



# **POLYAMID 12 For GAS FOR HIGH PRESSURE GAS INSTALLATIONS VESTAMID L, PA 12 from Degussa AG**

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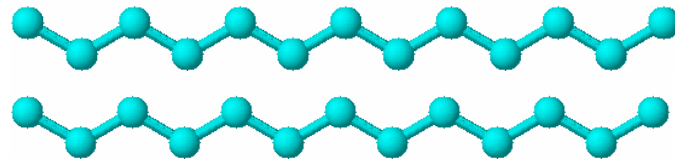
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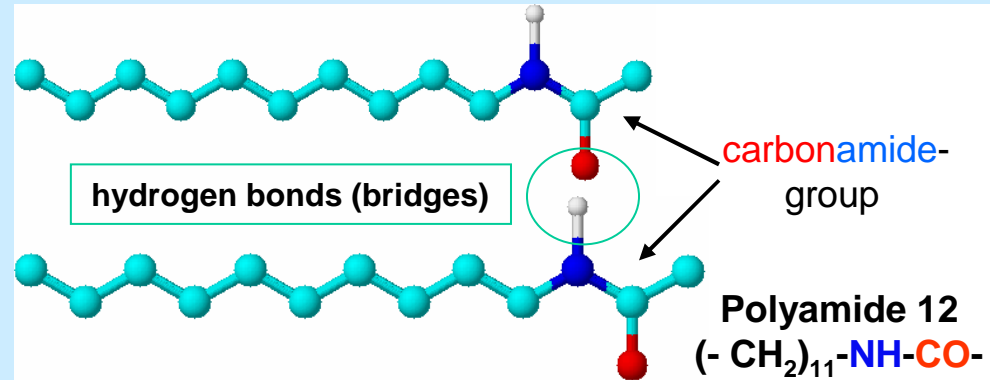
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# Technical Positioning PA 12 vs. PE



**Polyethylen**  
- CH<sub>2</sub>-CH<sub>2</sub>-CH<sub>2</sub> -



Property	PA 12	HDPE	MDPE
Melting point (°C)	178	130	126
Tensile strength at yield (MPa)	45	20 - 23	17 - 19
Tensile elongation at break (%)	>200	>800	>800
Flexural Modulus (MPa)	1200	950	700
Charpy impact strength (kJ/m2)	no break	30	20
Hardness, Shore D	74	63	58
Permeability for methane	<0.005 <sup>*)</sup>	0.24	
<sup>*)</sup> under investigation for hydrogen	<0.1 <sup>*)</sup>	0,7	



## Technical Positioning PA 12 vs. PE

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MRS data (ISO) up to 20 MPa <sup>\*)</sup>  
HDB data (ASTM) up to 3150 psi

MOP in bar	23°C	60°C	80°C
MDPE	4	4	0
HDPE	10	7	0
<b>PA 12 <sup>*)</sup></b>	<b>&gt; 16</b>	<b>&gt;10</b>	<b>&gt;8</b>

<sup>\*)</sup> expected values, tests on Degussa VESTAMID in progress



## Technical Positioning of Plastic Pipes vs. Steel

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### **No corrosion!**

- no passive and active corrosion protection, no maintenance

### **Lower installation cost, especially with coiled pipe!**

- some hundred meter pipe on a coil, less connections
- in easy soils: ploughing and inserting of a pipe from a coil simultaneously

