BLUCONNECTION INFORMATION | NOVEMBER 19, 2019

THE PRESENT AND FUTURE OF INDIGO IN THE DENIM INDUSTRY

panel discussion bluconnection, dystar, archroma
bluconnection's contribution – questions and answers
kingpins amsterdam, 24 october 2019

moving ahead

BLUCONNECTION
people. passion. projects.

OUR MISSION – EXCERPTS

- we share the passion for indigo and denim.
- among all synthetic colours for textiles indigo is the most fascinating dyestuff to us.
- we are committed to keep indigo and denim relevant in an ever changing world contributing indigo solutions to the denim world.
- we bring people across cultures and countries together who share our values and business ethics and who are committed to achieve business success.
- we take calculated risks to be among the leading companies in our field of activity. we provide internationally acknowledged quality products and services. we encourage creativity, ideas and entrepreneurial and responsible behaviour towards people and the environment.
- we are rooted in reality and reflect and adapt in an ever changing world. we conclude based on facts and best knowledge.
- we are independent and express our opinion if business interests disregard business ethics failing people and the environment.

Q

what is the current image of indigo in the denim industry?

A

denim and indigo are in a symbiotic relationship.

synthetic indigo is a copy of the molecule found in the natural indigo plant. there is no other blue matching the efficiency in terms of colour strength and economy.

historically indigo dyed textiles have been a symbol of luxury. with the synthesis of indigo and first industrial production in 1897 it became the first “democratic” dyestuff available and affordable to everybody.

indigo dyed denim has unique fading characteristics and the blue colour is not too bright and not too dull, pleasing the eye and getting more beautiful every time you wash your pair of jeans. no other colour can deliver this. in contrast to indigo dyed denim we all experience that many of our coloured clothes get dull and disappoint over time.

billions of consumers express their individuality with their indigo dyed pair of jeans making it the most sustainable item in the wardrobe, being often used for a lifetime.

Q

sustainability of indigo: is the industry going to be mostly for pre-reduced forms?

A

outside of china pre-reduced indigo is the leading commercial form already, reducing the CO2 footprint compared to indigo granules/powder considerably.

with more stringent environmental regulations in china a shift to pre-reduced indigo is likely to happen. if all denim mills in china would use pre-reduced indigo approximately 50,000 tons of toxic chemicals could be saved, improving the ecological and CO2 footprint accordingly.

pre-reduced indigo was a major breakthrough in 1993 in terms of quality, environment, health, safety and economy because of following advantages:

- savings in indigo
- savings in chemicals
- reduction in waste water load (less salt)
- improvement in consistency, reproducibility
- improved fastness and deeper shades
- improved industrial hygiene (dust free, automation, better handling, healthier and safer working environment)

Q

what are the main technical and sustainable issues to be tackled?

A

we see several issues in the whole denim supply chain, which need to be tackled.

A 1

issues in the production of indigo:

the current indigo synthesis process is highly efficient and results in a 92-96% indigo concentration. the remaining is water (1%), finishing auxiliaries (2%) and impurities (1-5%).

bluconnection is cooperating with indigo suppliers equipped with the latest process technology as well as efficient waste water and emission treatment assuring best quality raw material for the production of pre-reduced indigo.

we explore various technologies to reduce all impurities in the product to the minimum.

it is important to note that the impurities from indigo are not carried forward to the denim consumer. today indigo impurities are washed off in the after treatment of denim yarn and fabric processing and treated in the waste water treatment plant in the denim mill (no added cost and proven process). if retailer and customer demand a purified indigo product a purification process can be added in the production of pre-reduced indigo (additional cost).

A 2

issues in denim mills:

a fast and big improvement technically and from a sustainability point of view would be the use of pre-reduced indigo in all denim mills globally.

we need to find a replacement for hydrosulfite. biodegradable alternatives (no salt) available in the market have still some limitations.

we need to modify existing dyeing equipment to save water in the washing process and chemicals in the dyeing process. there is already innovative dyeing equipment in the market offering e.g. foam or spray application.

comparing the substancial amount of water used to grow 1 kg of cotton, for dyeing of 1kg of denim approximately 5-6 l of water are being used.

A 3

issues in laundries:

the laundry processes are using significant amounts of water and chemicals and even latest laser technologies are still generating substantial waste.

there are new technologies being developed. to raise awareness bluconnection is starting a cooperation with tonello to provide transparent and traceable information to the industry and consumers. to put water consumption into perspective: growing cotton is by far the major water consumer. to grow 1 kg of cotton 5,000 to 20,000 l of water is required. with latest laundry technology (e.g. tonello) for 1 kg of jeans approximately 5 -15 l of water is required.

A 4

issues with retailers:

we have to consider consumer behavior and fashion cycles driven by the retail industry.

from a sustainability point of view the fast fashion industry is the biggest issue in the denim supply chain due to super fast fashion cycles and waste generated from unsold collections.

from our chemical producer point of view our request to retailers and brands is to ask for responsible and realistic requirements from their supply chain based on knowledge and not for marketing reasons to edge out competitors (“green washing”). discussions about aniline free indigo and/or aniline free denim as a marketing tool is irresponsible and irritating to the consumer. it harms the entire industry and drives consumers away from denim, a proven and safe textile for more than 100 years. the textile industry is already under enough scrutiny and we suggest not to create “home-made” problems for a short-dated marketing purpose.

we recommend to go back to the roots and wear true denim – just indigo dyed with a minimum wash. also recycling and upcycling should be a driver and should not become a marketing bubble.

we suggest to buy less and get quality and value to enjoy longer.

Q

do we have a monopoly of indigo raw material?

