

2016.

X-ray inspection of Rubber hoses (with different defects)

Defects: burns on surface, hole in side wall of hose, salt inside hose, particle inside of hose, spots on surface.

Samples were inspected batch by batch. Inspected using low energy X-rays.

Inclusions, incl. salt shows up as dark spots. Holes in the hoses show up as light areas.

Rubber Hoses Burnt and w/ salt inside, Image 1

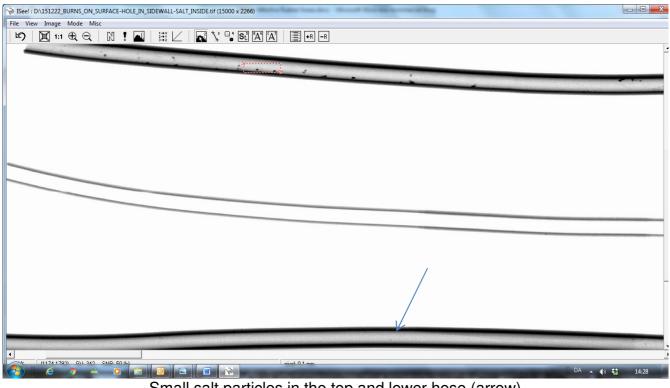


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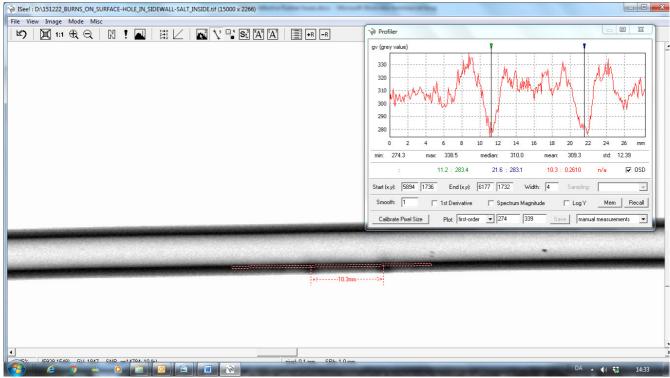
Abundant salt deposits internally to upper hose. The hose in the middle is thinner in wall thickness

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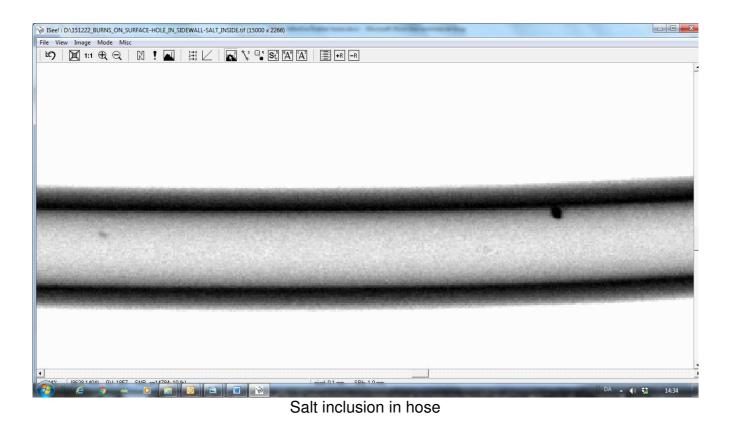
Holes in the wall of the upper and middle hose



Small salt particles in the top and lower hose (arrow)



Dark areas in the wall of the lower hose. Profile line shows irregularities (dips) in the grey level profile (which should be fairly even for an undamaged hose wall)



Rubber hoses - holes and salt internally (part I)

