



Product Proving Test Report: Fluid Properties

	Fluid	Date	Recommendation
Fluid ID	62-CA-01	09.06.09	Pass
Fluid Vendor	Picco		
Vendor code	Xaar Pro series		
Xaar code	62-CA-01		
		Author: Tim Wickens	
Printhead	Xaar Proton		

Summary

Test	Pass/Fail	Notes	Page
Viscosity vs. temperature	Pass		4
Viscosity range across set	Pass		
Surface Tension	Pass		5
Surface Tension range across set	Pass		
Speed of Sound range across set	Pass		6
Filtration	Pass		7
Particle Size	N/A		8
Flush Compatibility	Pass	Butoxyethyl acetate recommended	9
UV/visible absorption	N/A		10
FTIR	N/A		13
Storage Conditions	TBA		15

Report No.	Revision	Date	File Name	Location
	A		62CA01 Picco Ink Properties Report	Applications Engineering/Platform 1

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Introduction

Picco solvent inks are manufactured by Pikolitre Kimya for use in Xaar Proton ink printheads as a graphics ink.

This report describes the physical properties of the ink with reference to the ink formulation guidelines for the printhead.

1. Summary Physical Properties

Purpose:

- Standard comparative set of physical properties at 25°C

Method: E200

Test Results

	Method	Cyan	Magenta	Yellow	Black
StretJet Reference		Xaar Series	Xaar Series	Xaar Series	Xaar Series
StretJet Batch		090412-937	090320-925	090415-943	090412-938
Xaar Reference		SA90240	SA90241	SA90242	SA90243
Viscosity (mPas)	E146	9.76	10.4	10.1	10.1
Surface Tension (mNm ⁻¹)	E150/E159	28.3	28.9	28.2	28.5
Density (g/ml) @25°C	E163	0.9655	0.96764	0.96433	0.96744
Density (g/ml) @40°C	E163	0.9509	0.9531	0.9497	0.5278
Speed of Sound (ms ⁻¹)	E094	1281	1291	1283	1281
Filter Time (s)	E206	5,7,7,7,7	3,5,5,5,5	3,5,6,6,6	4,6,6,7,7
A5-A1 (s)		2	2	3	3
pH (aqueous inks)	E142	NA	NA	NA	NA
Conductivity (μS)	E121	0.046	0.126	0.080	0.074

2. Viscosity

Purpose:

- Confirmation of fluid set uniformity
- Required information for determining printhead operating temperature.

Method: E156

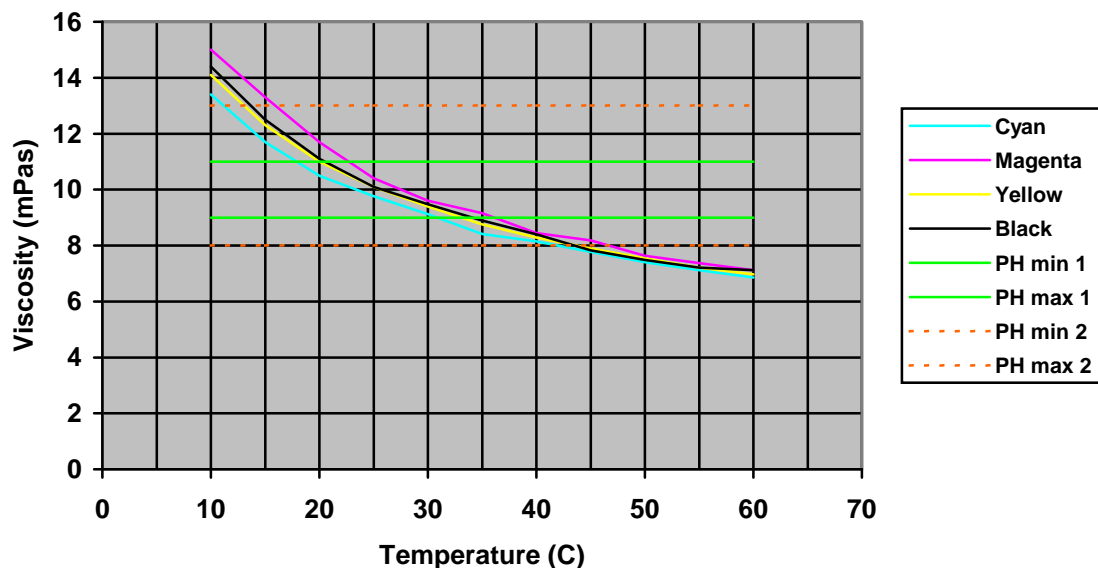
Specification:

- Viscosity at jetting temperature 8 to 13mPas
- maximum range between colours at jetting temperature 10%.

