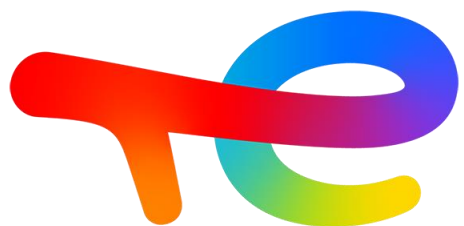


Inland
Navigation
Week

TECHNOLOGY MATCHMAKING WORKSHOP

Jacques Vankeerberghen
TotalEnergies

Monday March 20th 2023



TotalEnergies



Diesel XTL/HVO

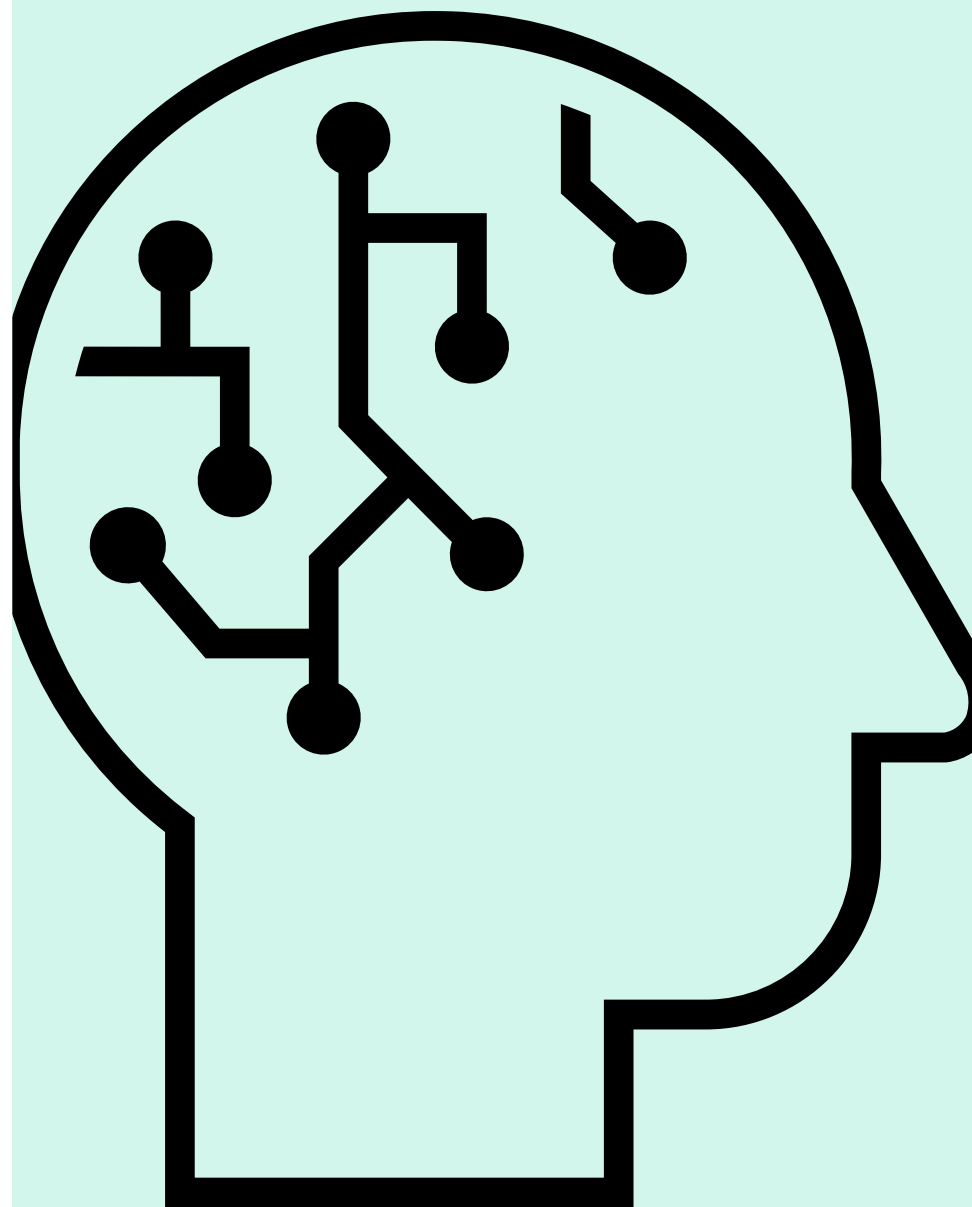
Jacques Vankeerberghen

Product Energies & Interactive administration Manager

01.

