



**AdBlue®**



**NPL** | **KRUSE**  
AUTOMOTIVE

**NPL BlueSky Automotive**  
Technical JV between Nandan Petrochem and KRUSE Automotive GmbH, Germany



**To Go Green,  
add a bit of Blue!**



# Quality System for AdBlue and Bypass of SCR System

Presented by

**Mr. Varun Agrawal**

Director and CEO

NPL BlueSky Automotive Pvt Ltd



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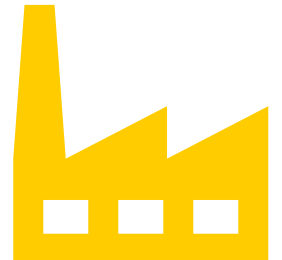
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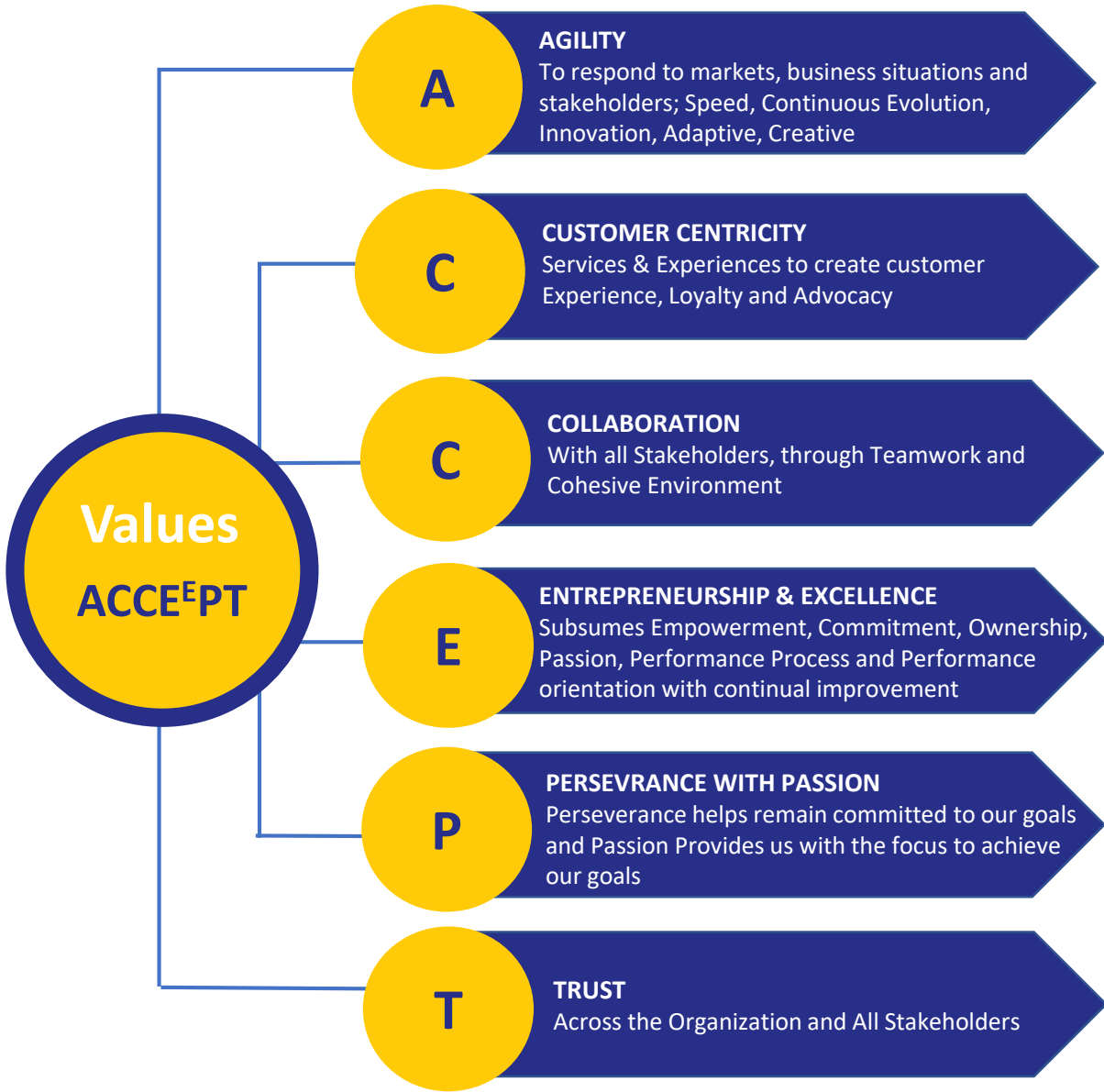


