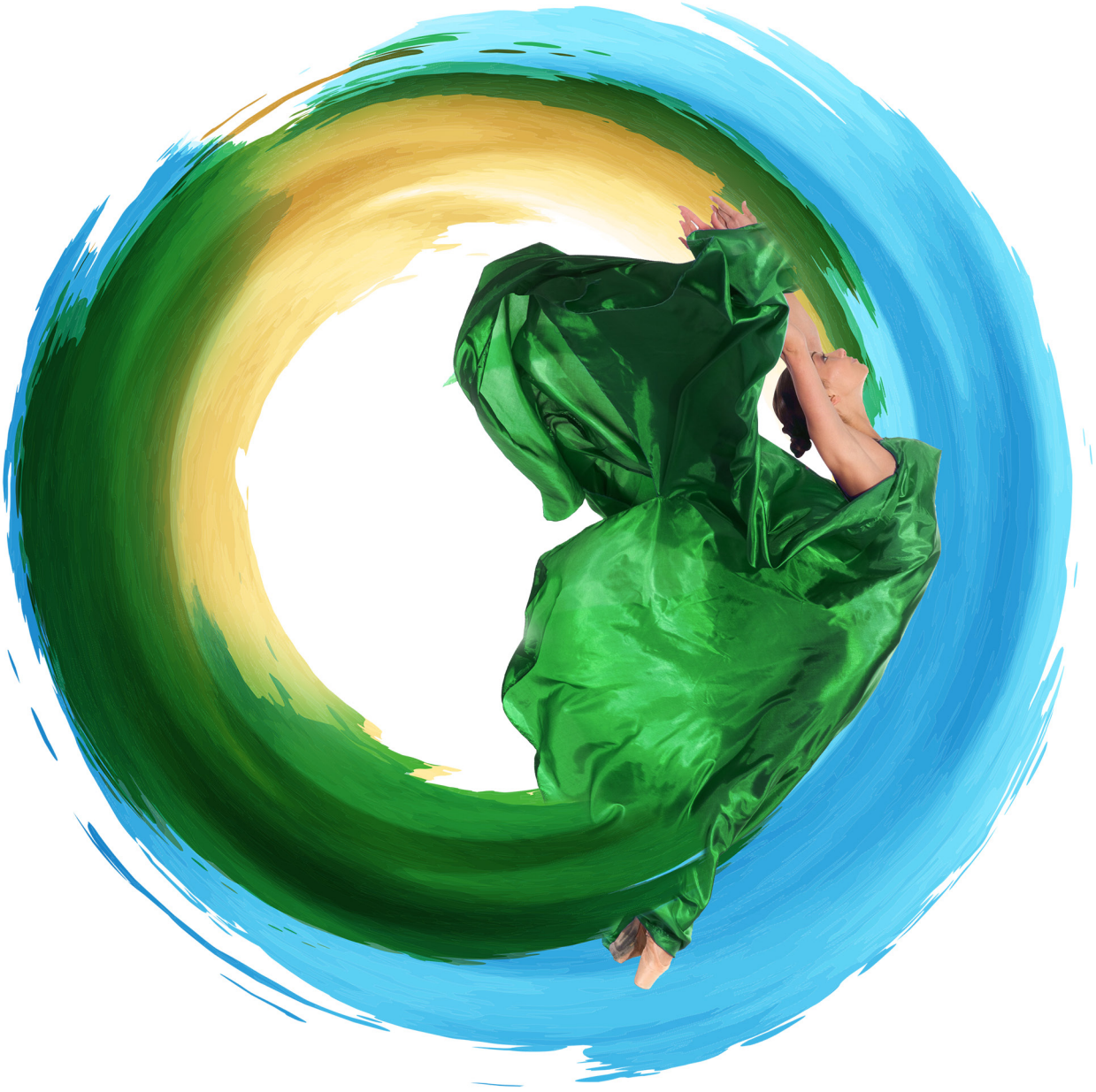
DyStar®



Committed to Sustainability

SUSTAINABILITY PERFORMANCE REPORT 2017 – 2018

PLAYING A ROLE IN THE CIRCULAR ECONOMY

At DyStar, researchers are exploring new frontiers to support the burgeoning circular economy. DyStar understands that for an item of apparel to be truly safe for recycling or reuse, the colors embedded in its threads also have to be safe.

Twenty eight of DyStar's dyes currently enjoy GOLD-level Material Health certification from the The Cradle to Cradle Products Innovation Institute. The certificate guarantees that no substance present in the formulation of C2C listed products, at concentration of 100 mg/kg or higher, poses risks to people or the environment during the dye application process, throughout the use phase of a clothing item, and even after disposal.

DyStar's responsible dyes mean you won't have to second-guess or compromise your color palette - or fabric type - when you're designing your next collection. Dianix® for polyester; Remazol®, Indanthren® and Levafix® for cotton come in a range of colors; and Realan® Black is made for dyeing of cashmere, wool and silk. There's also an alternative to traditional indigo powder dye: DyStar Indigo Vat 40% Solution for cotton. All of these dyes are already available, just ask for them at your DyStar representative.

TABLE OF CONTENT

ABOUT DYSTAR

02 Data at a Glance
03 Key Performance Indicators
04 Letter from our CEO
06 Our History
06 Our Economic Performance
07 Our Core Values
08 Our Core Products
10 Textile Effects and Labels
11 Our Service Divisions
12 Our Governance Structure
14 Ethics and Compliance
16 Leadership Close Up | Xu Yalin

ABOUT THIS REPORT

58 Methodology
59 Materiality Matrix
61 GRI Content Index
66 UN SDG Index
68 UNGC Index

OUR COMMITMENT

APPROACH TO SUSTAINABILITY

18 Applying the 4 C's Across our Value Chain
18 Environmental Compliance
18 Driving Sustainability from the Top
19 Embedding Sustainability

CREATING RESPONSIBLE PRODUCTS & SERVICES

20 From Product Stewardship to Sustainability Services
20 Product and Marketing Compliance
20 Product Stewardship Across Our Value Chain
20 Product Design
21 Green Chemistry
22 Responsible Sourcing
23 Supplier Sustainability
24 The UN SDGs Across DyStar's Value Chain
26 Leadership Close Up
Dr. Anette Weber and Dr. Christine Lorkowski
28 Modules Making an Impact
30 Products with a Difference
32 Guest Interview with China Water Risk
34 Enabling Sustainability Across Our Value Chain
36 Leadership Close Up | Omar Orrego and Dr. Siva Pariti

CONSERVING PLANETARY RESOURCES

38 The 2020 Target
38 Scope and Methodology
38 Water
39 Wastewater
40 Energy
41 GHG Emissions
42 Leadership Close Up
Dr. Clemens Grund and Dr. Qin Deng
44 Materials, Waste and Packaging
45 Sustainable Packaging and Logistics
46 Leadership Close Up | Theresa Hyde

CARING FOR PEOPLE

48 Our Employees
48 Skills Enhancement
49 The Year in Highlights
50 Diversity and Equality
50 Employee Health, Safety and Well-being
52 Human Rights
52 Community Engagement

COMMUNICATING WITH STAKEHOLDERS

54 Staying Involved and Connected
55 Building Sustainable Relationships: Engage, Listen, Respond

DATA AT A GLANCE

ECONOMIC (MILLION USD)	2015	2016	2017
Global Revenue	898.05	871.35	1,016.19
Asia	416.23	414.61	453.59
Europe	236.35	230.23	240.1
Americas	245.57	226.51	322.51
Global Operating Costs	670.57	652.34	765.48
Asia	420.06	429.61	461.78
Europe	138.64	124.06	137.46
Americas	111.87	98.67	166.24
Global Employee Wages and Benefits	100.51	108.93	133.21
Asia	43.26	46.09	47.62
Europe	35.58	38.39	42.23
Americas	21.67	24.45	43.36
Payments to Providers of Capital	3.98	7.47	6.07
Payments to Government	26.32	26.48	27.37
Economic Value Retained	96.67	76.13	84.06
ENVIRONMENT[1]			
Raw Material (thousand tons)	108.53	132.66	137.45
Raw Material Usage Intensity (tons per ton production)	0.77	0.79	0.79
Packaging Material (thousand tons)	5.71	5.53	6.69
Associate Material (thousand tons)	1.42	1.74	1.55
Direct Energy Consumed (TJ)[2]	362.38	673.8	631.56
Indirect Energy Consumed (TJ)	878.29	924.47	1,018.79
Energy Consumption Intensity (GJ per ton production)	8.52	9.28	9.33
Water Withdrawal (million m^3)	6.91	7.6	7.8
Water Withdrawal Intensity (m^3 per ton production)	48.97	45.05	45.07
Water Reused (million m^3)	1.73	1.80	1.97
Direct GHG Emissions – Scope 1 (thousand tCO_2e)[3]	21.06	39.26	35.96
Indirect GHG Emissions – Scope 2 (thousand tCO_2e)	105.38	117.44	125.88
GHG Emissions Intensity (tCO_2e per ton production)	0.865	0.905	0.914
Wastewater Discharged[4] (million m^3)	1.67	2.17	2.04
Wastewater Intensity (m^3 per ton of production)	13.40	14.29	12.86
Hazardous Waste (thousand tons)	5.95	6.84	5.87
Non-hazardous Waste (thousand tons)	3.64	3.85	4.25
Overall Waste Intensity (kg per ton production)	75.32	71.43	66.61
Number of Spills, Total Amount Spilled[5]	2 spills, 22 tons	0 spills, 0 tons	2 spills , 3 tons
Environmental Protection Expenditure (million USD)	6.81	10.31	8.00
SOCIETY[6]			
Number of Senior Management Staff	106	92 (17)	119 (24)
Number of Middle Management Staff	317 (105)	333 (115)	322 (100)
Number of Admin / Support Staff	588 (312)	612 (292)	671 (358)
Number of Technical Staff	418 (148)	363 (146)	457 (184)
Number of Production Workers / Supervisors	615 (11)	700 (46)	779 (26)
Total Workforce	2,044 (595)	2,100 (616)	2,348 (692)
Percent of Total Workforce Aged 18-29	-	11.2% (3.7%)	9.6% (3.7%)
Percent of Total Workforce Aged 30-49	-	69.0% (19.9%)	65.6% (17.5%)
Percent of Total Workforce Aged 50-64	-	18.3% (4.1%)	23.6% (5.2%)
Percent of Total Workforce Aged 65 and Above	-	1.5% (0.9%)	1.2% (0.2%)
Rate of New Employee Hires (Ages 18-29)	-	3.3% (1.4%)	3.5% (1.5%)
Rate of New Employee Hires (Ages 30-49)	-	5.7% (2.3%)	5.4% (2.8%)
Rate of New Employee Hires (Ages 50-64)	-	0.8% (0.3%)	0.8% (0.3%)
Rate of New Employee Hires (Ages 65 and Above)	-	0.0% (0.0%)	0.1% (0.0%)
Overall Rate of New Employee Hires	-	9.7% (4.0%)	9.8% (4.6%)
Employee Attrition Rate (Ages 18-29)	-	2.9% (1.5%)	2.6% (0.8%)
Employee Attrition Rate (Ages 30-49)	-	5.8% (1.9%)	4.4% (1.7%)
Employee Attrition Rate (Ages 50-64)	-	2.0% (0.7%)	1.8% (0.2%)
Employee Attrition Rate (Ages 65 and Above)	-	0.1% (0.0%)	0.4% (0.1%)
Overall Employee Attrition Rate	-	10.8% (4.1%)	9.2% (2.8%)

[1] New locations do not comprise more than 10% of DyStar's overall energy profile. Hence figures from 2011 to 2015 have not been retrospectively revised to accommodate sites acquired in 2016.
[2] 2016 figures for direct energy consumption and overall energy intensity have been retrospectively corrected to reflect the extent of the increase in on-site fuel consumption resulting from the acquisition of newer production sites.
[3] 2016 figures for Scope 1 greenhouse gas emissions and overall emissions intensity have been retrospectively corrected to reflect the extent of the increase in direct (on-site) emissions resulting from the acquisition of newer production sites.
[4] Depending on the physical and chemical nature of wastewater produced, the various stages of treatment are completed on-site and/or externally by an authorized third-party
[5] Significant spills reflect only spills that affected soil or water surfaces.
[6] Non-bracketed figures under Society include all employees. Where information is available, statistics for women employees are displayed in red brackets ( ).

KEY PERFORMANCE INDICATORS

CREATING RESPONSIBLE PRODUCTS AND SERVICES

500
regulated or restricted substances monitored through econfidence

671
textile customers trained in chemical management and Higg FEM 3.0 preparation

771
textile mills audited for chemical risk and textile processing

4,000
ColorWall™ reference available for better right-first-time performance

370,000
samples tested for eco-parameters since 1994

20
positive lists, e.g. for compliance to brand and retailer Restricted Substances Lists (RSLs)

6,470
DyStar substances pre-registered with REACH®

1,120
bluesign® approved DyStar products

2,200
DyStar products compliant with ZDHC MRSL 1.1

2,200
DyStar products approved for use on Oeko-Tex® Standard-compliant articles

CONSERVING PLANETARY RESOURCES

⬇ 7%
Energy Intensity
2017 vs. 2011

⬇ 9%
Emissions Intensity
2017 vs. 2011

⬇ 39%
Water Intensity
2017 vs. 2011

⬇ 30%
Wastewater Intensity
2017 vs. 2011

⬇ 21%
Raw Materials
2017 vs. 2011

⬇ 25%
Waste Intensity
2017 vs. 2011

⬇ 19%
Customer Packaging Reconditioned and Reused

2 million m³
Volume of Water Reused

CARING FOR PEOPLE

0%
work-related fatalities

40%
below industry average lost days injury rate

20,091 hrs
in staff training

28%
of management roles held by a women

80%
return-to-work rate after maternity leave

280,000 m³
of water provided to communities at no-cost since 2011

205 hrs
worked in volunteering

36 scholarships
provided to elementary school students

5 kg
of rice donated to each family in the village of Gabus, Indonesia

100%
of business locations audited for corruption-related risks

LETTER FROM OUR CEO

I am honored to present DyStar's 2017 Sustainability Performance Report, our eighth report describing the company's progress in sustainable business practices. As a trusted provider of colorants, auxiliaries and sustainability services, DyStar is uniquely placed to support textile producers, brands and retailers who are also seeking a more sustainable way to operate. In this report, we discuss our experiences in trying to drive positive change both within our own operations, as well as those of our closest stakeholders. As in previous reports, we lay bare the challenges and opportunities that our departments have encountered as the company continues to strive for a new and sustainable balance in these changing times.

DyStar reaffirms its commitment to the United Nations Global Compact (UNGC) principles and aims to uphold the highest ethical standards in the ways we interact with all our stakeholders. This report serves as DyStar's formal Communication of Progress (COP) to the UNGC principles. Across the world, 2017 saw the continued drive for broader integration of the landmark 2016 Paris Agreement and the United Nations Sustainable Development Goals (UN SDGs). DyStar continues to make concerted efforts to link our sustainability program with the global development goals, particularly in areas where DyStar can contribute significantly through its unique research and development capabilities.

The industries that we cater to continue to be affected by a changeable political, economic and regulatory environment. This has affected the demand for consumer goods in some geographical regions. Many companies involved in the textile dyes and chemicals industry continue to have difficulty adjusting to these global trends. China and India are evolving into world leaders in sustainability and the rapid change in regulations and enforcement practices have caught more than a few companies unprepared. While we and our peers continue to work through some of these newer requirements, it is becoming apparent how interconnected and interdependent all the businesses operating along the value chain can be. An impact on even one supplier's ability to operate has the potential to send shockwaves across that chain. We are coming to the realization that it is imperative for the entire industry to improve collectively, not individually, and our ability to do so may determine the long-term profitability of the industry as a whole. It is my belief that effective partnerships coupled with stronger support and incentivization from leading companies within this industry could be key to creating a new – and much needed – equilibrium.

DyStar credits its continued growth, despite the challenges faced by the industry, to its decade-long drive to create safer dyes and chemicals. In 2017, and for the first time in DyStar's history, we saw revenues exceed US$1.0 billion. But it was

“We are coming to the realization that it is imperative for the entire industry to improve collectively, not individually, and our ability to do so may determine the long-term profitability of the industry as a whole.

an important year for the company in more ways than one. Following the 2016 acquisition of Emerald Performance Materials LLC, a leading American manufacturer and marketer of specialty chemicals, our teams rallied together to ensure a smooth transition for our newest businesses. Over on the other side of the world, we celebrated the opening of DyStar's Global Innovation Center (GIC) in Nanjing, China. Our chemists at the GIC have been tasked with advancing green chemistry approaches – starting with the textile and apparel industry. Equipped with state-of-the-art equipment, our GIC laboratories are dedicated to the process technology development and research on next-generation alternatives.

Among our existing innovations, DyStar Cadira® modules have expanded to encompass nearly every major substrate type – including recycled polyester – helping textile mills save on water, electricity, steam and process time. DyStar's online tool eliot® is increasingly integrated into our Cadira modules and is increasingly recognized by customers, brands and retailers as an indispensable part of their decision-making process when it comes to product selection and process optimization.

More than anything else, our staff are the engine that keep this business running. DyStar embraces its responsibility for the care of their health, safety and general well-being. Team-building and staff training are two areas that will continue to be central to our staff engagement program.

By any standard, 2017 was a successful year for the company. I want to emphasize, however, that the standing we currently enjoy will last only as long as our commitment to continuous improvement. With this in mind, DyStar will continue to reach for greater heights.

With warm regards,

Eric Hopmann

OUR HISTORY

As a global market leader in colorants, chemicals and services to the textile and apparel industry, the DyStar Group offers a comprehensive range of products and services. Its worldwide presence involves work with a wide range of customers including leading brands, retailers, and their industry partners.

Since establishment in 1995, DyStar has continuously innovated its product and service offerings, covering a spectrum of dyes, colorants and chemicals. Its products help customers enjoy the highest product standards for quality, safety and the environment. The company's inherited legacy from its early parent companies, including Hoechst AG, Bayer AG, BASF AG, Zeneca, Mitsubishi and Mitsui Textile Dyes business, spans more than a century and leverages some of the most innovative work in synthetic dyes chemistry. Building on this foundation, DyStar has become a trusted partner in sectors including paints, coatings, paper and packaging.

As a company with diverse offerings, DyStar also provides a full range of solutions to textile and apparel businesses. It has helped drive consolidation in the industry of many core solutions providers over the last decade. Many organizations were integrated during that time, including Color Solutions Inc., Yorkshire Americas, The Rotta Group, The Boehme Group, Texanlab, and Lenmar Chemical Corporation.

In February 2010, Zhejiang Longsheng Group and Kiri Industries Limited (KIL) jointly acquired DyStar, beginning a new era for the company. DyStar has also made significant investments to the food and beverage, as well as personal care sectors. Emerald Performance Materials LLC, a leading American manufacturer and marketer of specialty chemicals, was acquired in 2016. Resulting from this, three businesses have joined, including DyStar Carolina Chemical, DyStar Hilton Davis and DyStar Foam Control. These businesses significantly diversify DyStar's product portfolio, and extend its efforts to bring the same trust and reliability that defines its reputation in the textile and apparel industry to other sectors.

As a result of this diversity and synergy, DyStar has evolved into a robust organization that thrives even in times of economic uncertainty. Headquartered in Singapore, DyStar has a talented workforce that is over 2,000 employees strong. The solid foundation on which the business stands allows it to broaden its ambitions even further.

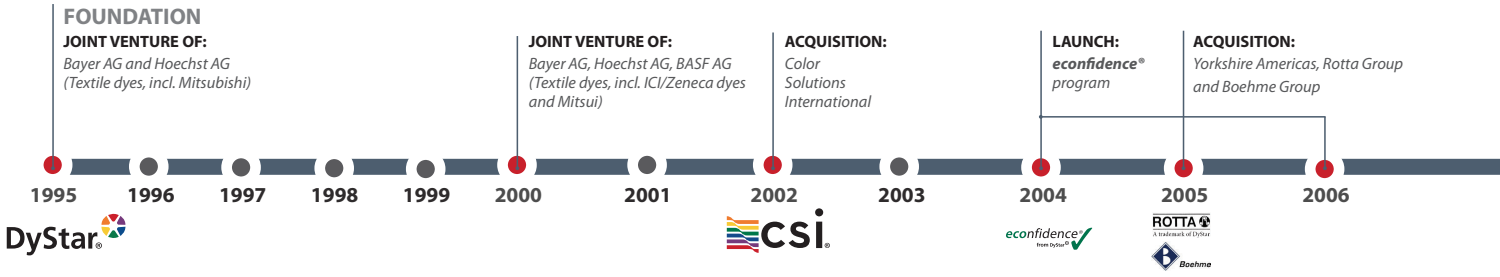
OUR ECONOMIC PERFORMANCE

The textile industry is heavily reliant on the availability and accessibility of materials and commodities, and hence remains volatile and unpredictable. Recent years have seen commodity costs increase, and the impact of changing consumer behavior has reverberated far down the supply chain. Also, numerous manufacturers in China have been affected by the local government's firm enforcement of environmental laws and regulations. The stability of supplies has hence been affected for many industries operating in this enormous market.

Market conditions were challenging due to the tight supply of raw materials and increasing supply costs. In the face of some erosion in gross margin percentage, FY2017 had an increase of more than 10% in EAT attributed to higher sales volume. Various locations restructured their businesses to proactively maintain competitiveness in light of market challenges. Amidst these challenges, DyStar maintained positive financial results for FY2017, with revenues of over US$1 billion. All DyStar entities are encompassed in the consolidated financial statements, including service divisions. Even excluding the newly acquired specialty businesses, DyStar recorded sales growth in excess of 5%. These results demonstrate that businesses putting people and the planet first ensure profitability has a better chance of being sustained in the long run.

In all its regions of operation internationally, DyStar has a commitment in supporting local economies, sourcing roughly half of its material purchases directly from local suppliers. By doing so, DyStar mitigates indirect emissions from transport, aids local businesses, and improves local livelihoods. Most production sites are in communities where DyStar is an important employer, with 80% of management being recruited locally as well. As much as feasible, DyStar directly recruits from local communities and develops the full potential of locally sourced employees through training and skills development programs. All company locations meet or exceed legal or industry minimum standards for employee wages in support of fair practices.

The company's direct economic impacts include internally on staff because it is a major employer at certain sites of operation. It has an indirect impact externally on the suppliers it purchases from, the customers it sells to, the customers that utilize its resource-saving products, and the consumers that purchase merchandise dyed with its high-quality dyes (because they end up having to buy fewer replacement pieces over their lifetimes). There are no significant indirect economy impacts identified in any of DyStar's locations of operation.



OUR CORE VALUES

Responsibility

We aspire to be the world's most sustainable and responsible supplier of colors, chemicals and services to the global textile industry.

500 RESTRICTED SUBSTANCES MONITORED BY THE ECONFIDENCE® PROGRAM

Innovation

Through continuous innovation, we create products and solutions to meet the needs of our stakeholders across the value chain.

1,153 PATENTS AND PATENT APPLICATIONS WORLDWIDE

Excellence

The quality of our products and services is a key factor in our company's success and underpins the fulfilment of our corporate goals.

$1 BILLION IN GLOBAL SALES REVENUE

OUR GLOBAL PRESENCE

17 PRODUCTION PLANTS ACROSS 12 COUNTRIES WITH OFFICES, COMPETENCE CENTERS AND AGENCIES IN 50 COUNTRIES, ENSURING THE AVAILABILITY OF EXPERTISE IN ALL MAJOR MARKETS.