Definition

Biofuels & alternative fuels



Definitions

- **Definition (according 2003/30/CE)**

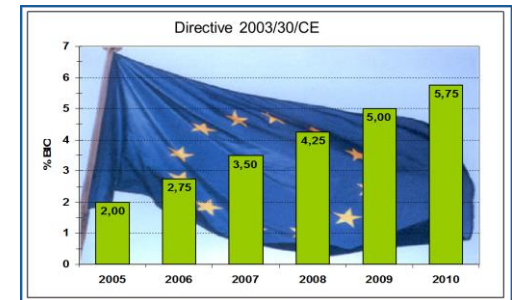
BIOfuels are liquid or gaseous fuels used to power engines and are obtained from biological products, waste or residues also called biomass. They can come from agriculture (plant or animal substances), forestry and related industries (Fisheries and aquaculture) or from biodegradable fraction of industrial and municipal waste.

Alternative fuels are liquid or gaseous fuels used to power engines and whose origin is different from conventional liquid fuels (gasoline and diesel).

➔ **LNG** (Liquid natural gas), **VNG** (Vehicule Natural gas), **CNG** (Compressed Natural gas) , **GTL** (Gas to liquid) ,...

- **Application**

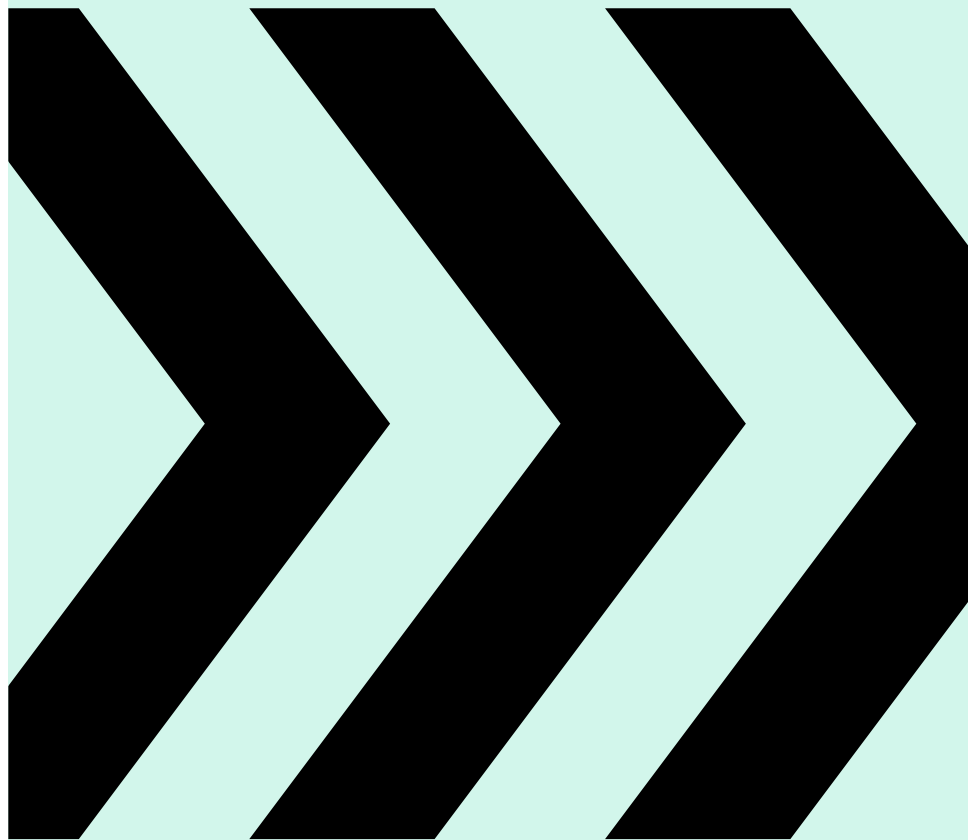
- Annual fraction of « biofuels » into fossil fuels





02.

Diesel XTL



Diesel XTL (x To Liquid)

Diesel XTL are paraffinic diesels that must meet the (NBN) EN 15940 standard

2 obtaining processes

- Synthetic
- Hydrotreatment

2 fuel classes

- Class A : High cetane number (> 70)
- Class B : Normal cetane number (> 51)

Alternative fuels : GTL (Gas To Liquid), CTL (Coal To Liquid)

