Shell NEODOL® Alcohols and Ethoxylates

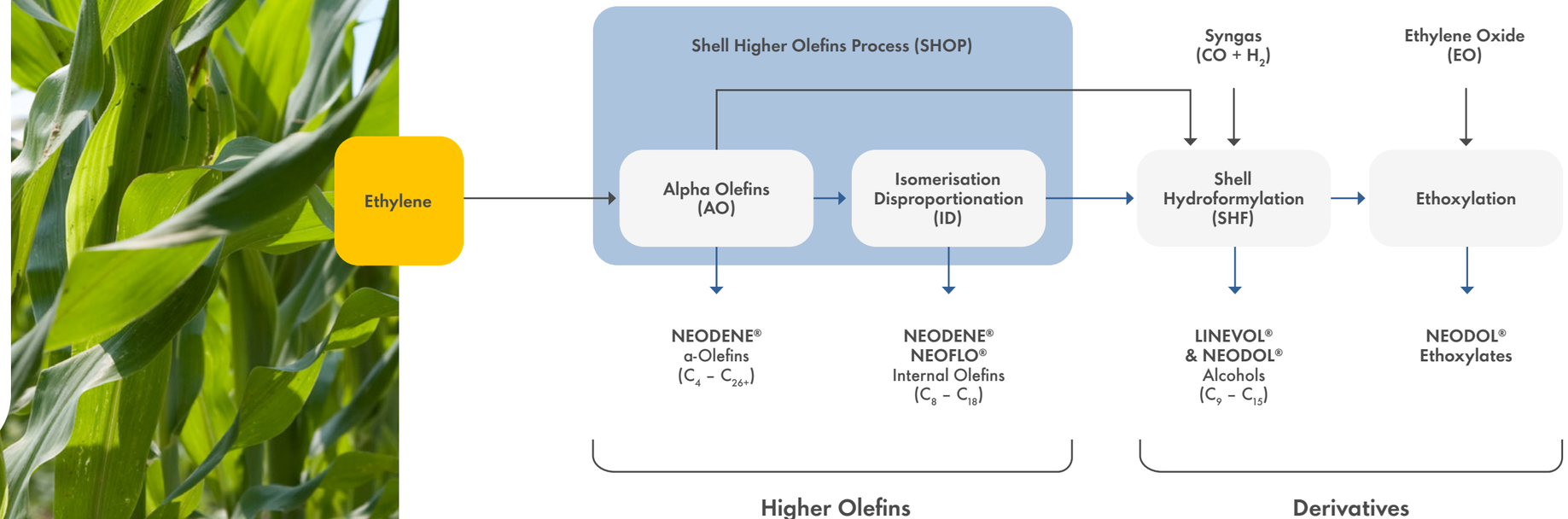
First choice for flexibility and performance

Agrochemical formulations

The two key properties of an agrochemical formulation that are supplied by a surfactant component are:

- the ability to wet the leaf surface and enable penetration of the formulation, and
- emulsification of ingredients that can be oily in nature. Emulsification keeps the aqueous formulation physically stable over time.

Our unique process



Shell NEODOL Alcohols

Key benefits

- Odd and even numbered primary alcohols ranging from C9 – C15
- Approximately 80% linear, 20% branched (largely methyl, with less ethyl, propyl)
- High purity chemicals with very low levels of contaminants (water, oxygenates, diols, and heavy metals)

All Shell NEODOL grades are readily biodegradable.

