



# TEST REPORT

Job Number : 1009C001 Date : 29-10-10  
Page 1 of 2

Sample Description : Pipe

Sample Source : The H.K. & China Gas Co Ltd  
14/F., 363 Java Road, North Point, Hong Kong

Sampling Done by : The above company

Receipt Date : 04-10-10

Test Performing Date : 06-10-10 to 27-10-10

Nature of Test : Copper-Accelerated Acetic Acid-Salt Spray (Fog) Test for Corrosion Resistance, as specified by ASTM B368-09

## Test Results :

Copper-Accelerated Acetic Acid-Salt Spray (Fog) Test was performed in accordance with conditions laid down in ASTM B368-09 as follows:-

Sodium Chloride (Solution)	5%
Copper Chloride (CuCl <sub>2</sub> •2H <sub>2</sub> O)	0.25 ± 0.02 g/L
pH adjusted to 3.1 by addition of Acetic Acid	--
Chamber Temperature	50 ± 2°C
Saturation Tank Temperature	65 ± 2°C
Air pressure	0.12 MPa

<u>Sample Code</u>	<u>Sample Description</u>
9	G.I. pipe pre-coated with Epoxy Primer
10	G.I. pipe with Class 4 corrosion
11	G.I. pipe with Class 5 corrosion
12	G.I. pipe with Class 3 corrosion & touch up with Rust bullet (after 500hrs. Neutral Salt Spray)
13	G.I. pipe with Class 4 corrosion & touch up with Rust bullet (after 500hrs. Neutral Salt Spray)
14	G.I. pipe with Class 3 corrosion & touch up with Rust converter & top paint
15	G.I. pipe with Class 4 corrosion & touch up with Rust converter & top paint
16	G.I. pipe with Class 4 corrosion, half touch up with Epoxy primer & half with zin rich primer

.../2



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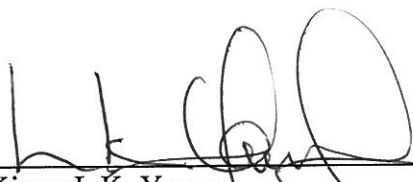
Test Performing Date : 06-10-10 to 27-10-10

Nature of Test : Copper-Accelerated Acetic Acid-Salt Spray (Fog) Test for Corrosion Resistance, as specified by ASTM B368-09

## Test Results :

Sample Code	Result										
	24 hours	72 hours	120 hours	168 hours	216 hours	264 hours	312 hours	360 hours	408 hours	456 hours	500 hours
9	N	N	R	NF	NF	R	NF	R	B	NF	B
10	R, W	R	NF	NF	NF	NF	NF	R	NF	R	R
11	N	N	N	N	N	N	R	NF	R	NF	NF
12	R	NF	R	NF	NF	NF	NF	NF	NF	NF	NF
13	N	N	R	R	NF	NF	B	B	B	B	NF
14	R	R	R	R	P	NF	B	B	B, R	B	NF
15	R	R	R	R	P	R	B	B	NF	NF	NF
16	R, W	R	R	NF	NF	R	R	R	R	NF	R

R= Rusting was observed  
N = No observable change  
NF = No further observable change  
W = White corrosion spots were observed  
P = Peeling off of coating was observed  
B = Blistering was observed

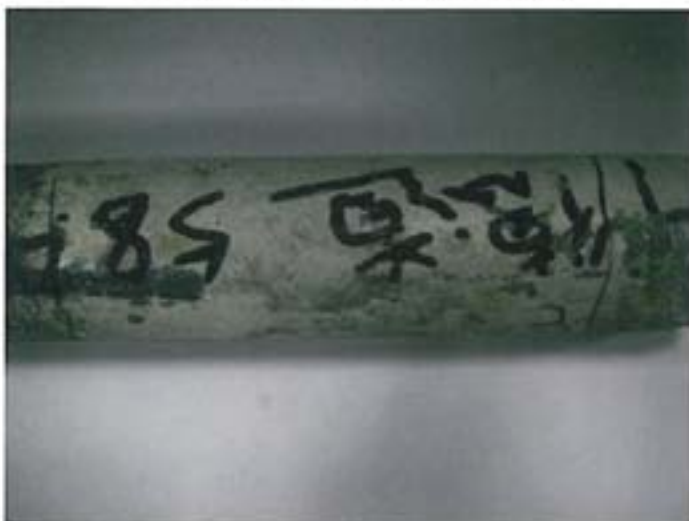
  
Dr. Kinny L.K. Yeung  
B.Sc. M.Sc. Ph.D. C.Chem MRSC FIMF. F.I.Ceram FIM  
General Manager – Materials Technology Division



Sample Before Testing (Sample 9)



Sample Before Testing (Sample 10)



Sample Before Testing (Sample 11)



Sample Before Testing (Sample 12)



Sample Before Testing (Sample 13)



Sample Before Testing (Sample 14)



Sample Before Testing (Sample 15)



Sample Before Testing (Sample 16)



Sample After Testing – 24 hours (Sample 9)



Sample After Testing – 24 hours (Sample 10)



Sample After Testing – 24 hours (Sample 11)



Sample After Testing – 24 hours (Sample 12)



Sample After Testing – 24 hours (Sample 13)



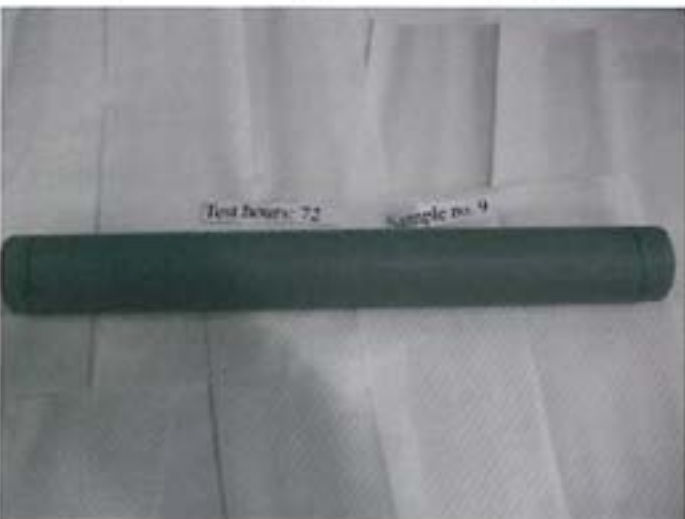
Sample After Testing – 24 hours (Sample 14)



Sample After Testing – 24 hours (Sample 15)



Sample After Testing – 24 hours (Sample 16)