The viscosity range specified applies to the Xaar Proton printhead; the type of ink supply used may limit the actual viscosity range that can be printed.

Results

**Viscosity vs Temperature:
Picco XaarPro ink and Xaar Proton
Guidelines**



PASS - The viscosity of the ink falls within the head specification between 15°C and 42°.

The measured range between inks was 6.15%

3. Surface Tension Purpose:

- Confirmation of fluid set uniformity
- Prediction of printhead wetting related performance.

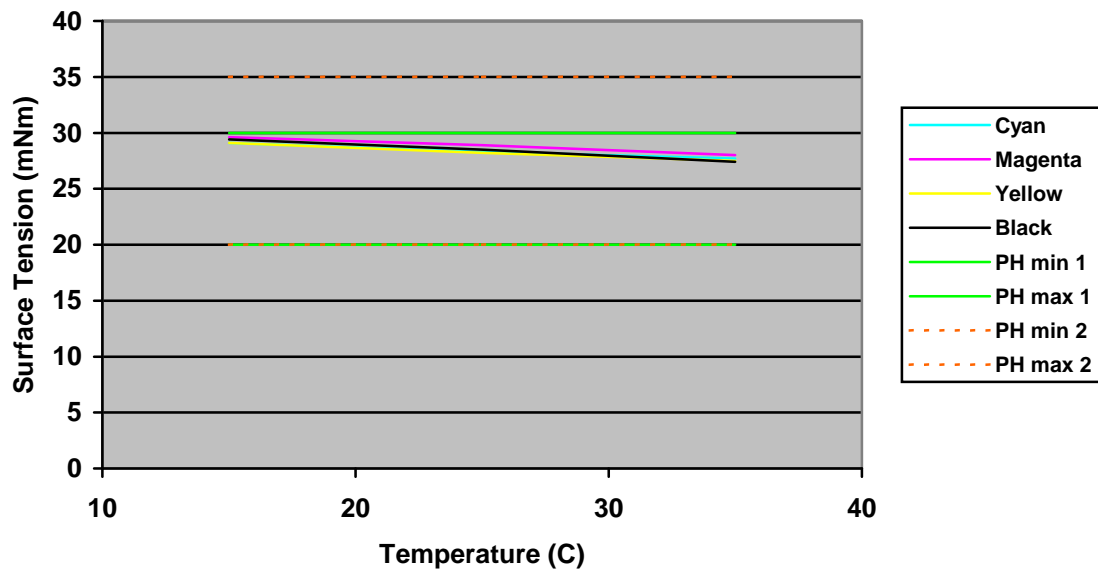
Method: E150

Specification:

- maximum surface tension 35mNm^{-1} .
- maximum range at jetting temperature 5%.

Results

Picco Xaar Pro volatile Inks: Surface Tension vs Temperature



PASS – surface tension is below 35mNm^{-1} .
Measured range across the set was 2.42%