BIOfuels : BTL (Biomass To Liquid), HVO HydroHO/HOA,

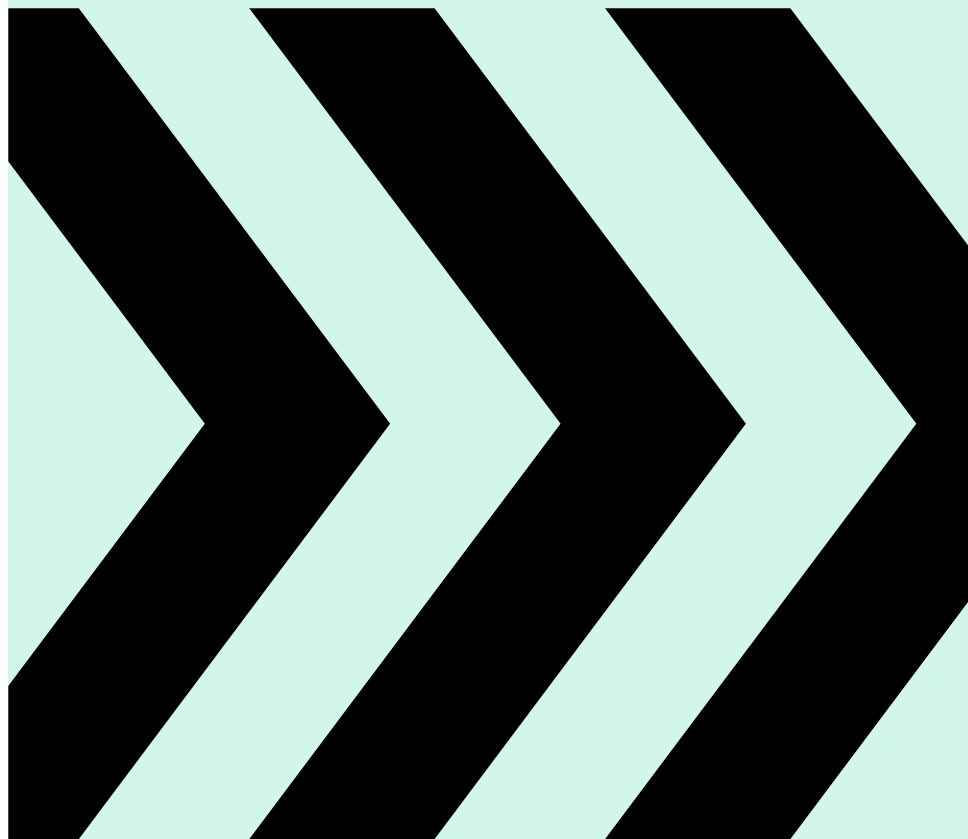
Specifications allow up to 7% FAME in the product



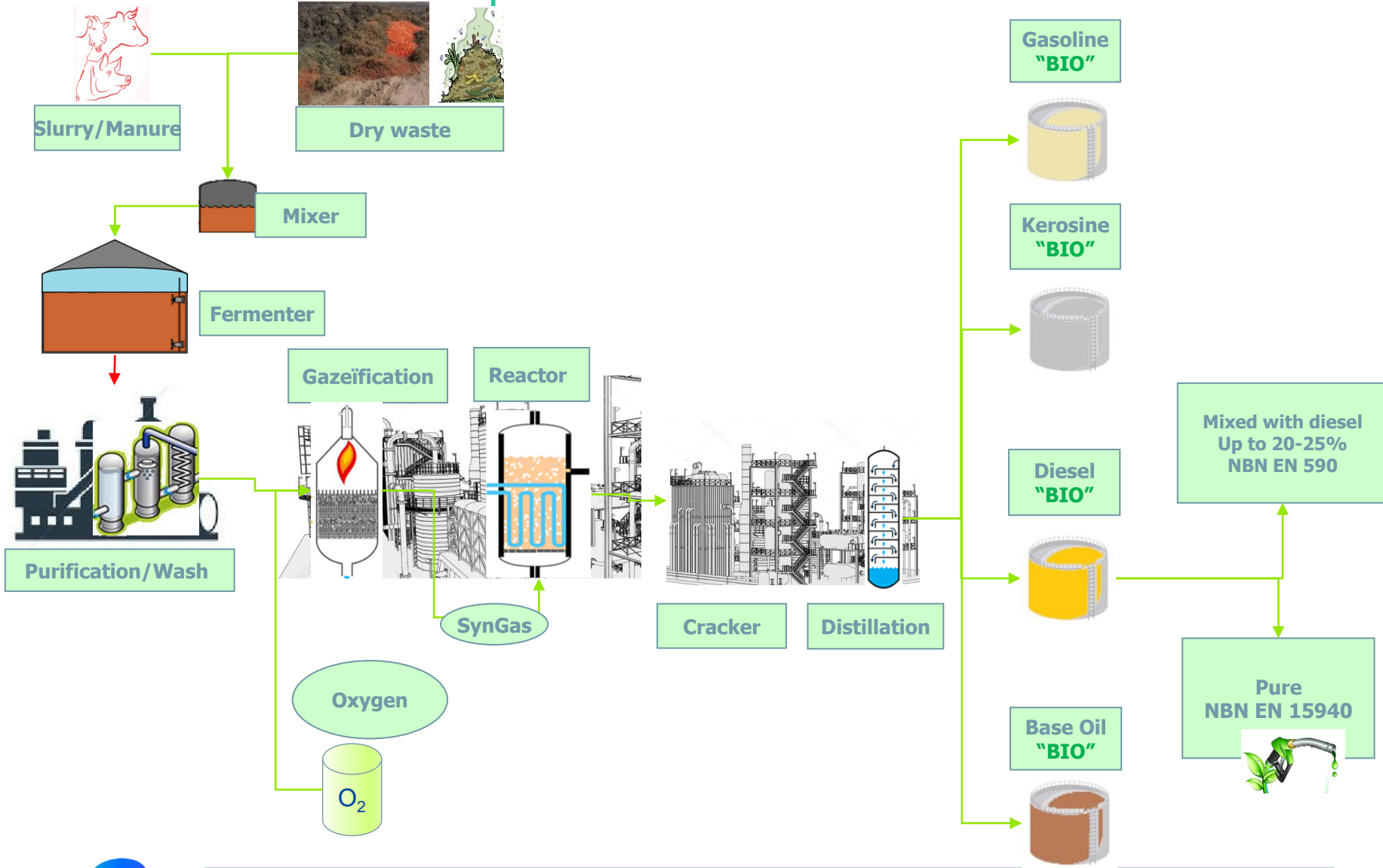
03.