A

actually it is an oligopoly. in 2018 the shortage of indigo was a major issue with increasing prices. due to environmental issues all indigo producers in china were forced to close temporarily, in the meantime most of them relocated to inner mongolia in china.

they are checked and inspected frequently to ensure compliance with latest environmental and safety regulations.

since mid of 2019 prices started to drop considerably and are now back to competitive levels.

Q

what would be the definition of "better" indigo?

A

indigo is indigo, a very well known and defined chemical substance with unique characteristics as mentioned before. all other dyes behave different and are more costly.

any attempt to "better" or change indigo will end up as somewhat else than indigo. see all the unsuccessful attempts with sulphur dyes since many years to replace indigo.

we are open to alternatives based on natural indigo and bio-engineered indigo. we also explore alternatives for pre-reduced indigo to be produced by other technologies.

we should bear in mind that the final instance is the customers preference.

Q

could denim go forward without indigo?

A

we believe that denim and indigo are in a symbiotic relationship.

Q

which is the current situation of the indigo in the denim industry: is it still the "king of dyes"?

A

yes. until 1897 for the privileged upperclass and since then for all.

Q

which are the main challenges, threats for the indigo to overcome in order to stay as dyestuff reference in denim?

A

the only threat we see are mislead consumers based on fake information. it is sad that even a chemical competitor is feeding the supply chain with irritating

information to gain an edge. this is bad for the denim supply chain and bad for the reputation of the already challenged reputation of the textile dyestuff industry.

Q

is there room for innovation in indigo? Where do the main efforts need to be made – type of synthesis, raw materials, final commercial from..?

A

yes. innovation never stops.

Q

can natural indigo be a realistic competitor to synthetic indigo? why not?

A

this year at the indian denim fair in bangalore we had an interesting discussion with a producer of natural indigo and we got some data regarding the cultivation of the indigo plant and its yield. we figured out that it needs to convert nearly 10% of all agricultural area in india in order to replace synthethic indigo globally.

there are some interesting features in growing indigo plants: it allows 2 crops per year, one season for indigo and second one for another agricultural product. the indigo plant belongs to the family of leguminosae, which are capable to gain fertilizer (nitrate) for the ground out of atmospheric nitrogen.
up to now all natural indigo goes into artisanal application where the purity of the product does not matter. only 1/3 of a typical natural indigo product consists of indigo. the remaining is dried plant material. for artisanal products it is fine, at present in a big scale it is not a viable option.

Q

what do you think about the information given by brands and published by some specialised press on indigo?

A

the information by brand and press should be more knowledge based and factual. chemistry is science and not a playground for tabloid press. there is too much show-manship without real substance. this is not only true for indigo, but we may refer to the discussion and marketing about organic cotton.

unfortunately some of the technical literature is in continuous decline, specialised press becomes more mainstream and is mainly interested in sellable stories.

AWARD CEREMONY SPEECH 1/3

In regard to von Baeyer's work, Professor A. Lindstedt, President of the Royal Swedish Academy of Sciences, made the following statement, on December 10, 1905

A characteristic feature of chemical science is the close interaction between theory and practice, between pure science and technology, which is here assuming ever greater importance. This feature became especially prominent during the last decades of the nineteenth century. Many a time has a reaction, carried out with small quantities of substances in the research worker's test tube, by being correctly evaluated and systematically applied, achieved a revolution in the chemical industry, and in such fashion that emphasis has shifted from one industrial centre to another, or that completely new branches of industry have been created.

One such new branch which was hardly dreamed of fifty years ago, but which now provides work for many thousands and spreads its products all over the world, is the preparation of organic dyestuffs from coal tar.

Among the living research workers who have contributed directly or indirectly to the unique development of the tar-dyestuff industry the place of honour goes to the Professor at Munich University, Adolf von Baeyer, for his researches into the composition of indigo as well as into the triphenyl methane dyestuffs.

AWARD CEREMONY SPEECH 2/3

Indigo, the gorgeous pigment of the indigo plant, has been considered the most important of all organic pigments on account of its beauty and colour fastness,.... To reproduce the pigment by synthetic methods and make it more easily obtainable was therefore an exceptionally inviting task for chemical research.

The complex and unique composition of indigo, however, made this also one of the hardest of tasks. Here there could be no question of one of those casual discoveries, which by happy accident seem to achieve half the work. Years of work were required for even von Baeyer's acumen and experimental skill to achieve the necessary insight into the pigment's chemical composition and to be able to manufacture it from simpler constituents. Even after the purely scientific part of the work had been completed it still took a number of years to make the results obtained from research applicable to technology.

AWARD CEREMONY SPEECH 3/3

Von Baeyer succeeded in producing indigo synthetically in three principal ways, namely from ortho-nitrophenylacetic acid, from ortho-nitrocinnamic acid and from ortho-nitrobenzaldehyde and acetone. This paved the way for the reproduction of indigo from raw material obtainable without much difficulty from coal tar. And if the problem of producing indigo industrially has now been solved from the technical as well as the economic point of view, this is entirely due to von Baeyer's basic work in the fields in question.

The result is striking. Already the price of indigo has fallen to a third of its former price, and Germany's export of synthetic indigo in 1904 could be valued at over 25 million marks. This shows that the synthetic product has been able to compete with decisive success against the natural product. The effects of this discovery, which was made in the Munich University laboratory, can already be traced as far as the banks of the Ganges, and the time is probably not far distant when the immense fields, which up to now have been used for cultivation of the indigo plant will instead become available to produce cereals and other foodstuffs for India's starving millions.

www.bluconnection.com

BLUCONNECTION

people. passion. projects.