2007 — **ACQUISITION:** *Texan Lab*

2008

2009

2010 — **JOINTLY ACQUIRED BY:** *Longsheng Group and Kiri Industries*

2011

2012 — **FOUNDATION:** *Sustainable Textile Solutions*

2013 — **ACQUISITION:** *Lenmar Chemicals (Business and Assets)*

2014

2015

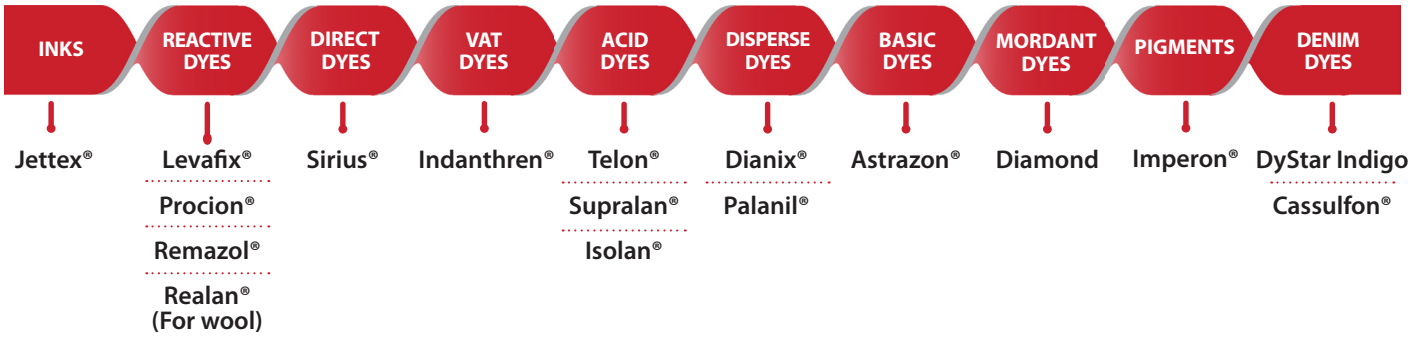
2016 — **ACQUISITION:** *Emerald Performance Materials Specialties Group™*

2017

OUR CORE PRODUCTS

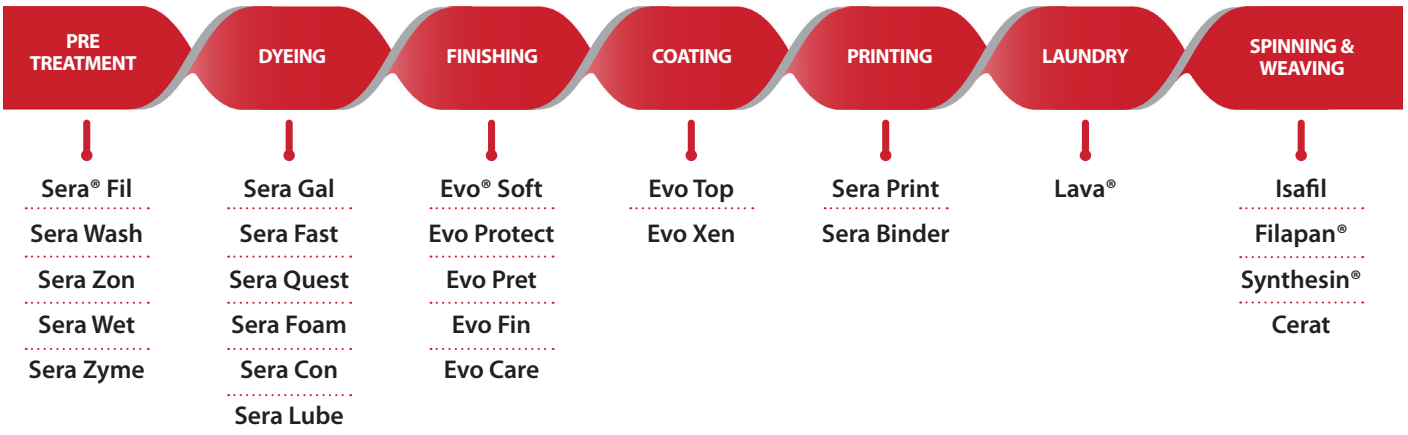
TEXTILE & APPAREL DYES, INKS AND PIGMENTS

As a leading global supplier of textile dyes, DyStar provides one of the broadest product ranges on the market. Our offerings cover a majority of fiber and quality specifications, as well as enable the myriad of dyeing and printing techniques used by its customers. As a company committed to sustainability, it constantly innovates to deliver products that are safer and more resource-efficient for customers and end-users alike.



TEXTILE & APPAREL AUXILIARIES

DyStar's comprehensive auxiliaries range spans the entire textile wet processing chain. When used in combination with its dyes, DyStar's auxiliaries provide textile manufacturers enhanced cost and resource efficiency. To meet growing environmental expectations, its EVO Protect range offers the latest in PFC-free water-repellent solutions.

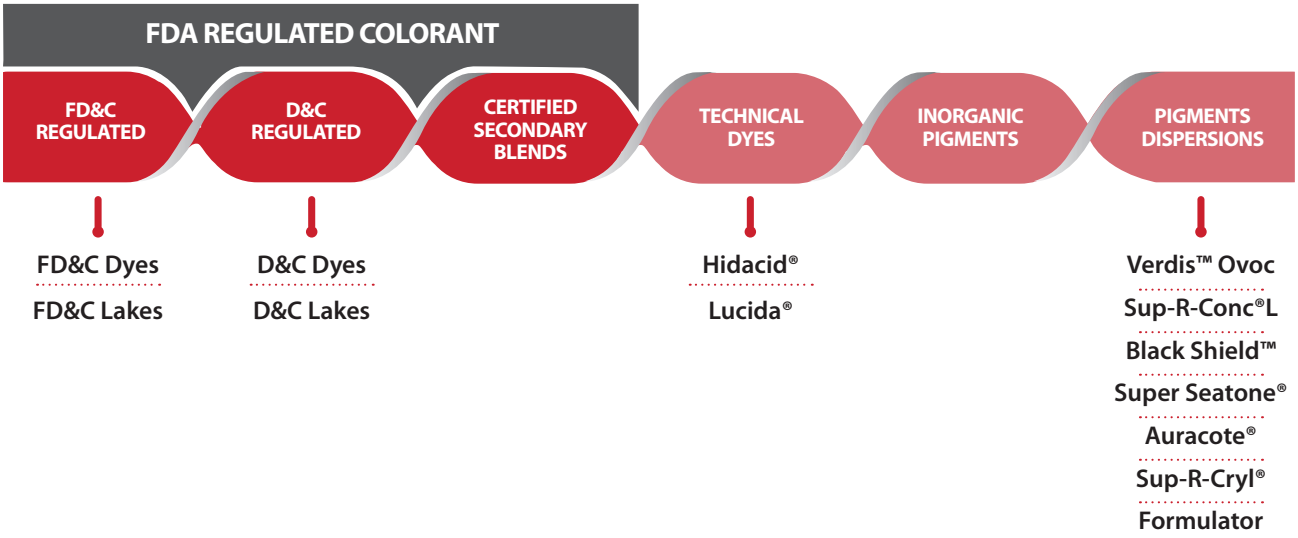


LEATHER

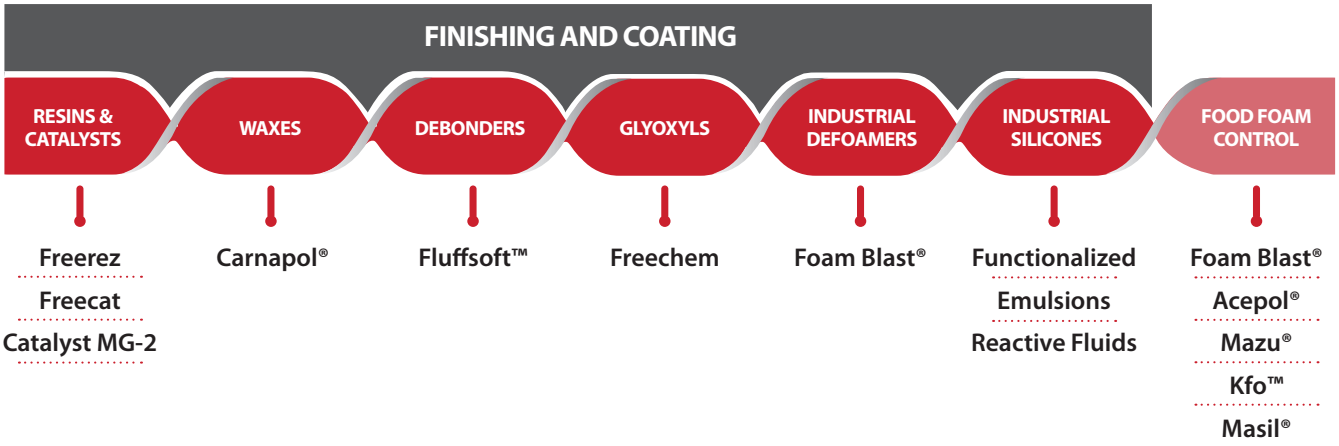
From the basic shoe to high-fastness upholstery leathers and high-fashion products, the company offers superior quality leather dyes suitable for many uses. Its specialized services assist customers to meet the widest range of leather test specifications and ecological standards.

COLORANTS APPLIED IN OTHER INDUSTRIES

DyStar offers colorants to multiple industries including food, drugs and cosmetics (FD&C) and is a leading producer of the highest quality regulated, certified food dyes. Its regulated FD&C dyes are crafted with strict manufacturing controls to recreate exact shades every time. These provide brilliant colors and high tinctorial strength, with excellent heat and light stability to maintain color over time. Customers can rest assured that all FD&C colors are tested to meet US Food and Drug Administration requirements for certification of colors and pigments.

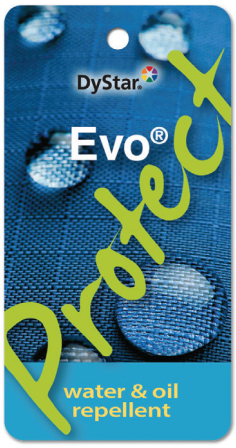


As a manufacturer of additives for food and cosmetics, DyStar's priorities are product safety and quality. As with its food dyes, its range of food foam control products and silicones for personal care meet all FDA and USDA standards. The company's foam control solutions for food provide outstanding consistency, performance and reliability, whereas silicone technologies and products enhance the performance of personal care applications.



TEXTILE EFFECTS AND LABELS

DyStar's Evo® finishing products provide solutions for a variety of requirements in the textile industry. Together with the Evo product range, DyStar also offers labels for customers to demonstrate the high quality standard on the finished product.



EVO® Protect

- Water and oil repellent
- Soil repellent
- Keeps fabrics cleaner for longer
- Wash-fast durability
- Based on PFOA- and PFOS-free recipe

EVO® Protect D

- Water repellent
- Soil repellent
- Keeps fabrics cleaner for longer
- Wash-fast durability
- Based on flourine-free recipe

EVO® Care Aloe

- Contains natural aloe vera extract
- Comfortable softness and absorbency
- Wash-fast durability

EVO® Care Vital

- Contains natural aloe vera extract, jojoba oil, and vitamin E
- Comfortable softness and absorbency
- Wash-fast durability

EVO® Fresh

- Odor absorbing finish
- Long-lasting freshness
- Eco-friendly
- Reactivated by washing
- Wash-fast durability

OUR SERVICE DIVISIONS

COLOR SOLUTIONS INTERNATIONAL (CSI)

CSI provides retailers and brands with a variety of flexible color options and services. Expert staff will create, manage and distribute color standards, and CSI's dedicated Color Team supports designers and color managers from the first inspiration throughout the entire supply chain to meet customer expectations. CSI's solutions guarantee a fast, efficient, and accurate color communication process to bring inspirations into reality. By improving clients' chances for right-first-time results, CSI also helps them save time and money.

ECONFIDENCE®

The econfidence program is designed to provide assurance to customers that DyStar dyes and chemicals meet all applicable statutory restrictions in the markets they are sold. econfidence is backed up by the most extensive eco-testing program of any textile chemical supplier.

Overseen by a dedicated and multi-disciplinary team of experts, the econfidence program was meticulously developed to monitor over 500 restricted chemicals and ensure the continued reliability of DyStar products. In turn, customers and their stakeholders enjoy the comfort and reassurance that their sustainability performance will not be compromised through supply chain activities.

SUSTAINABLE TEXTILE SOLUTIONS (STS)

Offering consultancy, auditing, and capacity building services, STS is dedicated to assisting brands, retailers, and their industry partners implement sustainable textile production practices within their organizations. STS guides textile industry clients through complex quality and eco-testing requirements, and help them meet all applicable standards and regulations. It also provides expertise to customers interested in operating more efficiently, and achieving reductions in cost and resource consumption.

TEXANLAB

Since 1994, Texanlab Textile and Analytical Laboratory is an ISO 17025 certified, specialized testing laboratory focused on ensuring compliance and resolving failures in the customer supply chain. It is a repository of know-how in chemical testing, and analysis for the textile industry, meeting the requirements of CPSIA, EU Eco-label and brand- or retailer-defined Restricted Substances Lists (RSLs). Whether handling liquid or fabric samples, Texanlab applies correct and accurate methods to produce dependable results. The company prides itself on a 100% on-time performance record, delivering accurate results in a cost-effective, fast, and reliable manner.

OUR GOVERNANCE STRUCTURE

Since its inception in 1995, DyStar's corporate philosophy has emphasized integrity and values. The company has consistently upheld high standards of corporate governance, performance, and fair dealings in business processes. This is lead from the top by Board members and Senior Management of the business, with the collective recognition that transparency and accountability in management secure long-term sustainability for DyStar.

The company has worked hard to ensure that even in a fast-paced operating environment, any weaknesses in management systems are acknowledged and improved. This is the case across all business units in all countries, and is recognized to be vital to DyStar's future success. It has also helped the company to adapt quickly to many changing circumstances that have been experienced over the years.

THE BOARD OF DIRECTORS

DyStar's Board of Directors is headed by a non-executive Chairman. The Chairman and the Chief Executive Officer (CEO) are different people, and this structure encourages a balance of authority and better enables the Board to make independent decisions.

The members of the Board contribute core competencies to the Group's decisions including knowledge of applied chemistry, insight into technological advances, legal and regulatory expertise, accounting and finance skills, business and management know-how, and a developed understanding of customer expectations. Their combined experience and expertise supports quality decision-making at the top and counters any tendencies toward groupthink.

BOARD OF DIRECTORS

Ruan Weixiang
Chairman

Xu Yalin
Executive Director

Yao Jianfang
Director

Manish Kiri
Director

Amit Mukherjee
Director

The Board maintains oversight of the company and sets the tone for DyStar's long-term business objectives, organizational strategy, risk management and global dealings. They review and approve business plans, and ensure that sufficient resources are available for DyStar to realize its objectives. As leaders in this niche industry, it is also the Board's priority to see that environmental, social and economic responsibilities are ingrained in operations. Their view of corporate responsibility extends to the manner in which DyStar legally conducts itself and also its dealings with business partners.

One Executive Director from the Board oversees the company's daily operations from DyStar's headquarters in Singapore, serving as the primary link between the Board and Senior Management. Xu Yalin coordinates closely with Senior Management to ensure that the Board's decisions and strategies are successfully realized.

COMMITTEES

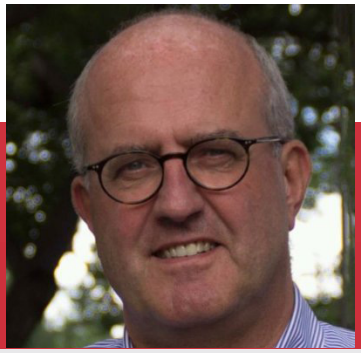
DyStar's governance is reinforced by specialized committees that support the Board in their decision-making and provide guidance to the company's Senior Management. The Audit Committee and Remuneration Committee are vital maintaining good business conduct across the DyStar Group. The committees meet periodically throughout the year to assess the latest developments, plan, discuss progress and setbacks, and assess the value of newly proposed projects and policies.

The Audit Committee holds critical responsibilities in the company. Apart from monitoring the effectiveness of DyStar's internal control processes and internal audit function, they also evaluate the independence and objectivity of external auditors. The Group's financial statements and all announcements related to financial performance are verified by the Audit Committee ahead of publication.

Remuneration decisions for management and employees are handled by The Board, as well as reviews of management performance, and other matters related to appointments and compensation.

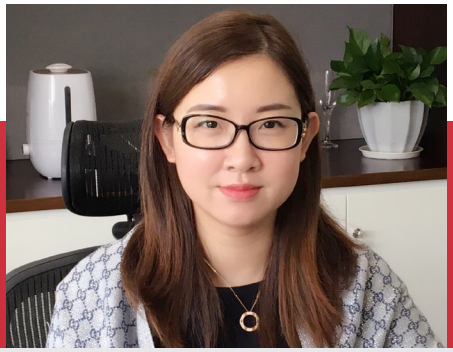
THE SENIOR MANAGEMENT TEAM

The members of Senior Management, headed by the Group's CEO, work with the aim of implementing the Board's strategy and directions in an effective, transparent and sustainable manner. The CEO is responsible for day-to-day management of DyStar, including execution of strategic plans and policies together with the members of his team, while also balancing the interests of the Board and the two key committees. Four Vice Presidents hold positions in the Senior Management team and support the CEO in their individual capacities as leaders of one or more key functions within DyStar. Aside from their daily tasks, the company depends on the example of the CEO and his team to instill an ethical business culture among managers and employees alike.



Eric Hopmann
Chief Executive Officer

Gerald Talhoff
VP Global Manufacturing and Global Supply Chain Management



Vera Huang
VP Global Procurement and North Asia Region

Philip Tan
VP Global Finance

Kevin Tan
VP Global Human Resources

ETHICS AND COMPLIANCE

DyStar is committed to conducting all business activities in accordance with the highest ethical and legal standards, operating under the company's Code of Conduct, which was established to help employees understand the company's expectations. It sets out the legal and ethical principles guiding work and is binding for all employees in DyStar Group entities. Maintaining the company's reputation as an employer of choice and as a reliable business partner builds on the foundation of adherence to these principles.

Globally, increased political attention to environmental effects, as well as increasing economic and community interest has meant that corporations have needed to evolve to become better corporate citizens. DyStar recognizes that no company is immune to bribery, fraud and corruption, but steps to bolster existing safeguards can be taken. In addition to the Code of Conduct, the company also instated a Fraud Policy in 2015 to protect whistle-blowers. More recently, the Code of Business Conduct for Suppliers and Third Party Service Providers, as well as the Code of Business Conduct for Sales Related Service Partners has been introduced. Taken together, DyStar's principles and policies are the first line of defense in stamping out corruption, and depend on the everyday vigilance of managers and employees.

Anti-corruption policies have been communicated to all governance body members, managers, directors and VPs, as well as all employees that interact with external business partners, and all external business partners in every region of operation. In addition, DyStar's policy is to train all managerial staff and above that interact with external business partners on these matters.

Like all businesses, we are subject to laws and regulations governing anti-competition behavior, and DyStar makes clear to staff this is also not tolerated. The company's policy is to abide by all laws and regulations and legal counsel is available to advise any employee that may have questions regarding what may or may not constitute anti-competitive behavior. In FY2017, there were zero legal actions pending or completed in 2017 regarding anti-competitive behavior and violations of anti-trust and monopoly legislation in which the organization has been identified as a participant.

DYSTAR'S CODE OF CONDUCT

Each of the eight principles that constitute DyStar's Code of Conduct corresponds to an internationally accepted ethical standard in business. The Code serves the moral compass of the business to protect the interests of both internal and external stakeholders. When applied within DyStar, the Code of Conduct promotes transparency in operations and safer workplace practices.

It is DyStar's position that ethical companies are at a competitive advantage, more able to attract and retain the best people. Likewise, external stakeholders across the value chain benefit from the rules laid out in the company's Code of Conduct. DyStar's commitment to ensuring compliance of all parties by all applicable laws and regulations safeguards the long-term interests of the company, its customers, suppliers, brands and retailers, and the local communities it operates in.

Our Code of Conduct promotes eight key principles that are aligned with international standards[1]:

1. **Compliance with Laws and Regulations**
2. **Protection of Intellectual Property Rights**
3. **Commitment to Fair Competition**
4. **Separation of Private and Company Affairs**
5. **Prioritizing Health, Safety and the Environment**
6. **Ensuring Product and Service Quality**
7. **Respect for the Rights of Employees**
8. **Cooperation with Authorities**

[1] The international standards referred to include the following: The International Labour Organization Core Labour Standards; ILO Tripartite Declaration of Principles Concerning Multinational Enterprises and Social Policy; The Universal Declaration of Human Rights; The OECD Guidelines for Multinational Enterprises; The United Nations Global Compact Ten Principles; Social Accountability SA8000; and The Responsible Care Global Charter.

> **The DyStar business conduct policy is straightforward: there is zero tolerance for giving or receiving bribes. There is never a justifiable reason for corruption, as it exposes DyStar and its employees to possible criminal prosecution, civil fines and penalties.**

FRAUD POLICY

Communities can experience severe environmental impacts when individuals defy local laws and seek personal gain. Successfully fighting the potential for corruption requires both a top-down and a bottom-up communication approach. In addition to internal audits for corruption-related risks, DyStar's Fraud Policy was instated in 2015 to reinforce the company's anti-corruption efforts by fostering a work environment where staff could safely and anonymously report known or suspected instances of fraud. The policy aids efficacy in identifying instances of wrongdoing by assuring potential whistle-blowers that they can act without fear of unjust retribution.

CODES OF BUSINESS CONDUCT

In 2016, DyStar introduced the Code of Business Conduct for Suppliers and Third Party Service Providers to communicate its fundamental principles and expectations to upstream partners. The policy includes, but is not limited to, all suppliers of raw material, intermediate goods and finished goods; IT and engineering suppliers or service providers; and freight forwarders and logistics providers. No matter their geography of operation, companies wishing to cultivate long-term relations with DyStar must conduct their businesses in compliance with the principles outlined in the Code of Business Conduct.

The DyStar business conduct policy is straightforward: there is zero tolerance for giving or receiving bribes. There is never a justifiable reason for corruption, as it exposes DyStar and its employees to possible criminal prosecution, civil fines and penalties. The company's Code of Business Conduct forbids inappropriate payments–whether to government or private sector organizations–across all business functions and dealings in all its countries of operation. In order to combat real or perceived conflicts of interest, company employees and their relatives are forbidden to accept payments, gifts, or entertainment services from any individual or company desiring to do business DyStar.

In addition to the obligation to eliminate bribery in the value chain, DyStar's suppliers and third party service providers are expected to adhere to fair competition and antitrust laws, keep accurate accounts and business records, and comply with all applicable local, national and international laws and regulations in the provision of products and services to the company. Trusted suppliers have systems and controls in order to comply with laws and principles set forth in DyStar's Code of Business Conduct. These include policies, training, monitoring, and auditing mechanisms. Company suppliers and third party service providers should also use these same principles in turn towards their own suppliers and contractors.

There are many risks facing DyStar's upstream stakeholders that can also be encountered among by downstream businesses. Accordingly, beyond the Code of Business Conduct for Suppliers and Third Party Service Providers, the company also implemented a Code of Business Conduct for Sales Related Service Partners. DyStar will not hesitate to discipline or dismiss any staff found in deliberate breach of either codes, or suspend business relations with partners contravening company policies, or repeatedly failing to implement corrective actions in their operations. For FY2017, there are no reported cases of non-compliance with laws or regulations in social or economic areas.

COMPLIANCE MANAGEMENT

DyStar's Compliance Group ensures adherence to all applicable laws and regulations, as well as to DyStar's internal policies and management directives. It evaluates and mitigates potential risks to the business and to stakeholders across the value chain. By raising awareness among managers and employees, the Compliance Group plays a central role in maintaining a culture of honesty and high ethics.

A Global Compliance Manager, whose contact details are supplied to employees as part of DyStar's orientation procedure, leads the Compliance Group. Each region is further supported by one or more Compliance Management Representatives to ensure that all entities operate in line with company policies and relevant legislation. Legal counsel is also accessible for anyone seeking guidance on the legality of potential decisions and actions.

LEADERSHIP CLOSE UP
XU YALIN

How is DyStar keeping its competitive edge and keeping its workforce ready for the future? Take an insider look with XU YALIN, EXECUTIVE DIRECTOR OF THE DYSTAR GROUP OF COMPANIES.

DyStar has high growth in sales in recent years. What were the key enablers for this sustainable growth?

Xu Yalin: DyStar does not just produce thousands of tons of chemicals for sale. We are a creative company that innovates products and solutions to meet the needs of stakeholders across the value chain. Innovation and speed are the two reasons for our growth.

The newly established global research and development center in Nanjing enables innovative new products to capture the latest market trends. We also innovate our services to address the new needs of our customers to help them save on energy and water, while reducing wastewater when using DyStar's products. Our production techniques are also innovative in terms of how we save energy and cut costs, how we work towards to be more environmentally friendly, while driving sustainability.

In terms of our supply management, DyStar has also set up a global plant and warehouse hub to coordinate customers' needs in a safe and timely manner. DyStar's processes are also innovative in terms of the well planned and accurate operational procedures which allow us to maximize our internal resources.

We are also fast-moving. Our sales and marketing teams have strong business acumen and as reflected in the latest market trends for our products and services. The other important piece is price, as DyStar's price actions are also fast to maximize sales and profits.

What actions has DyStar taken to maintain its profitability?

Xu Yalin: A fundamental problem we tackled to improve profitability was to address the inefficiency of cost control due to the complexity of our system. The very first issue we looked into was the organization structure and operational processes to improve collaboration, flatten hierarchies, and speed up execution of decision-making. When we addressed those issues, we created more savings and synergy.

The second area we improved on was the procurement for both direct and indirect expenses. We leveraged on Longsheng Kiri and reduced unit prices through larger economies of scale. In addition, we had also centralized all indirect expenses and achieved better savings.

We also improved manufacturing and encouraged more innovation of production techniques to achieve savings and minimize wastage. Together, these improved our P&L structure, and our profits have improved over the last five consecutive years.

In dynamic global markets, how does DyStar differentiate from other companies globally, and what are its unique competitive advantages?

Xu Yalin: DyStar is one the few of the players that provides full product and service solutions. In a nutshell, it is the diversification that makes us unique. Started off in 1995 as a coloration specialist, we have evolved into a one-stop shop providing solutions and services, and have recently also expanded into the food and beverage coloring segment.

Our business goes beyond pure products, expanding to services to better fulfill the needs of our customers. Some examples include sustainable textile solutions, audit of textile mills, and ensuring minimized risks along textile processing.

The competitive advantage for DyStar going forward will be to drive diversification, to provide quality and 360-degree products and solutions.

Despite the current strong momentum, what are the key challenges that DyStar is facing, both from industry and macro economy level?

Xu Yalin: The industry we operate in faces many external threats from competition, environment, and resources. We have maximized our efforts in areas like production, logistics, warehouse, and in our employees' mindsets in this regard.

The economy is another challenging area. Business is good in emerging markets such as Asia, where the economy and demand are growing. But we also have markets like South Africa that faces huge inflation. So, we need to balance our global strategy, as well as adapt our market and sales strategies to specific contexts. Other challenges like political situations and material shortages can also occur. Therefore, DyStar must plan ahead and act fast.