New generation biofuels

Synthetic paraffinic Diesel
BTL



BTL – Biomass To Liquid



BTL – Biomass To Liquid

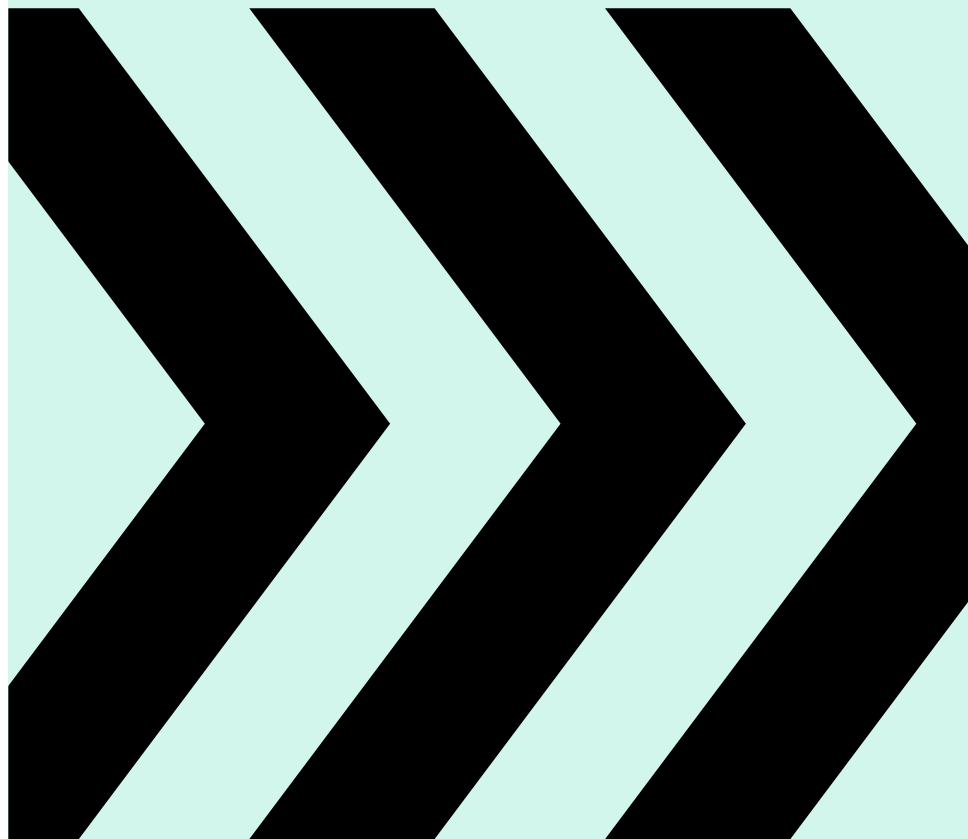
- *NBN EN 15940 (Paraffinic fuels from synthesis or from hydrotreatment)*
- *Density below the NBN EN 590 standard*
- *High cetane number*
- *Emissions reduction (CO, HC et Particules)*
- *NOx Emissions similar or slightly higher*
- Principe
 - Raw material: wood, straw, ...
 - ↳ **Does not compete with the food chain**
- Process in development
 - Abundant but scattered resources
 - Complex process
 - Expensive investments