4. Speed of Sound Purpose:

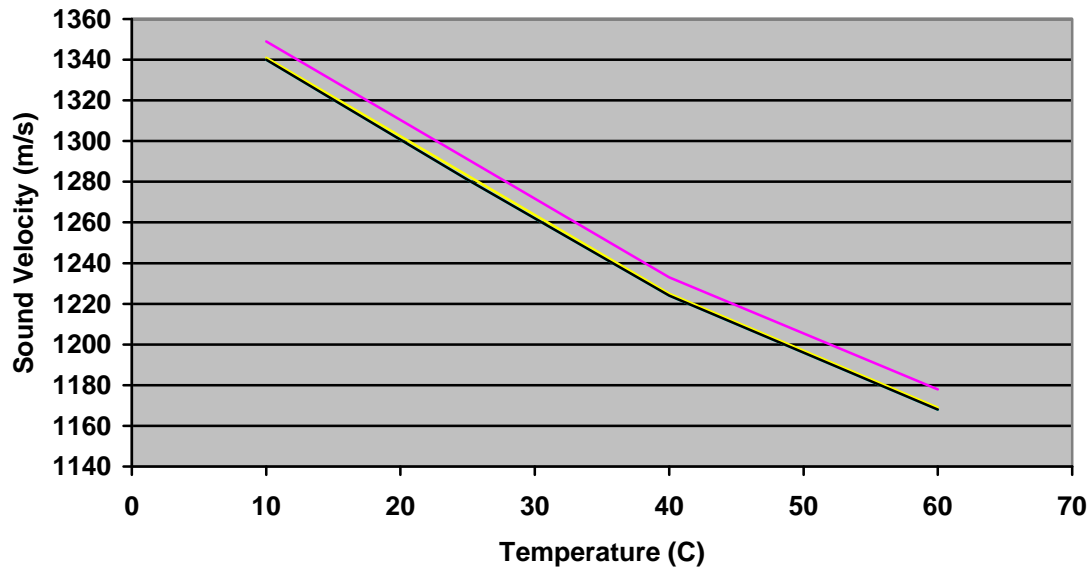
- Confirmation of fluid set uniformity
- Information related to printhead sample clock time.

Method: E094

Specification: maximum range at jetting temperature 1%.

Results

**Picco Xaar Pro volatile Inks:
Speed of Sound vs Temperature**



Pass- the measured range is 0.77%.

5. Filter Test

Purpose:

- Confirmation of particle size.

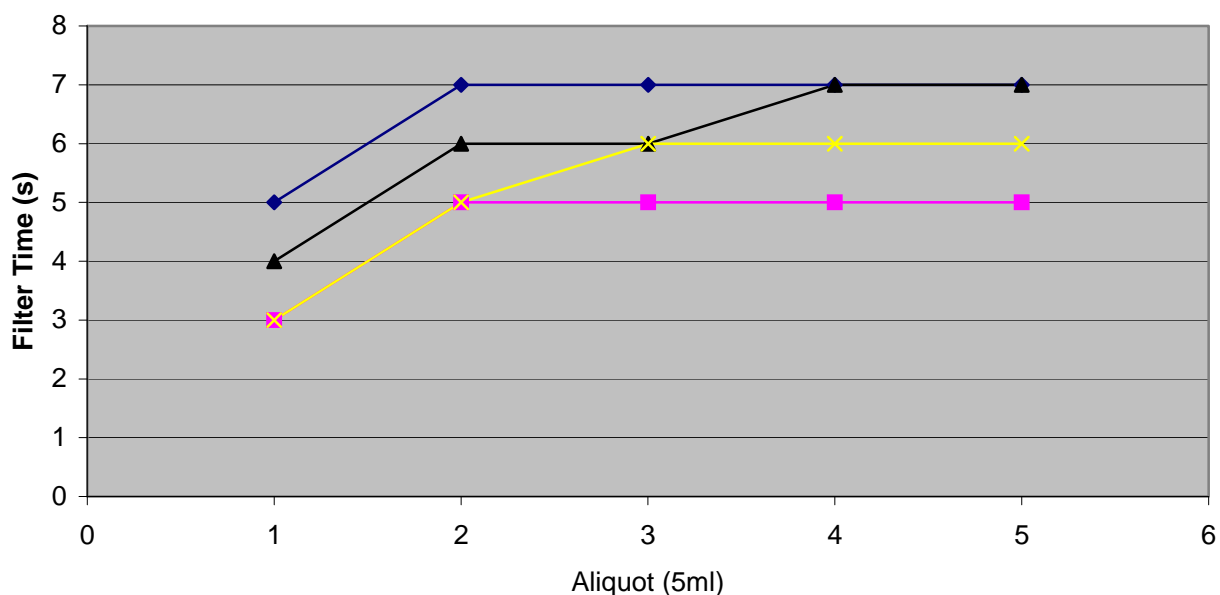
Method: E206

Specification:

- maximum 30s
- A5-A1 <10s

Results

Picco XaarPro Solvent Ink: 5 Aliquot Filter Test



PASS - Maximum filter time 7s

Maximum A5-A1 time 3s

Adjusted for viscosity filter times

Cyan 6,8,8,8,8

Magenta 3,5,5,5,5

Yellow 3,5,6,6,6

Black 4,6,6,7,7

Maximum filter time 8s

Maximum A5-A1 time 3s

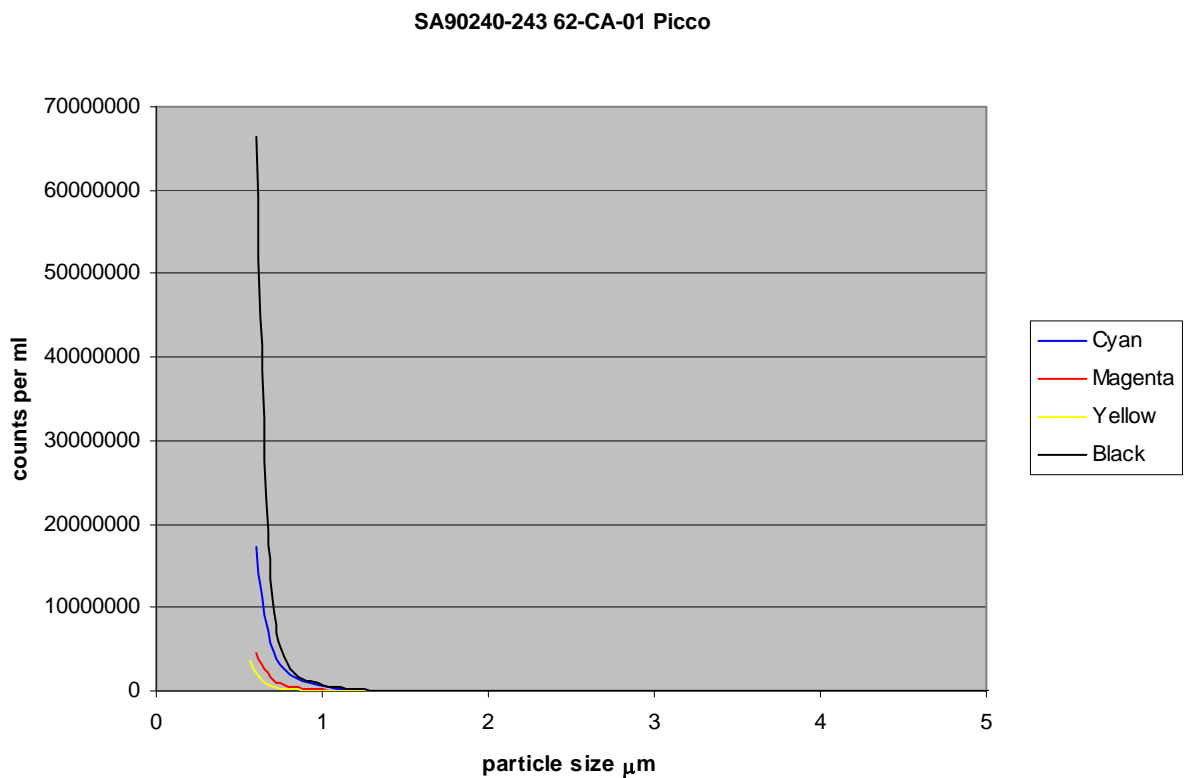
6. Particle Size

Purpose:

- Confirmation of fluid set particle size
- Information related to printing reliability.

Method: E060

Results



Particle counts > 1 micron:

Cyan	265335
Magenta	73867
Yellow	57757
Black	387553

7. Flush Compatibility

Purpose:

- Confirmation of fluid set compatibility with printhead and ink flush

Method: E149

Specification: no flocculation or separation after 1 hour.

Flush compatibility is checked by mixing the ink and flush and examining microscopically after 1 hour for signs of flocculation or separation.

Results

Ink Concentration (%)	Head Flush: EDGA				Ink Flush: butoxyethyl acetate			
	C	M	Y	K	C	M	Y	K
2	OK	OK	OK	OK	OK	OK	OK	OK
10	OK	OK	OK	OK	OK	OK	OK	OK
20	OK	OK	OK	OK	OK	OK	OK	OK
50	OK	OK	OK	OK	OK	OK	OK	OK

PASS – recommended flush is **Butoxyethyl Acetate**

8. UV/visible Absorption

Purpose:

- Confirmation of colour consistency (conformity)
- Obtaining UV ink photoinitiator peaks.

