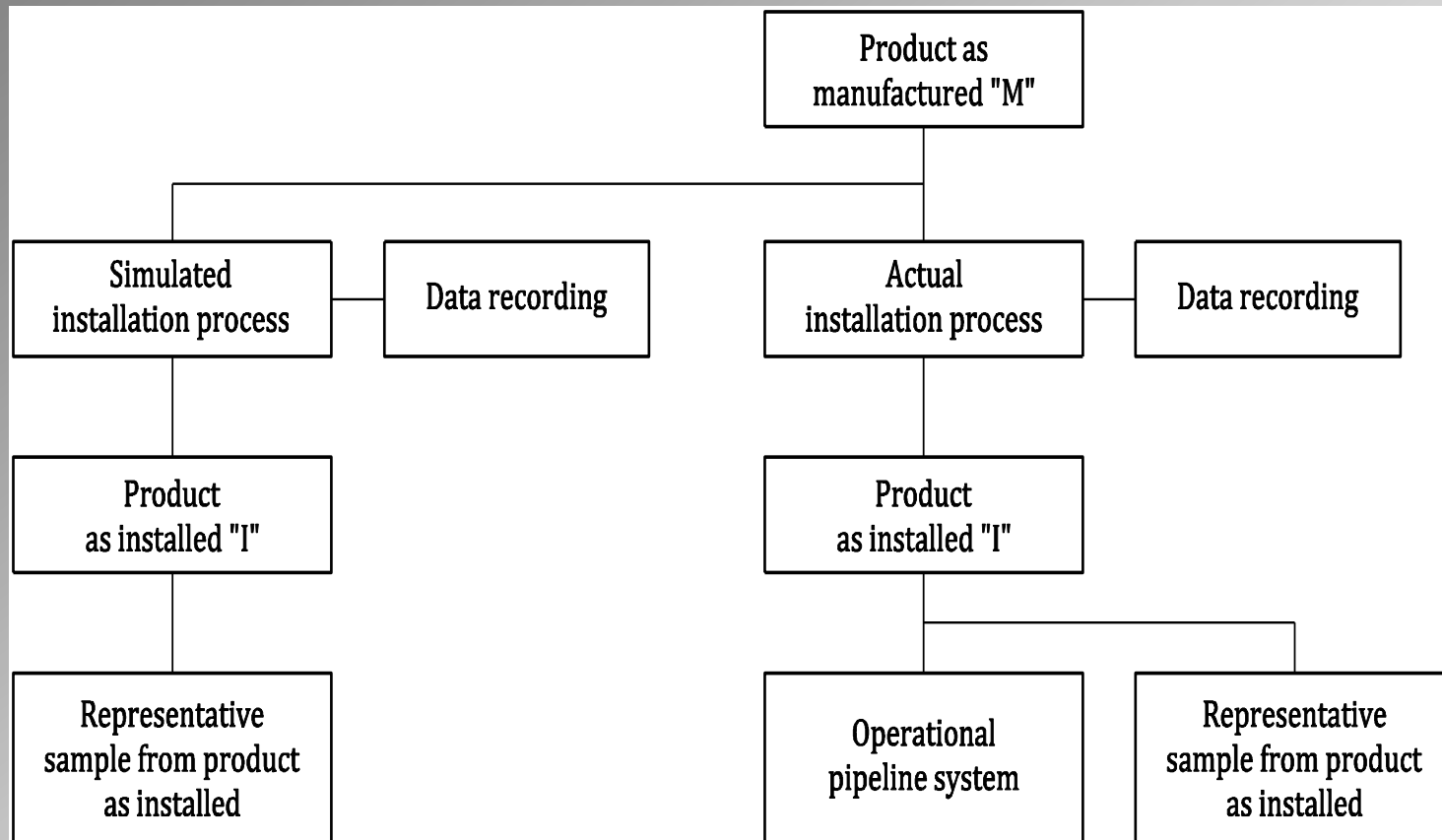
**Clause 6: Fittings at the "M" stage**

**Clause 7: Ancillary components**

**Clause 8: Fitness for purpose of the installed lining system at the "I" stage**

**Clause 9: Installation practice**

# Type testing of installed linings

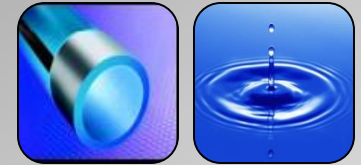


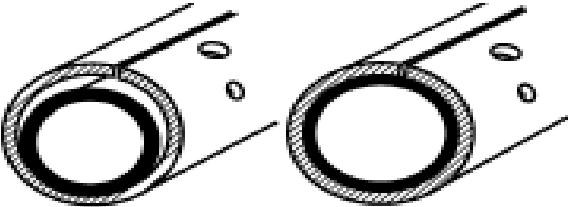
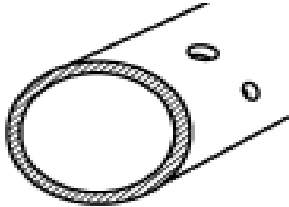
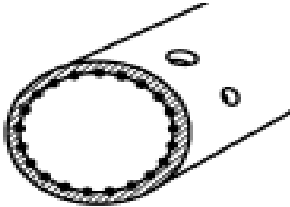
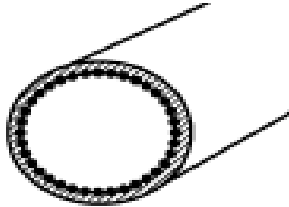
# Independent vs Interactive linings