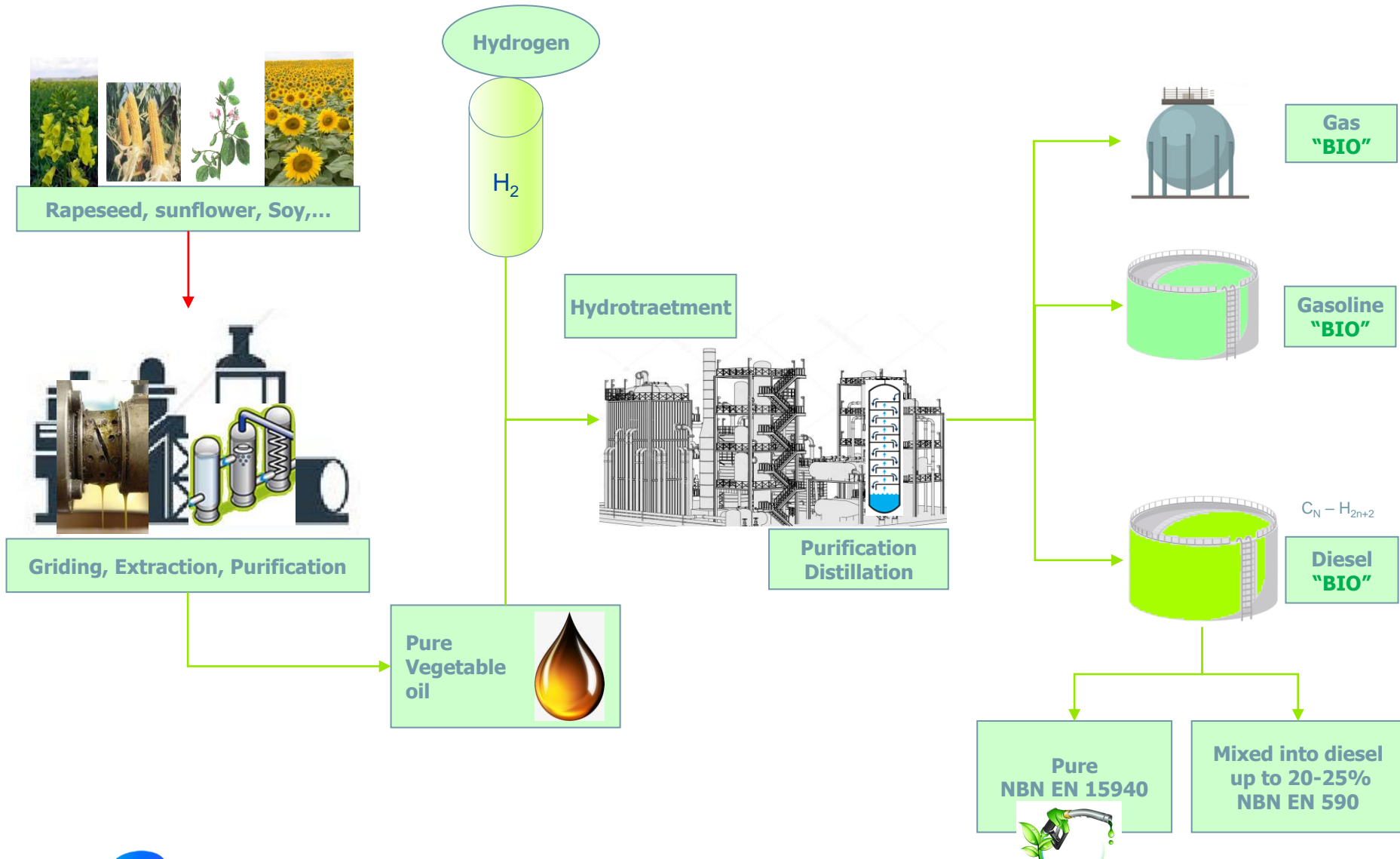
03.

