

Case Study: Water Based PU

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Background information

- Dimethylformamide, CAS no.: 68-12-2, (DMF, sometimes known as DMF(A)):
 - the organic solvent
 - substance of very high concern (SVHC)
 - included in the candidate list for authorization under REACH
- DMF: harmful, associated with pollution risks and occupational health risk in factory working environment
- As a sustainable company- both under the aspects of product safety and environmental sustainability – Esprit wants to take leadership in the DMF phase out
- Target: shift to 100% water based synthetic leather by 2025



Research project of PU

- DMF phase out: decision was driven by the Esprit Minimum Requirement Steering Committee in June 2016
 - Committee's targets: update and review the company's chemical requirements (RSL&MRSL throughout our hazardous screening methodology) and to establish a strategy to implement these
- Installed trainings within Esprit : product and buying teams regarding new technology, pointing out possible material challenges
- Briefed suppliers: importance of putting effort on more sustainable PU solutions
- Esprit joined technical ZDHC workshops for brands, vendors, PU and chemical suppliers on a pilot project base - to support and encourage exchange for the DMF phase out of the textile industry



Research project of PU

- November 2016: Esprit partnered up with chemical suppliers for technical research: Covestro AG (insqin® technology) and TFL Ledertechnik GmbH (Hydro PU)
- for bags and wallets we concentrated on Covestro partner mills, already successfully using the Covestro insqin® technology.
 - Besides our regular tier 2 audit, based on sustainability (among others: environmental management, waste water, air emission and general waste reduction), chemical management and production process control, we audited these partner mills (located in China) regarding the water base PU production capabilities in terms of a set up evaluation in September 2017
 - we assessed the capability of separated production lines, storage areas, and chemical separation in order to minimize the risk of cross contamination with DMF released from conventional PU production
 - results have been rated and based on this score the water base PU mills were selected for our trials and first bulk production order



Research project of PU

- Trial phase to overcome difficulties based on material characteristics
 - e.g. wrinkle recovery issues during production by choosing the right water based PU materials for selected styles.
 - e.g. embossing failures triggered by different melting points of the water based PU compared to conventional PU- heat and embossing time had to be adjusted
- During the trial phase we enhanced communication between all stakeholders involved: chemical supplier, PU producer as well as point of fabrication of the final product, in order to achieve a successful outcome
- Discussed potential solutions on technical issues with the support of Covestro as chemical supplier, in order to achieve an end product outcome which is fulfilling Esprit's expectations



Trial Phase

- Trial example 1



Unacceptable!!
Wrinkle recovery
problem

Tier 1 feedback :	Still have Wrinkle recovery issue, workmanship may need to be adjusted
Tier 2 feedback :	Need further study on WB raw materials

Trial Phase

- Trial example 2

Unacceptable



Successful trial



Tier 1 feedback :

Trial on different time, pressure and temperature of the emboss process

Tier 2 feedback :

Have to further check with Chemical supplier what material should be suitable to use to fulfil customer requirement.

Current status

- 2018: We have included water based PU in our product line
(with an Esprit audited mill, which is also one of the ZDHC Pilot mills)
- We are supporting and encouraging our suppliers to help us achieving our aim to shift more and more production towards water based PU
- IRMA GROUP, SEASON 08/09 2018, Waterbase PU collection



Verification

- Esprit requests all material supplier to provide full transparency on their entire supply chain
- All chemicals used in the material must be disclosed to Brand, together with all documents support (TDS and MSDS)
- Necessary to provide a Letter of Guarantee for all chemicals included in the recipe to ensure NO DMFa content
- External testing report is required for material



Objectives

- The objective: eliminate DMF based PU material completely in our products by the year 2025
- We encourage the industry to use Water Based (DMF free) in the production processes
- By committing to this project, Esprit is fully ready to take commercial and technical challenges ahead



Case Study

- All details information is summarized as a material case study and published in our Esprit website.
- <https://www.esprit.com/en/company/sustainability/produce-responsibly/responsible-for-the-planet>

MORE SUSTAINABLE SYNTHETIC LEATHER

Synthetic leather, which is generally polyurethane-based, allows us to create leather-like products without using material derived from animal. However, the challenge is that the manufacture of conventional polyurethane (PU) requires a solvent called DMF, which can be hazardous for workers and can pollute the environment. We are working to shift our production from conventional polyurethane to water-based polyurethane that does not use DMF. Our target is to switch all synthetic leather to water-based polyurethane by 2025. To learn more about our research work on DMF-free synthetic leather, please read our [case study](#).

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