



SASOL

ISOFOL C₁₂ to C₃₂

Guerbet Alcohols

Sasol Performance Chemicals



Contents

1. About Us.....	3
2. General Information.....	4
3. Applications	6
4. Other Products and Trademarks.....	6
5. ISOFOL Product Range.....	8–10
6. Viscosity and Density.....	11
7. Analytical Methods.....	12
8. Packaging and Delivery	13
9. Handling and Storage.....	13
10. Sasol Performance Chemicals Portfolio.....	14
11. Registration	15

1. About Us

Sasol's Performance Chemicals business unit markets a broad portfolio of organic and inorganic commodity and speciality chemicals. Our business consists of four key business divisions: Organics, Inorganics, Wax and PCASG (Phenolics, Carbon, Ammonia and Speciality Gases). Our offices in 18 countries serve customers around the world with a multifaceted portfolio of state-of-the-art chemical products and solutions for a wide range of applications and industries.

Our key products include surfactants, surfactant intermediates, fatty alcohols, linear alkyl benzene (LAB), short-chain linear alpha olefins, ethylene, mineral oil-based and synthetic paraffin waxes, cresylic acids, high-quality carbon solutions and high-purity and ultra-high-purity alumina. Our Speciality Gases business supplies its customers with high-quality ammonia, hydrogen and CO₂, as well as liquid nitrogen, liquid argon, krypton and xenon gases.

Our products are as individual as the industrial applications they serve, with tailor-made solutions creating real business value for customers. Ongoing research activities result in a continuous stream of innovative product concepts that help our customers position themselves successfully in future markets.

Our products are used in countless applications in our daily lives to add value, security and comfort. Typical examples include detergents, cleaning agents, personal care, construction, paints and coatings, leather and metal processing, hot-melt adhesives, bitumen modification and catalyst support for automotive catalysts and other diverse specialty applications including oil and gas recovery, aroma production, plastic stabilisation, and polymer production. Every day, our researchers explore ways to improve our products and develop innovations that improve the quality of people's lives.

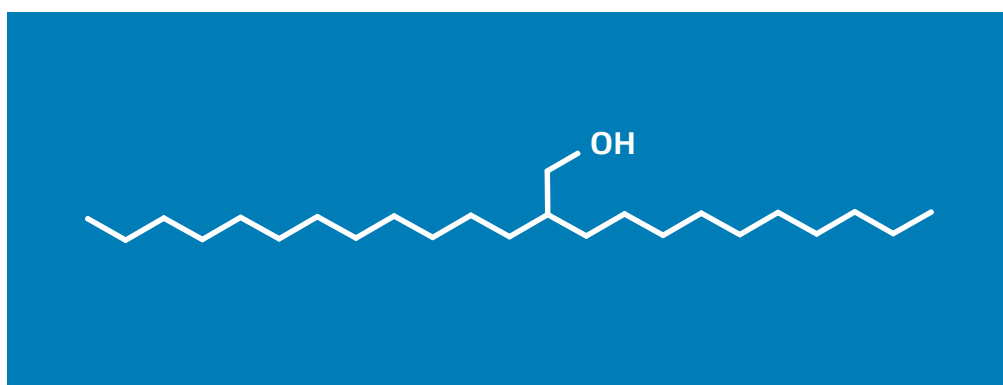


2. General Information

ISOFOL is the registered trademark of Sasol Performance Chemicals for saturated primary alcohols with defined branching of the carbon chain.

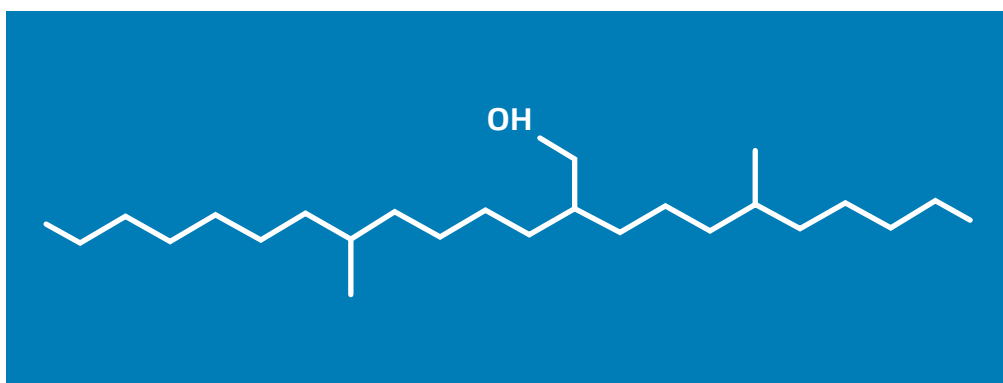
Such alcohols are chemically described as 2-alkyl-1-alkanols and are well known as Guerbet alcohols.

