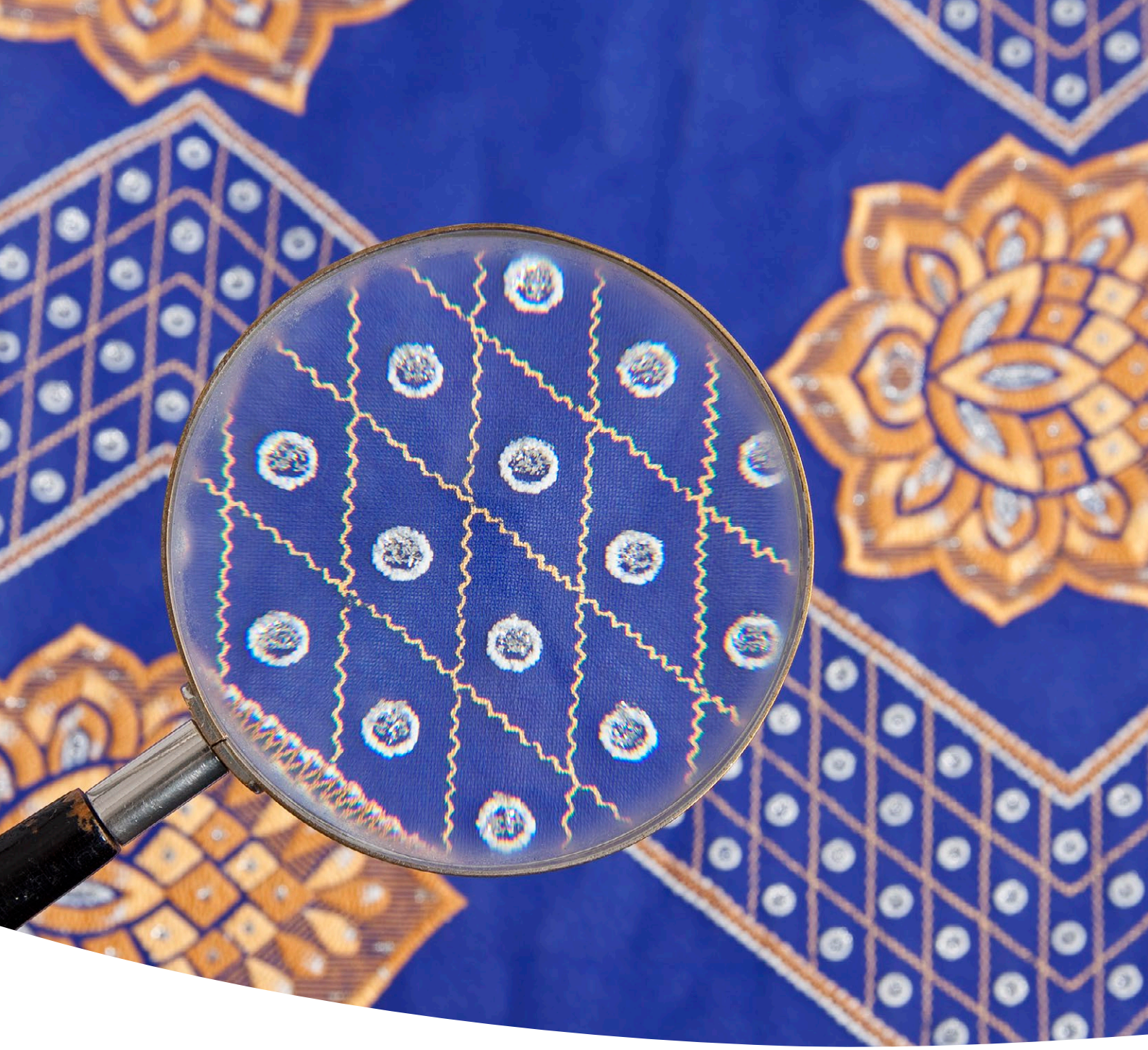

Trouble Shooting Guide for Printing Inks with Expancel® Microspheres

Expancel®

Nouryon

Properties of the Printing Ink

Dispersion

Problem	Cause	Action
Problems to disperse WU, difficulties to achieve a homogeneous dispersion.	• Expancel® microspheres does not hold room temperature - frozen microspheres	• Let the microspheres thaw to room temperature before mixing
	• The mechanical agitator is broken	• We recommend a Silverson mixer (or dissolver)
	• The WU has dried	• Seal the WU bag after use
	• Wrong or too little dispersant	• Add dispersant
The dispersion foams	• Defoamer absent	• Add antifoam agent, e g Nopco/ Foamaster ENA 515
The microsphere settle or flotate in the ink	• Incorrect rheology in the ink	• Add thickener
The microspheres expand	• Too powerful dispersion - heat development	• Decrease the mixing time
		• Check the temperature during the process
		• Cool the preparation container