What are some of the key highlights of DyStar's long-term strategy for sustainable growth?

Xu Yalin: We are continuing the focus on innovation to maintain our leading edge in the industry. The first area is setting up our global R&D centre in Nanjing as a strategic step for cooperation and development. The R&D centre was completed and will begin operation in 2018, providing us with innovation capability and a place to develop talent, ensuring that we have the best people for our future work. The second area is our branding. We face local rivals that are certified with sustainability labels. We continuously work on our brand and product differentiation, through our quality, value-added services, and network rather than to compete on price. The third area is environmental regulation. DyStar's advantage in this field will be further strengthened as we promote environmental protection in every aspect of our business through our customers, retailers and consumers. This ensures environmental performance in both upstream and downstream of our production with all stakeholders.

With the rapid development of the organization, how does DyStar develop its people?

Xu Yalin: Our people are the most important company asset. We develop them using a variety of approaches like daily on the job training, via peers, cross-functional teams and mentoring, and with standard training, where employees will learn both functional competency and soft skills. DyStar is now setting up a global online training platform to provide interactive courses to over 2,400 employees worldwide.

We also ensure development plans for every employee, with setting and tracking of annual targets. The management trainee program provides a fast track for fresh graduates to become competent managers. Additionally, we are also rolling out a high potential employee program to boost our talent pool, and have succession plans for all key positions to groom future leaders or recruit new competent candidates in accordance with the company's development plans. This has greatly strengthened our business continuity.

DyStar has also fully leveraged employee localization, allowing us to understand and accommodate local needs and to develop local staff strength. Finally, to further enable our international expansion, we have provided multiple rotation programs, and aim to develop employees with a global, multicultural view.

DyStar has completed the acquisition of Emerald Performance Materials. Are there any other M&A plans in the near future?

Xu Yalin: It is vital for us to expand our product and service portfolio, and M&As are probably the most important and efficient approach to achieving these outcomes. Therefore, we are seeking potential opportunities in America and Europe, for instance, in specialty chemicals.

APPROACH TO SUSTAINABILITY

THE VALUE CHAIN APPROACH

The textile and apparel industry has earned a reputation for being a highly polluting one. Garment production is complex and involves extensive supply chains for fiber production, raw material sourcing, textile manufacturing, garment construction, shipping, storage, retail, use, and disposal. Any comprehensive analysis would have to take into account not only the direct sources of pollution which include – but are not limited to – the excess use of fertilizers and pesticides in cotton farming; the copious quantities of dyes and auxiliary chemicals applied in textile manufacturing; the accumulation in lakes and oceans of plastic microfibers shed by synthetic garments; and the growing volume of waste composed of cast-off clothing. Another factor to consider is the sizable amount of natural resources required for raw material extraction, farming, harvesting, processing, manufacturing, storing, and shipping.

Industry issues such as these are the responsibility of a myriad of stakeholders. As a company that supplies dyes and auxiliaries, DyStar acknowledges the potential risks associated with the use of these chemicals can be more severe than risks associated with their manufacturing process. Further, climate change has the potential to severely impact DyStar's access to water in certain parts of the world, which is an important for our production processes as well as for our customers' business operations. Without adequate waste and wastewater management practices, the substances applied by customers in textile production are highly polluting. To meet growing public concern, governments in emerging market countries are stepping up enforcement of environmental laws and regulations– particularly those that target emissions, waste, and wastewater. Consequently, many textile producers face immense pressure to clean up. These and other factors have made DyStar a necessary partner to businesses that are keen to improve their performance.

Similar to others in the industry, DyStar has learned controlling what happens within its own premises is easier than exerting influence over businesses upstream and downstream. But broadening attention beyond internal operations is required. As such, DyStar is committed to sustainability across the entire value chain and that commitment begins at home, working on its own operational impacts, and extending upstream to our suppliers, who are expected to uphold basic standards of ethical conduct. Downstream, a diverse range of responsible products, tools, and services cater to the needs of customers, brands, and retailers. The guiding principles that identify positive and negative impacts across DyStar's value chain are known simply as the "Four C's"– Creating, Conserving, Caring and Communicating.

ENVIRONMENTAL COMPLIANCE

DyStar is aware the materials it handles and produces can have severe consequences. In 2017, the company had three fines relating to environmental conduct. Its production sites in Charlotte, North Carolina and Pietermaritzburg, South Africa received fines of USD 250 and USD 90 respectively. The only significant fine amounted to USD 3.6 million, and was imposed in Nanjing, China. Based on a final court ruling in 2017, the fine was imposed on its subsidiary company DyStar Nanjing Colours Co. Ltd (DNCC) in January 2017 for a 2014 incident involving a vendor and two employees that dealt with used sulfuric acid resulting from DNCC production processes. This is the second and last fine related to the 2014 incident and was imposed for the environmental damage that was attributed to the actions of a former waste management vendor.

In June of 2014, DyStar was informed by local authorities that a vendor, after having accepted used sulfuric acid for resale and reuse, had transferred a significant amount of the material to another party that, in turn, was caught illegally discharging chemicals from multiple companies, including sulfuric acid from DNCC, into a local waterway. DyStar cooperated fully with the authorities throughout the investigations that ensued. Although the company maintains that it has not once authorized the illegal disposal of hazardous waste material, the verdict of the court has been accepted with the knowledge that the fine will be used to repair some of the environmental damage caused to the waterway.

DRIVING SUSTAINABILITY FROM THE TOP

Sustainability is driven from the very top of DyStar throughout all operations. At the helm of this effort is DyStar's senior management team, which integrates sustainability into the Group's business strategy, corporate culture, ground operations, and beyond. Unwavering leadership support in this regard is one of DyStar's key strengths, and enables both scope and depth of sustainability-related programs.

The Chief Executive Officer chairs DyStar's Sustainability Committee, comprising nine members from key functions in the company. Together, the Committee sets the overall direction of the company's long-term sustainability strategy and spearheads its implementation in line with its core objectives. Once each quarter, the members convene to discuss progress, deliberate new initiatives, and debate industry developments. The Committee also oversees preparation and distribution of DyStar's annual Sustainability Performance Report, which presents interested internal and external parties with a transparent overview of the company's achievements and challenges in the calendar year.

The five members of Senior Management work to identify and manage the economic, environmental, and social topics material to each function, as well as their impacts, risks, and opportunities. Where feasible, they also ensure the inclusion of these aspects into the due diligence processes. Stakeholder engagement exercises are conducted periodically and are used to inform Senior Management thinking - helping them to identify and manage economic, environmental, and social topics, as well as associated impacts, risks, and opportunities.

Several other practices take place to help management oversee the business' sustainability challenges, including a quarterly Sustainability Committee meeting to review of economic, environmental, and social topics and their impacts, risks, and opportunities, and an internal sustainability newsletter (covering the latest industry news and developments surrounding relevant laws and regulations, science and technology, research and findings, NGO programs, etc.).

The detailed results of the annual sustainability data collection process (i.e. the step that precedes the annual report) are shared with members of Senior Management. The quantitative as well as qualitative data resulting from this exercise help the company understand the effectiveness of its risk management processes.

Stakeholder engagement occurs throughout the year through meetings and forums attended by our various stakeholders. In addition, an external consultant carries out a formal stakeholder engagement survey exercise annually. Six stakeholder groups are consulted including employees, shareholders, customers, brands and retailers, NGOs and industry groups, and suppliers. Individual responses are kept confidential by the third party consultant. The summarized results are presented to the members of Senior Management and all regional, functional and sales Presidents and Vice Presidents.

Generally, unless members have already made their own observations, Senior Management and the members of the Sustainability Committee depend on directors and managers to inform them of critical concerns. To anticipate any knowledge gaps, an email has been set up Sustainability@DyStar.com so that the members of the Sustainability Committee, including the CEO, have direct access to feedback. All new hires are also provided with the e-mail address of the Global Compliance Manager. The Internal Audit team also has a mailbox that accepts anonymous reports.

DYSTAR SUSTAINABILITY COMMITTEE

Eric Hopmann,
Chief Executive Officer

Gerald Talhoff,
Vice President Global Manufacturing & Supply Chain Management

Ron Pedemonte,
Vice President North & Central America and Head of DyStar Textile Services

Fanny Vermandel,
Vice President Global Marketing Coloration

Clemens Grund,
Senior Director Global Technology and Ecology

Hartmut Behnke,
Director Global Marketing Auxiliaries

Leong Li Sun,
Global Sustainability Manager

DyStar's Global Sustainability Committee evaluates the management approach toward each material topic following the annual sustainability reporting exercise every year, and subsequently adjusts the company's management policies based on the results of that exercise as well as other information at their disposal. This practice applies to all topics deemed material GRI criteria, such as economic performance, market presence, procurement practices, environmental compliance, energy, emissions, effluent and waste, employment, occupational health and safety, diversity and equal opportunities, human rights, customer health and safety, marketing and labelling, and so on.

Evaluation methods are specific to each material topic and include but are not limited to internal or external auditing or verification, measurement systems, external performance ratings, benchmarking, stakeholder feedback, and grievance mechanisms.

Reviewers of this report are encouraged to read on to learn more about DyStar's journey and some of the specific adjustments that have been made to each material topic, where it has been necessary to do so following internal evaluation.

EMBEDDING SUSTAINABILITY

Across DyStar's value chain, there is a sustainability journey underway which has seen both enormous progress in some areas while challenges remain in others. As an industry frontrunner, DyStar and its leaders are committed for the long term. But on a day-to-day basis, the company depends on the involvement of its talented colleagues to stay on course. Support comes from many corners of the company: from the innovative chemists creating safer and more resource-efficient products, to Ecology team members who watch out for hundreds of potential contaminants in the supply chain, to the plant managers entrusted with the well-being of workers and community residents alike, and sales teams who travel far and wide promoting cleaner products to textile producers. More sustainable practices are taking root in many parts of the organization, evolving through innovation and setting new standards for both our clients and competitors.

To help transform behavior, DyStar has increasingly focused on staff engagement, providing knowledge resources to enable team learning, innovation, and sharing with the wider DyStar community. The Sustainability Committee also ensures all managers and employees with potentially impactful work portfolios are tasked with sustainability-related performance targets. Even with all this thought and planning, DyStar recognizes that no company will have all the answers, and values receiving stakeholder feedback. This can be submitted via email to Sustainability@DyStar.com.

CREATING RESPONSIBLE PRODUCTS AND SERVICES

FROM PRODUCT STEWARDSHIP TO SUSTAINABILITY SERVICES

To help stakeholders across the value chain achieve higher standards for quality, safety and the environment, DyStar has continuously invested resources in innovation to deliver responsible products and solutions to the customer. Initially, teams focus on product quality and performance matters. During development, the company's R&D chemists scrutinize the entirety of a product's life cycle. Applying the precautionary steps early on, at design and sourcing, could have positive and resounding impacts further down the value chain.

This direction behind DyStar's product stewardship program successfully delivered products that not only minimized its own impacts, but those of its customers and end users as well. However, customers required more than a good product: they were also looking for a comprehensive support system to help them achieve their goals and targets.

As a result, DyStar Textile Services (DTS) was formed to provide brands, retailers, and textile producers with the specialized tools and services they need to achieve results in the most sustainable way possible. While product stewardship continues to be an essential component of DyStar's sustainability framework, the scope of responsibility expanded. It now encompasses many solutions enabling downstream stakeholders to make informed and responsible choices covering areas from product selection to process optimization.

PRODUCT AND MARKETING COMPLIANCE

Throughout the reporting period, DyStar received zero fines, penalties, or warnings for health and safety impact violations of its products and services. There were also no violations of local laws and regulations regarding the use of DyStar's products and services. The company also had no fines or penalties regarding product and service information and labelling for FY2017. The company adheres to all applicable regulatory and voluntary codes for marketing communication practices, and FY2017 had zero fines, penalties, or warnings related to the company's advertising, promotion or sponsorship activities. Further, DyStar's IT team ensures that customer information is protected and remains confidential, as customer privacy is a priority; there were no breaches in this respect for FY2017.

PRODUCT STEWARDSHIP ACROSS OUR VALUE CHAIN (TEXTILE PRODUCTS)

Product stewardship is an integrated process at DyStar that depends on dedication and expertise of multiple divisions towards a common goal: to identify and minimize environmental, health and safety risks through out a product's lifecycle. This is due to the recognition that indirect impact of a product can be comparable or even greater than that resulting from the company's internal activities. DyStar's strategy focuses on how the early stages of design and sourcing can imbed sustainability. By doing so, customers are likely to attain the desired color and effect on workers, communities, and the environment.

PRODUCT DESIGN

Better chemistry, better results

Sustainability begins with design at DyStar, because the most effective way to mitigate a product's lifecycle impact is to get it right from the onset. The Product Stewardship program builds on the company's R&D innovations. Its efforts are driven by Green Chemistry design principles (see table) to provide safer and more environmentally benign products for customers and ultimately the final users. All products and services are assessed for health and safety related impacts and improvements; there have been no substantiated cases of non-compliance in this respect.

DYSTAR AND THE UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

The 17 United Nations (UN) Sustainable Development Goals (SDGs) serve as a common framework for all countries, companies and civic societies totransform the world by 2030. As a responsible corporate citizen, DyStar has joined the global movement and taken the opportunity to evaluate the alignment of its sustainability strategy to this worldwide agenda.

Of the 17 SDGs, eight are recognized as targets to which DyStar can make significant contributions, though there is some engagement by the company with the other nine goals, where feasible. DyStar acknowledges the interconnection of all the SDGs and that all deserve support when opportunities arise.

As one example, Goal 12, which promotes responsible consumption and production, is one where DyStar has had a direct and positive impact through our internal commitment to the second 'C' – to conserve planetary resources in our own operations. Indirectly, we also contribute to Goal 12 through our internal commitment to the first 'C' – to create responsible products and services, many of which are designed to help our customers become more resource-efficient. Moreover, DyStar's colors are made to last; this is not just a matter of product performance, since high quality dyes can also reduce quantities of items (e.g. t-shirts) purchased over a consumer's lifetime.

THE 10 GREEN CHEMISTRY PRINCIPLES

APPLIED AT DYSTAR

1 Preventing pollution

2 Developing high performance products with reduced toxicity

3 Maximizing the incorporation of material inputs into the final product

4 Using or generating substances with little or no toxicity

5 Minimizing the use of solvents

6 Designing for human safety

7 Improving energy efficiency

8 Reducing derivation steps

9 Leveraging on the power of catalysts

10 Designing for degradation

RESPONSIBLE SOURCING AND ECONFIDENCE

CONFIDENCE AND CERTAINTY FOR TEXTILE PRODUCERS

Ultimately when it comes to textiles, the quality of the ingredients used determines the quality of a final product. DyStar's econfidence program provides the assurance that customers need: the certainty that products meet all applicable statutory chemical restrictions in the markets they are sold. The econfidence program is backed by the most extensive eco-testing program of any textile chemical supplier in the industry. It ensures the prevention of 500 restricted substances from entering DyStar's supply chain. For textile producers, this assurance enables dyes and chemicals to be used with confidence that final merchandise will be safe.

Why do businesses need to know what they are buying?

1. Recent years has seen science make significant advances in the understanding of carcinogenic, mutagenic and reprotoxic substances. DyStar's knowledge of the environmental impacts that can be caused by toxic and hazardous substances has also matured considerably.
2. Governments around the world are keeping pace with scientific revelations, bolstering chemical regulations surrounding textile, leather, and apparel articles accordingly.
3. Consecutively, sourcing for textile and leather articles has become a dynamic and multi-national exercise. For many companies, this has made their supply chains lengthier and more fragmented, and thereby embodying more risk.
4. Brands and retailers are becoming aware of the reputational impact that can result from product contamination, and these stakeholders have created their own restricted substances lists (RSLs). Suppliers must comply with RSLs for the materials they produce in order to continue doing business with established brands and retailers.
5. In an interconnected, media-savvy world, the public is also better informed about environmental and health issues. People are increasingly having their say, and transparency has increased significantly.

What is the econfidence commitment?

1. **Leadership:**
   A multi-disciplinary team of experts in the econfidence group study and prevent potential risks across the length of DyStar's product chain.
2. **Expertise:**
   DyStar's team of chemists know where to look for impurities at every stage of the product chain. They leverage on their extensive knowledge to carefully monitor for individual chemicals.
3. **Dependability:**
   In order to be reliable, systematic eco-testing starts early with raw materials. This ensures that purchases–and ultimately output products–meet all applicable quality and ecological specifications.
4. **Traceability:**
   A proprietary global business platform monitors, controls, and services the complete supply chain to ensure traceability.
5. **Guarantee:**
   Eco-conformity declarations are available for brands, retailers and their industry partners.

SUPPLIER SUSTAINABILITY

All suppliers must comply with basic standards of ethical conduct. This requires constant vigilance by DyStar and continuous improvement by suppliers. DyStar and its industry peers function in a business environment where essential materials are typically available from a limited number of specialized suppliers. For this reason, when suppliers are identified that meet or exceed minimum expectations, DyStar aims for long-term business relationships, allowing the opportunity to influence and improve their decisions and practices.

Beyond suppliers, responsible procurement begins within DyStar, and internal changes have been made to ensure the procurement process is fair and transparent. As part of this effort, the Code of Business Conduct for Suppliers & Third Party Service Providers was put in place to define a baseline for suppliers as well as all DyStar employees interacting with them. For more policy details, please refer to Ethics and Compliance.

Most of DyStar's Tier 1 suppliers produce raw and intermediate materials needed in the production of dyes and auxiliaries. This tier includes 1,200 companies. At the onset of the screening procedure for these companies, all potential suppliers are requested to submit samples for targeted eco-testing. This helps to ascertain the quality of materials that may be used and the ability to rule out suppliers with samples testing positive for restricted substances. All new direct suppliers of material are screened using environmental and social criteria. DyStar does not partner with businesses identified as having a high actual or potential negative impact on the environment. Existing suppliers that are not able to uphold these standards are suspended until they are able to prove that the necessary corrective and preventative actions are implemented.

Those that pass these testing requirements move on to the second step of the selection process, where they are evaluated against a more extensive list of criteria. A supplier that reaches the final stages of the screening process is visited by members of DyStar's sourcing team to examine a range of issues including the quality and reliability of services provided, competitiveness in pricing, adherence to environment laws and regulations, waste and wastewater management capabilities, treatment of workers, etc.

Following the screening procedure, accepted suppliers are required to submit samples for targeted eco-testing on a routine basis. This ensures that, should contamination arise, restricted chemicals are identified and removed before they reach the product chain. In addition, for existing suppliers, the procurement team conducts an annual re-evaluation that includes the top 80% of material suppliers (by purchase volume).

Through a combination of desktop reviews and site visits, they cover a range of topics that touch on commercial, quality and sustainability performance. Vendors with consistently strong performance records undergo full audits on alternate years, whereas new or less established vendors are required to undergo full assessments every year. After each audit, suggestions are shared with suppliers on how to improve and monitor their annual progress.

In cases of minor breaches of basic principles for good conduct, DyStar works closely with the supplier to improve performance and to ensure that corrective actions are implemented wherever necessary. For suppliers found to be in material breach of laws and regulations, business relations are either terminated or suspended until an audit can establish that all necessary corrective and preventative actions are implemented.

While some significant actual and potential negative environmental impacts risks exist in the supply chain, particularly among suppliers in emerging markets, regulators in those countries have in recent years been very effective in identifying and punishing errant companies. As DyStar has always been relatively selective, its supply chain has remained comparatively intact–although not unaffected.

Beyond raw and intermediate materials, DyStar's Tier 1 supplier base also consists of equipment and packaging providers and a variety of service contractors, which includes waste management, wastewater treatment, cleaning, maintenance, IT, security, etc. With regards to this category of suppliers, the assessment employed for each is specific to the nature of the services provided as well as the risks associated with those services.

As an example, the selection of waste and wastewater contractors requires an added level of due diligence to the risk associated with such businesses for illegal dumping. As such, hazardous waste and wastewater contractors are subject to initial site audits during the screening process. Further, existing contractors receive annual site visits from members of DyStar's HSE team to ensure the safe transport, treatment, and disposal of hazardous materials.

DyStar conducts three sustainability-related supplier surveys. The Environmental Incidents Summary lists all major accidents that occur within a reporting period – including explosions, leaks and spills. The Ecological Compliance Questionnaire is a self-declaration that touches on all major classes of regulated substances in the industry. The most recent addition, the Supplier Sustainability Questionnaire, provides partners with the chance to share their principles and targets where environmental and social issues are concerned. The topics included in this survey are as diverse as energy consumption, emissions targets, community relations, health and safety, labor conditions, etc.

Together, the surveys give an overall picture of supplier performance across a spectrum of material issues. For new suppliers that may be unfamiliar but keen to join the sustainability agenda, the surveys encapsulate the expectations that are required from DyStar's best business partners.

In recognition of its efforts, DyStar received top ranking in the CITI transparency list for industrial chemicals from the Chinese NGO, the Institute of Public & Environmental affairs, placing well ahead of many other industry peers.

Also, to help meet client demands and demonstrate its responsibility and care in the food and beverages industry, DyStar is also implementing a supplier diversity program in the USA. A new supplier diversity section is in the process of being incorporated – site by site – into existing supplier responsibility questionnaires. Product quality remains a first priority, but greater effort will be taken to support businesses in the USA that are at least 51% owned by minority groups, women, veterans and people with disabilities.

THE UN SDGs ACROSS DYSTAR'S VALUE CHAIN

DIRECT IMPACTS

DESIGN

Research and Development for New or Improved Products and Processes

Product stewardship in DyStar starts with the application of green chemistry principles. The development of safer and more resource-efficient products benefits the environment and DyStar's stakeholders all across the value chain.

MANUFACTURING

Production of Dyes and Auxiliaries

Risk assessments are carried out for all production steps and precautions are taken to mitigate any known risks. Products are discontinued if there are indications that their production or application present a significant danger to human lives.

By eco-testing raw materials and ensuring that contaminated substances do not enter the production process, DyStar safeguards the well-being of nearby ecosystems, our own workers as well as stakeholders further down the value chain.

Product and process design for the planet reduces raw material, energy and water consumption during production, e.g. by utilizing catalysts and shortening the synthesis process chain.

At all times, the use of adequate personal protective equipment (PPE) is mandatory to prevent long-term health risks to on-the-ground staff.

STORAGE

Warehousing of Dyes and Auxiliaries

Risk assessments are also carried out for warehousing and transportation. Proper packaging, storage and handling practices help workers stay safe from accidents and incidents in the workplace.

DyStar optimizes product stocks and strategically situates warehouses near client locations and shipping ports to reduce costs and transport emissions.

Dyes and auxiliaries placed in storage should only be handled by trained personnel with appropriate PPE.

Cleaning kits are available and clean up protocols are in place so that leaks and spills can be safely contained and cleared.

TRANSPORT

Delivery of Dyes and Auxiliaries to Customers

DyStar complies with the Globally Harmonized System (GHS) for labelling which requires product packaging to display correct warning symbols and statements so that workers can know the chemicals that they are handling, the hazards involved as well as the precautionary measures to take.

Quality packaging material also mitigates risks and prevents damage to the product while en route to the customer.

DyStar's logistics optimization approach aims to maximize the use of cargo space. This strategy minimizes space wastage, fuel consumption and annual transport costs.

In some regions, clients can return intermediate bulk containers to a DyStar partner who will oversee their reconditioning and distribution.

INDIRECT IMPACTS

PROCUREMENT

Sourcing of Materials and Services

DyStar's econfidence® program prevents more than 500 restricted substances from entering the value chain, some of which can have long-lasting impacts to the natural environment. The program also protects workers, communities and consumers all throughout the value chain from substances known to be carcinogenic, mutagenic, reprotoxic, etc.

CUSTOMERS

Application of Dyes and Auxiliaries in Textile & Apparel Manufacturing

Customers can benefit from a range of resource-efficient DyStar products to achieve cost savings at various stages of textile production while also yielding quality results. For example, DyStar's latest Cadira® VAT module gives customers a significantly less resource-intensive option in the dyeing of cellulosic fibers.

On top of raw material testing, product eco-testing is conducted by DyStar as an added precaution to identify and control for restricted substances. This added step protects customers in textile and apparel production from the risk of contaminating their textiles and, possibly, the environment with restricted chemicals. Brands and retailers also get the reassurance they need that their clothing and apparel are free of harmful substances.

The safety of workers in the supply chain is increasingly a matter of concern for responsible brands and retailers. Risk assessments conducted at the design phase ensure that, when handled appropriately, the chemical nature of DyStar products do not pose intrinsic risks to the safety of textile workers.

Brands and retailers want assurance that the chemicals used in their value chain are not substances known to be hazardous to human health. Product testing keeps restricted chemical substances out of the value chain and away from textile workers. However, the physical nature of a product can also be a significant factor in safety (e.g. DyStar Indigo Vat 40% Solution reduces the risk of inhalation exposure compared to indigo powder).

BRANDS AND RETAILERS

Sale of Clothing and Apparels

CONSUMERS

Use of Textiles and Apparels

Protecting consumers from exposure to carcinogenic, mutagenic and reprotoxic substances is pertinent to the clothing and apparel industry. DyStar does its part by ensuring that raw material and product batches undergo targeted eco-testing.

High fastness dyes improve the average longevity of clothing and apparels. When colors last longer, consumers delay disposal and reduce the need to replace basic clothing and apparel items over the course of their lives. This has indirect but positive impacts further upstream because, at every point of the supply chain, resources are saved that would otherwise have been used to meet consumer's desire for new pieces.