### **More safety!**

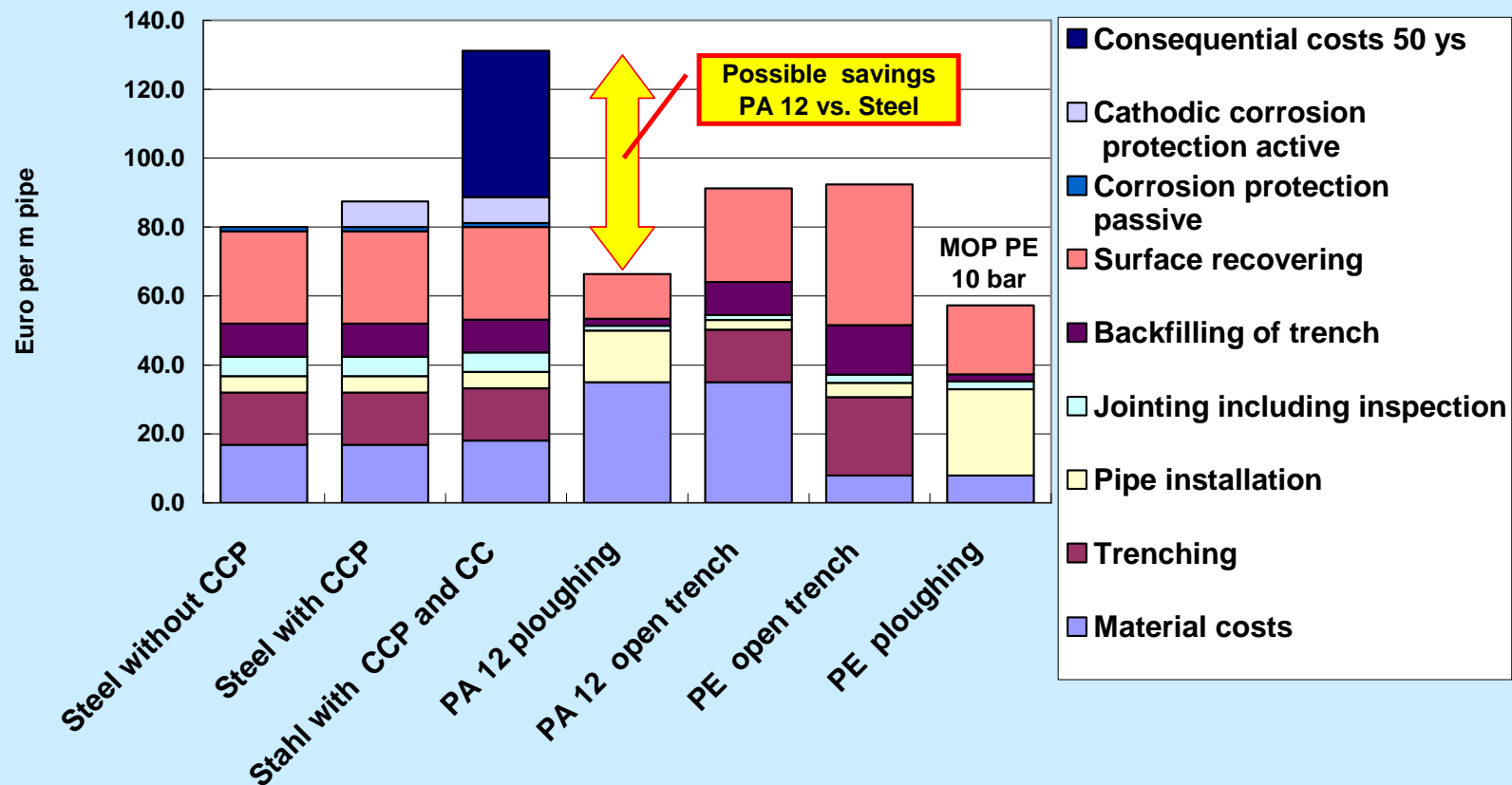
- less connections
- flexible pipes with higher elongation at break  
(more reserve in earth movements, earth quakes, etc.)



# Economical Positioning of PA 12 vs. PE and Steel

**Lower overall cost compared with steel!**

Cost comparison gas pipe materials and installation





## Feasibility Studies and Test Installations

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**Feasibility study is in progress in USA at  
Gas Technology Institute (GTI, Des Plaines, IL)**

**Test installations in USA in preparation for September 2006**

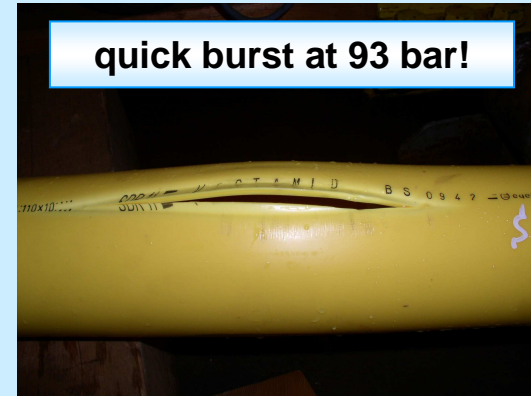
**Feasibility study in cooperation with  
E.ON Ruhrgas in Dorsten, Germany:  
Test installations running **at 24 bar and 36 bar** natural gas!**



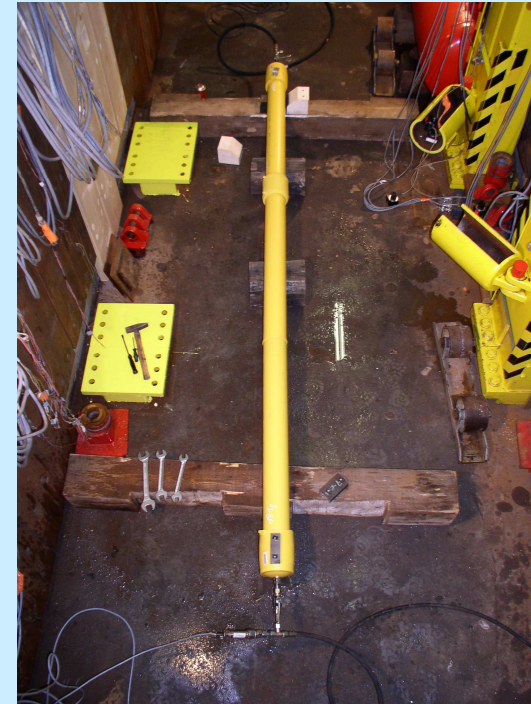
**PA 12 on PE extruder!**



**quick burst at 93 bar!**



**Coiling of D100 SDR-11 pipe on 2.7 m drum!**







## Installations on E.ON Ruhrgas site, operating at 24 and 36 bars for 2 years

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**60 m D110 SDR-11 pipe, two butt fusion and two electro-fusion joints, electro-fused endcaps**



**See our video, meet me at the poster!**





**Summary:**

**PA 12 (VESTAMID from Degussa) for high pressure gas installations**

- is strong**
- is reliable**
- is economic**
- is yellow**

**PA 12 is the material of choice for MOP 10 - 20 bar**

**PA 12 is competing with steel not with PE!**

**Believe it - or meet me at my poster!**