Sample After Testing – 72 hours (Sample 9)



Sample After Testing – 72 hours (Sample 10)



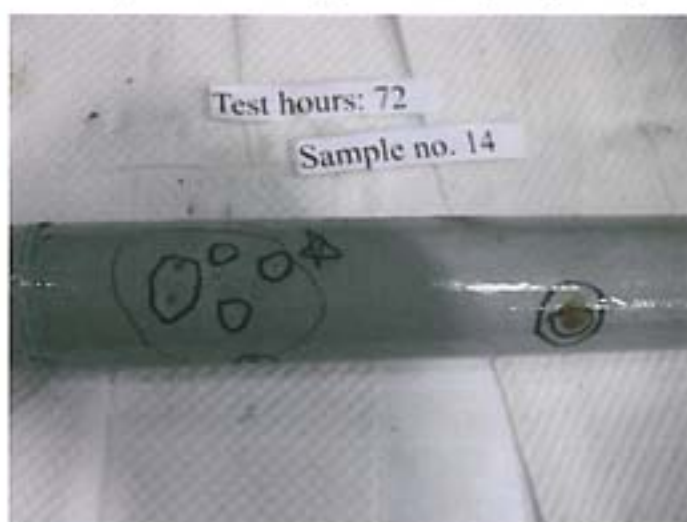
Sample After Testing – 72 hours (Sample 11)



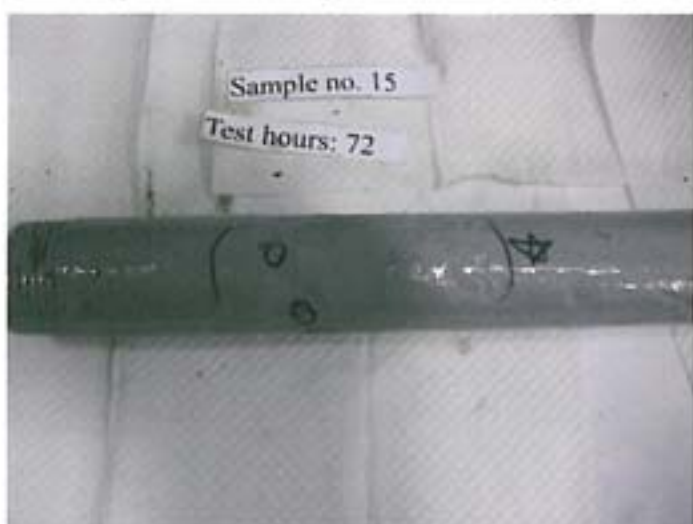
Sample After Testing – 72 hours (Sample 12)



Sample After Testing – 72 hours (Sample 13)



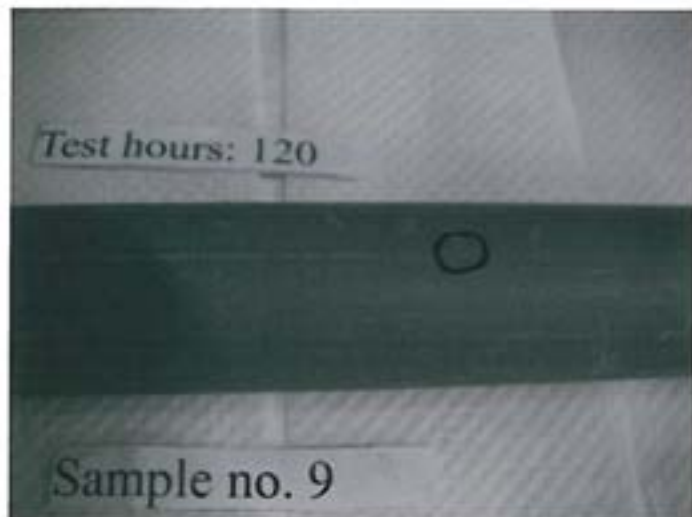
Sample After Testing – 72 hours (Sample 14)



Sample After Testing – 72 hours (Sample 15)



Sample After Testing – 72 hours (Sample 16)



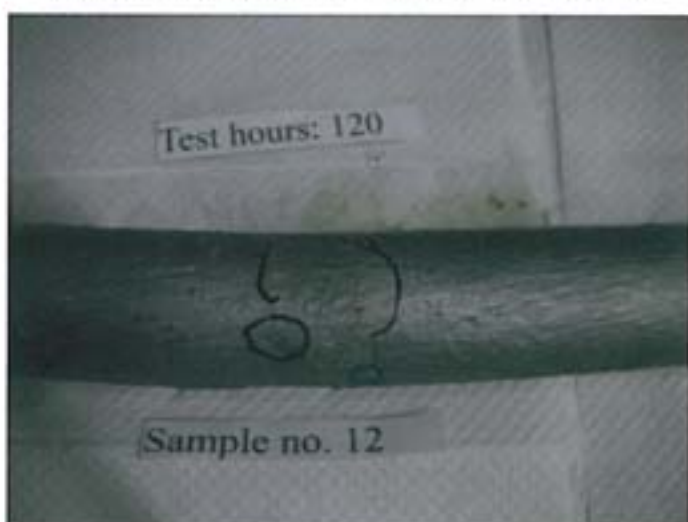
Sample After Testing – 120 hours (Sample 9)



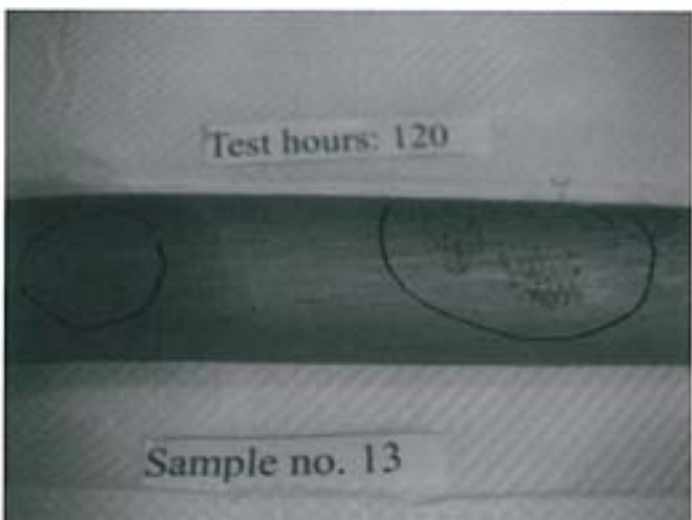
Sample After Testing – 120 hours (Sample 10)