- Independent linings defined as:  
“liner capable on its own of resisting without failure all applicable internal loads throughout its design life”
- Interactive linings defined as:  
“liner which relies on the existing pipeline for some measure of radial support in order to resist without failure all applicable internal loads throughout its design life”

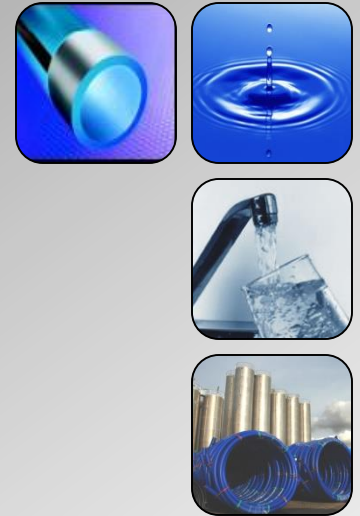
# Structural vs semi-structural



Class A		Class B	Class C	Class D	
					
loose-fit	close-fit	inherent ring stiffness	relies on adhesion	relies on adhesion	
Independent		Interactive			
Fully structural		Semi-structural		Non-structural	
Lining with continuous pipes	-		This International Standard is not applicable		
Lining with discrete pipes	-				
-	Lining with close-fit pipes				-
Lining with cured-in-place pipes					-
-	-	Lining with sprayed polymeric materials			-

**NOTE** Classification of lining with inserted hoses yet to be determined, pending development of product standards for this technique family.

# Replacement Standards



- These are stand alone documents – though EN ISO 11295 is useful
- EN ISO 21225-1: Replacement on the line by pipe bursting and pipe extraction
- EN ISO 21225-2: Replacement off the line by horizontal directional drilling and impact moling

# Structure of Replacement standards



**Clause 1: Scope**

**Clause 2: Normative references**

**Clause 3: Terms and definitions**

**Clause 4: Symbols and abbreviated terms**

**Clause 5: Design aspects**

**Clause 6: Material selection**

**Clause 7: Installation practice**

**Clause 8: Fitness for purpose**

# Publication

- All SC8 standards are/will be published as BS EN ISO documents
  - Note that some already exist
- As such all documents come under the PPD for utilities
- Documents are first published by ISO and ratified by CEN before publication by national standards bodies such as BSi



# Status of renovation standards

## Updated work programmes of WG 2, WG 3 and WG 4:

	Responsible WG:	WG 2		WG 3	WG 4
	ISO standard:	11296	11297	11298	11299
	Application area:	sewer	sewer	water	gas
Part no.		non-pressure	pressure	pressure	pressure
1	General: <b>2<sup>nd</sup> Edition</b>	<b>ISO Pub</b>	<b>ISO Pub</b>	<b>ISO Pub</b>	<b>DIS stage</b>
2	Continuous pipes	<b>BS EN 2<sup>nd</sup> Edi-</b>	<b>ISO Pub</b>	<b>BS EN</b>	<b>DIS stage</b>
3	Close-fit pipes: <b>2<sup>nd</sup> Edition</b>	<b>FDIS Stage</b>	<b>FDIS Stage</b>	<b>FDIS Stage</b>	<b>DIS stage</b>
4	Cured-in-place pipes	<b>BS EN 2<sup>nd</sup> Edi-</b>	<b>BS EN</b>	<b>W</b>	<b>N</b>
5	Discrete pipes	?	?	?	-
6	Adhesive-backed hoses	-	?	N	N
7	Spirally-wound pipes	<b>FDIS Stage 2<sup>nd</sup></b>	-	-	-
8	Pipe segments	?	-	-	-
9	Rigidly anchored plastics	<b>W</b>	-	-	-
10	Sprayed polymeric materials	?	-	?	-
11	Inserted hoses	-	-	N	N



# Status of replacement standards

- Both ISO 21225-1 and ISO 21225-2 are awaiting ISO publication – should be soon

# Other standards work

- WG6 are working on two/three assessment of conformity standards:
  - PE materials
  - GRP materials
  - PVC materials?
- CEN TC165 WG12 are working on a structural design of linings standard – B/505/12 mirror
  - Timescale ??????

# Thank you

.....any questions????