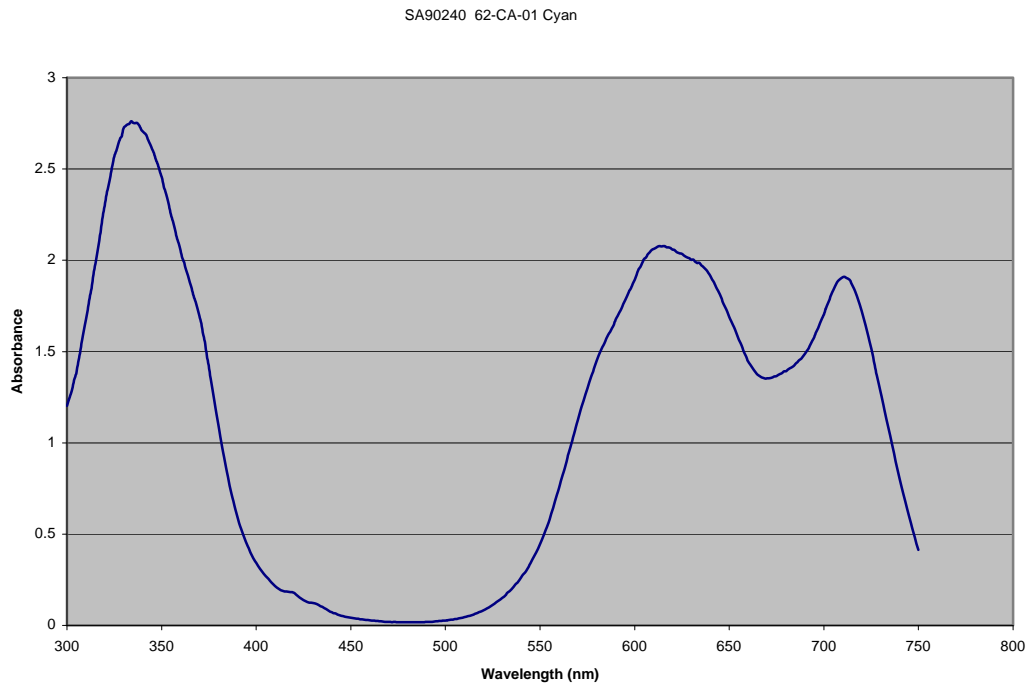
Method: E205

Specification: no specification

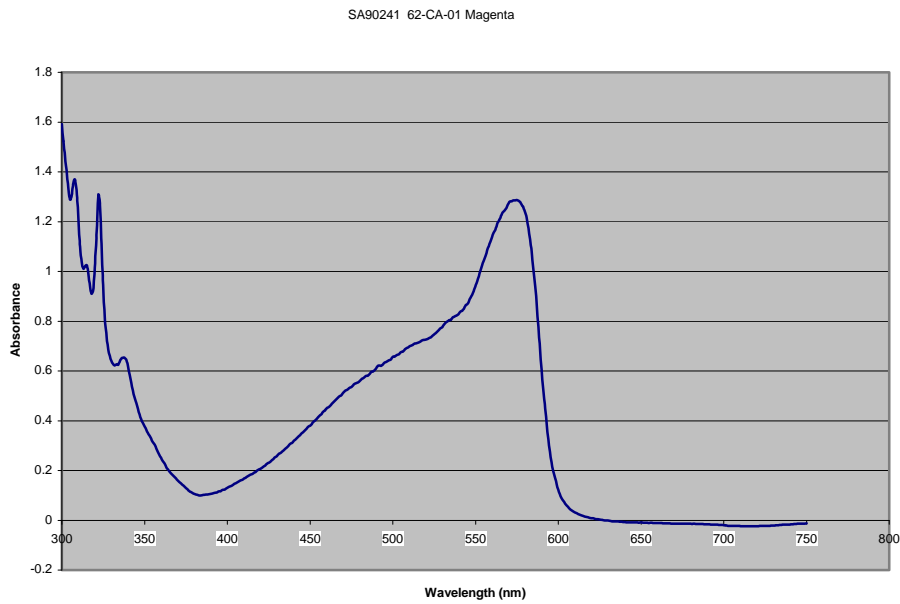
The spectrum of a solution of ink at 0.1% in the ink flush is measured between 150 and 900nm wavelength.

