

Reliability Comparison Report Genuine Ink and Refill ink Comparison

By Allion Japan Inc

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1. Foreword

Today, the industry has made great progress by providing high quality photo prints. End users expect that the prints result can last without serious change on color appearances. Manufacturers of printers, inks and papers have felt the need to improve the longevity and stability of photo prints. As for the Image permanence objectives targeted by ink makers, some test results on lightfastness, ozone resistance test performed by third-party laboratories have been published in the past years, however, only few publications reported on gas resistance test with the combination of ozone (O₃), nitrogen oxide (NO_x), and sulfur oxide gases (which are atmospheric gases in our environment) to simulate the fading of photo prints.

In order to perform such test in a more realistic environment, Allion has performed a gas resistance comparison test with the combination of 3 gases to compare color fading of photos inkjet-printed by using printer manufacturers' genuine ink and other manufacturers' refill ink.

The following is a summary of the mixed-gas resistance test performed on prints printed with manufacturers' genuine ink and third-party's refill ink.













※Mixed-gas test

Ozone (O₃), nitrous oxides (NO_x) and sulfur oxides (SO_x) are existed in our atmosphere. Those have been reported to have caused color fading of photos. By performing accelerated gas resistance test using mixed gases at a measured ratio similar to indoor air composition, it becomes possible to reproduce inkjet print photos fading in indoor environment. Using accelerated test procedures to perform gas resistance test with a combination of various gases existing in our living environment is called mixed-gas test.

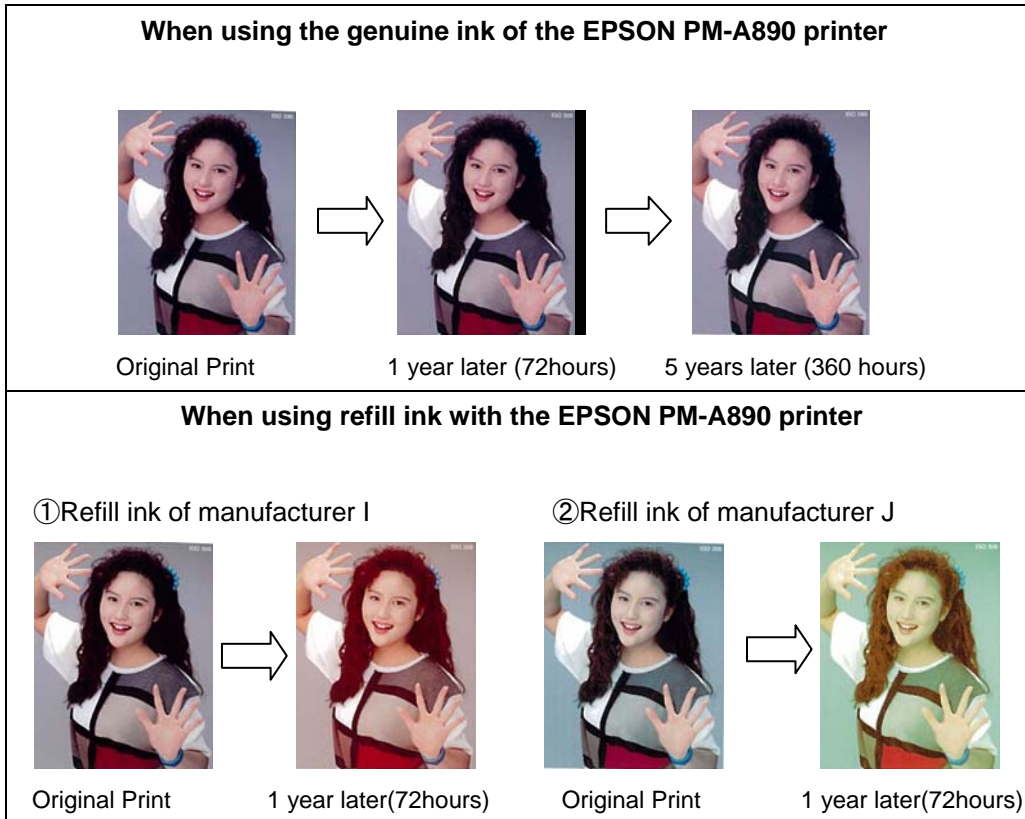
2. Test Summary

The below results were obtained after performing an accelerated mixed-gas resistance test using samples printed by a random pick of popular models of printers in the market today. We will follow the saying “Fading is in the eye of the beholder” and let you judge of the results.

Test Result 1: Gas resistance comparison using sample images printed by Canon PIXUS iP7500 printer

When using the genuine ink of the Canon PIXUS iP7500 printer		
	⇒	
Original Print		1 year later (72hours)
	⇒	
		5 years later (360 hours)
When using refill ink with the Canon PIXUS iP7500		
① Refill ink of manufacturer I		
	⇒	
Original Print		1 year later (72hours)
② Refill ink of manufacturer J		
	⇒	
Original Print		1 year later (72hours)
③ Refill ink of manufacturer K		
	⇒	
Original Print		1 year later (72hours)
④ Refill ink of manufacturer L		
	⇒	
Original Print		1 year later (72hours)

Test Result 2: Gas resistance comparison using sample images printed by EPSON PM-A890 printer



3. Test Method

Test Environment:

- 1) Test Image: "N1A.tif" a standard image of The Institute of Image Electronics Engineers of Japan
- 2) Printers and Papers: We used Canon PIXUS iP7500 and EPSON PM-A890 printer as well as papers sold in the market. Each printer and papers were combined with different manufacturer's ink.
- 3) Test Equipment: Suga Test Instrument Co., Ltd.'s "DS-UV" as Gas corrosion test equipment

Test Condition:

- 1) Gas Concentration: O₃ (Ozone) : 150ppb
NO₂ (nitrous oxides) : 900ppb
SO₂ (sulfur oxides) : 50ppb
- 2) Temperature : 24°C
- 3) Humidity : 60%RH

Duration of the test: 72 hours (equivalent to 1 year), 360 hours (equivalent to 5 years)

An acceleration test of 72 hours results in aging equivalent to one year, and 360 hours to 5 years.

References

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2. Hiroyuki Ogino, Yojiro Kojima, and Takao Yamamoto, “A Study on Digital Photo Image Permanency 2 – Gas Fading Acceleration by Mixed Gas”. Proceedings of “Japan Hardcopy 2004” – The Annual Conference of the Imaging Society of Japan, pp.77 Tokyo Japan (2004).

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