DIRECT IMPACTS

INDIRECT IMPACTS

UN SDGs that the company has limited capacity to contribute in a direct manner.

LEADERSHIP CLOSE UP
DR. ANETTE WEBER AND DR. CHRISTINE LORKOWSKI

HOW DOES DYSTAR GRAPPLE WITH CHEMICAL SAFETY, GLOBAL STANDARDS, AND HELP ITS STAKEHOLDERS? TAKE A CLOSER LOOK WITH CHEMICAL EXPERTS DR. ANETTE WEBER AND DR. CHRISTINE LORKOWSKI.

Please share about your training and background.

Dr. Weber: I am an organic chemist and the head of the product safety group since the very beginning of DyStar in 1995. As I will retire by the end of the year, my successor, Dr. Christine Lorkowski, will be continuing this important work.

Dr. Lorkowski: After finalizing my postgraduate studies in natural science and being awarded Doctorate at the University of Dortmund in 2001, I started to work in Global Product Safety & Ecology (GPS & Eco) for a family-owned competitor of DyStar. In the summer of 2008, I was hired by DyStar and started to work in the group of Dr. Weber beginning of January 2009. Within that group, I head eco-related customer service projects, PDM processing, support of the econfidence® program, and the European REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) initiative.

How long have you been in this business and how has it evolved since you first joined?

Dr. Weber: I started with the former parent company Bayer in 1984, already in the product safety group. Things became much more technical when personal computers and systems like SAP were introduced. Nowadays, expectations are to respond the same day, even though the work has become increasingly complex. The number of countries with chemical regulations is increasing and the existing retailer standards have developed tremendously.

Dr. Lorkowski: I would agree. Throughout my entire career, regulatory requirements especially on chemicals managements have been proposed and enforced all over the globe. This has included the harmonization on classification and labeling of hazardous chemicals, based on UN model regulations that have been implemented in most of DyStar's sales regions.

What is the best thing about your job?

Dr. Weber: Each day is different, and we have the chance to help shape the organization to ensure DyStar is always well prepared for the future. For example, through setting of standards that will be valid for a longer time, we help to set the foundation for DyStar's reputation.

Dr. Lorkowski: It is definitely never boring. Helping to meet customer requests, monitoring regulatory developments globally, handling impact assessment for DyStar, and implementation in DyStar processes is a challenging and interesting task. The cooperation within our team and in interdisciplinary teams within the DyStar group is hugely beneficial.

For those who are not already aware, what are the various functions of DyStar's Global Product Safety & Ecology Group?

Dr. Weber/Dr. Lorkowski: We handle DyStar's global chemical registration and support legal compliance in chemicals' distribution worldwide in areas like marketability, labelling, and the provision of safety data sheets reflecting national requirements. We also service customer requests for things like third party certifications, assess DyStar products versus customer requirements, provide extensive information via our customer service portal eliot®, and ensure that besides the known technical performance, the quality of DyStar goods also is characterized by a high level of purity.

Your group is known to handle a wide variety of highly complex issues. What are some of the more common challenges that your colleagues encounter?

Dr. Weber: The most common problem is what to do first as we have a lot of products in our portfolio. There are naturally many different tasks and challenges we need to continually prioritize.

Recent years have seen an array of changes to laws and regulations pertaining to the textile and apparel industry. Tell us about how team has been involved in helping the company remain compliant.

Dr. Weber: We are constantly working on updates to the safety data sheets with respects to the implementation of the Globally Harmonized System (GHS) regulation. We did all the REACH registrations during the past 10 years.

What is a common source of apprehension for textile and apparel producers, and how has DyStar been able to earn the trust of this particular stakeholder group?

Dr. Lorkowski: The Greenpeace DETOX campaign raised a lot of interest with customers and other stakeholders. But since DyStar has already has responsibly managed its product portfolio, the supply chain and the impact for DyStar in relation to this campaign was minimal.

How have you seen stakeholders' concerns evolve over the past two decades?

Dr. Weber: Due to the activities of both NGOs and authorities, customer awareness has increased. But based on our econfidence® results (a set of services preventing more than 500 restricted substances from entering the value chain), we have always been able to match the highest expectations.

"Unfortunately, there is no common 'fundamental' level within the industry. Some regions or retailers try to really improve their business, but some still only see the financial figures. The perceived conflict between ecology and economy needs to be stopped as soon as possible to get to real widespread improvement for the industry as a whole.

As a top expert on chemical compliance in the textile and apparel industry, what do you think needs to change for the industry to improve at a fundamental level regarding chemical compliance and safety?

Dr. Weber: Unfortunately, there is no common "fundamental" level within the industry. Some regions or retailers try to really improve their business, but some still only see the financial figures. The perceived conflict between ecology and economy needs to be stopped as soon as possible to get to real widespread improvement for the industry as a whole.

Can technological advancements play an essential role in cleaning up the industry or should there be more focus placed on policies and regulations?

Dr. Weber: Policies and regulations alone will not be able to clean up the industry, as long as big parts of the industry do not change their mindset and operational practices.

SPOTLIGHT ON

DYSTAR CADIRA® POLYESTER

Saving Valuable Resources

DyStar's newest innovation considerably reduces water, waste and energy consumption. Cadira concepts will help brands, retailers and their production partners to save valuable resources, reduce the carbon footprint of their textile goods and increase productivity by improving utilization of machinery.

MODULES MAKING AN IMPACT

CADIRA® REACTIVE

Saving Costs and Valuable Resources in Reactive Dyeing

The company wants its customers in textile production to know that being environmentally responsible is not necessarily more expensive. By investing in better products and processes, and thereby improving resource efficiency, textile manufacturers can achieve cost savings and simultaneously reduce their impact on the environment.

Cadira Reactive is DyStar's new resource efficiency program for reactive dyeing. The module helps brands, retailers and their production partners save on energy, water and steam. Besides being a more energy- and water-efficient process, Cadira also delivers significant reductions in greenhouse gas emissions and wastewater.

How does it work? It's all about the right combination of dyes and auxiliaries.

❶ High Fixation Dyes

Cadira Reactive is a selection of Remazol and Levafix dyes that have high fixation yields, thus ensuring a more effective dyeing process and reduced wastewater.

❷ Process Optimization

Compared to conventional dyes, the selected reactive dyes offer similar or enhanced fastness performance. Cadira has the added advantage of being effective at lower application temperatures, which yields additional energy savings.

❸ Special Wash-off Process

Using DyStar's Sera Fast C-RD allows a lower temperature wash-off at 60°C instead of 100°C. The process also requires only four instead of six wash-baths which reduces overall water consumption by almost 30%.

Cadira® Reactive Dyeing > Compared to Conventional Reactive Dyeing

- ↓ 28% Water
- ↓ 22% Electricity
- ↓ 24% Process time
- ↓ 31% Steam
- ↓ 30% Emissions
- ↓ 28% Wastewater

NEW! CADIRA REACTIVE/DISPERSE CONTINUOUS

Dyeing of Polyester/Cellulosic blends in open width in a continuous pad-dry-thermosol-pad-steam (PDTPS) process without reduction clearing

Cadira Reactive/Disperse Continuous Dyeing > Compared to Conventional Continuous PDTPS process

- ↓ 45% Electricity
- ↓ 54% Water
- ↓ 41% Chemical

CADIRA POLYESTER

Resource-efficient exhaust processing of polyester fibers with Dianix® dyes and Sera® process chemicals†

*Fully Optimized Cadira Polyester Dyeing > Compared to Conventional Polyester Dyeing**

- ↓ 50% Water
- ↓ 43% Electricity
- ↓ 46% Process time
- ↓ 46% Steam
- ↓ 45% Emissions
- ↓ 50% Wastewater

CADIRA VAT

Resource-efficient exhaust processing of cellulosic fibers with Indanthren® dyes and Sera process chemical

*Cadira Vat Dyeing > Compared to Conventional Vat Dyeing**

- ↓ 30% Water
- ↓ 20% Electricity
- ↓ 30% Process time
- ↓ 25% Steam
- ↓ 24% Emissions
- ↓ 30% Wastewater

* Actual reductions may vary. Figures presented in diagram represent best known performance results.
† Fully optimized process for Cadira Polyester includes combined application of scour/dyeing, Optidye PES and optimized reductive clearing.

SPOTLIGHT ON

DENIM SOLUTIONS

DyStar Indigo Vat 40% Solution – the cleanest Indigo on the market

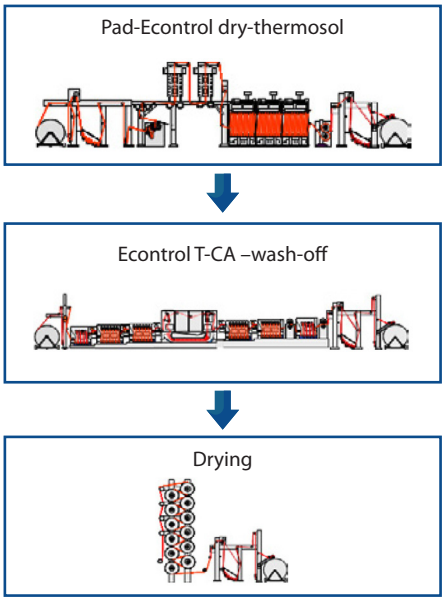
DyStar Indigo Vat 40% Solution has met the Gold level requirements of the Cradle to Cradlet Certified™ standard in Material Health, making it a preferred choice in terms of human and environmental health. DyStar Indigo allows a cleaner, healthier work environment, a reduced effluent load and lower water consumption.

PRODUCTS WITH A DIFFERENCE

ECONTROL® T-CA

Sustainable Technology for Continuous Dyeing

Rising cost pressure remains a problem in the textile industry. It is a particularly pertinent issue for parts of the industry that specialize in woven polyester/cellulose. The conventional paddry- thermosol-pad-steam (PDTPS) dyeing process used for PES/ CO fabric is as complicated as it sounds. Consisting of multiple separate and repetitive steps, it is a system that frequently leads to high costs and poor reproducibility. By contrast, Econtrol T-CA is a significantly shorter process, involving three steps instead of the eight required in PDTPS.



As a single bath process, Econtrol T-CA may seem minimalistic, but its simplicity belies the substantial cost and resource savings that can be achieved. Econtrol T-CA delivers tangible benefits for customers through a smart combination of machinery, dyes and auxiliaries.

1. No intermediate reduction clearing and no steamer required
2. Wide range of shades available to fulfil fastness requirements
3. Significant cost savings for textile producers

*Econtrol T-CA Single Pad Continuous Dyeing Process > Compared to the Standard Pad-Dry-Thermosol-Pad-Steam Process**

- ↓ 65% *Water*
- ↓ 50% *Electricity*
- ↓ 85% *Chemicals*
- ↓ 50% *Emissions*

DYSTAR INDIGO VAT 40% SOLUTION

The Cleanest Indigo on the Market

About 1.2 billion pairs of jeans are sold worldwide annually and that number is set to grow with denim's rising popularity as a fashion apparel. This is all good news for business but not so much for the environment if conventional processing methods continue to be widely used. Indigo's intrinsic insolubility in water makes it a difficult pigment to work with. To render it soluble, indigo powder must undergo a chemical reduction process requiring considerable amounts of hydrosulphite powder prior to the dyeing process.

DyStar's answer to this challenging but coveted pigment is its pre-reduced DyStar Indigo Vat 40% Solution – the cleanest and safest alternative to conventional indigo. The solution gives a consistently cleaner denim production and up to 70% reduction in sodium hydrosulphite usage. Moreover, the catalytic hydrogenation step that achieves indigo reduction in the process is carried out safely in a closed system (at a DyStar production plant) and generates water as the sole by-product.

Why DyStar Indigo Vat 40% Solution is Safer and Cleaner:

1. Because the dye is delivered in the form of a solution and stored in closed circulating systems, a cleaner and safer working environment is achieved.
2. Working with a dye solution also removes the respiratory risks that can result from inhaling chemical dust.
3. Chemical input is significantly reduced. Consequently, customers also save on costs for specialized waste disposal services.
4. By doing away with the hydrosulphite-dependent chemical reduction step, considerably less sulphates end up in wastewater. Up to 70% reduction in Chemical Oxygen Demand (COD) levels is achievable, with proportionate energy saved from reducing the load on effluent treatment plants.

DyStar Indigo Vat 40% Solution > Compared to Conventional Powedered Indigo

- ↓ 70% *Hydrosulphite*
- ↓ 15% *Indigo*
- ↓ 70% *Caustic soda*
- ↓ 70% *Wastewater*

GUEST INTERVIEW WITH CHINA WATER RISK'S DAWN McGREGOR

China Water Risk, a non-profit organization based in Hong Kong, works across sectors to increase awareness of water and related climate factors as business and financial risks, while also finding holistic solutions for a water secure Asia. Dawn McGregor, Head of Partnerships & Projects, talks water and shares key findings from her survey report of 85 Chinese textile manufacturers in 2017.

China Water Risk has produced some of the most insightful reports on current water security issues in the region. Your team has tackled topics from a range of industries but what, ultimately, is the organization's vision?

Dawn McGregor: Our ultimate vision is for sound decisions to be made to ensure a water secure Asia in a changing climate. As the world, but especially Asia, faces a new resource reality, policies need to be set with a water-lens, new business models that holistically balance the economy and the environment are a must, and embedding water in the global financial system is key. These are our three main work streams.

Why is the textile and apparel sector so important in relation to water security?

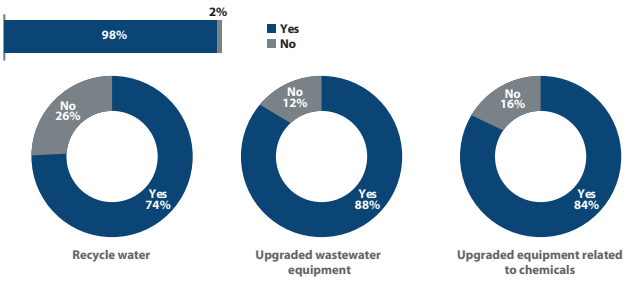
Dawn McGregor: The textile and apparel sector is dirty and thirsty so, how it manages water can significantly impact water security, especially quality. In China, the sector discharges 1.5x the amount of wastewater than the entire coal industry–and remember that China produces nearly half of the world's coal. As for its thirst, a single cotton t-shirt has the virtual water footprint of around 13 bathtubs of water.

CWR's 2017 report "Insights from China's Textile Manufacturers: Gaps to Overcome for Clean & Circular Fashion" generated interest in the textile and apparel sector. Tell us more about the key findings.

Dawn McGregor: There is a unique opportunity now to lay the foundations for a new fashion business model, as the goals of Chinese textile manufacturers and leading fashion brands are now converging: both need to clean up and want to go circular. This opportunity is made even more real as China is still a major supplier of fashion raw materials. The country produces 65% of the world's synthetic fibers. Some interesting findings from the report include:

- Chinese manufacturers really are taking action to clean up: 74% are recycling water, 88% have upgraded their wastewater equipment and 84% upgraded equipment for chemicals.

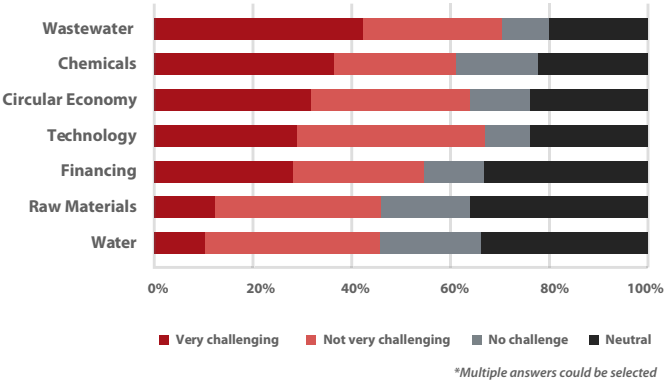
Manufacturers taking action to become green...



Source: China Water Risk report, "Insights From China's Textile Manufacturers", August 2017

- They are also moving to go circular: 68% say they have heard of it and 72% report seeing business benefit in moving to the circular mode.
- But they still face three key challenges are: wastewater, chemicals and circular economy practices. With 13% of manufacturers and 18% of brands admitting they are not compliant with China's indirect and direct discharge wastewater standards, there are clear operational and reputational risks being faced.

Manufacturers on their biggest challenges to being green...



**Multiple answers could be selected*

Source: China Water Risk report, "Insights From China's Textile Manufacturers", August 2017

- Manufactures also face significant challenges and pressure from regulations. 14% say they feel they face shutdown risk and 74% say they have felt more pressure from regulations over the last two years.
- Manufactures have three key wishes: 1) more training across three key areas: wastewater, chemicals & regulations, 2) more help with sourcing (particularly cost-effective and compliant chemicals), and 3) more financial support.
- The finances of the current model and demands of the industry raise serious questions about fast fashion's future. 56% of manufacturers reported they have invested more than RMB2 million to upgrade their factory, which means already low margins are dropping even further as prices aren't reflecting this CAPEX.

In practical terms, what should sustainability mean for the average textile and apparel producer in China?

Dawn McGregor: Compliant, clean, and moving towards a circular economy, since that is where the Chinese government has said the industry needs to go.

The report notes a significant number of textile and apparel producers have already invested heavily in sustainability. Based on the survey responses, can you give us some insight into some of the unique qualities that define companies in this category?

Dawn McGregor: Generally, many medium and large manufacturers with access to capital have made investments. However, as a result of these CAPEX investments, the majority of manufacturers are reporting material impacts on operating costs. 30% of respondents say their operating costs increased by 0-20% and 28% of respondents by 20-40%. Moreover, 81% say they have plans for future investment. Numbers like these highlight the fundamental question here: how sustainable is this current business model?

What obstacles are faced by producers that want to improve?

Dawn McGregor: Manufacturers said that help, be it on training, sourcing, and so on, needs to be more specific so that they can action it. This is important and shows that while training and other efforts are being made, it is not translating into capacity. Specific wishes to brands and industry associations are listed in the report.

In your view, how can Tier 2 suppliers like DyStar contribute to the global effort?

Dawn McGregor: DyStar is already doing so much for the industry, and on a personal note, thank you for your support in our survey last year. It would be great to see companies like DyStar continue to drive innovative solutions for the textile sector and make them as cost-effective as possible so that manufacturers and brands are able to use them at scaled level. This will help make clean and more sustainable fashion the norm.

As someone who follows this industry quite closely, are you optimistic about the future?

Dawn McGregor: Definitely, though I do have my moments. Sustainability, the environment and water are now pretty much mainstream topics in the global fashion industry. Actions are being seen across the value chain and though there is still much to do, it really feels like there is a new business case becoming clearer: go clean and circular.

ENABLING SUSTAINABILITY ACROSS THE VALUE CHAIN

DyStar takes a holistic approach to sustainability, going beyond product responsibility by presenting brands, retailers, and textile producers with a reliable and innovative support system. User-centric tools and services are available to help customers in making informed product selections, accurately communicating color requirements with industry partners for better right-first-time results, training employees in the finer points of chemical management, and conducting chemical testing for traces of contamination at their end of the supply chain.

These tools and services are under the remit of DyStar Textile Services (DTS), combining the expertise of three business units– Color Solutions International (CSI), Sustainable Textile Solutions (STS), and Texanlab. DTS's solutions have become indispensable to customers and play a central role in DyStar's long-term goal to imbed sustainability across the industry.

ELIOT®

Sustainability Made Accessible via Online Technology

As a unique offering at DyStar, eliot is a free, internet-based tool providing quick-access guidance on product selection and process optimization. The tool helps make sustainable products and processes easy to understand and freely accessible to any client with an internet connection. Any time of the day, any place in the world, customers can skip the middleman and get the answers they need with direct access to this system.

eliot has four modules: Positive Lists, Product Finder, Optidye, and Information. It is quick to use, with customers able to explore the entire DyStar product list, choose from an extensive selection of RSL and eco-standard compliant products using the Positive Lists module, and even determine the most resource-efficient recipe for their chosen product through Optidye®–all in just one sitting.

POSITIVE LISTS

Search through a selection of recommended DyStar products that are suitable for textile articles with brand and retailer Restricted Substances Lists or selected eco-standards, such as bluesign® and GOTS. Preferred products can be bookmarked in the system, giving users the added flexibility to explore their favorite products in other eliot modules.

PRODUCT FINDER

The Product Finder module helps customers narrow down the dyes and chemicals that meet the required fastness and dyeing performance criteria. Users can search for products based on the desired technical properties and export results onto a spreadsheet before exiting.

OPTIDYE® PROGRAMS

Through Optidye, users can access recipes and process optimization tips to help shorten their dyeing cycles and reduce effluent load. Optidye programs were designed to improve the reliability of the dyeing process for better right-first-time processing and improved product quality.

INFORMATION

eliot gives users direct access to product information from different industry segments including active wear, technical textiles, denim, work wear, carpet, digital printing, home textiles, automotive and fashion. Shade cards and brochures are also available through the Information module.

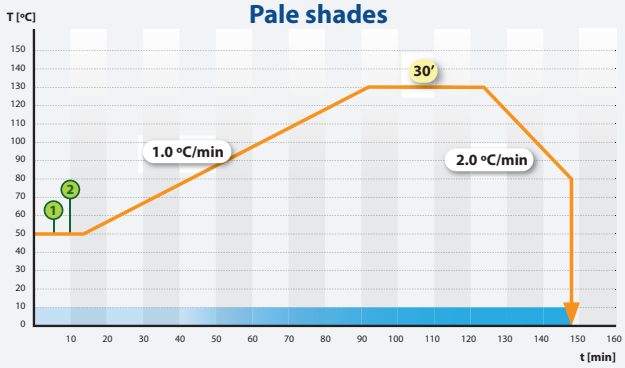
SPOTLIGHT ON ELIOT® OPTIDYE

Benefits of Optidye Polyester (PES) Optimization for Pale Shades

Part of the Cadira Polyester Module, DyStar's eliot Optidye is an online tool providing better information to textile producers so they can achieve better results.

STANDARD DYEING PROFILE

Pale shades

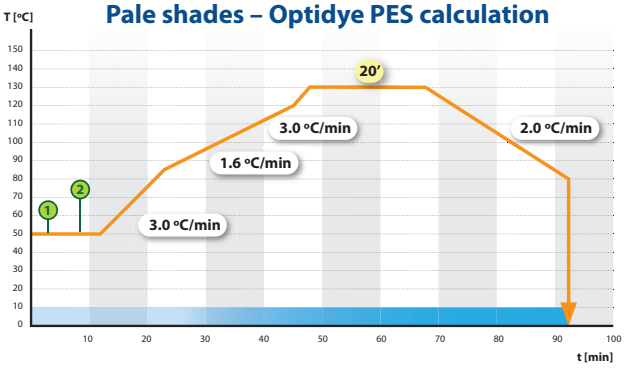


1	1.0	g/l	dispersing agent		
	2.0	g/l	crease inhibitor		
	1.0	g/l	sequestering agent		
	sodium acetate/acetic acid pH 4.5				
2	0.3	%	C.I. Disperse Yellow mix		
	0.1	%	C.I. Disperse Red mix		
	0.2	%	C.I. Disperse Blue mix		

Water & Energy savings
Dianix dyes &
Sera process auxiliaries
in combination with
Optidye PES program

OPTIDYE PES OPTIMIZATION

Pale shades – Optidye PES calculation



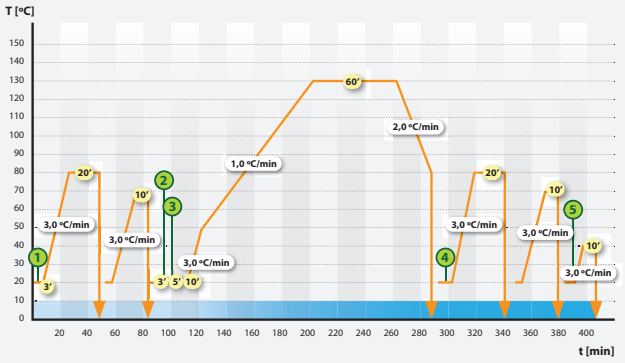
1	1.0	%	Sera® Gal P-LP		
	2.0	g/l	Sera Lube M-CF		
	1.0	g/l	Sera Quest C-PX		
	pH 4.5		Sera Con M-TC		
2	0.3	%	Dianix® Yellow CC		
	0.1	%	Dianix Red CC		
	0.2	%	Dianix Blue CC		
			V-value = 1		

Benefits in process savings
34% Electricity
5% Steam
25% Process time
17% Cost in total (including equipment, overhead ..)