New generation biofuels

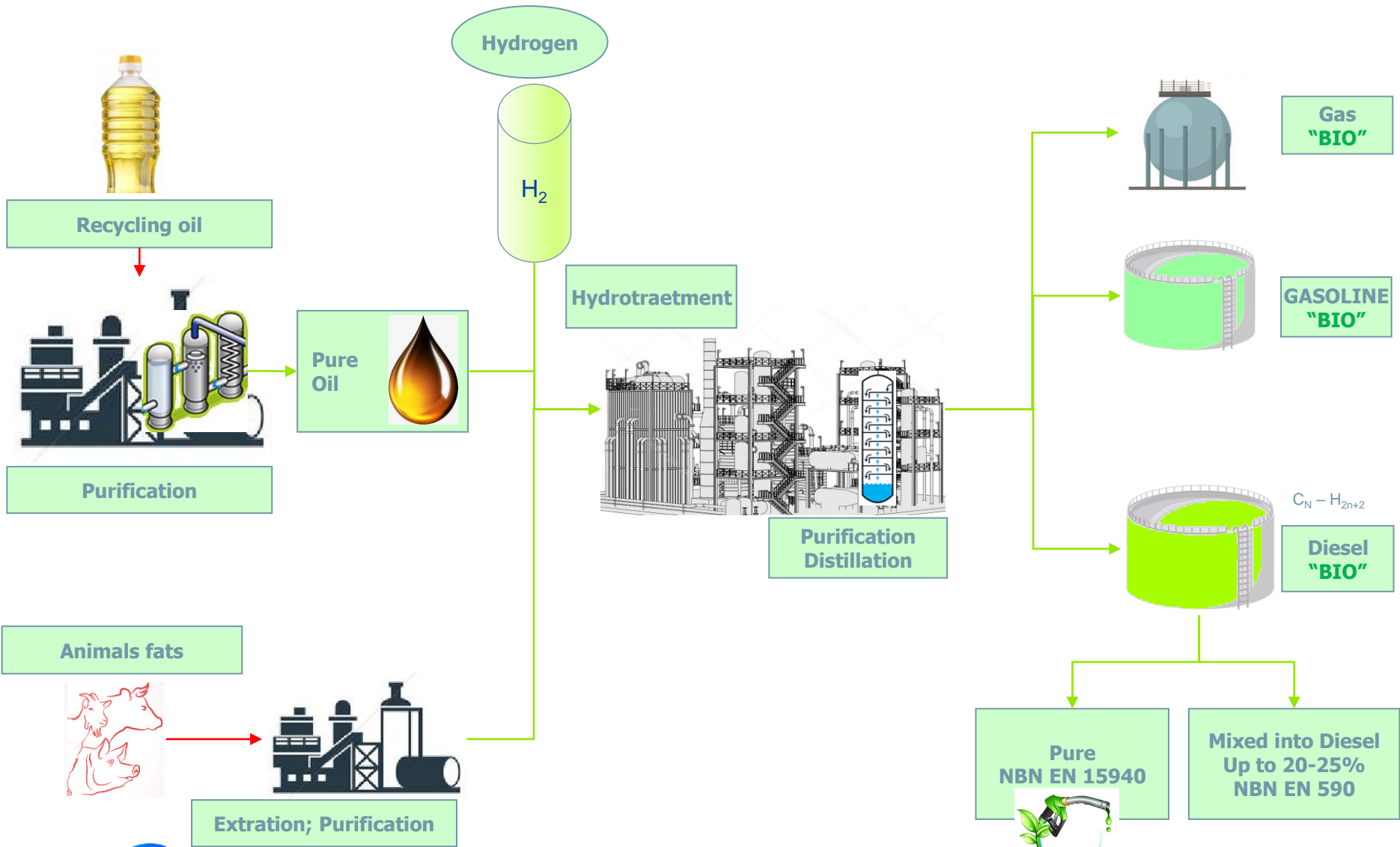
Hydrotraeted oil
HVO/HO/HOA