Figure 1:
Structure of ISOFOL 24



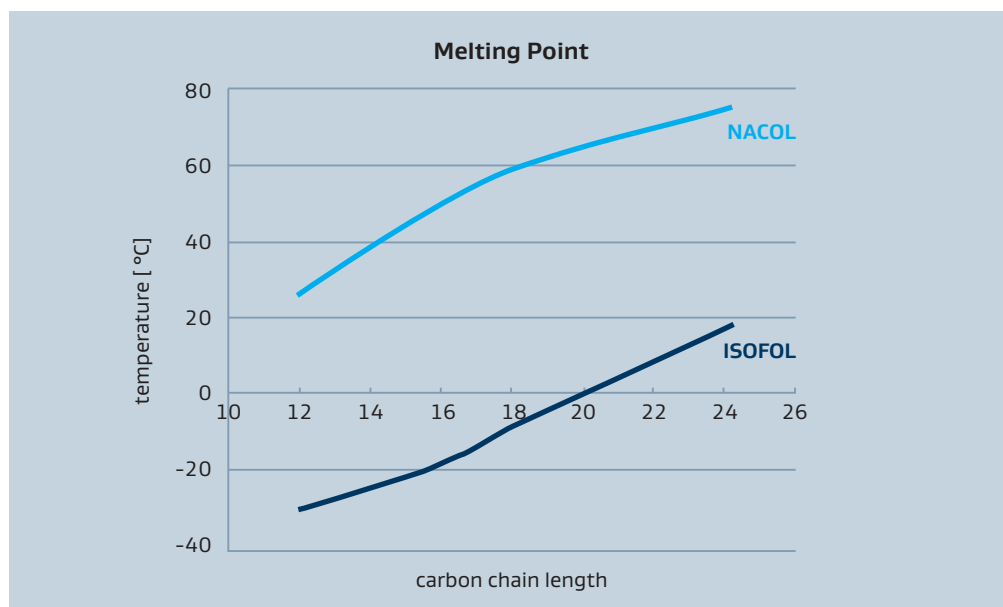
ISOFOL 2426 S is a multi-branched Guerbet alcohol derived from Sasol's Fischer-Tropsch-based, methyl-branched **SAFOL 23** alcohol, which is used to initiate the Guerbet reaction.

Figure 2:
Structure of one isomer of
ISOFOL 2426 S



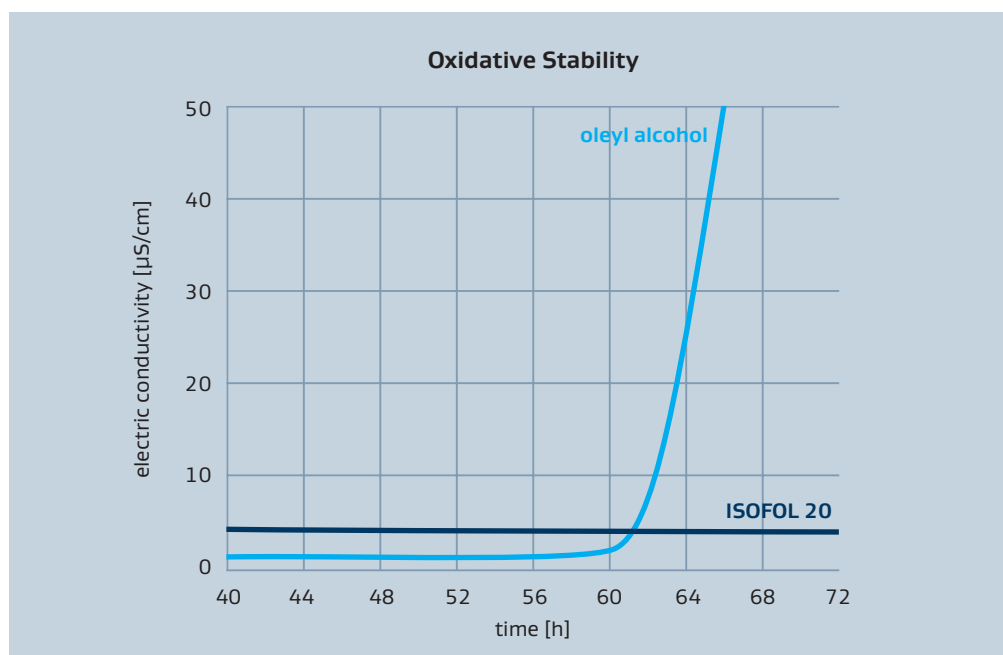
The **ISOFOL** alcohols C₁₂ to C₂₄ are liquid at ambient temperature, whereas corresponding linear and saturated alcohols are solid. While oleyl alcohol starts to solidify at approx. 10 °C, **ISOFOL** alcohol of similar chain lengths remains liquid (Figure 3).