Benefits in productivity
35% productivity increase
Higher RFT performance achieved with Optidye PES

Conventional processing for medium to dark shades

PROCESS TIME: 415 min, 6 bathes

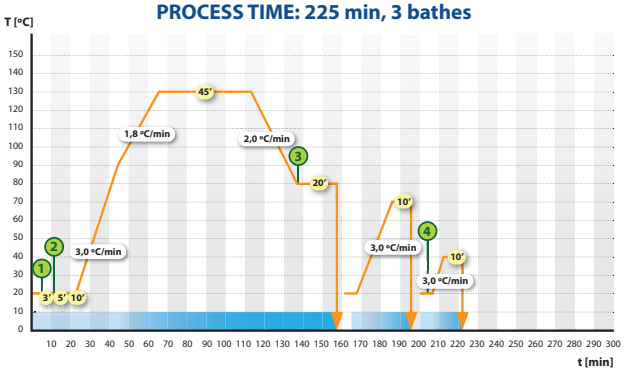


1	1.0	g/l	washing detergent		
	2.0	g/l	soda ash		
3	0.38	%	C.I. Disperse Brown		
	0.45	%	C.I. Disperse Red Mix		
	7.20	%	C.I. Disperse Red Mix		
2	1.0	g/l	dispersing agent		
	2.0	g/l	crease inhibitor		
	1.0	g/l	sequestering agent		
	pH 4.5 sodium acetate/acetic acid				
4	30	ml/l	caustic soda 50%		
	3.0	g/l	hydrosulfite		
5	pH 5 acetic acid				

Water & Energy savings
Dianix dyes &
Sera process auxiliaries
in combination with
Optidye PES program

Optimized processing with scour/dyeing, Optidye PES calculation and reductive clearing in dyeing bath

PROCESS TIME: 225 min, 3 bathes



1	2.0	%	Sera® Gal P-DSL		
	1.0	g/l	Sera Lube M-CF		
	2.0	g/l	Sera Con P-NR		
3	Alkaline reductive clear				
	5.0	ml/l	caustic soda 50%		
	3.0	g/l	Sera Con P-RCN or		
	Acid reductive clear				
	2.0	g/l	Sera Con P-ACT, pH 3.5-4		
2	0.38	%	Dianix® Yellow Brown XF2		
	0.45	%	Dianix Rubine XF2		
	7.20	%	Dianix Black XF2		
4	pH 5 sodium acetic acid				

Benefits in process savings
43% Electricity
46% Steam
50% Water
39% Process time
38% Cost in Total

Benefits in productivity
58% Productivity increase
Higher RFT performance achieved with Optidye PES

LEADERSHIP CLOSE UP
OMAR ORREGO AND DR. SIVA PARITI

Omar Orrego

In this interview, the leadership of Sustainable Textile Solutions (STS) discuss its future and the role of its new parent company BluWin®. STS veteran Omar Orrego is BluWin's incoming CEO, with over 42 years experience in the textile industry. Dr. Siva Pariti, who is a highly skilled senior technical manager at STS, is one of the industry's most recognized experts. Both share insights on the strategic direction of BluWin and how it will advance client's operational performance.

Sustainable Textile Solutions (STS) caters to the sustainability-related demands of brands, retailers and textile producers. What is the story behind the STS and why it was formed in the first place?

Omar Orrego: STS was created in early 2012 out of a group of engineers called Expert Solutions, which provided advice to textile mills for optimizing wet processing steps in the production chain. STS started offering same services to retailers in their supply chain and then offering advice on chemical risk and inventory management, aiming to ensure a clean supply chain for brands and retailers.

Dr. Siva Pariti: During the initial phase, processing mills looked for experience and expertise in their interactions with DyStar technical staff. There were some clients who even offered to compensate to access the experience and expertise of DyStar's technical team, and a technical and chemical expertise consultancy evolved. This was beyond simply sharing information about DyStar's products. Initially the areas we covered included coloration, optimization, and resource efficiency topics–mainly related to the wet processing mills–and later this evolved to guiding brands and retailers in other areas as well. Clients have always enjoyed the value received from STS services.

What services does STS provide, and why are these so valuable to stakeholders in the value chain?

Omar Orrego: We offer services in many different segments. Chemical risk and environmental management help build the right strategy for chemical compliance, but we also do chemical risk assessment, root cause analysis, energy, emissions, and wastewater management. We work closely with partners

and customers to help build capacity through workforce training. The optimization of wet processing in textile and leather is another major area, which helps form a solid foundation for real circular economy for the future of sustainable textiles and footwear. These services are critical to build a clean supply chain, protecting brands and their end customers, as well as to guarantee the lowest environmental impact and a sustainable production as key factors for better living conditions worldwide.

Dr. Siva Pariti: That's absolutely right. STS collaborating with large companies to help several of them become global leaders in the field of sustainable manufacturing, and with smaller, dynamic and forward-thinking ones are being helped to accelerate their journey of value creation and sustainable operations. We partner with many NGOs to help drive growth, create skills and jobs, and strengthen services such as education and sustainable processing. We have developed high-quality knowledge, data, and analytics on a variety of areas, through our experts in the field working closely with the industry partners across the globe.

Tell us about the new umbrella organization that STS is now housed under?

Omar Orrego: BluWin was formed in July of 2018 as a separate entity within the DyStar Group and fully focused on services and consultancy. STS is the first business unit under BluWin, and Texanlab will join us soon. With Texanlab, both business units have a lot of very interesting synergies and supplementary services. The fact that they will be better able to support each other within the same legal entity is powerful. The changes in the organization will allow us to build a better platform and make BluWin the preferred option for retailers and partners in our service.

How will things be different for STS under BluWin?

Omar Orrego: The textile service divisions under DyStar needed their own platform to develop faster and adapt in a space that demands flexibility and immediate results. The marketing, logistics and supply mapping platforms will also be able to grow and continue to differentiate from all other potential competitors in the market.

Dr. Siva Pariti: We also have plans to build the best web-based platforms to add value to our fieldwork. This will also provide stakeholders control of running projects and achievement of objectives during implementation. The goal for us is to have the best software and application platform to support all our activities. As an independent organization, BluWin will be given greater freedom to explore these exciting new possibilities.

There are a variety of options when it comes to voluntary standards and eco-labels in this sector. What are your opinions on this topic?

Omar Orrego: Voluntary standards cover gaps in existing chemical laws related to clean textiles and their production impact on our environment due to the desire of stakeholders for a cleaner supply chain. Those gaps—and in several cases lack of regulations or the non-compliance with those regulations—otherwise allow production and selling activities of dirty and risky dyes and chemicals which can be found in all production countries. This is an important risk for the supply chain of brands and retailers. This situation promotes the creation of different standards, labels, certifications etc. to tackle the problem, but unfortunately not a single unified standard covering the whole supply chain.

Dr. Siva Pariti

Will we see a day when all parties are aligned and in agreement with one universal standard for the industry?

Omar Orrego: Well, between legal regulations and voluntary control for restricted substances, there will be always room for differentiation, which makes it difficult to have a universal standard. For some it can seem lenient but for others quite strict and unnecessary. This, together with the diversified textile applications and end user markets, makes such a standard not viable any time soon. Furthermore, a universal standard should be implemented with testing and auditing throughout the whole supply chain from textile processing, production of dyes and chemicals to the intermediaries industry, which, given the current situation, would be extremely complex to implement.

Dr. Siva Pariti: I agree that the challenges are real, but feel that currently the world is moving towards a universal standard for textile sustainability. The methodologies employed in ensuring the implementation of these standards are also slowly aligning. Though creating a uniform standard and code would make things easier, the real challenge—regardless of what standard is used—definitely remains in implementation and certification.

Can you share your thoughts on Texanlab's recent expansion?

Omar Orrego: Early in 2017, DyStar's Texanlab Laboratories Private Limited launched its third advanced laboratory at Tirupur, Tamil Nadu, a town in Southern India famous for knitwear exports. This new laboratory will provide end-to-end solutions in the supply chain, from raw materials to final products, and is equipped with cutting-edge equipment for testing of textiles in terms of all physical and color fastness parameters. With sustainability in mind, one-third of the lab uses natural daylight and fresh air to reduce electricity usage, aligned to the company's commitment to sustainable development.

CONSERVING PLANETARY RESOURCES

SEVEN-YEAR ENVIRONMENTAL PERFORMANCE

Summary: 2017 vs 2011

⬇ 7%
Energy consumed
per ton production

⬇ 9%
GHG emitted
per ton production

⬇ 39%
Water drawn
per ton production

⬇ 30%
Wastewater
per ton production

⬇ 21%
Raw materials
per ton production

⬇ 25%
Waste
per ton production

THE 2020 TARGET

DyStar's production teams are progressing in the seventh year of their journey towards reducing the production footprint by 20% for every ton of production by the year 2020. This goal encompasses the resources used for production including energy, water and raw materials as well as addresses their corresponding outputs—greenhouse gas (GHG) emissions, waste and wastewater. Operating an efficient production system is fundamental and essential to maintaining the company's balance with the planet and its ecosystems, and is also cost-effective, enabling DyStar's industry competitiveness.

Through the talent and commitment of its production teams, the company has successfully met or surpassed four of the six 2020 targets. These were supported by a series of wise decisions made in recent years resulting in markedly more efficient facilities into the Group. Because of these changes, the average resource requirements across all product offerings has been reduced, due to newer ranges that demand less energy and water to produce.

SCOPE AND METHODOLOGY

A centralized reporting platform is employed to monitor DyStar's impacts across all production sites, warehouses, offices and laboratories. In addition, a standardized auto-dashboard tool is available to help company teams understand their performances with respect to all six 2020 targets. Throughout the year, the dashboard doubles as a reporting tool that facilitates and aligns communication across our various departments.

This year's data consolidation exercise was widened to include smaller office locations in South America and Northeast Asia, as well as warehouses owned or operated by DyStar across five continents. Taken together, the newly added office and warehouse locations do not contribute significantly to our overall environmental profile. Nevertheless, they do give, for the first time, a truly complete overview of all locations that are owned or operated by the company.

The impact of DyStar's internal operations is still predominantly the result of production activities. Owing to the magnitude of the footprint associated with production, this year's report also incorporates environmental performance data from the three newly acquired manufacturing sites in the United States.

WATER

Water is required for most of DyStar's functions. It is an ingredient in synthesis, serves as a convenient medium for dispersions that are required at various stages of processing, and is frequently added as a formulant in many products. Water is also commonly used at plants for more routine purposes such as equipment cleaning, but its most important function is to keep staff sufficiently hydrated throughout their shifts.

During 2017, DyStar's overall water withdrawal increased to 7.8 million m^3, a 3% increase since 2016. Despite this year-on-year increase in volume, the overall water intensity has improved and improvements in efficiency are noted for the sixth consecutive year. Water withdrawal intensity stands at 45 m^3 per ton production, showing improvement of 39% since 2011. Business development teams have continually demonstrated the importance of taking the environment into account with each new investment or divestiture. Technology upgrades have also improved the overall performance of the company. Likewise, continuing out-dated methods and technologies is detrimental to the environment and can affect long-term profits.

Diligent planning by DyStar's production managers also has been an important factor in reducing the company's water intensity. To minimize water withdrawal, one effective method employed has been the reuse of steam condensate. Production typically requires large quantities of steam, and the resulting liquid condensate can be safely reused for a range of purposes such as floor cleaning. As the condensation process takes place through indirect heat exchange mechanisms, steam condensate remains uncontaminated by chemical mixtures and can be used in place of municipal water, surface water, or ground water sources. This is a basic and easily applied practice, which reduced water withdrawal quantities at multiple locations. For FY2017, the quantity of reused water made up 2 million m^3, the equivalent of 20% of the company's total consumption needs.

WASTEWATER

To ensure minimal risk to communities and environment, responsible wastewater management is employed. To sufficiently treat wastewater, DyStar uses a combination of onsite and offsite methods. Effective treatments are tailored to the unique characteristics of each plant and its activities. What is included in the sequence of chemical, biological, mechanical, or thermal treatment processes depend on the physical and chemical nature of the wastewater generated at each production plant.

Regardless of whether final treatment is carried out by DyStar or by an external contractor, treated wastewater should only be discharged in accordance with all applicable legal frameworks and local permits. Further, treated wastewater that is intended for final treatment elsewhere should undergo monitoring to ensure that regulatory or contractual threshold limits are not exceeded. This also applies to wastewater bound for final treatment at a municipal plant, as well as wastewater handled by third-party contractors. DyStar does not allow the reuse of its wastewater by other organizations.

In some locations, DyStar production plants are authorized to discharge treated wastewater into nearby river bodies. For these instances, extra precautions are taken to ensure that all applicable standards are met. At production plants in Apiúna, Brazil and Corlu, Turkey, treated cleaning water needs to meet acceptable levels of chemical oxygen demand (COD) before being released into local waterways. In Germany, the Ludwigshafen Production Plant is legally allowed to release only uncontaminated cooling water into the nearby river. This site's water is monitored for high temperatures before being allowed to exit the site. Even though the water discharged into their river is uncontaminated, this step is important to the ecosystem of the river as it safeguards the development of temperature-sensitive species.

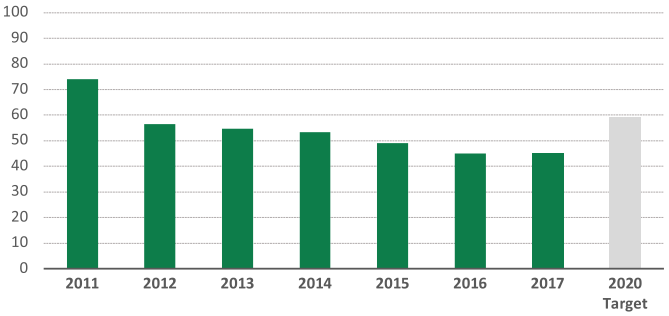
In terms of destination for wastewater, other than the few instances where water is discharged into the river (with government approval and within limits at Apiuna Prouction Site, Ludwigshafen Production Site, and Corlu Production site) all other wastewater is sent to licensed external contractors. The Gabus production site and Ankleshwar production site are the exceptions where onsite machinery exist for zero wastewater discharge, allowing wastewater to be evaporated into a semi-solid, solid, or powder form. Residual substances can then be disposed of as hazardous waste by licensed vendors.

A combination of treatment methods are employed by all DyStar production sites, including those utilizing external contractors. Typically, various forms of pre-treatment methods—e.g. sedimentation, flocculation, pH neutralization, chemical treatment, biological treatment—are employed before wastewater is transferred for final treatment by an external contractor.

Following the upward trend in production volume, DyStar treated 2.0 million m^3 of wastewater in 2017 compared to 2.17 million m^3 in the previous year. Likewise, wastewater intensity stands at 13 m^3 per ton of production, which is 10% less than it was in 2016, and 30% below 2011 levels, surpassing the 20% target. Many production teams employ a common approach when it comes to wastewater—they start by addressing the water-demanding processes that result in wastewater. For example, by maximizing batch sizes wherever and whenever possible, DyStar has been able to reduce the volume of cleaning water needed for product changeover processes. Another approach included the conversion of two sizeable production plants to zero wastewater discharge plants. For many years, DyStar productions sites in India and Indonesia have employed a combination of evaporation and spray drying methods to convert their wastewater into solid or semi-solid sludge. Conversion in this way minimizes difficulties in handling and treating wastewater, but the compromise is that active drying processes tend to consume more energy.

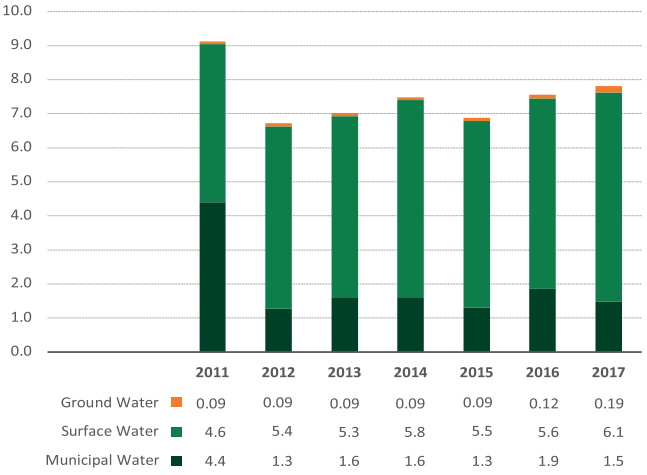
WATER WITHDRAWAL INTENSITY

(m^3 water withdrawn per ton production)



WATER WITHDRAWAL BY SOURCE

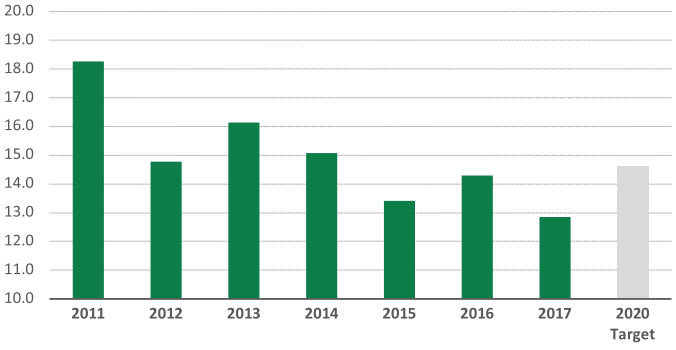
(million m^3)



	2011	2012	2013	2014	2015	2016	2017
Ground Water	0.09	0.09	0.09	0.09	0.09	0.12	0.19
Surface Water	4.6	5.4	5.3	5.8	5.5	5.6	6.1
Municipal Water	4.4	1.3	1.6	1.6	1.3	1.9	1.5

INTENSITY OF WASTEWATER PRODUCTION

(m^3 wastewater per ton production)



ENERGY

DyStar's energy originates from purchased electricity, steam, natural gas, and liquefied petroleum gas (LPG). The bulk of electricity is used to run plant machinery, IT systems, and air conditioning. Steam, generated both on site and purchased from external providers, is required largely for purposes relating to process heating.

Production sites are major consumers of energy, and hence targets for energy savings. To make this a reality, production heads work to meet specific reduction targets each year. Regularly throughout the reporting period, energy and other resources undergo joint reviews with members of senior management. These discussions are valuable to monitor progress and also give production teams an opportunity to debate the feasibility of newly proposed measures on a regular basis.

DyStar's overall energy consumption in 2017 was 1,650 TJ, compared to 1,279 TJ in 2011. The difference is primarily due to the impacts from three newly acquired production sites. Because of this, DyStar is farther from its original desired target to reduce energy intensity by 20% by the year 2020. While work has been underway to diversify the company's product portfolio in favor of less resource-intensive substances, energy intensity is down by about 7%, from 10 GJ to 9.3 GJ for every ton produced over the same seven-year period. Intensive efforts are underway to ensure that the company's less efficient acquisitions are provided the support required to align with the rest of the company in terms of energy management.

The production of textile dye usually utilizes the largest proportion of energy in manufacturing. In 2017, these activities accounted for 1,471 TJ in energy consumption. Production of auxiliaries and chemical production activities consumed just 146 TJ by comparison. Offices, laboratories, and non-production site warehouses used a combined 34 TJ.

Also in 2017, indirect energy from purchased electricity and steam comprised roughly 62% of DyStar's overall energy use, totalling over 1,018 TJ. Annual consumption in this category was just 2% higher than in 2011, despite production volumes going up by over 40% in that same period. This indicates a positive impact that auxiliaries are having on the company's overall environmental footprint, and attest to the efforts of dyes production engineers, where the per ton demand for energy would ordinarily trend significantly higher.

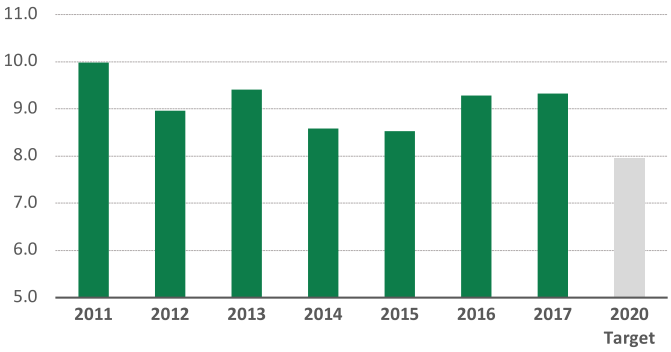
Direct energy sources in 2017 included about 38% of DyStar's total demand compared to just 28% in 2014. Between 2014 and 2017, there was a notable shift from purchasing steam to generating more of it on-site. This shift, along with the acquisition of three new production sites, caused direct energy consumption to rise from 353 TJ to 632 TJ over a three-year period. Among direct energy sources, the company consumed more than 584 TJ of natural gas and 27 TJ of LPG, accounting for 35% and 2% of the overall total direct and indirect energy consumption respectively.

The remaining 1% of energy, amounting to 21 TJ, was derived from a combination of other stationary combustion fuels and vehicular fuels. The steep rise in direct energy consumption is noted, and DyStar is continually exploring more advanced technologies to mitigate this trend. These include more fuel-efficient combustion units and carbon capture technology. However, the importance of diligently implementing simple and cost effective solutions has been found to be the best practice for reducing energy use. Installing variable frequency controllers for water pumps, reducing, cancelling or shortening processing steps, and replacing live steam with indirect heating through a heat exchanger have all been useful initiatives. These combined measures in 2017 resulted in quantifiable reductions of 740 m^3 of water, 128 thousand m^3 of wastewater, 56 tons of waste, over 3,000 liters of gasoline, 600 kg in printing paper and 18 tons of packaging.

For FY2017, renewable energy sources made up less than 1% (2.5 TJ) of overall electricity consumption at the company. Most site leads face limited access to cost-effective forms of renewable energy that are also appropriate for the geography and climate of their respective locations. Nevertheless, renewable energy technology development is being carefully monitored with the hope that appropriate innovations will soon become available. The difference is primarily due to the impacts from three newly acquired production sites.

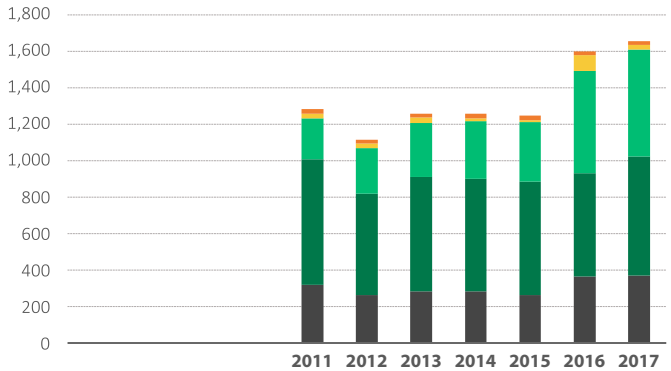
NON-RENEWABLE ENERGY INTENSITY

(GJ energy used per ton production)



NON-RENEWABLE ENERGY CONSUMPTION BY SOURCE

(TJ)



	2011	2012	2013	2014	2015	2016	2017
Vehicular Fuels	25	21	21	22	22	21	18
Stationary Combustion (LPG, diesel and fuel oil)	25	24	29	17	10	86	28
Stationary Combustion (natural gas)	227	251	295	314	330	565	584
Purchased Steam	686	556	628	620	621	564	656
Purchased Electricity	316	257	277	277	257	360	363

GHG EMISSIONS

Direct (Scope 1) emissions are those that occur from sources owned or operationally controlled by DyStar. These include emissions from stationary combustion fuels, vehicular fuels, process emissions, refrigerants, and ozone-depleting substances. A large proportion of the company's direct emissions come from the stationary combustion of fossil fuels. Indirect (Scope 2) emissions, by contrast, are produced during the generation of purchased electricity and purchased steam.

DyStar production sites evaluate GHG emissions in terms of tons of CO_2-equivalent (tCO_2e) per ton of production as a performance metric. Non-production sites, comprising a minor fraction of the company's emissions footprint, also contribute to the company's commitment to reduce emissions intensity by 20% by the year 2020 by tracking and assessing their emissions profiles in absolute quantities.

Scope 1 and Scope 2 GHG emissions in 2017 amounted to about 161,800 tCO_2e, representing a 25% increase since the 2011 baseline year and 3% compared to 2016. Collectively, Scope 2 sources made up about 78% of DyStar's emissions in 2017, with purchased steam (68,000 tCO_2e) accounting for slightly more emissions than purchased electricity (57,900 tCO_2e). The remaining 22% were Scope 1 emissions, of which natural gas alone accounted for 31,800 tCO_2e. LPG combustion resulted in 1,800 tCO_2e in emissions, while the remaining stationary combustion fuels combined with vehicular fuels accounted for 1,500 tCO_2e in emissions.

Textile dye production facilities generated emissions totalling about 147,000 tCO_2e, more than 90% of DyStar's entire footprint. The remaining 14,600 tCO_2e stemmed from activities at auxiliary and chemical production sites, as well as non-production sites including laboratories, offices, and warehouses.

Energy reduction measures are coordinated with Scope 1 and Scope 2 GHG emissions management. DyStar actively mitigates daily energy use by streamlining production operations and product ranges. The company has also discontinued manufacturing products proven to be cost or energy inefficient. The current company focus is on reversing the impact of the new acquisitions temporarily impacting GHG emission intensity, currently at 0.91 tCO_2e for every ton of production, 9% below 2011 levels and 1% below 2016 levels.

In 2017, an inaugural preliminary summary of Scope 3 emissions—those resulting from company operations, but not directly owned or controlled by the organization—concluded that Scope 3 emissions totalled nearly 3,150 thousand tCO_2e. Similar to the pattern observed in other companies, Scope 3 emissions at DyStar account for over 90% of the company's total emissions profile, when taken into account alongside its Scope 1 and Scope 2 emissions. The categories that contribute most significantly to Scope 3 emissions are goods transportation (1,388 thousand tCO_2e), product use and treatment (953 thousand tCO_2e), spending for various supplies and services (741 thousand tCO_2e), packaging (28.5 thousand tCO_2e), and energy (26 thousand tCO_2e). Scope 3 is a class of indirect emissions that represents a new challenge for corporations like DyStar. The company will increasingly focus on partnerships with its upstream and downstream businesses and suppliers to make quantifiable change in this area.