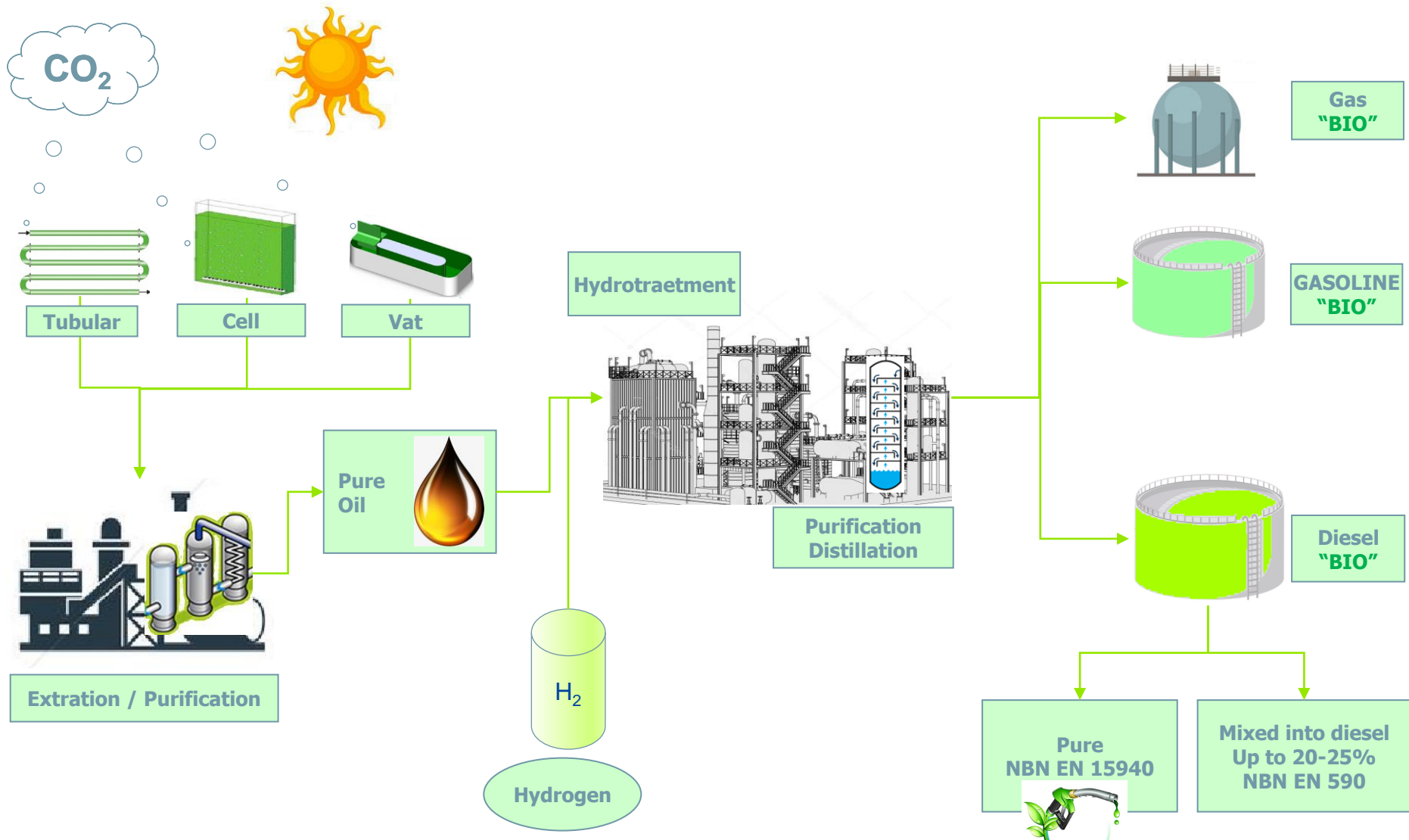
HVO: Hydrotreated Vegetable Oil (1st generation)