NPL BlueSky Automotive Pvt Ltd is a Technical Joint Venture between Nandan Petrochem Ltd and KRUSE Automotive GmbH, Germany to manufacture and market AdBlue (AUS32/DEF) in India

As early as in 2011, when India decided to implement BS IV in 13 cities, NPL BlueSky Automotive commissioned the AdBlue manufacturing plant in India.



**Thereby, today the pioneer and largest manufacturer of AdBlue in India.**



## Vision

“We at Nandan Group as a responsible Corporate, aim to be a preferred Partner delivering stakeholder value in all our endeavours”



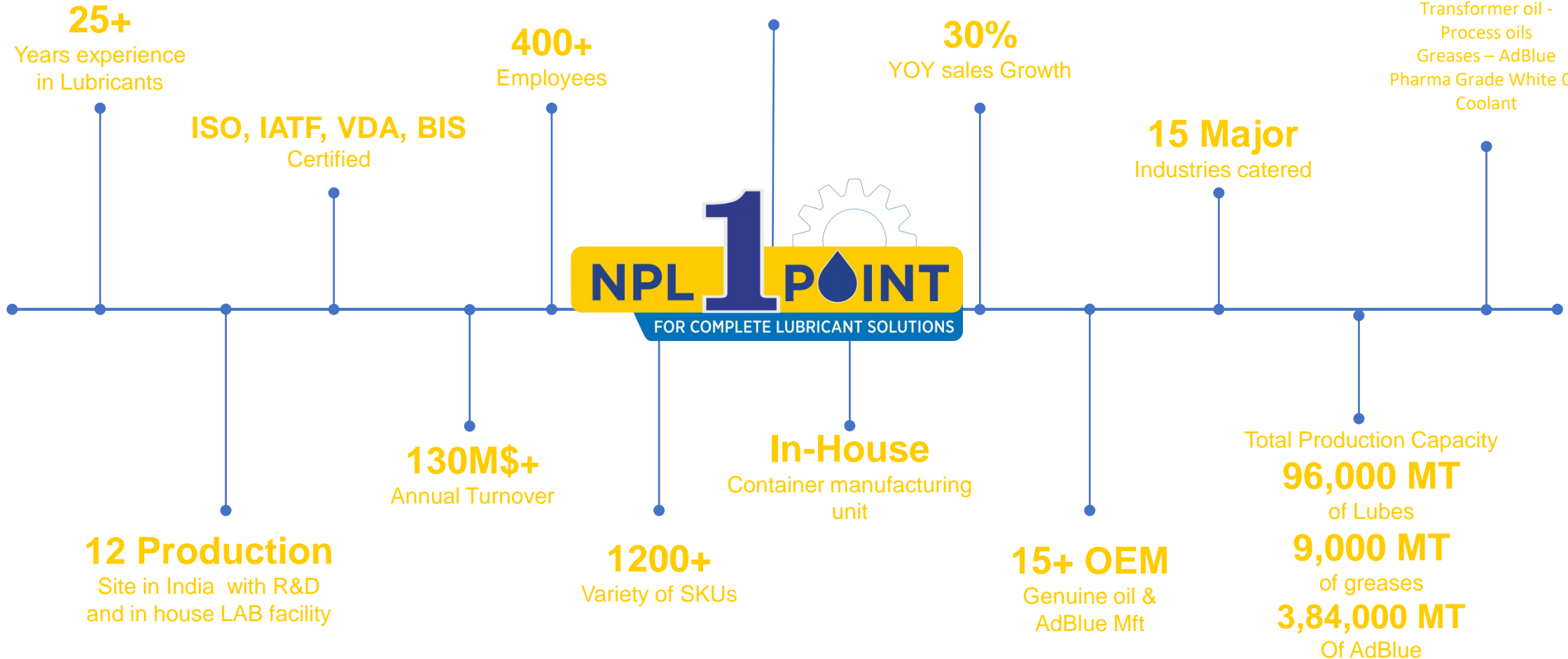
## Mission

“We believe in providing solutions to make “Effort Effortless” and superior experience for “Contemporary Mobility