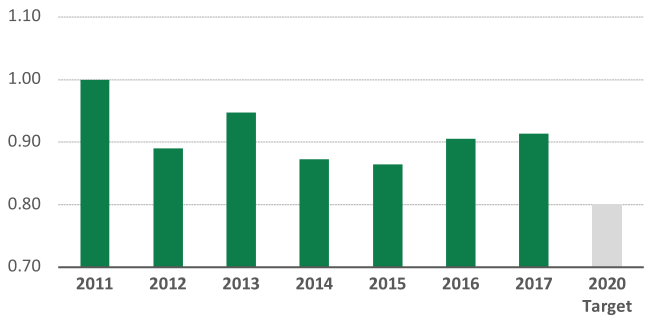
The methodology employed to quantify Scope 1, Scope 2 and Scope 3 emissions is in accordance with the Greenhouse Gas Protocol Corporate Standard, developed by the World Resources Institute (WRI) and World Business Council for Sustainable Development. Scope 1 emissions are selected for reporting based on their presence in company operations. Hence, CO_2e figures for scope 1 emissions sources include carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons. Global Warming Potentials (GWP) and Scope 1 emission factors are sourced from the GHG Protocol guidelines. Scope 2 and Scope 3 emission factors were drawn from a variety of sources, chiefly the 2011 Guidelines to Defra/DECC's GHG Conversion Factors for Company Reporting, jointly developed by the United Kingdom Department for Environment, Food and Rural Affairs and the Department for Energy and Climate Change.

OZONE-DEPLETING SUBSTANCES

DyStar dyestuff, pigments, and auxiliary preparations do not contain any ozone depleting chemicals (ODCs) as intended components. To the best of company understanding, these substances are not used in the synthesis or finishing of DyStar products. On that basis ODCs are unlikely to be present in DyStar products. Scope 1 emissions from refrigerants amounted to 489 tons, entirely from use of R22 (Chlorodifluoromethane). The GWP for refrigerants, including R22, are derived from the Intergovernmental Panel on Climate Change's Fifth Assessment Report.

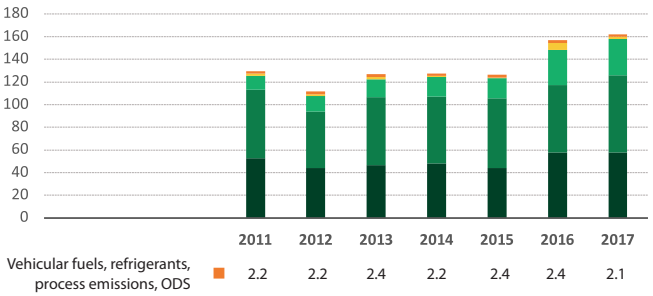
GREENHOUSE GAS EMISSIONS INTENSITY

(tons CO_2e emitted per ton production)



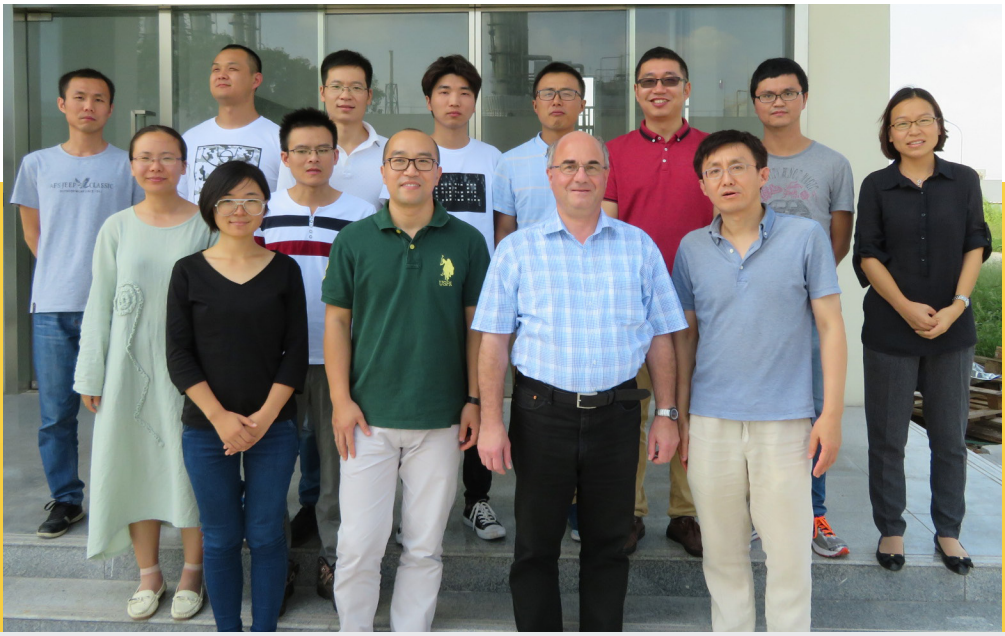
GREENHOUSE GAS EMISSIONS BY SOURCE

(thousand tons CO_2e)



	2011	2012	2013	2014	2015	2016	2017
Vehicular fuels, refrigerants, process emissions, ODS	2.2	2.2	2.4	2.2	2.4	2.4	2.1
Stationary Combustion (LPG, diesel and fuel oil)	1.8	1.7	2.1	1.2	0.7	6.1	2.0
Stationary Combustion (natural gas)	12	14	16	17	18	31	32
Purchased Steam	61	50	60	59	61	60	68
Purchased Electricity	53	44	47	48	44	58	58

LEADERSHIP CLOSE UP
DR. CLEMENS GRUND AND DR. QIN DENG



Dr. Clemens Grund, Senior Director Global Technology and Ecology and Dr. Qin Deng, Head of DyStar Global Innovation Centre (GIC) share more on new lab facilities and the future of dye technology R&D to serve customer needs.

The design of the GIC incorporated sustainable architecture and construction techniques. What are some of the benefits of operating a more sustainable facility?

Dr. Clemens Grund: The architecture and construction of the new lab building demonstrates many green features. As a working environment, the building also has openness and transparent feel by using big windows and bright colors.

Dr. Qin Deng: Yes, it is a great feeling. Features-wise, we have incorporated a number of innovations into the design of the building. For instance, the GIC's solid waste and wastewater treatment facilities are shared with DyStar Nanjing plant, removing the need for additional facilities. Lab waste gases are treated by an organic active carbon adsorption process, and monitored online to meet all local regulations & requirements. Also, all laboratory infrastructure is made from environmentally friendly materials. The lab's fume hoods use a variable air volume system that is 50% more energy efficient than usual–helping to ensure healthy indoor air quality while minimizing energy use. The shower room heater uses an air source heat pump heater, which has energy efficiency savings 4-6x that of an electric heater.

Your research team is relatively new and it was not a simple task to assemble a group of such highly skilled individuals at the GIC. What have you learned from working together?

Dr. Clemens Grund: It is not easy to recruit a team of highly specialized and skilled scientific experts in a very competitive environment like Nanjing. You must use all HR tools available to hire such employees. One of the most important factors though is the working environment of the company. We can demonstrate to people that they are working in a company with good reputation, that they are respected in what they are doing, that their results are appreciated, and will result in new products for our customers. We do our best to demonstrate to that company takes care about its people, and fortunately for us today, we now have a dedicated core group of employees.

Dr. Qin Deng: Indeed, our GIC team is about 1-2 years in existence, which quite relatively new. What we learned from working together is that GIC team needs to focus on safety first, be open to innovative ideas, flexible to change, show respect for each other and staff diversity, be results driven, and work well together as a team.

What are some of the challenges that customers face, and why is DyStar's R&D such an important part of the solution?

Dr. Clemens Grund: Our customers need to reduce their impacts on our environment. They are under pressure to improve their production processes. DyStar's products achieve the highest levels of chemical quality and safety. To enable this, we develop new reactive dyes with high strength and fixation rates which can lead to improvements in the sustainability of their productions processes.

Legal requirements for chemicals regarding environmental and toxicological aspects are also constantly changing. Accordingly, customers are interested in products that are free of harmful impurities. DyStar's econfidence® program supports the customers in the selection process for the best dyes and chemicals.

Also, the occupational health and safety requirements in their textile mills are getting more challenging. With new eco-friendly products that we offer, customers will be supported with regards to related requests in this area.

Dr. Qin Deng: DyStar already has pioneered and advanced many useful chemical technologies like dyes with higher wash and light fastness, healthy dyes not harmful to human body, and environmental friendly dyes that have treatable wastewaters. The GIC is helping to lead development of the next generation of chemicals like these to help customers meet their challenges.

We are also working on dyes with innovative processes and technologies, which eliminate the wastewater, solids, and gases during production, water and energy-saving dyes, functional dyes with higher values for a variety of applications, and many other technologies.

Can better chemistry also render the chemical production process more efficient or safer for DyStar's manufacturing teams?

Dr. Clemens Grund: Yes, safety is paramount, and we have operationalized many best practices in this regard. Risk assessments are performed for each new synthesis step, to prevent accidents during production. We have optimized synthesis processes by increasing batch size, used less solvents, reduced the number of synthesis steps, used substances with lower toxicological profile such as bromo derivatives instead of more toxic chloro derivatives, and used no persistent chemicals as ingredients for new products.

Dr. Qin Deng: Adding onto that, going forward GIC R&D will use green chemistry to design or explore more healthy and safe substances.

One of the unique features of the GIC is the "KG Lab". What is it and how will it cater to the needs of customers?

Dr. Clemens Grund: The KG Lab is equipped with state of the art technology and will enable us to more easily transfer new production processes to the factory level after optimization of the design. It will provide bigger samples of dyes and chemicals for performing customer trials and for the chemical registration for global regulation requirements.

Dr. Qin Deng: That's right. Our GIC KG Lab will be very important for DyStar to quickly prepare and ship kilogram scale samples for customer pre-screening or evaluation, which is critical for our industries.

At a broader level, what R&D driven changes will the industry witness over the course of the next century?

Dr. Clemens Grund: There will be increased focus on resource savings, especially water. DyStar's work towards providing special formulated products for alternative dyeing processes are important in this regard. R&D will also change the whole product stewardship process, and design will incorporate principles of green chemistry, like using safer alternative chemicals, product risk assessments, and so on. We will also see increases in production automation in the industry and will need to support the customers to transfer lab work to bulk production results.

Dr. Qin Deng: The next century will also evolve many new innovative products based on high-end molecular structure innovation, design that satisfies special functions, cleaner production, and improvements made to the chemical security requirements of product. We are also looking into innovative colorants to match requirements for materials such as plastics, polyester, and fiber. Improved enterprise efficiency and profitability are also key areas, as we hope to improve product technology content and add value, improve equipment operational efficiency, use revolutionary new process technology, and reduce discharge of wastewater, solids and gas from production processes.

MATERIALS, WASTE AND PACKAGING

MATERIALS

Raw material consumption in DyStar's production plants—the chemical substances that are either processed or manufactured into a finished product—totalled 137,400 tons. Utilization intensity stood at 0.79 tons per ton of production for the second year in a row, a 21% decrease from base year, exceeding the company's 2020 reduction target by 1%. Associate materials, such as glass beads used for grinding press cakes, are necessary in the production process but do not actually become part of a product. In 2017, 1,540 tons of associate materials were purchased.

Aside from lignin-based dye dispersants sourced from plants, most of DyStar's materials are derived from non-renewable sources. Like other chemical industries, limitations exist for many essential materials, and the majority of raw and associate materials are derived from virgin, rather than recycled, sources. The company recognizes all materials have an environmental footprint, and hence should be used in an efficient manner.

Recent years have seen DyStar improving its efficiency, preventing excess inventory from accumulating. This effort requires frequent and accurate communication between master planners, sales teams and production heads. Master planners know that by being smart about what and when to purchase, mitigation options can be maximized with respect to impacts from extracting, processing, and delivering raw and associate materials. Upon passing testing requirements, orders are accepted for manufacturing purposes, but it is up to the R&D chemists and process development teams to ensure the final product is obtained the least number of steps possible. The best scientific minds are hard at work seeking pathways to maximize the utilization of material inputs.

HAZARDOUS AND NON-HAZARDOUS WASTE

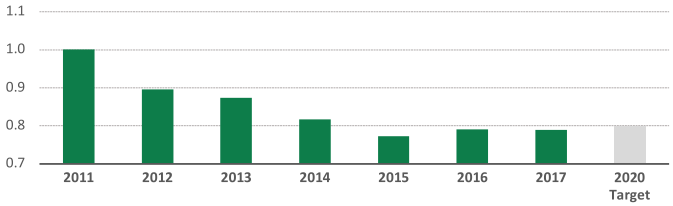
Most of DyStar's hazardous waste is derived from manufacturing activities. Hazardous waste comprises primarily of packaging material, product residues, residues resulting from the distillation recovery of solvents, solutions and other liquids that cannot be disposed as wastewater, and residues remaining after wastewater evaporation at certain plants.

Non-hazardous waste comprises a small proportion of overall waste quantities, mostly consists of office waste, uncontaminated packaging material, and pallets. DyStar's teams aim to reuse and recycle as much of their non-hazardous waste as possible. Material categories deemed acceptable for recycling by contractors vary from country to country. Non-hazardous waste unsuitable for recycling due to local limitations is disposed of as municipal waste.

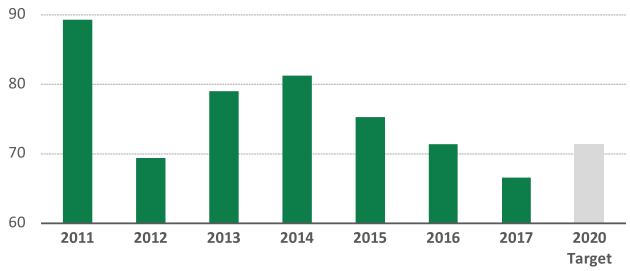
For FY2017's totals, hazardous and non-hazardous waste came to 10,100 tons, a reduction of 5% from 2016 and 3% compared to 2011. The amount of hazardous and non-hazardous waste generated per ton of production fell 25% since 2011. Hazardous waste intensity alone dropped 26% since 2011. The 2017 reporting year had no major environmental accidents or spillage incidents at any of DyStar's locations.

Of the total waste generated by DyStar sites, 15% (1,470 tons) was either reused or recycled, 48.5% (4,900 tons) incinerated, and 36.5% (3,710 tons) was landfilled. The bulk of landfill waste was non-hazardous, with a small proportion of hazardous waste contained on licensed sites dedicated to stabilized industrial waste. Hazardous waste was the main category of material sent for incineration, with roughly 600 tons converted to energy at vendor-located waste-to-energy incineration plants.

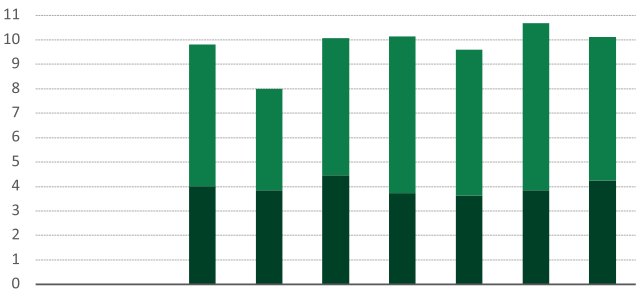
RAW MATERIAL USAGE INTENSITY
(tons of raw material per ton production)



WASTE PRODUCTION INTENSITY
(kg of waster per ton production)



WASTE PRODUCTION BY CATEGORY
(thousand tons)



A framework of precautions is a central tenet of DyStar's HSE management system. It governs the handling and disposal of hazardous waste. Hazardous waste marked for disposal exists company premises only via licensed waste management contractors. All external partners are expected to abide by all applicable laws and regulations and are audited annually. Beyond local laws and regulations, DyStar's policy prohibits hazardous waste from being discarded in a manner that can harm communities or the environment, as well as the transportation of company waste across national borders.

To the best of current knowledge, DyStar does not operate near ecosystems that are either protected or known to be highly biodiverse. When considering new sites for manufacturing, environmental and social impact assessments are conducted to evaluate potential risks that resulting from company presence and activities. Hazardous waste and wastewater contractors are also evaluated along these lines.

There are no known significant impacts on local biodiversity due to DyStar production activities in any location. However, it is acknowledged that inadequate treatment of DyStar products by customers after the use phase do have the potential to damage ecosystems. There is little transparency as to the fate of dye products post-sale, but an open line of communication with clients is maintained to encourage outreach and technical advice regarding wastewater treatment.

SUSTAINABLE PACKAGING AND LOGISTICS

The transportation of dyes, auxiliaries, and other chemicals presents the possibility of spillage caused by cargo mishandling. Potential consequences to human health and safety as well as to the environment are not taken lightly. Multiple precautionary layers are required to ensure that DyStar products arrive safely and intact. Selecting experienced and licensed transportation contractors minimizes many of the potential risks. Packaging should be functional and effectively contain and protect products throughout the entire course of a journey. It also requires strength to withstand the unique weather conditions of each destination.

DyStar used 6,700 tons of packaging material in FY2017 – including cardboard boxes, plastic drums, bulk containers, plastic wrapping, etc. In countries where the service is available, specialized service providers can be engaged to collect, clean, and re-distribute the company's Intermediate Bulk Containers (IBCs) for reuse, thereby encouraging a more circular approach to packaging. More than 19% of DyStar's 2017 global packaging needs were met by these reconditioned IBCs.

Ahead of product shipping, appropriate warning labels are applied on every box, drum and container, in accordance with the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS). Without these labels, customers working directly with DyStar products would have limited information on appropriate handling and emergency response requirements. DyStar products are 100% compliant with GHS requirements and have not had a serious labelling-related incident.

For product transport, the in-house logistics team has taken active steps to minimize DyStar's indirect environmental impacts. Coordination is undertaken with a multitude of customers and transport companies with the aim of meeting the expectations of all partners. The logistics team also aims to make optimal use of each container loads, with the priority to dispatch full, rather than partially empty, containers. By doing so, they help mitigate the company's indirect emissions impact and cut overall transportation costs.

DyStar's distribution networks are also organized with efficiency in mind, using direct shipments from production plants to sales regions. Regionally, the company maintains a distribution center as well as a network of smaller local warehouses that are strategically located near clusters of textile producers. Ultimately, the careful selection of warehouses based on geographical locations helps reduce the number of partial truckload trips required to reach our various customers. In areas where purchase volumes tend to be consistently high, the company also provides on-site consignment stocks. Though DyStar bears risks for any consignment inventory that goes unsold, the benefits from being able to reduce trucking frequency makes this a feasible arrangement at certain locations. Because of these and other mitigation measures, DyStar has managed to reduce the overall cost for logistics over the previous half decade, even though sales have gone up by roughly 40% since 2011.

LEADERSHIP CLOSE UP
THERESA HYDE

Theresa "Terry" Hyde heads up the DyStar Hilton Davis plant, responsible for producing many F&D dyes commonly used in a variety of consumer products. Find out about her experience securing SQF certification for this important production facility.

Tell us about your role and why you are drawn to it.

Terry Hyde: I look at my role as one who removes daily obstacles for a team of very talented manufacturing, engineering, maintenance, and chemistry professionals so that they can make improvements to the business.

What are some of the key products manufactured at the DyStar Hilton Davis plant?

Terry Hyde: We manufacture FD&C food dyes, food lakes (water insoluble dyes), technical grade dyes, drug and cosmetic dyes, and lakes on the dye side of the business. We also manufacture dispersions products—pigments used in paints, stains, mulch products, and other industrial applications.

In this line of business, what specifically are we referring to when we discuss lakes?

Terry Hyde: Lakes are dyes that are further processed thus becoming water insoluble. They will not "run" or spread. These products are used in confection colors and cosmetics. The example that often comes to mind is a candy cane. When you look at a candy cane and the red and white do not run together, that's because the red is a lake.

How is the DyStar Hilton Davis plant unique in this industry?

Terry Hyde: Our wide mix of product lines is a very different than most businesses. The company was established in the early 1920s.

"I look at my role as one who removes daily obstacles for a team of very talented manufacturing, engineering, maintenance, and chemistry professionals so that they can make improvements to the business.

The site has made significant investments in recent years to acquire state-of-the-art facilities and SQF certification. Can you tell us more about this?

Terry Hyde: We became a Safe Quality Food (SQF) certified site in 2015. SQF is a certification body much like ISO only for food safety. It requires us to develop strict plans and practices that ensure we protect our processing from any biological, physical, or chemical hazards. Current good manufacturing practices (cGMPs for short) are employed throughout the food dye operations. These include use of equipment such as hair and beard nets, restrictions on wearing jewellery and nail polish, maintaining equipment in sanitary conditions, and other methods to protect against contamination. Customers look at a supplier as a better caliber when they are SQF certified because it shows a higher level of discipline and process control which ensure safe products. This was a huge undertaking for the plant in terms of upgrading the facility, training the employees, and teaching a new mindset around food safety.

What is required for a facility to become SQF certified?

Terry Hyde: Rigorous documentation of the process showing that "we do what we say, and we say what we do" is required as in ISO. In addition, we must have an SQF practitioner on staff who oversees our program to ensure compliance at all times. Internal audits are performed on a weekly basis, and annual recertification must also take place through a certified outside SQF auditing firm.

What are some of the improvements that you are particularly proud of?

Terry Hyde: We have been involved in automation projects for several years now. We have automated the press cycle on three of our large presses for lakes processing, thus improving quality, consistency of product, and reducing cycle times. We also decoupled our lakes drying and packing process resulting in a 40% throughput improvement.

Can you tell us about Six Sigma and how it has been applied at your site?

Terry Hyde: We do not practice Six Sigma per se, but have introduced operational excellence which is a practice of using lean methodology to drive improvement. Focus on 6S, process mapping, material organization and waste reduction all play a part in improving plant efficiencies.

What has been the outcome of these changes (i.e. related to Six Sigma)?

Terry Hyde: We have seen improvements in cycle time and overall plant performance. In addition, our disciplined approach to housekeeping was instrumental in our achieving SQF certification.

What are some of the daily challenges faced by your team and how have they learned to cope?

Terry Hyde: Our facility is older, and as such, we have daily equipment challenges, but a sense of urgency and creativity always keeps us ahead of issue.

What do you appreciate most about your team?

Terry Hyde: They are creative and enjoy the challenges. Each member brings a unique talent to the business. They are serious about success, but we always take time to make it fun!

CARING FOR PEOPLE

OUR EMPLOYEES

DyStar's success depends on its employees. To enable this, the company aims to attract and recruit the best people and strives to cultivate a diverse and inclusive work culture. Its extensive workforce engagement program is structured to enhance employee skills and advance individual career aspirations. By mapping employees' needs to relevant training and development opportunities, numerous avenues exist to help DyStar's workforce progress in their professional and personal lives. The results of this approach are demonstrated in both workforce diversity and the growing employee retention, often for extended periods of time.

Of DyStar's 2,350 employees, 91% are permanent full-time employees and roughly 4% are permanent part-time employees. Non-permanent employees, including employees with fixed-term or temporary employment contracts, make up 5% of company workforce. About 11% of work performed on company premises are handled by external contract workers including those overseeing security, cleaning, IT and maintenance services, based on the number of man-hours. Excluding gender and age groups, about 5% of the global workforce is composed of employees from groups that are identified as being minority or vulnerable groups in their country locations. In the United States, 27% of the workforce is composed of members from minority groups. Employment numbers at DyStar are not subject to seasonal variation. All permanent employees receive annual performance reviews.

DyStar respects the rights of all employees to set up and support labor unions and also the right to collective bargaining. The company ensures that labor union representatives are not discriminated against and that their members have access to the workplace.

SKILLS ENHANCEMENT

Beyond technical prowess and business acumen, the efforts of DyStar's talented workforce have contributed greatly to its market leadership. Globally, the business' leadership maintains high-quality skills development through a range of training and development programs. For skilled, knowledgeable employees with many years of service with the company, it is essential to ensure that their skills continue to remain relevant and provide opportunities. For these individuals, additional learning opportunities are offered to help maintain their edge with industry trends and technological advances. In particular, there has been a strong and continuing drive toward HSE training and language training.

Annual performance appraisals, career development planning, and training opportunities to fulfill tasks and targets enable staff with a clear trajectory for their development. Training opportunities extend across all levels of the company, from boots-on-the-ground production workers and laboratory technicians through to middle and even senior management.

Having a common language gives the company a decisive advantage. DyStar has a global presence in over 20 countries. This makes language and communication skills an imperative to ensure that the best ideas can shine through. English is the lingua franca at DyStar, which has been further reinforced over the years with reported success. Teams view positively their ability to communicate information and gain knowledge from colleagues outside of their own location.

Some regions face human resource challenges such as a lack of skilled labor, especially in rural production plants. At such sites, DyStar provides opportunities to members of the local community by hiring them, providing on-the-job training, and facilitating personal coaching. Through this approach, there is greater opportunity to ensure a good job fit for staff from the local area. The residents, in return, acquire skills that give them lasting employment prospects.

During the 2017 financial year, over 20,000 hours were invested in skills enhancement at DyStar, with roughly two thirds of those hours dedicated to occupational health and safety topics. Male employees received about 70% of overall training, with most of the disparity being traceable to the markedly higher number of hours invested in production sites workers. Owing to the physical nature of their work, applicants for production site roles continue to be overwhelmingly men. It should be noted however that female applicants are welcome, and the company does not condone discriminatory job advertisements or hiring practices for these or other positions.