Figure 3:
Melting points of **ISOFOL** alcohols
in comparison with linear **NACOL**
alcohols



Due to complete saturation, **ISOFOL** alcohols demonstrate excellent oxidative and colour stability (Figure 4).

Figure 4:
Oxidative stability of **ISOFOL 20**
vs oleyl alcohol – Rancimat method



The use of **ISOFOL** alcohols is recommended if oxidative and colour stability, low volatility and excellent low-temperature properties are required.

The various derivatives synthesised from **ISOFOL** alcohols maintain many of the beneficial properties of the parent alcohol.

3. Applications

Cosmetics

- **ISOFOL** alcohols as skin conditioning agents with good solvent properties for active ingredients and UV filters
- **ISOFOL** alcohol esters as oily components
- Alkoxylated **ISOFOL** alcohols as emulsifiers
- Application in skincare, haircare, toiletries and decorative cosmetics

Textile Industry

- **ISOFOL** alcohol esters as lubricants in spin finishes
- **ISOFOL** surfactant derivatives as wetting agents and emulsifiers
- **ISOFOL** alcohol phosphoric acid esters and alkoxylated **ISOFOL** alcohols as anti-statics in spin finishes

Metal Processing

- **ISOFOL** alcohols as component for minimum quantity lubrication (MQL)
- **ISOFOL** alcohols as lubricating components of stamping and rolling oils

Lubricants

- **ISOFOL** alcohol esters as components of synlubes

- **ISOFOL** alcohols as starting material for viscosity index improvers

Surfactants

- Alkoxylated **ISOFOL** alcohols for cleansing hard surfaces
- Alkoxylated **ISOFOL** alcohol sulphates as surfactants which enable advantageous combination of wetting and foaming properties
- **ISOFOL** alcohol sulphates as low-foaming and good wetting surfactants

Paints, Inks, Coatings and Adhesives

- **ISOFOL** alcohols as components of defoamers
- **ISOFOL** alcohols as solubilisers for printing inks and other special inks
- Resin modifiers for example for PUR or poly-methacrylates
- Pigment wetting aids

Oilfield

- **ISOFOL** alcohols as modifiers of pour point depressant polymers

4. Other Products and Trademarks

Based on linear alcohols, Sasol Performance Chemicals produces the following specialties:

GALENOL	Self-emulsifying blends of linear alcohols
ISOCARB	Defined branched Guerbet acids C ₁₂ to C ₃₂
LINPLAST	Plasticisers made from alcohols
NACOL ETHER	Linear di-n-alkyl ethers C ₁₂ to C ₃₂
PARAFOL	High-purity normal paraffin cuts C ₁₂ to C ₂₂

Product-specific brochures are available with detailed information for **ISOCARB** acids, **NACOL** ethers and **PARAFOL** pure paraffin cuts.

Additional information on **GALENOL** and **LINPLAST** can be requested by contacting the local sales office listed on the back of the brochure.



Our products are used in countless applications in our daily lives to add value, security and comfort.