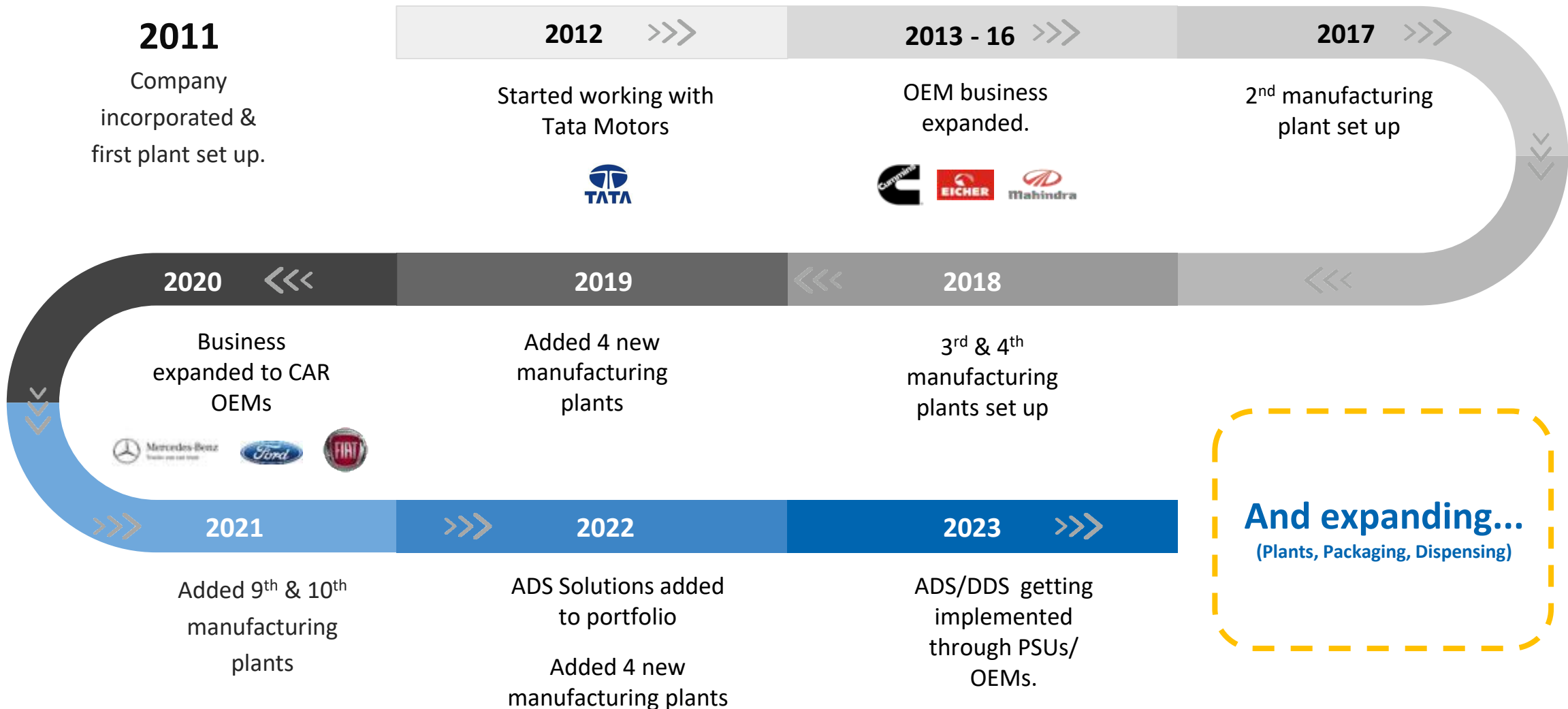
**German**  
Technology Lubricants

**Portfolio**

Automotive | Industrial  
Lubricants  
Transformer oil -  
Process oils  
Greases – AdBlue  
Pharma Grade White Oil  
Coolant



# NPL BlueSky Journey So Far...



## Our PAN India Presence



16 Plants - Total Production Capacity – 3,84,000 MT of AdBlue/DEF



Plan to add 10 plants – Taking total capacity to 1 Million KL per annum

## Standards & Quality Approval



Approved by Major OEMs in India



# Enhancement to our offerings!



# OEM Customers



DAIMLER



Mercedes-Benz  
Trucks you can trust





# To Go Green, add a bit of Blue!

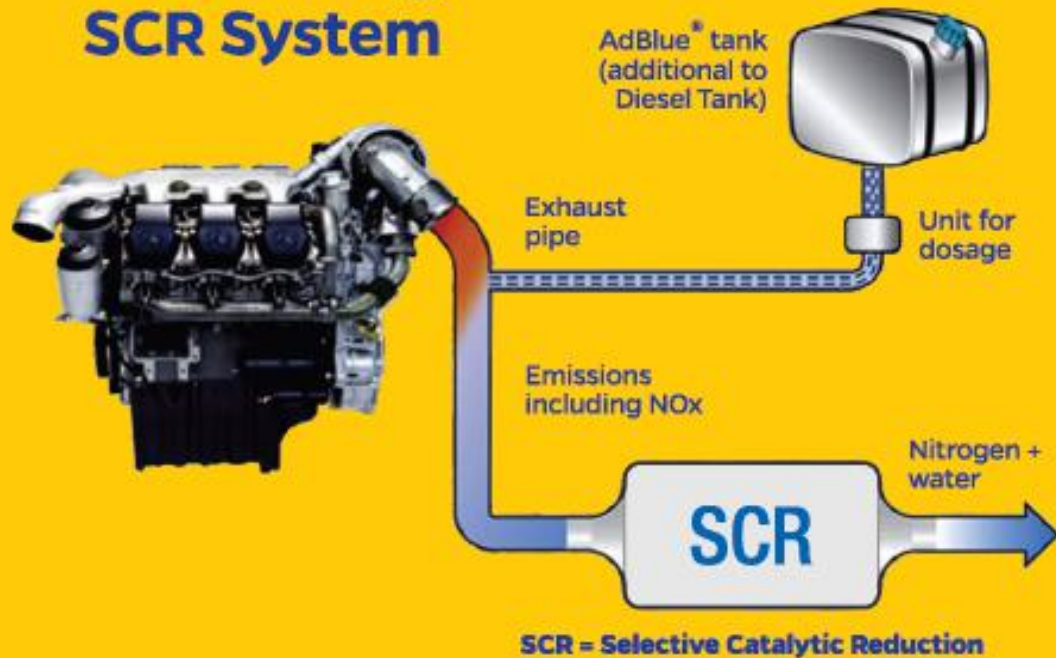


# India : Current Scenario

- With increasing SCR population, there is a growth of AdBlue demand in the country.
- Along with reputed organized players, many unorganized players entering this segment
- Volume of substandard AdBlue being sold in the market is increasing due to the following reasons:
  - Contamination of AdBlue is taking place due to **Non Dedicated Dispensing Equipment**.
  - **Cheaper Industrial / Agricultural grade urea and supplies without mandated testing** of product are some of the mechanisms adopted to reduce cost of manufacturing.
  - Spurious manufacturers supplying AdBlue / DEF / AUS32 with **lower urea concentration** to reduce cost.
- In addition, there is now increasing use of cheat technology to by pass SCR and avoid AdBlue/DEF refilling.