Differentiated performance

Shell NEODOL alcohol properties

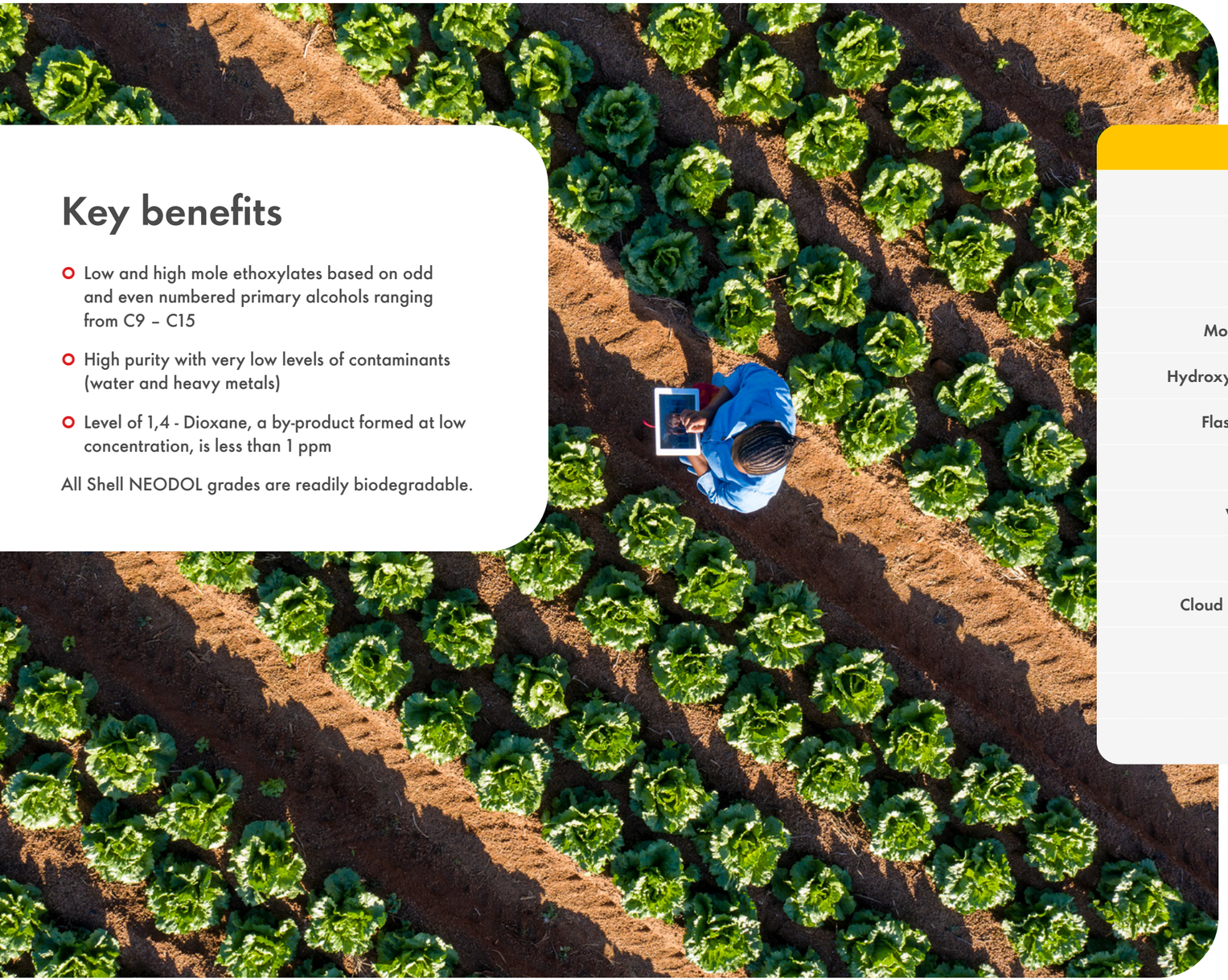
Shell NEODOL	91	1	23	25	45	3	5	135
Carbon chain	C_9 C_{10} C_{11}	C_{11}	C_{12} C_{13}	C_{12} C_{13} C_{14} C_{15}	C_{14} C_{15}	C_{13}	C_{15}	C_{11} C_{13} C_{15}
Molecular weight, g/mol	160	172	194	207	221	197	228	207
Hydroxyl number, mg KOH/g	350	325	289	271	254	284	246	271
Flash point via PMCC, °C	108	121	135	149	157	143	149	143
Pour point, °C	-12	11	15	20	29	27	38	24
Viscosity at 40°C, cSt	9	11	13	14	18	11	15	15
Density at 25°C (or at 40°C), kg/l	0.827	0.828	0.831	0.832	0.833	(0.839)	(0.842)	0.832

The N135 alcohol (with C11, 13 and 15 alcohols) is designed to have the same average molecular mass and carbon numberas N25 (with C12, 13, 14 and 15 alcohols).This means that the N135 alcohol and the resulting ethoxylates have similar properties to the analogous N25 grades.

What's in a name?

The first part of a Shell NEODOL alcohols and ethoxylates grade name reflects the parent alcohol. For example, Shell NEODOL alcohols and ethoxylates 23 is a blend of C12 and C13 alcohols. The number that follows indicates the average moles of Ethylene Oxide (EO) added. So, Shell NEODOL alcohols and ethoxylates 23-2 has an average of approximately 2 moles of EO per mole of alcohol.

Shell NEODOL Alcohol Ethoxylates



Key benefits

- Low and high mole ethoxylates based on odd and even numbered primary alcohols ranging from C9 – C15
- High purity with very low levels of contaminants (water and heavy metals)
- Level of 1,4 - Dioxane, a by-product formed at low concentration, is less than 1 ppm

All Shell NEODOL grades are readily biodegradable.

Differentiated performance

Shell NEODOL alcohol ethoxylate properties

Shell NEODOL	91-5	91-6	91-8	23-2	25-3	25-7	45-7	135-1*	135-3*	135-7*
EO groups/alcohol	5.0	6.0	8.0	2.0	2.9	7.0	7.4	1.0	2.9	7.0
Active content, %w	100	100	100	100	100	100	100	100	100	100
HLB number	11.6	12.5	13.7	6.5	7.5	12.2	11.8	3.5	7.5	12.2
Molecular weight, g/mol	380	425	511	282	332	515	546	250	332	515
Hydroxyl number, mg KOH/g	148	132	110	199	169	109	103	224	169	109
Flash point via PMCC, °C	150	150	160	152	163	186	190	146	161	184
Pour point, °C	4	6	16	0	5	20	24	13	5	18
Viscosity at 40°C, cSt	18	21	27	14	17	32	35	12	17	30
Cloud point, °C	32	54	81			50	46			50
Cloud Point, ml H_2O titrated				23	33			10	32	
Water, %w	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,4-Dioxane, mg/kg	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Density at 40°C, kg/l	0.964	0.976	0.996	0.891	0.908	0.972	0.969	0.859	0.911	0.966

*Shell NEODOL alcohol ethoxylates 135-1, 135-3 and 135-7 are new grades for test marketing

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To find out more about our products, visit www.shell.com/neodol