Sample After Testing – 120 hours (Sample 11)



Sample After Testing – 120 hours (Sample 12)



Sample After Testing – 120 hours (Sample 13)



Sample After Testing – 120 hours (Sample 14)



Sample After Testing – 120 hours (Sample 15)



Sample After Testing – 120 hours (Sample 16-1)



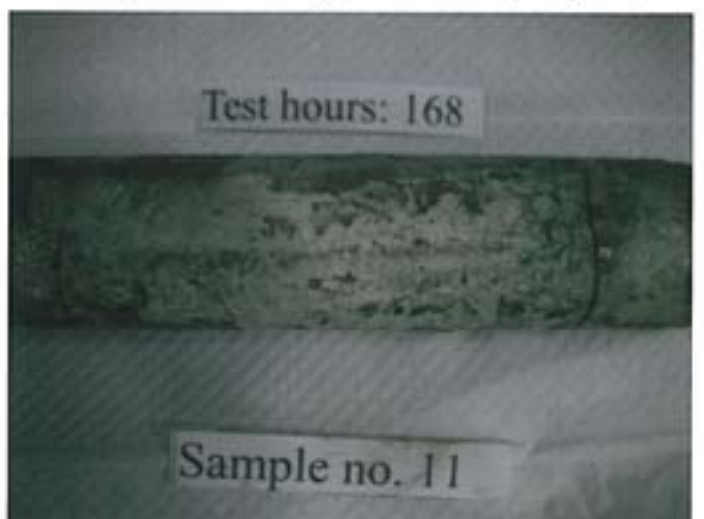
Sample After Testing – 120 hours (Sample 16-2)



Sample After Testing – 168 hours (Sample 9)

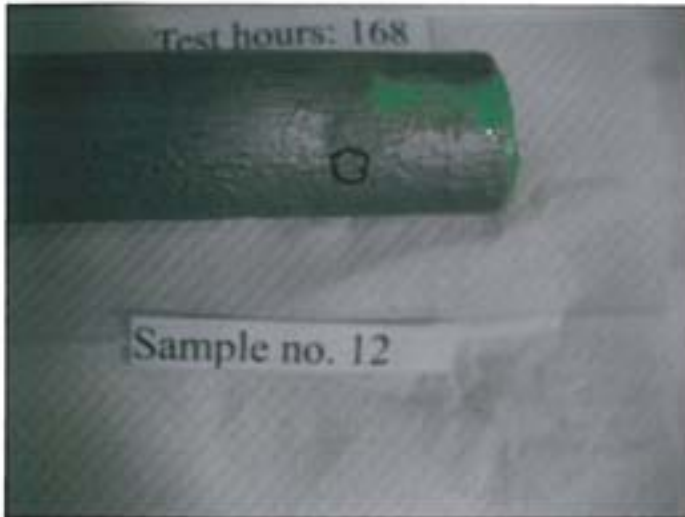


Sample After Testing – 168 hours (Sample 10)

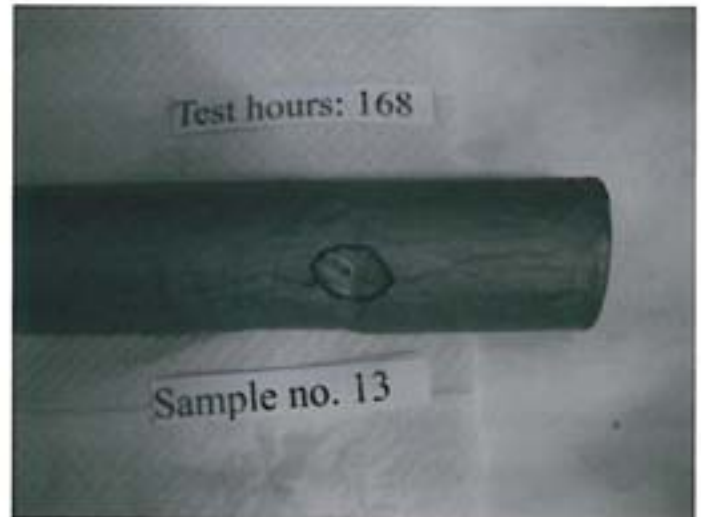


Sample After Testing – 168 hours (Sample 11)

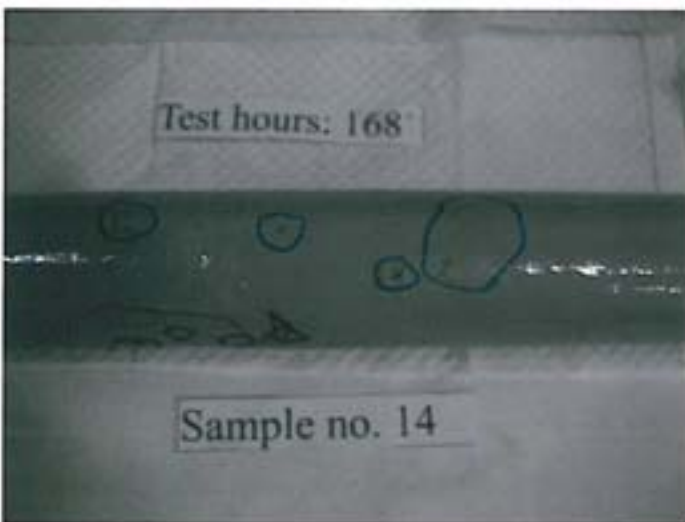




Sample After Testing – 168 hours (Sample 12)



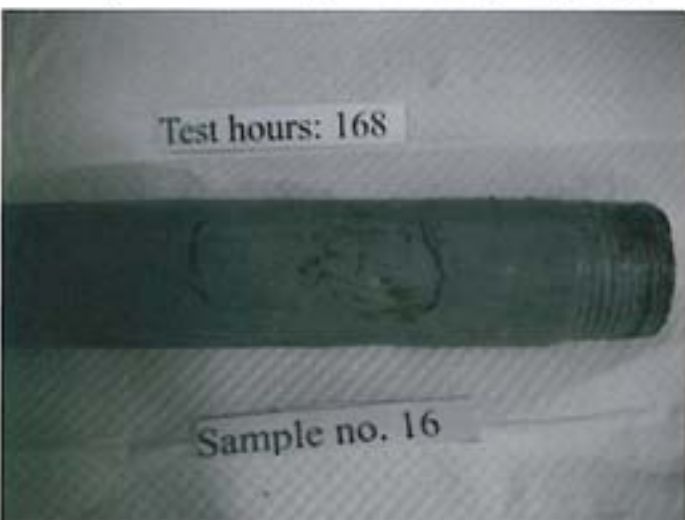
Sample After Testing – 168 hours (Sample 13)