Results

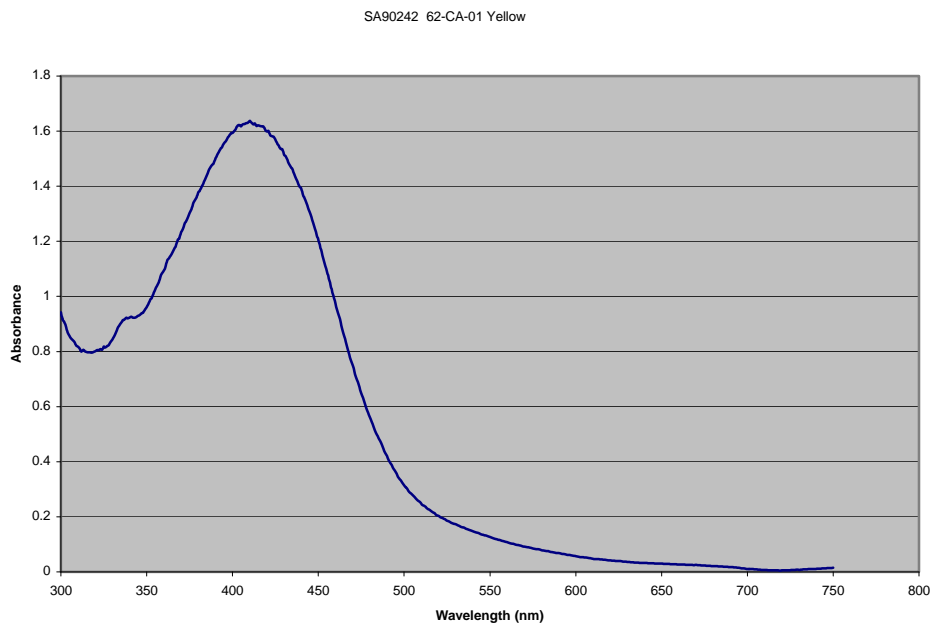
Cyan



Magenta

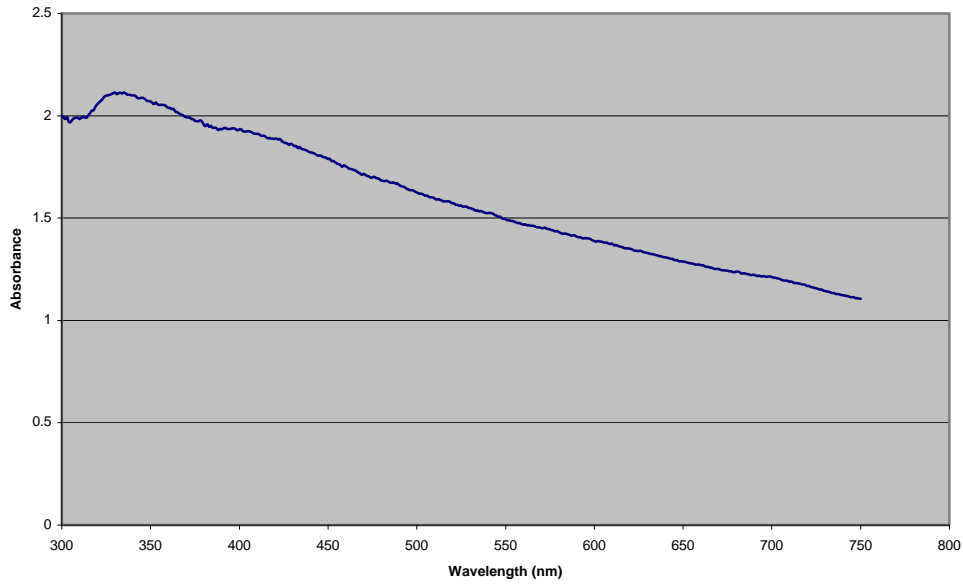


Yellow



Black

SA90243 StretJet 62-CA-01 Black



Peak #	C	M	Y	K
	Peak wavelength (nm)			
1	336	574	413	332
2	617			
3	713			
4				
5				

9. IR Spectra

Purpose:

- Provide ink fingerprint
- Provide information for RMA analysis

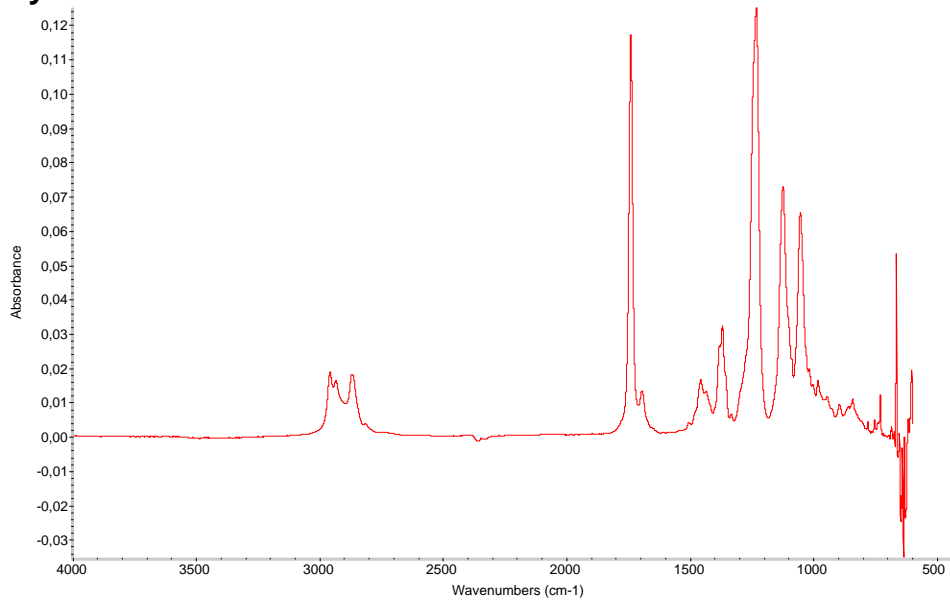
Method: E204

Specification: no specification

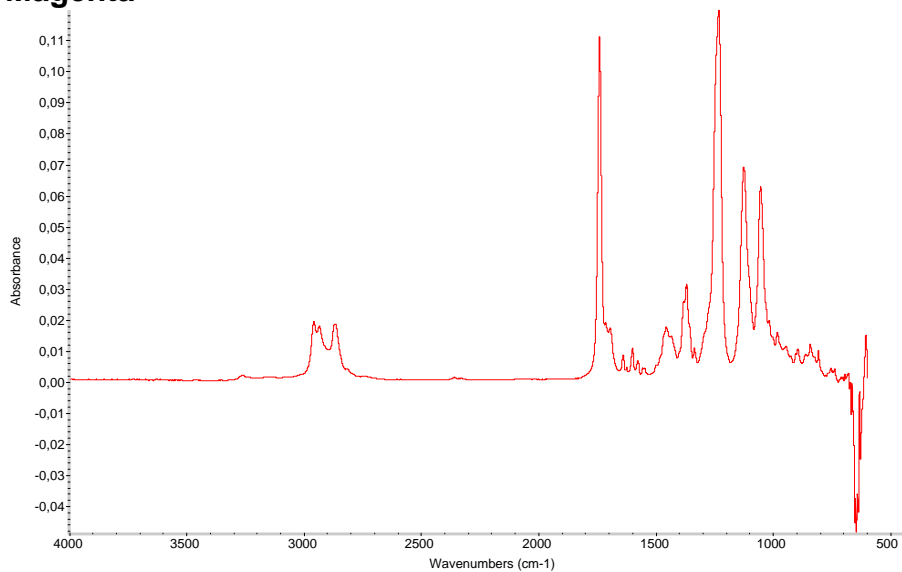
The spectrum of the ink and a dried/cured film of ink is measured using an ATR accessory on a FTIR spectrometer.