While they make up 57% of the company, production workers received over 75% of all training because the number one priority towards DyStar staff is keeping them safe from physical harm. Beyond the company's production sites however, the total number of hours invested in training men vs. the hours invested in training women at DyStar are comparable. However, it has come to attention that there is more investment needed in training women at the middle and senior management level. Although there are no policies at DyStar that prioritize training for men above that for women employees, there may be less tangible factors that prevent women employees from applying for training. The company is beginning to examine this area more closely.

Total hours invested in staff training

	Men	Women
Senior Management	626	176
Middle Management	2,275	875
Administration and Support	2,041	2,338
Technical and Laboratory	2,552	1,752
Production Workers and Supervisors	7,148	309
Total Training Hours	**14,641**	**5,450**

THE YEAR IN HIGHLIGHTS

DyStar Pakistan went on a scenic team building excursion

The Pietermaritzburg team joined forces with nearby companies to clean up their neighborhood on Mandela Day

Omuta Production Site was recognized as a safe working site by the Fukuoka prefecture in Japan

Employees from DyStar Shanghai and CSI joined forces to organize the 2017 New Year party

The DyStar Kimya team in Turkey hosted a day of fun and entertainment for the local orphange

The DyStar Global Innovation Center (GIC) in Nanjing, China went live

DyStar LP/CSI team took an opportunity to volunteer with Samaritans Purse in North Carolina

DyStar employees from South Africa participated in the Durban Colour Run

DIVERSITY AND EQUALITY

As a multinational, DyStar is committed to promoting diversity throughout its offices, laboratories, and 17 production plants. A fair and equitable workplace should be provided for all employees at all times in all areas of the company's work. DyStar does not support any form of discrimination, and no employee may be disadvantaged based on ethnicity, religion, ideology, gender, age, disability, or sexual orientation. DyStar's Code of Conduct does not condone any kind of harassment and will act on reported incidents pertaining to discrimination or harassment. Bound by the principles of equality, the company recruits, promotes, and rewards employees based on merit.

DyStar actively encourages women to join their male counterparts in entering its workforce. Of the 31 women employees that went on maternity leave in 2017, nearly 80% had returned to the workforce before the close of the year. However, at company production sites, many applicants and employees continue to be men due to the nature of the job, which involves manual labor and machinery–roles that most women choose not to work in. The company is fortunate to have a considerable number of talented women serving as engineers, chemists, and laboratory technicians at many production sites. Women are also far better represented in non-production sites. Overall, about 30% of DyStar's management roles are held by women, and among technical and administration staff, this figure rises to 40% and 53% respectively. There is still clear room for improvement. With women increasingly opting to forge careers of their own–particularly now in emerging markets–it could be expected that more opportunities will rise to further narrow the workplace gender gap.

In 2017, there was one resolved grievance related to alleged gender discrimination, which was reviewed by the organization and found to be unsubstantiated. The grievance was originally reported in 2016 and is now no longer subject to action. While this instance turned out not to be a case of discrimination, DyStar is aware it does not preclude the possibility that there may be legitimate cases elsewhere in the company, and company management remains vigilant in this regard.

INTERNATIONAL WOMEN'S DAY WORKSHOP – DSI TEAM

Dr. Vaishali Rane led a printing workshop for female colleagues to mark International Women's day

To celebrate International Women's Day in a unique way, DSI female colleagues organized a small, in-house workshop to understand printing techniques from fellow laboratory colleagues. Dr. Vaishali Rane and her team led the workshop, demonstrating how fabric is dyed and printed using stencils, and then finished in the oven. Dr. Vaishali Rane also taught the group the ancient embroidery artwork of India, including Aari work. Staff enjoyed the opportunity to bond over a creative activity.

EMPLOYEE HEALTH, SAFETY AND WELL-BEING

As the manufacturing of dyes and chemicals can involve harsh substances that require careful management, the occupational health and safety of DyStar employees is a top priority. Chemical production can also involve working with powerful, high-speed equipment and large volumes of chemical mixtures. Managers are conscious of the precautions that employees at production plants, laboratories, and warehouses must take, and are vigilant to avoid risk from factors like these.

Compliance with all applicable laws and regulations is the baseline, and DyStar goes further by implementing health and safety policies specific to activities at each of its location. Globally, a network of HSE teams function under central leadership. The local HSE manager and team are responsible for ensuring that all employees and subcontractors adhere to laws, regulations, and internal policies. They also develop guidelines and training programs to educate technical and production staff on the ways to exercise vigilance – both for the sake of their own safety and that of their colleagues.

Several pillars of DyStar's health and safety framework enable a safe working environment. First, is the provision of adequate personal protective equipment to employees to shield them from both direct and long-term health risks. Second, the implementation of regular and rigorous site inspections is essential to identify potential health and safety risks. Any inspection gaps are remediated within a set timeframe with appropriate follow-up actions. Third, in the event of an incident or accident, DyStar's safety protocol requires on-site management to conduct thorough investigations into its cause and subsequent implementation of remediation plans to prevent recurrences.

Breakdown of employees

	Men	Women
Senior Management	95	24
Middle Management	222	100
Administration and Support	313	358
Technical and Laboratory	273	184
Production Workers and Supervisors	753	26
Total Workforce	**1,656**	**692**

Safety boards are used to visually track the days without Injury on Duty (IOD). Having the sign visible reminds everyone on site to always keep safety at the forfront

DyStar believes that happy employees are also more productive employees. The company invests in a variety of awareness programs and activities to keep employees healthy.

There were no workplace fatalities in 2017, nor any recorded cases of occupational disease. There were 15 cases of staff injuries. No contractors suffered recordable injuries while working on company premises. In total, 258 workdays were lost as a result of employee injuries. The lost day rate for injuries in 2017 was 12.4. DyStar's injury rate[1] of 0.72 was 40% below the average figure for the chemical manufacturing industry, which stood at 1.2 in 2016[2].

Overall, the company's 2017 health and safety performance, despite being better than the average for the industry, was far from ideal. Best practices

Training is critical not only to maintain a safe worksite, staff also learn how to respond in the event of an accident.

continue to be promoted and diligently monitored. For example, each injury or near miss requires a follow-up Corrective and Preventative Action Plan (CAPA), and all production sites undergo regular and periodic health and safety audits. However, there is the challenge to do better and improve in this area as every injury as a serious event. DyStar recognizes it must continue to reduce such incidents by improving communication between teams and streamlining aspects of health and safety management.

The most notable recent addition to the company's health and safety framework was the implementation of a centralized Accident and Incident Management System (AIMS). It has been instrumental in making communication more effective with real-time incident reporting and system auto-alerts for key regional managers and global department heads. DyStar also recently expanded the AIMS reporting framework beyond production sites to include laboratories, warehouses, and office locations. By removing any layers of secrecy between the different levels of the organization, attention and accountability are raised for each incident. Through effective communication, the company aims to acknowledge shortcomings without blame and working cohesively toward effective solutions.

[1] *Incidence rates represent the number of injuries per 100 full-time workers and were calculated as: (N / EH) x 200,000 where, N=number of injuries or illnesses, EH=total hours worked by all employees within the calendar year, 200,000=base for 100 full-time workers (working 40 hours per week, 50 weeks per year).*

[2] *Source: Bureau of Labor Statistics, U.S. Department of Labor, Jun 4, 2018*

CELEBRATING 1,200 INJURY-FREE WORK DAYS

Pietermaritzburg team celebrate 1,200 working days without injury

20 March 2017 was a special day for the Pietermaritzburg Production Plant. They celebrated 1,200 continuous working days without an injury on duty. To commemorate this achievement all employees as well as on-site contractors were presented with certificates of achievement and personalized jackets. The commitment to safety on site by all involved in the day to day activities at the plant is the reason for this achievement and all involved are committed to reaching the next milestone.

HUMAN RIGHTS

Business should always be conducted with respect to the fundamental rights of all, regardless of whether they are DyStar employees or external parties. As a company committed to the principles of the United Nations Global Compact, this is of critical importance. In all countries of operation, labor laws are adhered to without exception. Operational changes are notified with two weeks provided at a minimum, but can be higher based on the region. Throughout the reporting period, DyStar received no fines or penalties related to labor practices and human rights abuse. There were no reported cases of illegal conduct surrounding the treatment of local communities and indigenous peoples.

One key element of DyStar's Code of Conduct is the Social Accountability Declaration. Accordingly, discrimination based on race, ethnic origin, gender, religion, philosophy, political or union membership, disability, age, or sexual orientation is not tolerated. DyStar employees are entitled to freedom of association, the right to form and join trade unions, and the right to bargain collectively. The company's policy is to allow trade union representatives unhindered access to their members at DyStar workplaces.

Instead of formalized procedures for human rights assessments, the company empowers and depends on its management teams to adhere to DyStar's Code of Conduct and the Codes of Business Conduct by actively monitoring activities at their respective locations. This ensures that activities are conducted in a locally relevant manner and to address any risks or known breaches in ethics at a local level. All new employees are required to read the company's Code of Conduct, which includes our policy regarding Human Rights. Further, all DyStar's agreements and contracts include a clause that requires our business partners to abide by all local laws and regulations.

However, company practices must be robust enough to withstand any oversight by local management. Hence, employees are enabled to report violations via a feedback channel directly to the Global Compliance Officer, whose contact details are shared with all new recruits. Any breaches of ethical principles–whether within or outside company premises–can also be brought to the attention of DyStar's Sustainability Committee via Sustainability@DyStar.com.

Through DyStar's supplier engagement process and regular on-site visits, the company monitors for signs of human rights abuses in its supply chain. One of the consequences of today's fast-changing political and economic climate is that risks are also evolving across our value chain. It is required that basic standards of business conduct are respected by suppliers and to ensure this is maintained, DyStar reassesses its approach to supplier management on a regular and periodic basis.

DyStar does not allow child labor, and no sites controlled by the company employ children. The head of compliance travels extensively to sites to ensure that this and other policies are adhered to. In addition, individuals below the age of 18 are also not employed for health reasons, even though in some countries it is legal for teenagers above 16 years of age to work. Externally, the company also has a zero-tolerance policy toward child labor when it comes to its suppliers. All existing material suppliers are audited onsite either annually or once every two years.

Forced or compulsory labor is a potential risk in every market, although it is generally considered a higher risk in developing countries. DyStar depends on internal audits to ensure that there is no forced labor in its operations. Although our risk is low internally, suppliers can be a potential source of concern. Hence, the procurement team is trained to be vigilant for signs of forced labor, including prison labor, during supplier audits.

In terms of influence of public policy, DyStar's position is not to make political contributions. The company does not participate in or support lobbying activities on any of a range of laws or regulations that do or have the potential to impact the industry.

DyStar's presence in each of its locations of operation is not large enough for its economic impact at the state, provincial, or national level to be considered significant. Our economic impact on the towns and villages that are located adjacent to some of our production sites, however, can in certain instances be considerable. Where there is the potential for DyStar to have a significant indirect impact on the local economy, it aims to contribute toward water and food accessibility, capacity building, and education.

COMMUNITY ENGAGEMENT

Communities are the bedrock of society and the pool from which DyStar's talent is drawn. When operating near local communities, it is not enough to be responsible about managing environmental risks. DyStar also adopts a mutually beneficial approach by actively providing jobs and training opportunities to residents. In some places, when DyStar invests in local communities, the company is also indirectly securing the future of its own workforce.

This is an important strategic imperative rather than merely a philanthropic one, and success is not measured by the monetary value of company donations. Increasingly, DyStar is looking into the quality of the social impact that its contributions can make. All teams are responsible for identifying and executing social initiatives based on local community needs. Regular, active dialogue with key community stakeholders better enables company management to understand the fundamental needs of its neighbors. This helps focus the direction and purpose of corporate social responsibility initiatives and programs. For FY2017, DyStar employees devoted 205 volunteer hours towards projects like these.

Community leaders may occasionally raise concerns on local impacts of DyStar's business operations, and these are treated with the seriousness they deserve. Through local engagement with the community, DyStar can address most grievances and mitigate corresponding impacts. Invitations have been extended to residents to tour plants, observe equipment, safety measures, and pollution control devices that are used. This open-door policy has enabled plant managers to effectively handle any concerns relating to operations and their impacts. To the best of company knowledge, there are no operational sites whose regular activities result in significant negative impacts on local communities.

COMMUNITY ENGAGEMENT

Copesville Primary School

Youth

- Copesville Primary School (in Pietermaritzburg, South Africa) has more than a thousand students. In collaboration with the school over several weeks, DyStar's maintenance team assisted to refurbish and repair desks, benches, and boards for students.
- DyStar Colours Indonesia presents scholarships to 36 students from elementary school SDN 3 Gabus each year to help support the youth of the local community.
- 10 volunteers from DyStar Kimya brightened up a day for orphanage children in Çorlu, Turkey. The kids had fun with the company of DyStar employee volunteers and clowns. Employees also donated gifts, clothes, toys, books, and school bags.
- The DyStar LP/CSI team took an opportunity to volunteer with Samaritans Purse, an organization known internationally for serving children in need. Employees helped pack boxes donated from the Charlotte, North Carolina area to be sent around the world for the Christmas Child program.

DyStar Gabus

Water and Sustenance

- DyStar Gabus distributed staple foods (5 kg rice and 1 liter cooking oil)–referred to locally as sembako–to each family in the local village ahead of Idul Fitri. The government of Serang district extended their appreciation to DyStar for continuously distributing necessities, noting the company as a role model for others.
- Since 2011, DyStar Indonesia has supplied more than 280,000 m^3 of water to nearby communities in the village of Gabus, free of charge. The team continues to install faucet valves for parts of the community where water flow unfortunately cannot be turned off. Their colleagues in Bandung, Indonesia also acknowledge that water is a fundamental right and allow nearby communities to collect water from their work site whenever water wells in the region go dry.

DyStar Colours Indonesia

Environment

- DyStar Colours Indonesia participated in the national tree-planting event in Curug, Bitung, Lebak District. The special event was officially launched by the vice governor of Banten. Around 500 companies in Banten province took part. On behalf of the government, the Vice Governor expressed appreciation to all participating companies including DyStar Colours Indonesia. For the event, DyStar contributed 25 mango and rambutan trees.
- Mandela Day cleanup takes place annually on the 18th of July, the day Nelson Mandela was born. In memory of the great man who devoted his life to the service of humanity, all employees of DyStar South Africa dedicated part of the day to clean up the surrounding area. Although it was a day of hard work, all employees took part and collected a mound of trash.

Uludag University, Turkey

Capacity Building

- DyStar supported researchers at Uludag University in Turkey who recently acquired a DyeCoo CO_2 dyeing machine. The state-of-the-art machine will allow students to conduct trials and understand the conditions required to achieve waterless dyeing, using supercritical CO_2. Experienced researchers at DyStar provided technical expertise and dye samples.
- Our colleagues in Brazil participated in the SENAI initiative (National Service of Industrial Learning) to create better environment for students. SENAI created a "coexistence area" for the students of the Tanning School in Estância Velha (Rio Grande do Sul) in Brazil, in partnership with the chemical industry. This project aimed to promote close links between SENAI students and chemical industry partners, as the school will groom future leather technicians and managers.

COMMUNICATING WITH STAKEHOLDERS

Regular, open, honest communication with stakeholders is a central part of DyStar's approach to working with the many parties that the company relies on. We aim to respond to all views and concerns expediently to build long-lasting meaningful relationships. This adds value DyStar's business while simultaneously serving the interests of our stakeholders.

BUILDING SUSTAINABLE RELATIONSHIPS: ENGAGE, LISTEN AND RESPOND

A conscious effort is made to communicate with our key stakeholders throughout the year. Groups that are fundamental to building a sustainable textile industry are a high priority for the company. These stakeholders are selected based on the potential or actual basis for DyStar to impact their part of the value chain, as well as their potential or actual basis to impact DyStar's business. Important groups include company employees, customers in textile production, brands and retailers, NGOs, industry groups, shareholders, and suppliers.

DyStar employs a combination of formal and informal channels to enable its stakeholder engagement. In FY2017, stakeholder groups were surveyed to understand their views on DyStar's sustainability performance and reporting practices. We also engaged with brands and retailers at a deeper level through one-on-one telephone interviews. The respondents were chosen based on their ability to speak with authority on a range of topics that are relevant to DyStar's sustainability performance and its future priorities.

STAYING INVOLVED AND CONNECTED

Industry Organizations

- American Association of Textile Chemists and Colorists (AATCC)
- Ankleshwar Industries Association
- Associação Brasileira das Indústrias Químicas (ABIQUIM), Brazilian Association of Chemical Industries
- The Association of Thai Textile Bleaching Dyeing Printing and Finishing Industries (ATDP)
- China Dyestuff Industry Association
- The Ecological and Toxicological Association of Dyes and Organic Pigments Manufacturers (ETAD®)
- German Chemical Industry Association (VCI)
- Gujarat Dyestuffs Manufacturers Association
- Japan Dyestuff and Industrial Chemical Association
- Society of Dyers and Colourists, United Kingdom
- Society for Leather Technologists and Chemists (SLTC)
- South African Dyers and Finishers Association
- Sindicato das Indústrias de Produtos Químicos (SINPROQUIM), Brazilian Union of Chemical Products Industries
- Taiwan Dyestuffs & Pigments Industrial Association

Business Associations

- Corlu Chamber of Commerce and Industry
- Dalton Chamber of Commerce
- Employers' Association of Indonesia (APINDO)
- Importers and Exporters Association of Taipei
- Pietermaritzburg Chamber of Business
- Reidsville Chamber of Commerce
- Singapore Business Federation

Sustainable Textile Standards and Organizations

- American Apparel and Footwear Association (AAFA)
- Associação Brasileira das Indústrias Têxteis (Abit), Brazilian Textile and Apparel Industry Association
- bluesign®
- Cradle to Cradle™
- Global Organic Textile Standard (GOTS)
- Oeko-Tex®
- Sustainable Apparel Coalition (SAC)
- Textile Exchange
- Zero Discharge of Hazardous Chemicals (ZDHC)

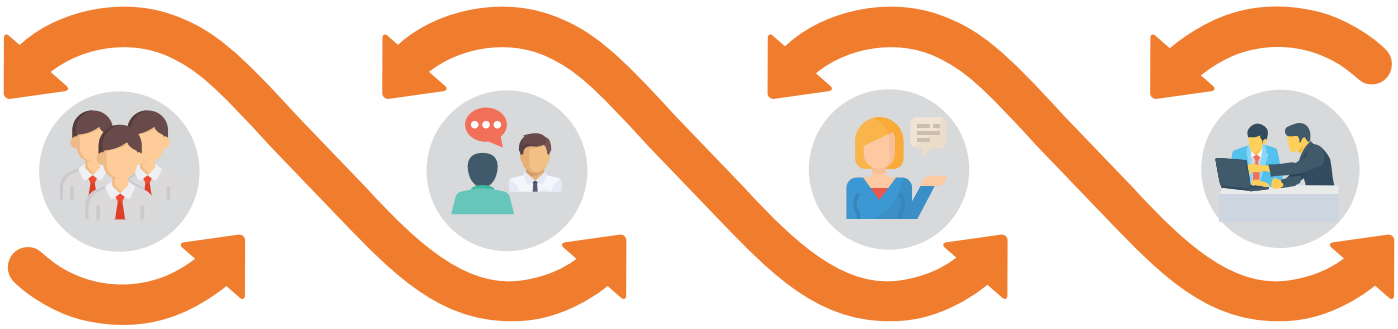
Global Corporate Sustainability Organizations and Local Chapters

- National Committee of Responsible Care, Indonesia (KNRCI)
- Responsible Care®
- Global Compact Network Singapore
- United Nations Global Compact (UNGC)

ENGAGE, LISTEN RESPOND

In order to maintain the pulse of pertinent stakeholder issues, DyStar actively participates in joint projects and dialogues with local and international organizations. Through its involvement in these networks, the company gains the opportunity to collectively drive responsible practices across the textile and chemical industries.

Building Sustainable Relationships: Engage, Listen, Respond



Our Stakeholders	How We Engage with Them (Method and Frequency)	What They Have Told Us	How We Responded
Employees	Internal communication channels (frequently) Team building days (yearly) Performance reviews (yearly) Employee Sustainability Survey (yearly) Sustainability@DyStar.com	Preference for products that enable textile manufacturers to operate more efficiently.	DyStar continues to offer an extensive collection of products that are designed to reduce costs and resource consumption. In 2017, new resource-saving Cadira modules were rolled out to keep up with industry demand.
		Brighter office spaces	Renovations have been completed or are in progress at multiple office locations around the globe to enhance colour scheme, branding, lighting, and many other improvements.
		Production teams care about maintaining high standards of workplace health and safety.	DyStar expanded the application of the centralized reporting tool to monitor accidents and incidents (already implemented at production sites) to warehouses, laboratories, and office locations. By efficiently documenting all injuries, accidents and near misses, the company is better able to understand existing risks and act on them accordingly.

ENGAGE, LISTEN RESPOND

Our Stakeholders	How We Engage with Them (Method and Frequency)	What They Have Told Us	How We Responded
Customers	Website, product brochures, social media, newsletter Meetings with sales associate (frequently) Interaction with DyStar's Ecology team for chemical guidance (frequently) Forums, seminars and conferences (frequently) Visits to DyStar production sites (as and when requested) DyStar's Customers, Brands and Retailers Sustainability Survey (yearly) Sustainability@DyStar.com	Preference for products that enable textile manufacturers to operate more efficiently.	DyStar continues to offer an extensive collection of products that are designed to reduce costs and resource consumption. In 2017, new resource-saving Cadira modules were rolled out to keep up with industry demand.
		Chinese-language website for clients in China	A new website was launched for DyStar customers in China, complete with all the same product information and updates that are found in the English-language website.
		Sustainability report in Chinese for clients in China	The 2017 report will be the first to be fully translated to Chinese, and DyStar hopes to set a positive example in the industry for GRI reporting in this important market.
		Better assurance that the STS and Texanlab service units are operating independently from DyStar and are able to make unbiased decisions when advising service clients.	To avoid potential conflicts of interest, STS and Texanlab will be housed under a new umbrella entity, BluWin.
Suppliers	Tendering process (as and when needed) Supplier site audits (yearly) Supplier Ecological Survey on chemical compliance (yearly) Supplier Sustainability Performance Questionnaire (yearly) DyStar's Supplier Sustainability Survey (yearly)	Suppliers in Asia would appreciate technical support and technology sharing to help reduce the impact of their own products and activities.	An e-copy of this report will be shared with all suppliers in Asia. Any suppliers inspired by initiatives or programs mentioned in this report are welcome to reach out via Sustainability@DyStar.com for more information and collaboration opportunities.
		It is important that the supplier selection process remains fair.	Management teams are now trained on the Code of Business Conduct for Suppliers and Third Party Service Providers–which expressly prohibits the acceptance of gifts by DyStar employees as well as relatives of DyStar employees.

ENGAGE, LISTEN RESPOND

Our Stakeholders	How We Engage with Them (Method and Frequency)	What They Have Told Us	How We Responded
Brands and Retailers	Meetings with sales associates (frequently) Color design process (frequently) Forums, seminars and conferences (frequently) DyStar's Customers, Brands and Retailers Sustainability Survey (yearly) Visits to DyStar production sites (as and when requested) Sustainability@DyStar.com	Supplier diversity is desired by food and beverages business brands and retailers in America want to make sure that all businesses are given a fair chance including those owned by women, minority groups, veterans, and people with disabilities.	DyStar operations in the United States have begun to incorporate diversity as a category in its standard supplier questionnaires. The company wants to ensure all business owners are given a fair chance, so long as they provide the same quality of service or product. DyStar is ready to support and participate in brand or retailer Tier 2 Supplier Diversity programs.
		Textile and apparel brands and retailers	DyStar attended all IPE related training invitations from textile and apparel brands and retailers this year and are gradually implementing changes in its own operations to become aligned with the standards defined by the China NGO IPE.
Shareholders	Shareholder meetings (quarterly) Long-term planning with senior management and key committees (quarterly) DyStar's Shareholder Sustainability Survey (yearly)	Long-term talent development	Management trainee program is underway with the first batch of recruits already dispatched to various key locations to broaden their understanding of business operations.
NGOs and Industry Groups	Forums, seminars and conferences (as and when opportunities arise) Working groups (quarterly or yearly) Collaborative projects (as and when opportunities arise) DyStar's NGO and Industry Group Sustainability Survey (yearly)	In China, NGOs want to see more transparent reporting on all aspects of the environment, including the performance at our DyStar plants as well as those of our Chinese suppliers.	DyStar is cooperating with the IPE in China to expand the framework of our supplier questionnaire. The company also has plans to heighten communication with suppliers within the country so they can understand expectations and are aware of where improvements can be realized.
		More participation in industry-related projects and initiatives.	In 2017, DyStar provided assistance and facilitated introductions to key stakeholder contacts for research related to environmental sustainability in the industry.

METHODOLOGY

This is the DyStar Group's eighth annual Sustainability Performance Report. It aims to provide details of our commitments, and performance to date on the environmental and social issues that matter most to our stakeholders. The content of this report also communicates DyStar's vision and plans to further the sustainability agenda throughout the industry.

With this report, the company hopes to reach out to as many of its stakeholders as possible and provide a transparent account of DyStar's progress toward driving sustainable practices across the value chain. From DyStar's perspective, its success in this endeavor is going to be one of the most accurate predictors of our ability to succeed as a business in the long-term.