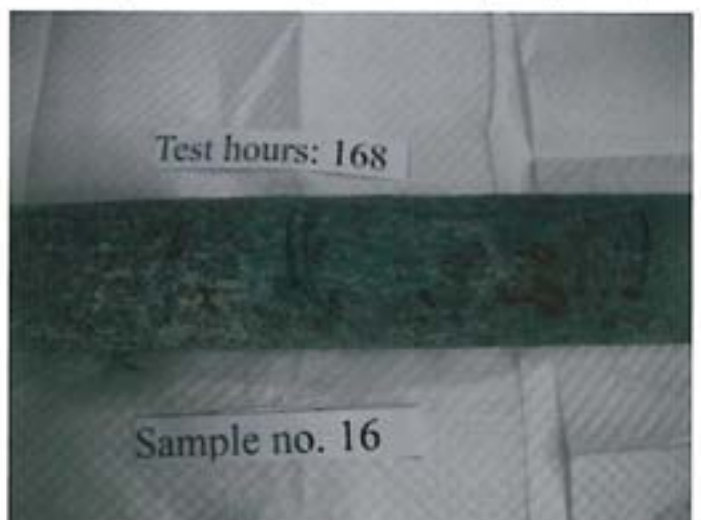
Sample After Testing – 168 hours (Sample 14)



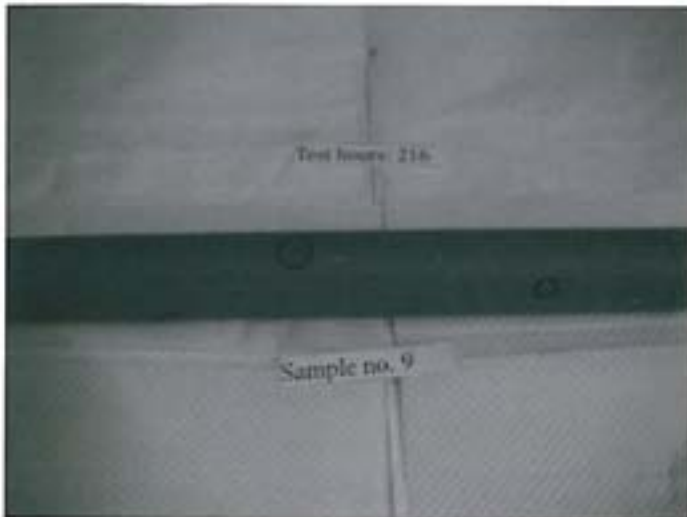
Sample After Testing – 168 hours (Sample 15)



Sample After Testing – 168 hours (Sample 16-1)



Sample After Testing – 168 hours (Sample 16-2)



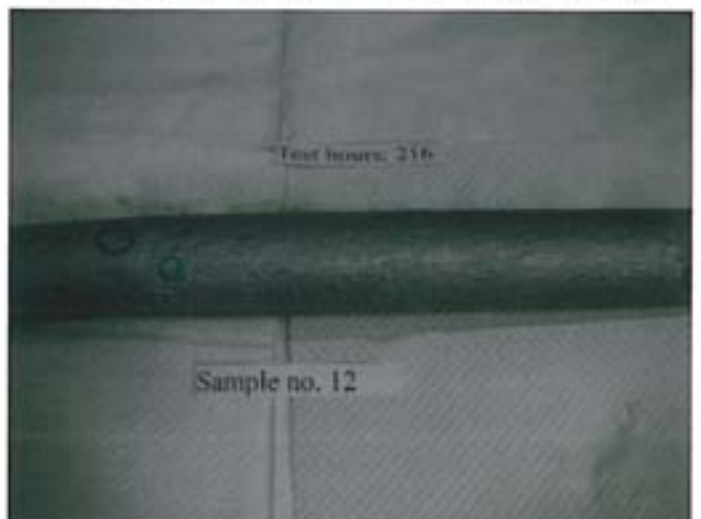
Sample After Testing – 216 hours (Sample 9)



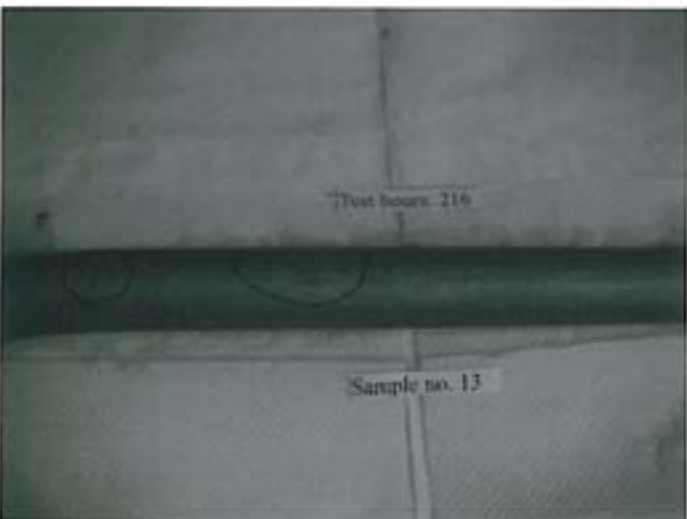
Sample After Testing – 216 hours (Sample 10)



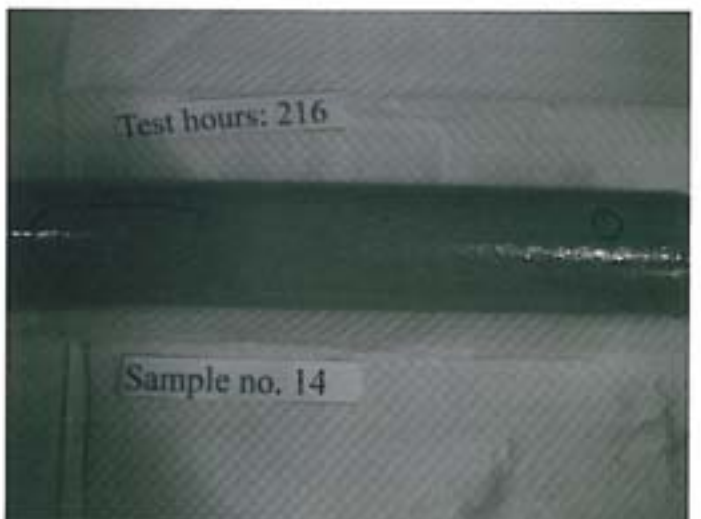
Sample After Testing – 216 hours (Sample 11)