Results

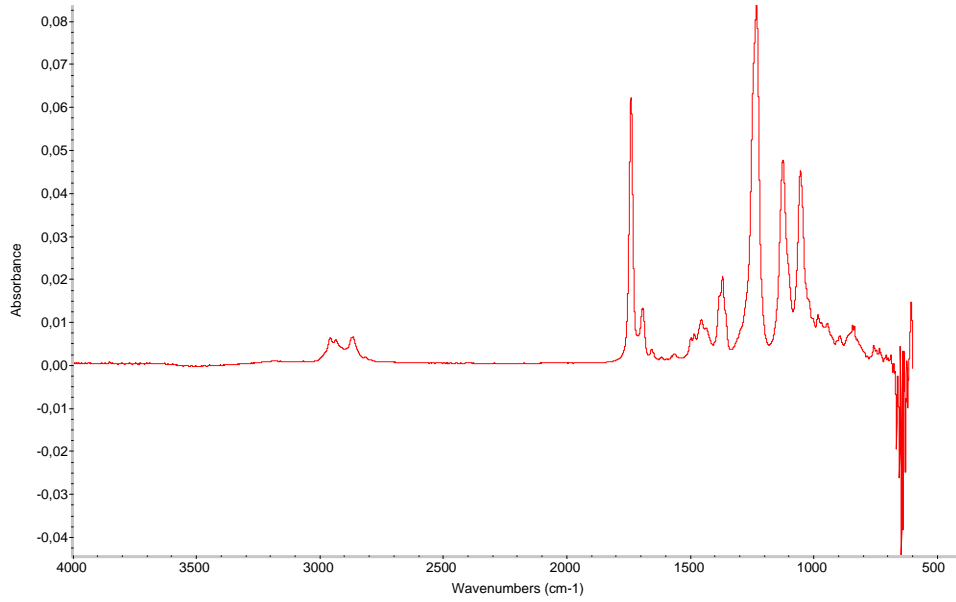
Cyan



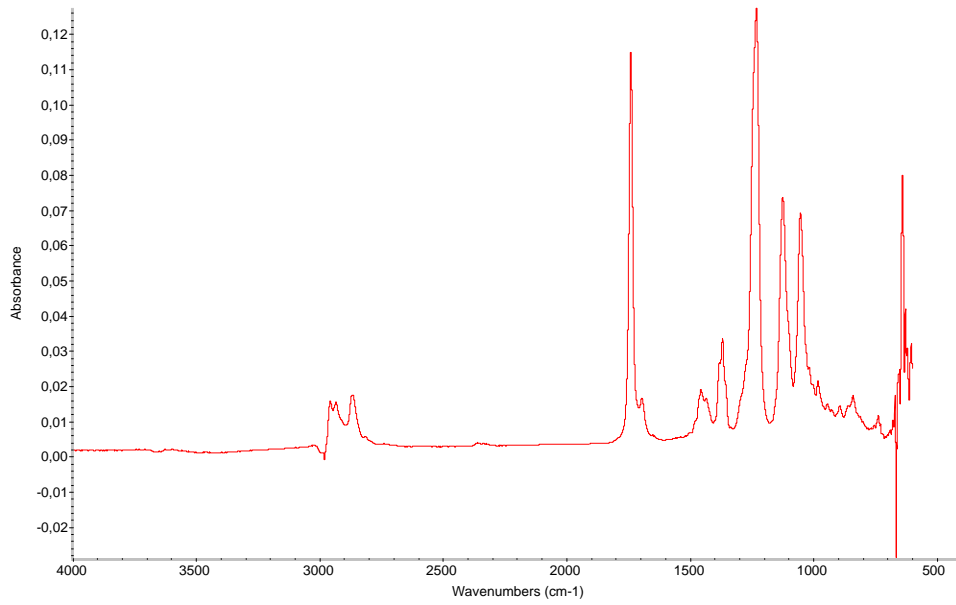
Magenta



Yellow



Black



10. Storage Conditions

Supplier recommendation:

Keep container tightly closed in a dry place at ambient temperature. Minimise exposure to air. Keep away from heat and sources of ignition.

11. Conclusions

The test results indicate that the physical properties of Picco xaar pro Series nk Solvent in the guidelines given in the formulation guidelines.

The ink viscosity is within the specifications of the printhead and should run within the range of 15°C to 42°C, which corresponds to a viscosity range of 8 to 13mPas. This range may be limited by the ink supply system used. The viscosity of the ink set is within the 10% limit

Surface tension is consistent across the set and is similar to other Solvent inks. It is within the range given in the formulation guidelines.

Filtration performance is good.

Speed of sound is consistent across the set.

Flush Compatibility Butoxyethyl Acetate