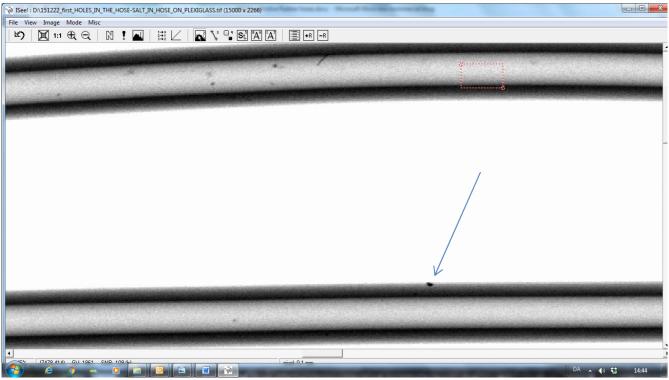


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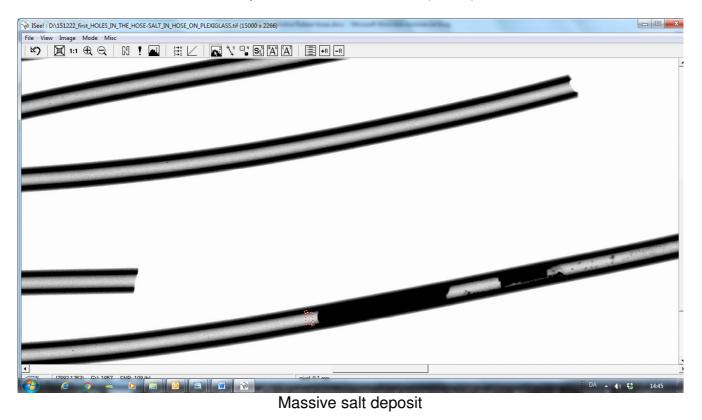
Holes and abundant salt particles in several hoses – left part of image

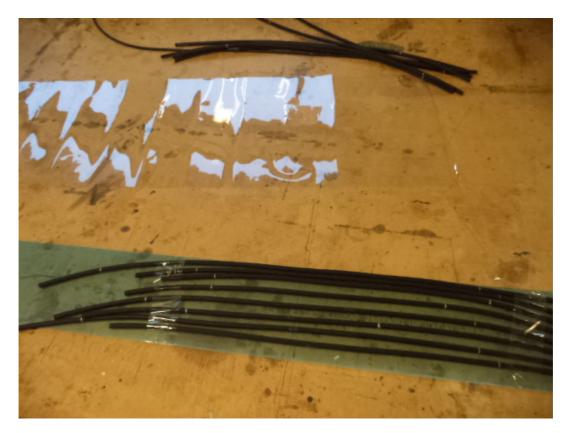
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Holes and abundant salt particles in several hoses - left part of image

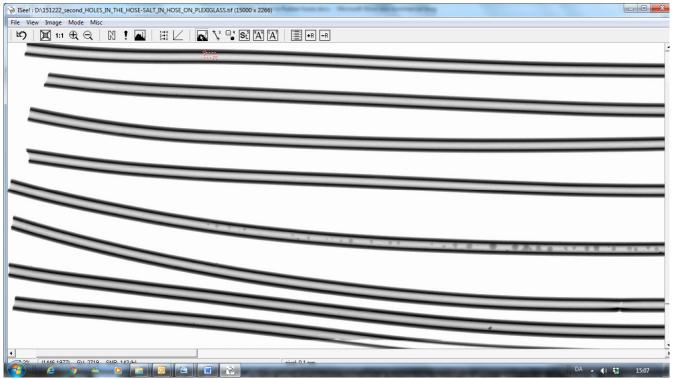


Example of hose with many very small and scattered salt particles, also seen (lower hose) is salt particle on outer surface (arrow).





Rubber hoses - holes and salt internally - II



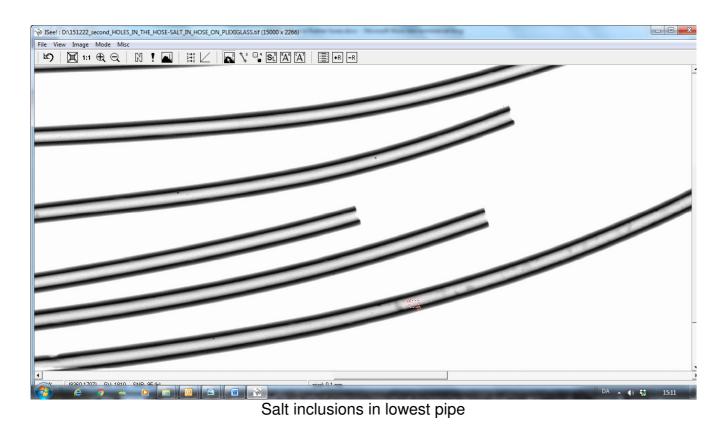
Leftmost part – prominent salt in middle lower hose