Sample After Testing – 216 hours (Sample 12)



Sample After Testing – 216 hours (Sample 13)



Sample After Testing – 216 hours (Sample 14)



Sample After Testing – 216 hours (Sample 15)



Sample After Testing – 216 hours (Sample 16)



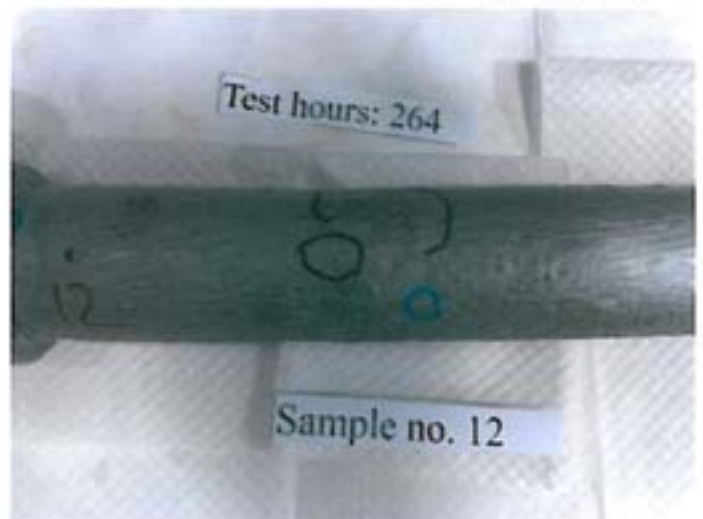
Sample After Testing – 264 hours (Sample 9)



Sample After Testing – 264 hours (Sample 10)



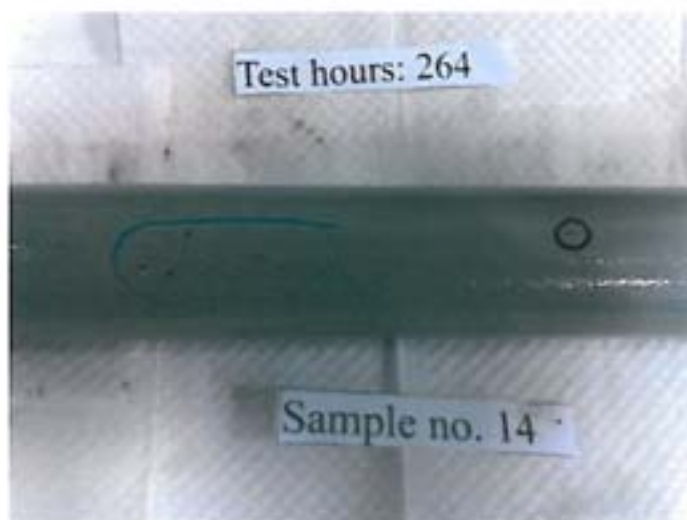
Sample After Testing – 264 hours (Sample 11)



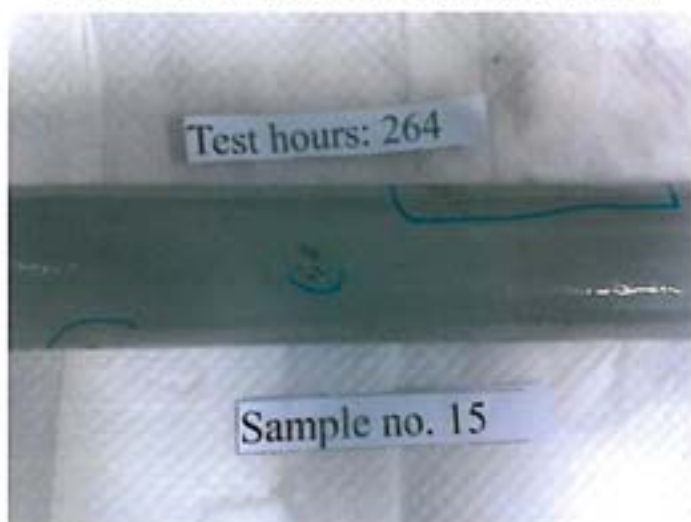
Sample After Testing – 264 hours (Sample 12)



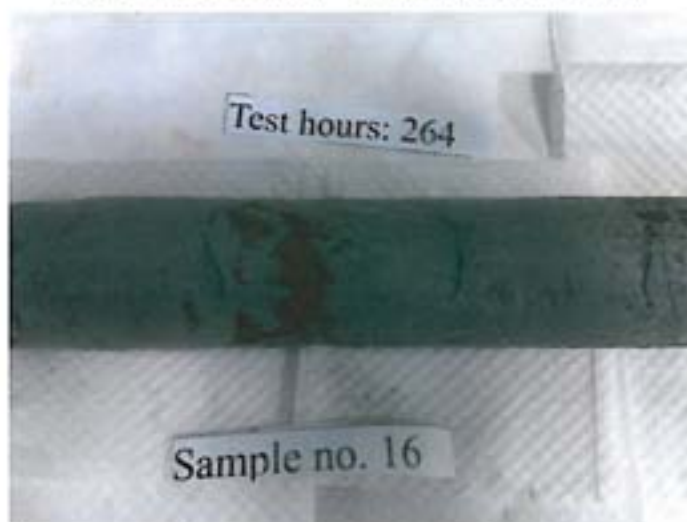
Sample After Testing – 264 hours (Sample 13)



Sample After Testing – 264 hours (Sample 14)



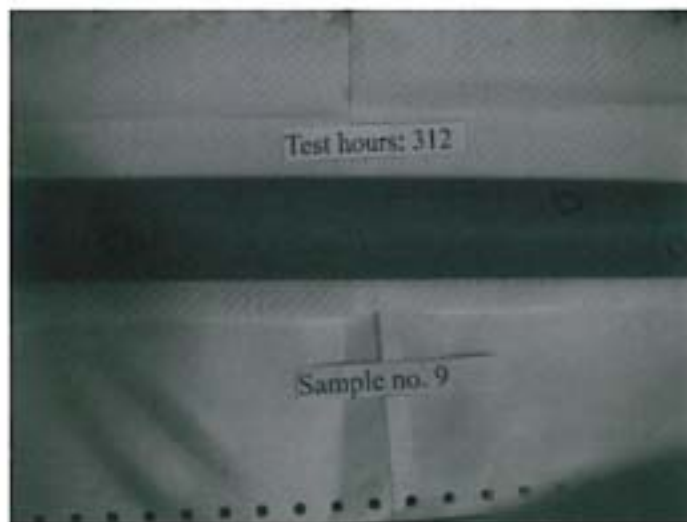
Sample After Testing – 264 hours (Sample 15)