## Functioning of the SCR System



## What is AdBlue...

- **AdBlue** is a high specification solution and is manufactured to the ISO 22241 standards.
- **AdBlue** is essential for the correct operation of SCR after treatment device used in Diesel Engines to meet Bharat Stage IV & VI emission norms.
- **AdBlue** is a clear, non-toxic liquid that is safe to handle and does not damage the environment
- **AdBlue** is not a fuel or fuel additive. AdBlue is carried on the vehicle in an additional tank.

# AdBlue Quality Standard

SCR systems are sensitive to potential chemical impurities in the urea solution. Therefore, it is essential to maintain high standards of quality in AdBlue manufacturing.

Formaldehyde-Free,  
Low Biuret Urea

Deionized Water



## AdBlue Specifications

Characteristics	Unit	Limits		Significance
		min.	max.	
Urea Content	% (m/m) <sup>d</sup>	31.8	33.2	Very critical to be in the range for ideal solution as it provides the lowest freezing point Also, the SCR system will be calibrated to 32.5% Urea content to get the optimum NOx reduction
Density @ 20°C	kg/m <sup>3</sup>	1087.0	1093.0	Product Identification, and to check possible contamination
Refractive Index at 20°C	-	1381.4	1384.3	Product Identification, and to check possible contamination
Alkalinity as NH <sub>3</sub>	% (m/m) <sup>d</sup>	-	0.2	Determines product shelf life
Biuret	% (m/m) <sup>d</sup>	-	0.3	Poison to catalyst
Aldehyde	mg/kg	-	5	Form Deposits
Insoluble Matter	mg/kg	-	20	Causes Injector Clog
Phosphate (PO <sub>4</sub> )	mg/kg	-	0.5	Poison to catalyst
Calcium	mg/kg	-	0.5	Causes Injector Clog
Iron	mg/kg	-	0.5	Poison to catalyst
Copper	mg/kg	-	0.2	Poison to catalyst
Zinc	mg/kg	-	0.2	Poison to catalyst
Chromium	mg/kg	-	0.2	Poison to catalyst
Nickel	mg/kg	-	0.2	Poison to catalyst
Aluminium	mg/kg	-	0.5	Poison to catalyst
Magnesium	mg/kg	-	0.5	Causes Injector Clog
Sodium	mg/kg	-	0.5	Poison to catalyst
Potassium	mg/kg	-	0.5	Poison to catalyst

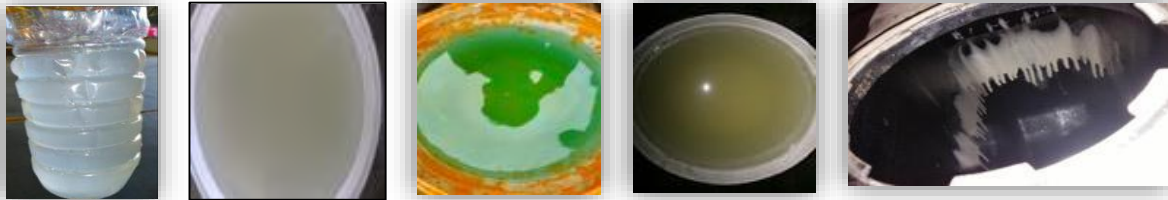
# Quality Assurance at NPL BlueSky

- SCR systems is sensitive to potential chemical impurities. Each batch is tested to meet ISO 22241-1 and IS 17042 (Indian Standard ) Part I specifications.
- Central team at HO for periodic plant audits to ensure:
  - Consistency of Quality
  - Commonality of processes across all plants
- Plants are automated to ensure consistency.
- Inhouse state of the art testing facility
- Design, Manufacturing and After Sales Service support for AdBlue Dispensing System (ADS)
- Logistics team to optimize and improve the supply chain challenges