Color

Problem	Cause	Action
The ink discolors during storage	• Too high pH	• Adjust pH or consider other Expancel® grades
	• Chemical agitation	• Identify the component affecting the microspheres

Print

Problem	Cause	Action
Too "fluffy" print - poor adhesion	• Too much microspheres	• The microsphere content should be 5 to 20 % dry content of total dry content
	• The wrong grade of microspheres is used	• Use 007 WU and decrease the amount to half of what is used with other microsphere grades.
The screen clogs	• Too little glycerine	• Add more glycerine/propylene glycol
	• Unstable binder	• Exchange binder • Filter the ink
Rough print	• The print has not dried before expansion, the water evaporates (boils) which gives a coarser surface	• Let the print dry before expansion
Smooth print	• The ink has dried before expansion	• To achieve a coarser print surface, expand for 0.5–2 min. • Use microspheres with coarser particle size
Poor resistance	• The wrong ratio binder/micro-spheres	• Increase the binder content (binder/microspheres > 3)
	• Poor binder	• Use a binder that can be crosslinked

Expansion

Problem	Cause	Action
Poor expansion	• Too little microspheres in the mixture	• Add more microspheres
	• Too low temperature • Too short time	• Increase the temperature in the process to the recommended sphere temperature
	• The wrong binder - heavily self crosslinking	• Exchange the binder (guide formulations in AG.INK02)
	• Too small deposit	• Identify print process • Increase the solid content of the ink
Too early expansion	• Chemical agitation	• Identify the component affecting the microspheres
	• Heat is emitted when the additives are mixed for too long	• Decrease the mixing time
	• Wrong choice of microsphere grade	• Select a more temperature resistant Expancel® grade

Viscosity

Problem	Cause	Action
Too high viscosity	• The printing ink has been stored too long (durability approximately 4 months in closed container)	• Identify the thickener used
Time-related change in the viscosity of the ink	• Unsuitable thickener	• Identify the amount and type of microsphere and type of thickener used
	• Bivalent metal ions disturb • the thickener	• Use salt-free microsphere grades • Exchange the thickener (with e g RM-825)

Properties of the End Product

Adhesion

Problem	Cause	Action
The prints come loose from the substrate	• Incompatibility between binder and substrate	• Identify the substrate • Identify the polymer in the binder • Exchange the binder
	• Too much microspheres in the ink	• Decrease the microsphere content

Surface

Problem	Cause	Action
Poor delustering	• Overexpansion of the surface layer • Too small microsphere content	• Decrease the expansion temperature • 1–5 % microspheres for delustering
Inhomogeneity (white dots)	• See dispersion	• See dispersion
Surface smoothness	• Moisture content at expansion - higher moisture content gives a rougher surface • Large spheres give a rougher surface and vice versa	• Go through the drying conditions before expansion of the microspheres • Change to a microsphere with suitable particle size

Color

Problem	Cause	Action
The end product is discolored at expansion	• Overheating has occured at the printing process or the heating time has been too long.	• Decrease the temperature or shorten the heating time.
The color of the ink fades at the use of microspheres.	• Volume increase at the expansion of microspheres also gives a dilution of the pigment.	• Increase the pigment content (certain compensation). • Overexpand the microspheres in the surface layer.

Other

Problem	Cause	Action
Not able to create a desired anti-slip effect.	• Too hard binder	• Identify the components of the formulation
	• Too little microspheres	• Dosage of microspheres: 1 to 20 %
	• Another filler in the formula that disturbs.	• Choose soft to medium soft binders.

To find out more about our microspheres, visit our website:
nouryon.com/products/expancel-microspheres

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