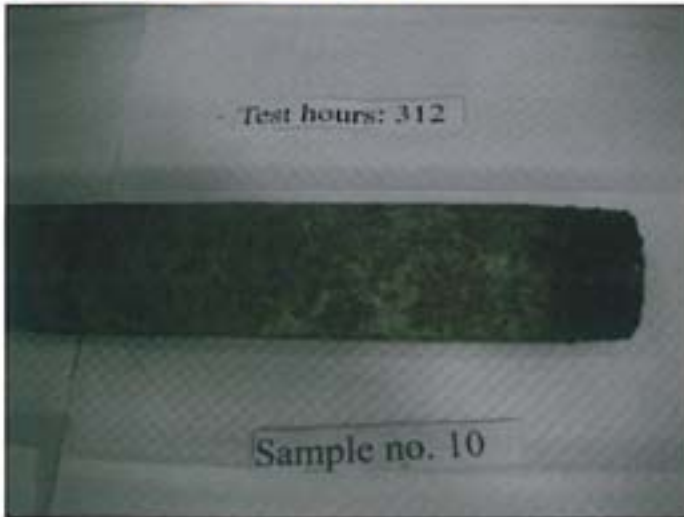
Sample After Testing – 264 hours (Sample 16-1)



Sample After Testing – 264 hours (Sample 16-2)



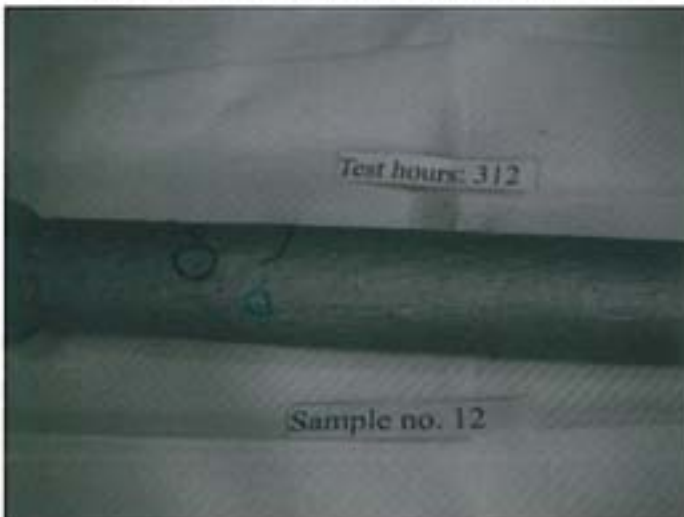
Sample After Testing – 312 hours (Sample 9)



Sample After Testing – 312 hours (Sample 10)



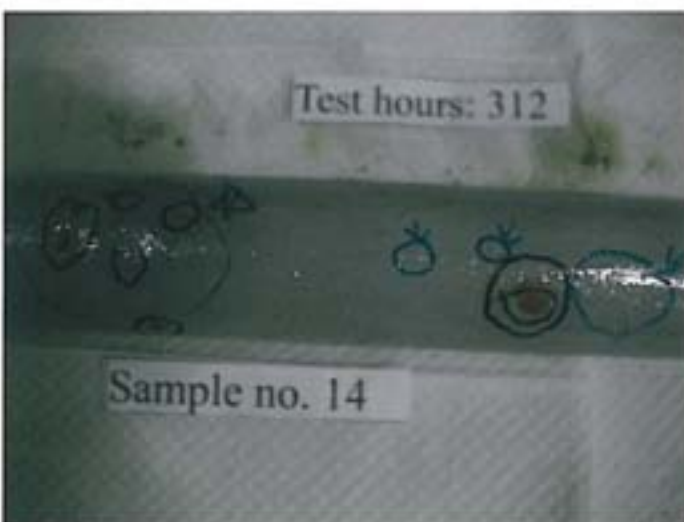
Sample After Testing – 312 hours (Sample 11)



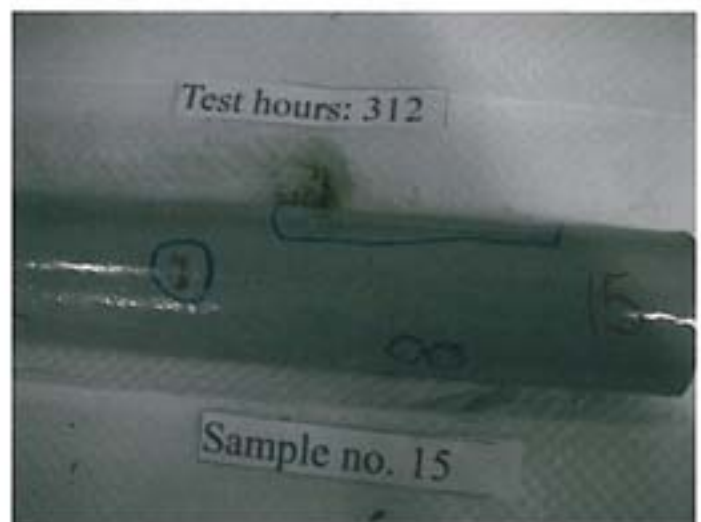
Sample After Testing – 312 hours (Sample 12)



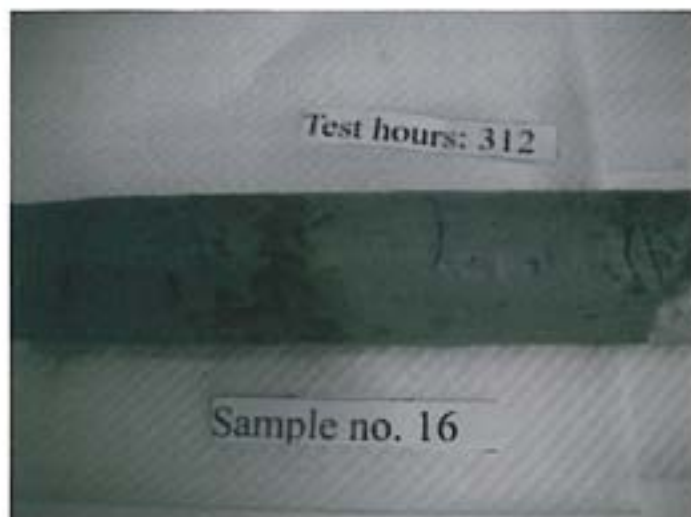
Sample After Testing – 312 hours (Sample 13)