# Implications of Sub standard product (1/2)

- In case effective NOx conversion does not take place will lead to engine torque reduction
- Sub standard AdBlue or wrong handling is the biggest cause of damage to SCR System leading to expensive the repair costs.
- Major components that gets damaged include:
  - AdBlue Dosage Pump
  - Urea Injector
  - The Catalyst

## Off Spec products from the Market



## Improper handling of SCR systems





# Implications of Sub standard product (2/2)

- Visibly **clogged strainer filter** clogged due to contamination
- Comparison of Contaminated and Regular filters



- AdBlue tank strainer **filter found detached** from the suction port leaving no filtration at the suction port.
- Risking reduced service life of main filter.



## Damaged SCR Systems



# Steps Taken in Other Countries



**Europe:** AdBlue is a registered trademark of VDA. VDA audits the manufacturing plants and certifies them to use the AdBlue trade mark.



**USA:** American Petroleum Institute (API), on lines of VDA, has set up an audit and licensing framework and manufacturers qualifying the audit can use the API logo on their packs.



**China:** In April 2015, the Internal Combustion Engine Industry Association set up a certification system for AdBlue and those enterprises who meet the manufacturing specification are authorized to use their trademark called CGT.



**Brazil:** The In metro (Brazilian Institute of Metrology) is responsible for conformity assessment of a range of products manufactured and sold in Brazil.

# Cheat Technology - Bypass of SCR Systems

- Through an initial dip stick market survey, observing rise in tampering of SCR systems in India.
  - Bypass of SCR systems is happening in both BS-IV and BS-VI vehicles
  - SCR Equipment lines are removed from the system
  - Use of OBD emulators to bypass the SCR system
  - Counter Technology Services providers
- As a result , AdBlue/DEF consumption or sale has come down in recent past.
- Possible means of tampering SCR system, as seen in Europe which may pick up in India
  - Remapping
  - OBD Plug
  - CAN bus emulators
  - NOx sensor emulators
  - Modifications/tampering with signals, removal of error codes
  - Additional tampering with DPF



# Effects of Bypassing SCR System



## ENVIRONMENT:

- Higher NOx emissions will directly impact public health giving rise to respiratory problems and other health issues
- Environmental degradation with negative impact on biodiversity



## OEMs

- Negative perception on BS-VI technology affecting Brand Equity
- Future regulatory challenges to implement and maintain emissions standards



## VEHICLE OWNERS:

- Loss of business due to frequent breakdown
- Higher combustion temperatures leads to increased engine wear
- Decreased resale value as consequences of such modifications
- Loss of warranty coverage for engine-related issues

# Way Forward

- As the 1<sup>st</sup> step, BIS has come up with a manufacturing standard (IS 17042) for DEF manufacturing in India.
- To further ensure that consumers get the right quality product, a Quality Control Order (QCO) is to be implemented soon. This is will help curb substandard DEF availability in the market.
- Strict monitoring and ban on the sale of OBD emulator devices including through online platforms.
- Launch public awareness campaigns to educate the negative consequences, emphasizing the environmental and health impacts
- Enhance emissions testing and certification processes to identify vehicles that may have tampered emissions control systems
- Strengthen emissions standards to keep pace with advancements in emission control technology
- In the larger interest of environment, reduce GST from 18% to 5% to reduce cost burden to customer.

***Vehicles running with inferior quality or without AdBlue / DEF / AUS 32 are more harmful to the environment and society as they emit more NOx than BS I standard***



# Thank You!

NPL BlueSky Automotive Pvt. Ltd.,

C-201, Lotus Corporate Park, Ram Mandir Lane,  
Jay Coach Junction, Western Express Highway,  
Goregaon (E), Mumbai – 63.

Tel: +91 22 4257720

Email: [info@npl-bluesky.com](mailto:info@npl-bluesky.com)

[www.adblueindia.com](http://www.adblueindia.com)