HO: Hydrotreated Oil



HAO: hydrotreated Algae Oil



HVO, a new generation of « bio » diesel

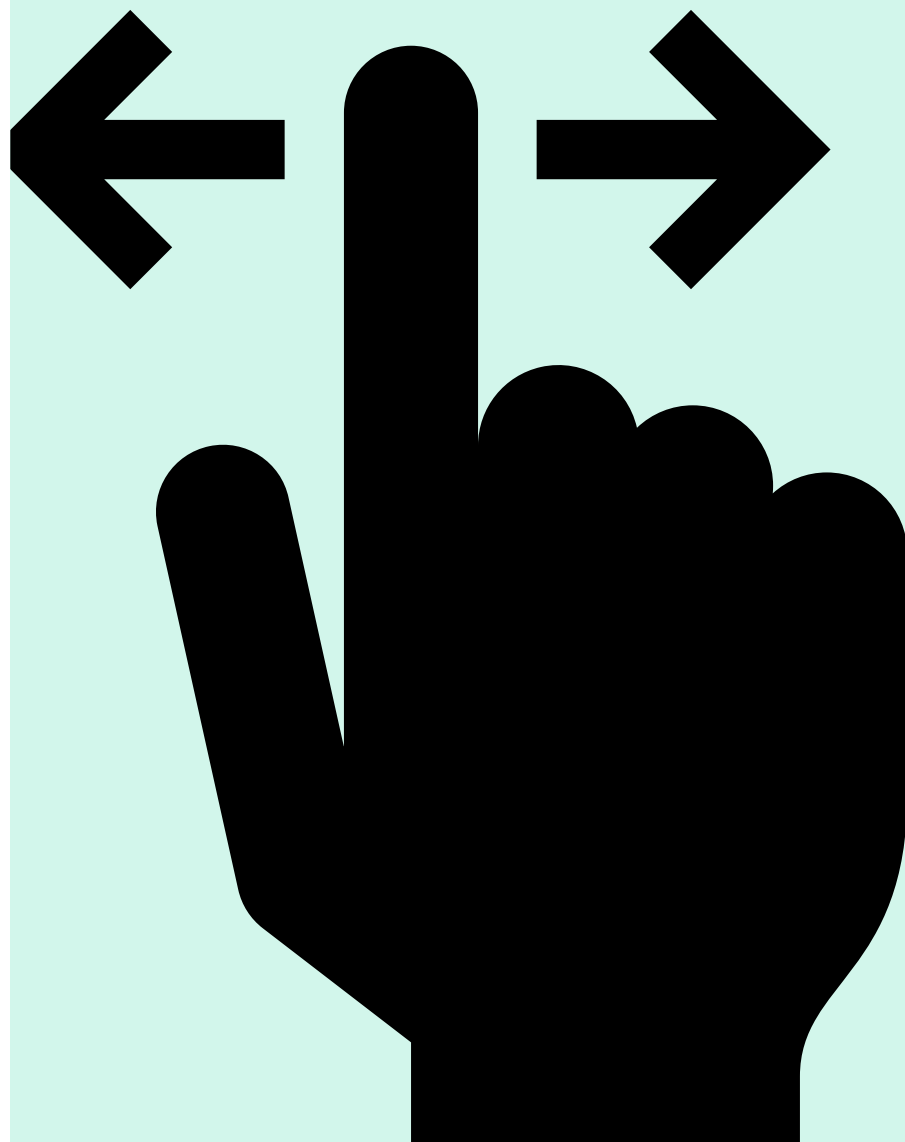
- *NBN EN 15940 (Paraffinic fuels from synthesis or from hydrotreatment)*
- *Density below the NBN EN 590 standard*
- *High cetane number (Classe A >70)*
- *Beter cold properties*
- *No poly-aromatics component*
- *Emissions reduction (NOx, CO, HC et Particules) and also unregulated emissions (, acroleine, poly-aromatics hydrocarbons)*



04.

Comparative

Diesel B7 (EN 590) —
Diesel XTL (EN 15940)



norms

CHARACTERISTICS	UNIT	GASOIL-DIESEL	GAS OIL-DIESEL XTL	
		NBN EN 590 +A1 (=B7)	NBN EN 15940 Klasse A	NBN EN 15940 Klasse B
APPEARANCE	---	No contamination	No contamination	No contamination
DENSITY at j15°C	kg/m ³	min. 820,0 – max. 845,0	min. 765,0 – max. 800,0	min. 780,0 – max. 810,0
DISTILLATION				
% distilled at 250°C	% (V/V)	< 65	< 65	< 65
% distilled at 350°C	% (V/V)	min. 85	min. 85	min. 85
95 % (V/V) condensed at	°C	max. 360	max. 360	max. 360
COLD FILTER PLUGGING POINT (CFPP)				
-Summer : 1 march – 30 november	°C	max. 0	max. 0	max. 0
-Winter : 1 december – 29 february		max. -15	max. -15	max. -15
COPPER STRIP CORROSION (3 h at 50°C)	cotatie	max. klasse 1	max. klasse 1	max. klasse 1
OXIDATION STABILITY	g/m ³ h	max. 25 min. 20 (3)	max. 25 min. 20 (3)	max. 25 min. 20 (3)
WATER CONTENT	% (m/m)	max. 0.020	max. 0.020	max. 0.020
MANGANESE CONTENT	mg/l	max. 2,0	max. 2,0	max. 2,0
VISCOSITY at 40°C	mm ² /s	min. 2,000 – max. 4,500	min. 2,000 – max. 4,500	min. 2,000 – max. 4,500
SULPHUR CONTENT	mg/kg	max. 10,0	max. 5,0	max. 5,0
FLASH POINT close cup	°C	> 55,0	> 55,0	> 55,0
CETANE INDEX (Calculated)	---	min. 46,0	-	-
CETANE NUMBER (measured)	---	min. 51,0	min. 70,0	min. 51,0
ASH CONTENT	% (m/m)	max. 0,010	max. 0,010	max. 0,010
CARBON RESIDUE	% (m/m)	max. 0,30	max. 0,30	max. 0,30
TOTAL CONTAMINATION	mg/kg	max. 24	max. 24	max. 24
TOTAL AROMATIC CONTENT	% (m/m)	max. 8,0	max. 1,1	max. 1,1
FATTY ACID METHYL ESTER (FAME)	% (V/V)	max. 7,0	max. 7,0	max. 7,0
LUBRICITY, corrected wear scar diameter (wsd 1,4) at 60°C	µm	max. 460	max. 460	max. 460



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*Thank you for
your attention*

questions