Sample After Testing – 312 hours (Sample 14)



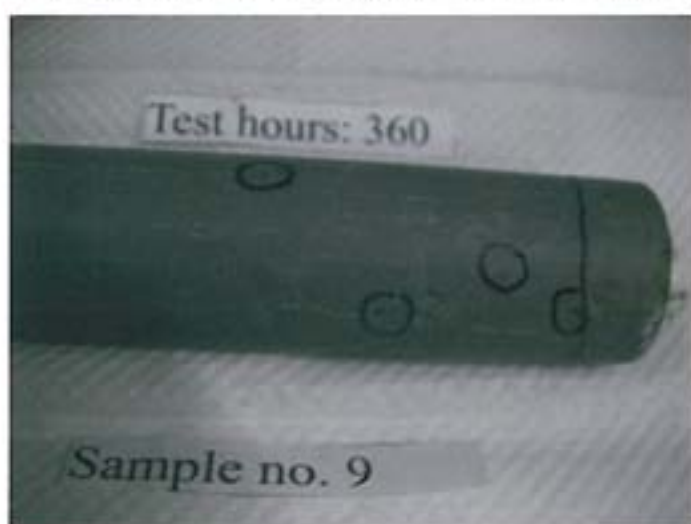
Sample After Testing – 312 hours (Sample 15)



Sample After Testing – 312 hours (Sample 16-1)



Sample After Testing – 312 hours (Sample 16-2)



Sample After Testing – 360 hours (Sample 9)



Sample After Testing – 360 hours (Sample 10)



Sample After Testing – 360 hours (Sample 11)



Sample After Testing – 360 hours (Sample 12)



Sample After Testing – 360 hours (Sample 13)



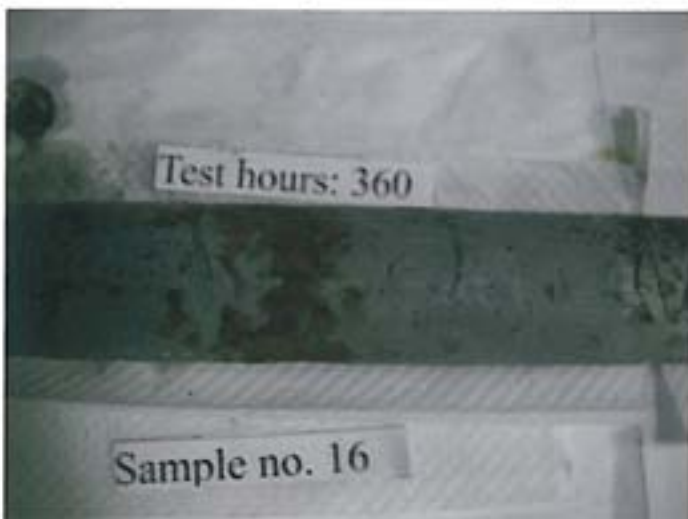
Sample After Testing – 360 hours (Sample 14)



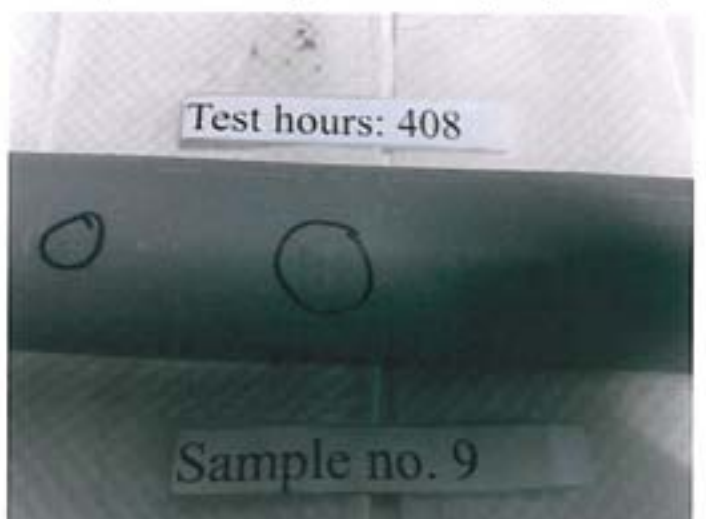
Sample After Testing – 360 hours (Sample 15)



Sample After Testing – 360 hours (Sample 16-1)



Sample After Testing – 360 hours (Sample 16-2)



Sample After Testing – 408 hours (Sample 9)



Sample After Testing – 408 hours (Sample 10)



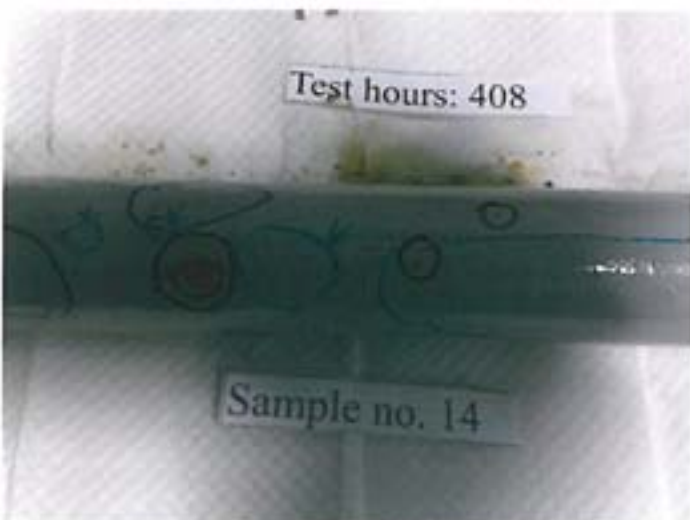
Sample After Testing – 408 hours (Sample 11)



Sample After Testing – 408 hours (Sample 12)



Sample After Testing – 408 hours (Sample 13)