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Holes/cracks in all pipes (except the lowest)

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Hole in the lowest pipe (arrow)



Rubber hoses - particles inside hose



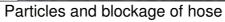
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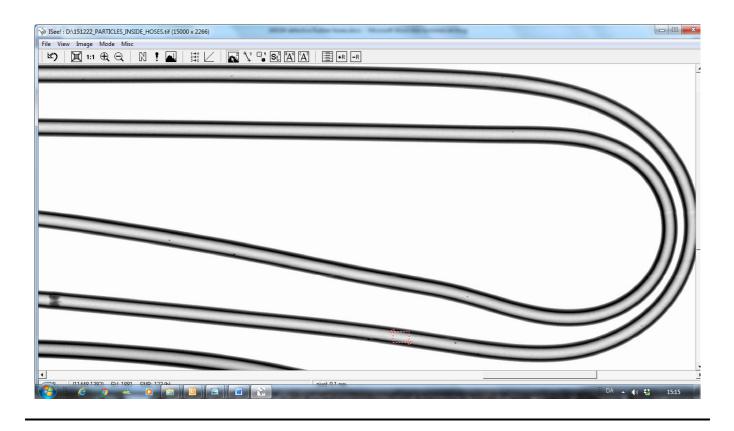
Leftmost part – lowest hose has higher wall thickness. Small particles (eg at arrow)

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Particles and blockage of hose

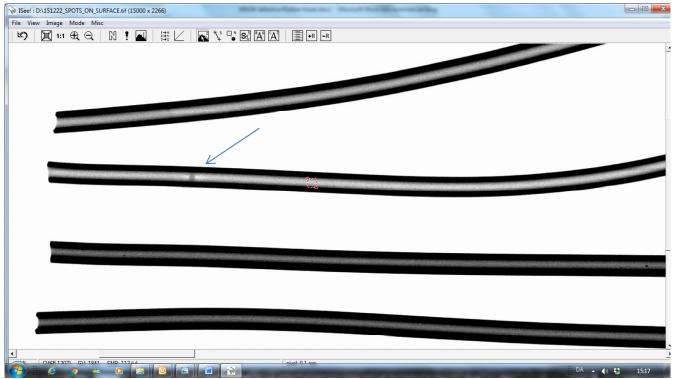
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Rubber hoses - spots on surface



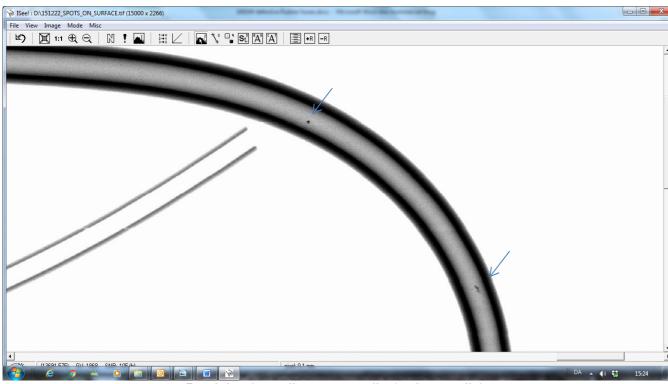
Reduced wall thickness

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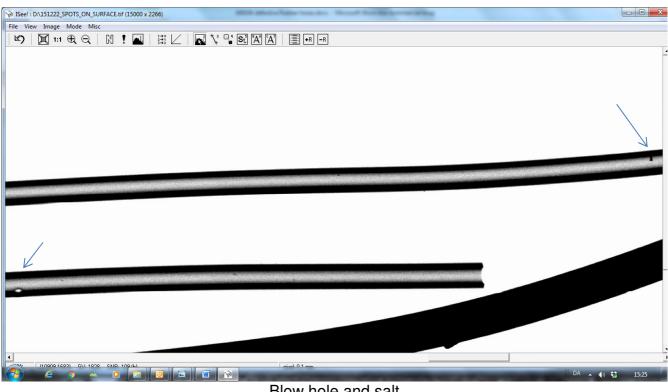
Bottom 3 hoses – leftmost part – these hoses are thicker than the others.

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External dents and deposits and a "blow hole"



Particles in wall or externally (or internally)



Blow hole and salt