The company values the opinions of both its internal and external stakeholders on how it can perform better. Do write in with feedback and suggestions by emailing: Sustainability@DyStar.com

SCOPE OF REPORT

This report covers DyStar's global operations for the financial year January 2017 to December 2017, inclusive of all material GRI-specific disclosures. It contains performance data for all production sites, warehouses, offices and laboratories that are either owned or operated by DyStar. The previous most recent report was the 2016 Sustainability Performance Report. DyStar reports on an annual basis and there have been no significant changes observed in this year's materiality.

DATA AND EXTERNAL ASSURANCE

DyStar takes a standardized approach to data collection and data analysis across all its operations. A centralized data management system is used to collect and assess sustainability performance data from its business entities. Information supplied to this system undergoes a two-step verification process to ensure the integrity of the final report's data. The procedure also lends accuracy to the year-on-year performance results. Wherever relevant, applied methods and assumptions are detailed within the body of the report.

The data disclosed in this report is not externally assured. DyStar is currently exploring options to externally assure sections considered critically important in subsequent sustainability reports.

REPORTING FRAMEWORK

This report is prepared in accordance with the Global Reporting Initiative (GRI) Standards: Core Option. The GRI Standards provide the principles and disclosures required by organizations to report their economic, environmental, and social performance and impacts. DyStar applies the GRI's principles in defining report content and quality, as set out by the GRI Standards. Readers may refer to the full GRI Standards Index at the end of this report for an overview the company's approach in this regard.

APPROACH TO MATERIALITY

To identify the issues that matter most to DyStar's business and stakeholders, DyStar carried out a materiality assessment exercise in 2017. The process involved identifying relevant issues based on industry mega-trends and stakeholder feedback. A materiality questionnaire was included in the annual stakeholder engagement survey. DyStar surveyed internal as well as external stakeholders to rank the issues based on how significantly each affected their decision-making process. Similarly, a survey was conducted where members of upper management at DyStar were asked to rank the same topics based on the potential for each issue to impact our business. Participant responses were assessed to create a materiality matrix that reasonably reflects the sustainability issues most relevant to DyStar.

DyStar aims to report, at a minimum, on the topics that are identified as being critical or very important. Following the recent re-assessment of the materiality matrix, some of the topics have been regrouped and renamed. The new matrix is more closely aligned with the GRI framework and better communicates the issues that concern DyStar's stakeholders.

I MATERIALITY MATRIX

Topic	Issues	Aspect Boundary	Priority
Circular Economy	Life cycle considerations in value chain Circular business model	▲	◆
Climate Change	Energy efficiency Global warming Air pollution Renewable energy Mitigating risks of releasing substances	▲	◆
Community Relations	Economic impact Labour and social policy rights Feedback channels Volunteering Social investment	▲	◆
Compliance with Product Related Laws and Standards	Restricted substances Commitment to voluntary standards	▲	◆
Customer Satisfaction	Customer satisfaction	▲	◆

Boundary ● Within the Organization ▲ Within and outside the organization
Priority ◆ Moderate ◆ High ◆ Critical

Topic	Issues	Aspect Boundary	Priority
Development of Human Capital	Employee training and development Remuneration Benefits Recruitment Retention	●	◆
Diversity and Equality	Gender Age Ethnicity Job security Preventing exploitation of labor	▲	◆
Economic Performance	Financial expectations	▲	◆
Ecosystem Biodiversity	Impact of manufacturing operations	▲	◆
Environmental Regulations	Compliance with local environmental laws and regulations	▲	◆
Ethics and Integrity	Code of Conduct Workplace and labour practices	▲	◆
Expansion in New and Emerging Markets	Catering to newer clients in emerging markets	▲	◆
Exposure in Mature Markets	Exposure in mature markets	▲	◆
Green Chemistry	Green chemistry practices and principles Energy efficiency Water efficiency Mitigating or removing potential impact to land, air, water bodies, flora or fauna	▲	◆
Product Impact Assessment	Chemical analysis Product life cycle assessment Research and development	▲	◆
Responsible Marketing	Accessible online tools and information Availability of expertise in all major markets Ethical marketing communications practices Responsible advertising	▲	◆
Responsible Sourcing	Traceability Chemical testing Supplier environmental performance Code of Conduct for supplier workplace ethics Supplier diversity Supplier health and safety performance	▲	◆
Waste Management	Treatment of hazardous chemicals Mitigating soil and water contamination risks	▲	◆
Stakeholder Engagement	Opportunities for dialogue Transparency Accountability Due diligence	▲	◆
Sustainable Logistics	Green logistics Efficient packaging Warehousing Transportation	▲	◆
Water and Wastewater	Water use efficiency Waste management Wastewater management Water pollution	▲	◆
Worksite Health and Safety	Process and plant safety Laboratorysafety Worksite health, hygiene and wellness Emergency preparedness and response	●	◆

Boundary ● Within the Organization ▲ Within and outside the organization
Priority ◆ Moderate ◆ High ◆ Critical

GRI CONTENT INDEX

This report was prepared in accordance with the Global Reporting Initiative (GRI) Standards, Core option. For many categories, the information provided in this document exceeds the GRI core disclosure requirement. Depending on the availability of information, some GRI disclosures are only partially addressed.

GRI 102: General Disclosures			
1. Organizational Profile	GRI 102-1	Name of the organization	p. 6
	GRI 102-2	Activities, brands, products and services	p. 6, 8, 9, 10, 11
	GRI 102-3	Location of headquarters	p. 6
	GRI 102-4	Location of operations	p. 7
	GRI 102-5	Ownership and legal form	p. 6
	GRI 102-6	Markets served	p. 7
	GRI 102-7	Scale of the organization	p. 2, 3, 7
	GRI 102-8	Information on employees and other workers	p. 48, 50
	GRI 102-9	Supply chain	p. 23
	GRI 102-10	Significant changes to the organization and its supply chain	p. 7
	GRI 102-11	Precautionary principle or approach	p. 20
	GRI 102-12	External initiatives	p. 14
	GRI 102-13	Membership of associations	p. 54
2. Strategy	GRI 102-14	Statement from senior decision-maker	p. 4
	GRI 102-15	Key impact, risks and opportunities	p. 4
3. Ethics and Integrity	GRI 102-16	Values, principles, standards, and norms of behavior	p. 14
	GRI 102-17	Mechanisms for advice and concerns about ethics	p. 14
4. Governance	GRI 102-18	Governance structure	p. 12
	GRI 102-19	Delegating and authority	p. 12, 19
	GRI 102-20	Executive-level responsibility for economic, environmental and social topics	p. 19
	GRI 102-21	Consulting stakeholders on economic, environmental and social topics	p. 19, 55
	GRI 102-23	Chair of the highest governance body	p. 12
	GRI 102-26	Role of highest governance body in setting purpose, values and strategy	p. 12
	GRI 102-27	Collective knowledge of highest governance body	p. 12
	GRI 102-29	Identifying and managing economic, environmental and social impacts	p. 13
	GRI 102-30	Effectiveness of risk management processes	p. 19
	GRI 102-31	Review of economic, environmental and social topics	p. 19
	GRI 102-32	Highest governance body's role in sustainability reporting	p. 58
	GRI 102-33	Communicating critical concerns	p. 19
	GRI 102-36	Process of determining renumeration	p. 12
	GRI 102-37	Stakeholders' involvement in renumeration	p. 12
5. Stakeholder Engagement	GRI 102-40	List of stakeholder groups	p. 55
	GRI 102-41	Collective bargaining agreements	p. 48
	GRI 102-42	Identifying and selecting stakeholders	p. 55
	GRI 102-43	Approach to stakeholder engagement	p. 55
	GRI 102-44	Key topics and concerns raised	p. 55
6. Reporting Practice	GRI 102-45	Entities included in the consolidated financial statements	p. 7
	GRI 102-46	Defining report content and topic Boundaries	p. 59
	GRI 102-47	List of material topics	p. 59
	GRI 102-48	Restatement of information	p. 2
	GRI 102-49	Changes in reporting	p. 58
	GRI 102-50	Reporting period	p. 58
	GRI 102-51	Date of most recent report	p. 58
	GRI 102-52	Reporting cycle	p. 58
	GRI 102-53	Contact point for questions regarding the report	p. 58
	GRI 102-54	Claims of reporting in accordance with the GRI Standard	p. 58
	GRI 102-55	GRI content index	p. 60
	GRI 102-56	External assurance	p. 58

GRI CONTENT INDEX

GRI 201: Economic Performance			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 7
	GRI 103-2	Management approach: The management approach and its components	p. 7
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 201-1	Direct economic value generated and distributed	p. 2
	GRI 201-2	Financial implications and other risks and opportunities due to climage change	p. 18
GRI 202: Market Presence			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 7
	GRI 103-2	Management approach: The management approach and its components	p. 7
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 202-1	Ratios of standard entry level wage by gender compared to local minimum wage	p. 7
	GRI 202-2	Proportion of senior management hired from the local community	p. 7
GRI 203: Indirect Economic Impacts			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 52
	GRI 103-2	Management approach: The management approach and its components	p. 52
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 203-1	Infrastructure investments and services supported	p. 52
	GRI 203-2	Significant economic impacts	p. 7
GRI 204: Procurement Practices			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 23
	GRI 103-2	Management approach: The management approach and its components	p. 23
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 204-1	Proportion of spending on local suppliers	p. 7
GRI 205: Anti-corruption			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 14
	GRI 103-2	Management approach: The management approach and its components	p. 14
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 205-1	Operations assessed for risks related to corruption	p. 3
	GRI 205-2	Communication and training about anti-corruption policies and procedures	p. 14
GRI 206: Anti-competitive Behavior			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 14
	GRI 103-2	Management approach: The management approach and its components	p. 14
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	p. 14
GRI 301: Materials			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 44
	GRI 103-2	Management approach: The management approach and its components	p. 44
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 301-1	Materials used by weight or volume	p. 44
	GRI 301-2	Recycled input materials used	p. 44
	GRI 301-3	Reclaimed products and their packaging materials	p. 44
GRI 302: Energy			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 40
	GRI 103-2	Management approach: The management approach and its components	p. 40
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 302-1	Energy consumption within the organization	p. 40
	GRI 302-2	Energy consumption outside of the organization	p. 40
	GRI 302-3	Energy instensity	p. 40
	GRI 302-4	Reduction of energy consumption	p. 40
	GRI 302-5	Reductions in energy requirements of products and services	p. 28, 30

GRI CONTENT INDEX

GRI 303: Water			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 38
	GRI 103-2	Management approach: The management approach and its components	p. 38
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 303-1	Water withdrawal by source	p. 38
	GRI 303-2	Water sources significantly affected by withdrawal of water	p. 38
GRI 304: Biodiversity			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 44
	GRI 103-2	Management approach: The management approach and its components	p. 44
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 304-1	Operational sites owned, leased, managed in, or adjacent to, producted areas and areas of high biodiversity value outside protected areas	p. 44
	GRI 304-2	Significant impacts of activities, products, and services on biodiversity	p. 44
GRI 305: Emissions			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 41
	GRI 103-2	Management approach: The management approach and its components	p. 41
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 305-1	Direct (Scope 1) GHG Emissions	p. 41
	GRI 305-2	Energy indirect (Scope 2) GHG emissions	p. 41
	GRI 305-3	Other indirect (Scope 3) GHG emissions	p. 41
	GRI 305-4	GHG emissions intensity	p. 41
	GRI 305-5	Reduction of GHG emissions	p. 41
	GRI 305-6	Emissions of ozone-depleting substances (ODS)	p. 41
GRI 306: Effluent and Waste			
	GRI 103-1	Management approach: Explanation of the material topics and its boundary	p. 39, 44
	GRI 103-2	Management approach: The management approach and its components	p. 39, 44
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 306-1	Water discharge by quality and destination	p. 39
	GRI 306-2	Waste by type and disposal method	p. 44
	GRI 306-3	Significant spills	p. 44
	GRI 306-4	Transport of hazardous waste	p. 44
	GRI 306-5	Water bodies affected by water discharges and/or run off	p. 44
GRI 307: Environmental Compliance			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 18
	GRI 103-2	Management approach: The management approach and its components	p. 18
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 307-1	Non-compliance with environmental laws and regulations	p. 18
GRI 308: Supplier Environmental Assessment			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 23
	GRI 103-2	Management approach: The management approach and its components	p. 23
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 308-1	New suppliers that were screened using environmental criteria	p. 23
	GRI 308-2	Negative environmental impacts in the supply chain and actions taken	p. 23
GRI 401: Employment			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 48
	GRI 103-2	Management approach: The management approach and its components	p. 48
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 401-1	New employee hires and employee turnover	p. 2
	GRI 401-3	Parental leave	p. 50

GRI CONTENT INDEX

GRI 402: Labor/Management Relations			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 14
	GRI 103-2	Management approach: The management approach and its components	p. 14
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 402-1	Minimum notice periods regarding operational changes	p. 52
GRI 403: Occupational Health and Safety			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 51
	GRI 103-2	Management approach: The management approach and its components	p. 51
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 403-2	Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	p. 51
	GRI 403-3	Workers with high incidence or high risk of diseases related to their occupation	p. 51
GRI 404: Training and Education			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 48
	GRI 103-2	Management approach: The management approach and its components	p. 48
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 404-1	Average hours of training per year per employee	p. 48
	GRI 404-2	Programs for upgrading employee skills and transition assistance programs	p. 48
	GRI 404-3	Percentage of employees receiving regular performance and career development reviews	p. 48
GRI 405: Diversity and Equal Opportunity			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 50
	GRI 103-2	Management approach: The management approach and its components	p. 50
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 405-1	Diversity of governance bodies and employees	p. 50
GRI 406: Non-discrimination			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 50
	GRI 103-2	Management approach: The management approach and its components	p. 50
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 406-1	Incidents of discrimination and corrective actions taken	p. 50
GRI 408: Child Labor			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 50
	GRI 103-2	Management approach: The management approach and its components	p. 50
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 408-1	Operations and suppliers at significant risk for incidents of child labor	p. 50
GRI 409: Forced or Compulsory Labor			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 52
	GRI 103-2	Management approach: The management approach and its components	p. 52
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	p. 52
GRI 411: Rights of Indigenous Peoples			
	GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 52
	GRI 103-2	Management approach: The management approach and its components	p. 52
	GRI 103-3	Management approach: Evaluation of the management approach	p. 19
	GRI 411-1	Incidents of violations involving rights of indigenous peoples	p. 52

GRI CONTENT INDEX

GRI 412: Human Rights Assessment		
GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 52
GRI 103-2	Management approach: The management approach and its components	p. 52
GRI 103-3	Management approach: Evaluation of the management approach	p. 19
GRI 412-1	Operations that have been subject to human rights reviews or impact assessments	p. 52
GRI 412-2	Employee training on human rights policies or procedures	p. 52
GRI 412-3	Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	p. 52
GRI 413: Local Communities		
GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 53
GRI 103-2	Management approach: The management approach and its components	p. 53
GRI 103-3	Management approach: Evaluation of the management approach	p. 19
GRI 413-1	Operations with local community engagement, impact assessments, and development programs	p. 53
GRI 413-2	Operations with significant actual and potential negative impacts on local communities	p. 53
GRI 414: Supplier Social Assessment		
GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 23
GRI 103-2	Management approach: The management approach and its components	p. 23
GRI 103-3	Management approach: Evaluation of the management approach	p. 19
GRI 414-1	New suppliers that were screened using social criteria	p. 23
GRI 414-2	Negative social impacts in the supply chain and actions taken	p. 23
GRI 415: Public Policy		
GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 53
GRI 103-2	Management approach: The management approach and its components	p. 53
GRI 103-3	Management approach: Evaluation of the management approach	p. 19
GRI 415-1	Political contributions	p. 53
GRI 416: Customer Health and Safety		
GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 20
GRI 103-2	Management approach: The management approach and its components	p. 20
GRI 103-3	Management approach: Evaluation of the management approach	p. 19
GRI 416-1	Assessment of the health and safety impacts of product and service categories	p. 20
GRI 416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	p. 20
GRI 417: Marketing and Labelling		
GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 20
GRI 103-2	Management approach: The management approach and its components	p. 20
GRI 103-3	Management approach: Evaluation of the management approach	p. 19
GRI 417-1	Requirements for product and service information and labelling	p. 20, 45
GRI 417-2	Incidents of non-compliance concerning product and service information and labelling	p. 20
GRI 417-3	Incidents of non-compliance concerning marketing communications	p. 20
GRI 418: Customer Privacy		
GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 20
GRI 103-2	Management approach: The management approach and its components	p. 20
GRI 103-3	Management approach: Evaluation of the management approach	p. 19
GRI 418-1	Substantial complaints concerning breaches of customers privacy and losses of customer data	p. 20
GRI 419: Socioeconomic Compliance		
GRI 103-1	Management approach: Explanation of the material topic and its boundary	p. 15
GRI 103-2	Management approach: The management approach and its components	p. 15
GRI 103-3	Management approach: Evaluation of the management approach	p. 19
GRI 419-1	Non-compliance with laws and regulations in the social and economic area	p. 15

SDG INDEX

HOW DYSTAR SUPPORTS THE SUSTAINABLE DEVELOPMENT GOALS (SDGs)

At DyStar, we believe businesses play an important role in helping achieve the SDGs. We reviewed how our sustainability activities through DyStar's Four C's (Creating, Conserving, Caring and Communicating) support the 17 Goals. As a global corporation, we acknowledge our ability to have an impact on all the goals but there are eight where we believe DyStar is able contribute in meaningful ways.

Sustainable Development Goal		How We Support The Goals	
	End poverty in all its forms everywhere	• Providing stable jobs that pay fair wages • Enhancing livelihoods through youth capacity building	p. 7, 53
	End hunger, achieve food security and improved nutrition and promote sustainable agriculture	• Organizing annual food donation drives in North Carolina • Providing food to local communities in Indonesia every year ahead of the Idul Fitri holiday	p. 53
	Ensure healthy lives and promote well-being for all at all ages	• Promoting good occupational health and safety practices among employees • Introducing safer dyes and chemicals to the market • Facilitating occupational health and safety for textile production workers • Mitigating impact to consumer health through product testing	p. 44-45, 48, 51-53
	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	• Supporting employees through knowledge, skills or technical training • Providing scholarships to students from rural communities • Providing dye samples and dying expertise to educational institutions	p. 52-53
	Achieve gender equality and empower all women and girls	• Ensuring a fair and equitable workplace, free from discrimination • Empowering underprivileged women through skills training	p. 50
	Ensure access to water and sanitation for all	• Providing water to nearby rural communities • Responsible withdrawal and consumption of water for manufacturing • Ensuring effective treatment and proper discharge of wastewater • Developing less water-intensive dyes and chemicals for application processes	p. 39, 40, 52
	Ensure access to affordable, reliable, sustainable and modern energy for all	• Adopting more energy-efficient technologies at production plants • Purchasing energy derived from renewable sources	p. 40, 42
	Promote inclusive and sustainable economic growth, employment and decent work for all	• Protecting labor rights and ensuring safe working environments • Decent work for employees, with fair opportunities for career progression • Hiring and training employees drawn from nearby communities	p. 7, 53

UN SDGs that the company has limited capacity to contribute in a direct manner.

Sustainable Development Goal		How We Support The Goals	
	Build resilient infrastructure, promote sustainable industrialization and foster innovation	• Establishing industry and fostering innovation in the places we operate • Investing in state-of-the-art research facilities and scientific know-how • Upgrading technology and infrastructure for resource-efficient processes	p. 16, 26, 52
	Reduce inequality within and among countries	• Actively providing jobs and training opportunities to nearby residents • Supporting rural communities through education and capacity building • Zero tolerance for discrimination enforced through the Code of Conduct	p. 14-15, 52-53
	Make cities inclusive, safe, resilient and sustainable	• Quality clothing dyes reduce the burden on city water treatment systems • Volunteering work hours to keep the local community clean and green	p. 39, 53
	Ensure sustainable consumption and production patterns	• Actively reducing intensity of resource consumption in manufacturing • Designing products and modules for resource-efficiency in application • Developing lasting colors to mitigate consumer consumption	p. 8, 22-23, 38
	Take urgent action to combat climate change and its impacts	• Adopting newer technologies in manufacturing to mitigate GHG emissions • Optimizing transport and logistics to reduce Scope 3 GHG emissions • Awareness raising through training courses organized by STS division • Developing products that enable customers to be more energy-efficient	p. 38-41
	Conserve and sustainably use the oceans, seas and marine resources	• Ensuring effective treatment and proper discharge of wastewater • Incorporating end-of-life considerations in product design • STS customer training on management of water and effluent treatment • Assessing wastewater treatment capabilities during supplier audits	p. 38, 39
	Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss	• Opting not to develop on virgin greenfield land • Completing Environmental Impact Assessments before projects go live • Printing sustainability reports on Forest Stewardship Council (FSC) paper • Printing CSI Color Analysis magazine on 100% recycled paper • Virtual color management tools available via DyStar CSI Design Tools	p. 8, p. 44-45
	Promote just, peaceful and inclusive societies	• Maintaining a robust governance structure • Conducting business in keeping with highest ethical and legal standards • Effectively implementing the DyStar Code of Conduct • Code of Business Conduct for Suppliers and Third Party Service Providers • Code of Business Conduct for Sales Related Service Partners • Auditing all business units for corruption-related risks	p.14-15, p. 19, 51
	Revitalize the global partnership for sustainable development	• Collaborating with responsible textile producers, brands and retailers • Encouraging and facilitating sustainable practices among suppliers • Supporting NGO and non-profit initiatives that help further the Goals • Youth capacity building through partnerships with academic institutions • Active engagement with authorities, residents and community leaders	p. 23, 52-53

UN SDGs that the company has limited capacity to contribute in a direct manner.

UNGC INDEX

UNITED NATIONS GLOBAL COMPACT

The United Nations Global Compact (UNGC) is a voluntary initiative through which companies that are committed to exercising responsible leadership act to help in the creation of global frameworks for realizing sustainable growth. The UNGC details 10 universally accepted principles for corporate social responsibility in the areas of human rights, labor, environment and anti-corruption. As a signatory member, DyStar is committed to incorporating the 10 principles in the way we conduct our business and disclose how we do so through this report which serves as our formal Communication on Progress (COP).

The Ten Principles of the UNGC	
Principle 1: Supporting and respecting the protection of internationally proclaimed human rights	p. 52
Principle 2: Making sure that business is not complicit in human rights abuses	p. 52
Principle 3: Upholding the freedom of association and the effective recognition of the right to collective bargaining	p. 48, 52
Principle 4: Supporting the elimination of all forms of forced and compulsory labor	p. 52
Principle 5: Supporting the effective abolition of child labor	p. 52
Principle 6: Eliminating discrimination in employment and occupation	p. 50-51
Principle 7: Supporting a precautionary approach to environmental challenges	p. 20-41, 44
Principle 8: Undertaking initiatives to promote greater environmental responsibility	p. 20-41
Principle 9: Encouraging the development and diffusion of environmentally friendly technologies	p. 20-41
Principle 10: Working against all forms of corruption, including extortion and bribery	p. 14-15

Committed to Sustainability

DyStar's products and services help customers worldwide reduce costs, shorten lead times and meet stringent quality and ecological specifications.

Information and technical advice – whether verbal, in writing or by way of trials – are given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. DyStar advice does not release you from the obligation to check its validity and to test DyStar products as to their suitability for the intended processes and uses. The application, use and processing of DyStar products and the products manufactured by you on the basis of DyStar technical advice are beyond DyStar's control and, therefore, entirely your own responsibility. DyStar products are sold in accordance with our General Conditions of Sale and Delivery.

Bluesign is a registered trademark of bluesign technologies ag, Switzerland.
ETAD is a registered trademark of The Ecological and Toxicological Association of Dyes and Organic Pigments Manufacturers (ETAD), Switzerland.
Öko-Tex is a registered trademark of Forschungsinstitut Hohenstein Prof. Dr. Jürgen Mecheels GmbH & Co. KG, Germany.
REACH is a registered trademark of The European Union, represented by the European Commission, Belgium.
Responsible Care is a registered trademark of Conseil Européen de l'Industrie Chimique – European Chemical Industry Council, en abrégé CEFIC, Belgium.
Cradle to Cradle is a registered trademark of McDonough Braungart Design Chemistry LLC, USA.
Nomex is a registered trademark of E.I. Du Pont de Nemours and Company, Wilmington Del., USA.
H&M is a registered trademark of H&M Hennes & Mauritz AB, Stockholm, SE.
Kering is a registered trademark of Kering S.A., Paris, FR.
Stella McCartney is a registered trademark of Stella McCartney Limited, W11 4BE, London, GB.
Eileen Fisher is a registered trademark of Eileen Fisher, Inc., 2 Bridge Street Irvington, New York, NY 10533, USA.
Loomstate is a registered trademark of LOOMSTATE, LLC, New York, NY 10012, USA.

FSC
www.fsc.org
MIX
Paper from responsible sources
FSC® C129961

DyStar® econfidence from DyStar SUSTAINABLE TEXTILE SOLUTIONS

Astrazon, BluWin, Boehme, Cadira, Cassulfon, Dianix, DyStar, econfidence, Econtrol, eliot, Evo, Imperon, Indanthren, Isolan, Jettex, Lava, Levafix, Palanil, Procion, Realan, Remazol, Sera, Sirius, Supralan and Telon are registered trademarks of DyStar Colours Distribution GmbH, Germany.

Global Headquarters
DyStar Singapore Pte Ltd

Tel: +65 6671 2800
Fax: +65 6659 1328
DyStar.Singapore@DyStar.com
www.DyStar.com

DyStar®

100.0005.01.1708