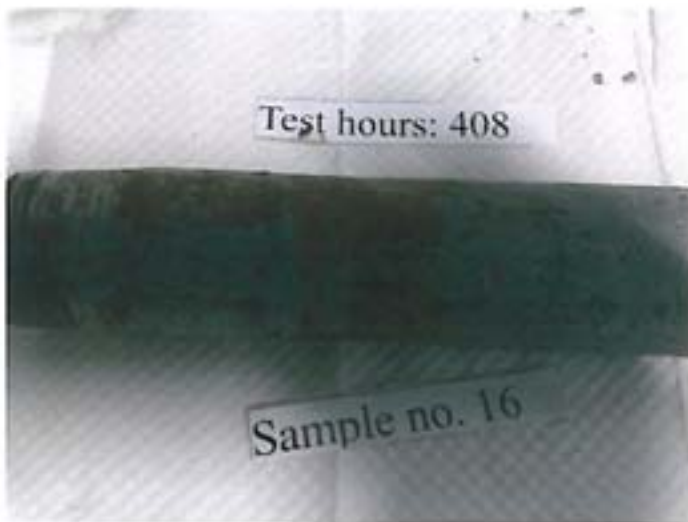


Sample After Testing – 408 hours (Sample 14)



Sample After Testing – 408 hours (Sample 15)





Sample After Testing – 408 hours (Sample 16-1)



Sample After Testing – 408 hours (Sample 16-2)



Sample After Testing – 456 hours (Sample 9)



Sample After Testing – 456 hours (Sample 10)



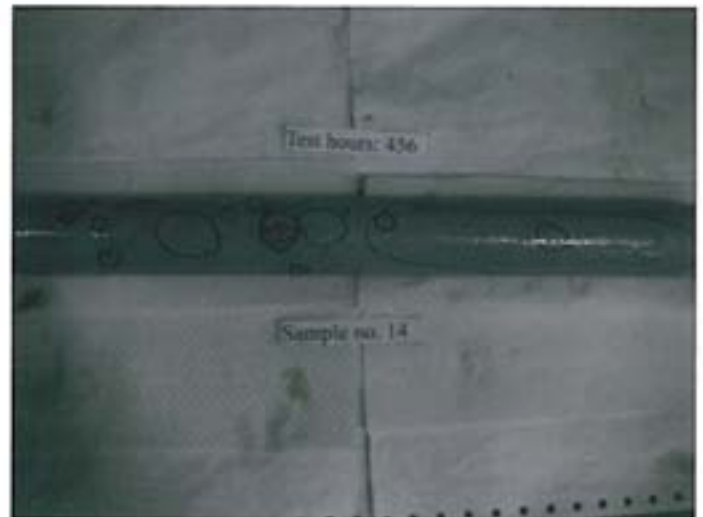
Sample After Testing – 456 hours (Sample 11)



Sample After Testing – 456 hours (Sample 12)



Sample After Testing – 456 hours (Sample 13)



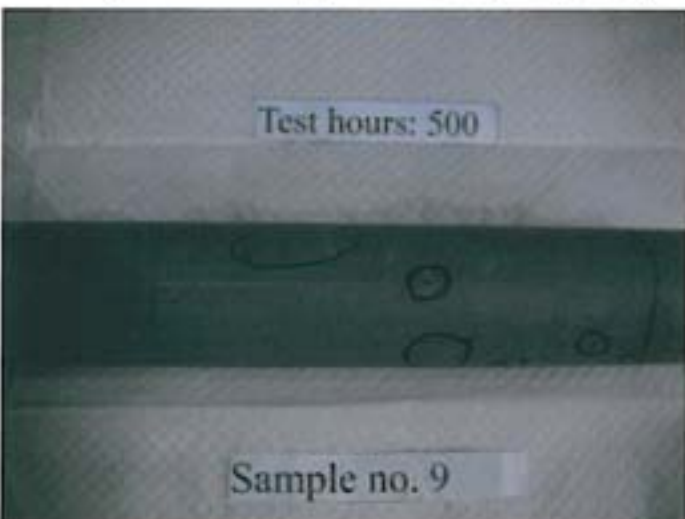
Sample After Testing – 456 hours (Sample 14)



Sample After Testing – 456 hours (Sample 15)



Sample After Testing – 456 hours (Sample 16)



Sample After Testing – 500 hours (Sample 9)



Sample After Testing – 500 hours (Sample 10)



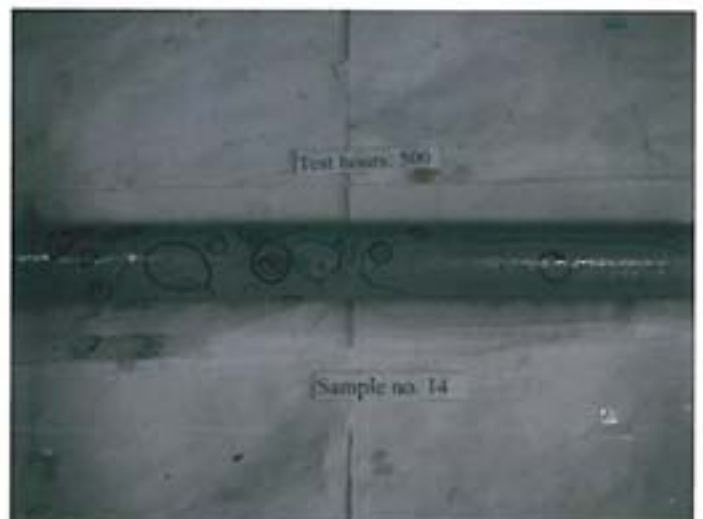
Sample After Testing – 500 hours (Sample 11)



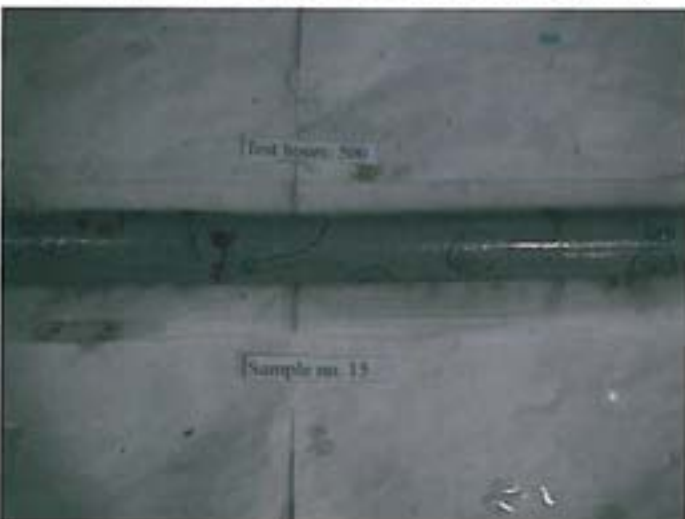
Sample After Testing – 500 hours (Sample 12)



Sample After Testing – 500 hours (Sample 13)



Sample After Testing – 500 hours (Sample 14)



Sample After Testing – 500 hours (Sample 15)



Sample After Testing – 500 hours (Sample 16)