5. ISOFOL Product Range

	ISOFOL 12	ISOFOL 16	ISOFOL 18T
Chemical name	2-butyl octanol	2-hexyl decanol	isostearyl alcohol
Appearance at ambient temperature	clear, colourless liquid	clear, colourless liquid	clear, colourless liquid

Sales Specification

Alcohol composition [wt. %]

2-butyl octanol	97 min.	—	—
2-butyl decanol	—	—	—
2-octyl decanol	—	—	46 to 54
2-hexyl dodecanol	—	—	—
2-octyl dodecanol	—	—	27 to 33
2-hexyl decanol	—	97 min.	15 to 20
Water content [wt. %]	0.1 max.	0.1 max.	0.1 max.
Colour [Hazen]	10 max.	10 max.	10 max.
Ester number [mg KOH/g]	0.3 max.	0.3 max.	0.5 max.
Acid number [mg KOH/g]	0.05 max.	0.05 max.	0.05 max.
Iodine number [mg I/100 mg]	0.5 max.	0.5 max.	0.5 max.

Additional Properties

Alcohol content [wt. %]	97 min.	97 min.	95 min.
Molecular weight [g/mol]	approx. 186	approx. 242	267 to 285
Hydroxyl number [mg KOH/g]	286 to 305	225 to 235	197 to 210
Carbonyl number [mg KOH/g]	0.3 max.	0.3 max.	0.3 max.
Refraction index [nD, 20 °C]	approx. 1.443	approx. 1.450	approx. 1.452
Surface tension [mN/m, 20 °C]	approx. 28	approx. 30	approx. 30
Pour point [°C]	approx. -70	approx. -69	approx. -59
Boiling range [°C]	145 to 149 (33 mbar)	193 to 197 (33 mbar)	207 to 236 (33 mbar)
Flash point [°C]	approx. 120	approx. 156	approx. 170

	ISOFOL 18E	ISOFOL 20	ISOFOL 24
Chemical name	isostearyl alcohol	2-octyldodecanol	2-decyltetradecanol
Appearance at ambient temperature	clear, colourless liquid	clear, colourless liquid	clear, colourless liquid

Sales Specification

Alcohol composition [wt. %]

2-hexyldecanol	5 to 8	—	—
2-octyldecanol	82 to 88	—	—
2-hexyldodecanol	—	—	—
2-octyldodecanol	5 to 8	97 min.	—
2-decyltetradecanol	—	—	97 min.
Water content [wt. %]	0.1 max.	0.1 max.	0.1 max.
Colour [Hazen]	10 max.	10 max.	10 max.
Ester number [mg KOH/g]	0.5 max.	0.5 max.	0.5 max.
Acid number [mg KOH/g]	0.05 max.	0.05 max.	0.05 max.
Iodine number [mg I/100 mg]	0.5 max.	0.5 max.	0.5 max.

Additional Properties

Alcohol content [wt. %]	95 min.	97 min.	97 min.
Molecular weight [g/mol]	269 to 279	approx. 298	approx. 354
Hydroxyl number [mg KOH/g]	196 to 206	184 to 190	154 to 160
Carbonyl number [mg KOH/g]	0.3 max.	0.3 max.	0.3 max.
Refraction index [n _D , 20 °C]	approx. 1.452	approx. 1.455	approx. 1.457
Surface tension [mN/m, 20 °C]	approx. 30	approx. 31	approx. 32
Pour point [°C]	approx. -59	approx. -20	approx. -1
Boiling range [°C]	211 to 218 (33 mbar)	234 to 238 (33 mbar)	271 to 275 (33 mbar)
Flash point [°C]	approx. 170	approx. 180	approx. 230

		NEW		
		ISOFOL 2426 S	ISOFOL 28	ISOFOL 32
Chemical name		Guerbet alcohols, C24-26, branched and cyclic	2-dodecylhexadecanol	2-tetradecyloctadecanol
Appearance at ambient temperature		colourless, liquid	colourless, solid	colourless, solid
Sales Specification				
Alcohol composition	[wt. %]			
2-dodecylhexadecanol		—	90 min.	—
2-tetradecyloctadecanol		—	—	80 min.
Guerbet alcohols, C24-26, multibranching		90 min.	—	—
Water content	[wt. %]	0.1 max.	0.1 max.	0.1 max.
Colour	[Hazen]	10 max.	40 max.	80 max.
Ester number	[mg KOH/g]	0.5 max.	0.5 max.	1 max.
Acid number	[mg KOH/g]	0.05 max.	0.05 max.	0.1 max.
Iodine number	[mg I/100 mg]	0.5 max.	0.5 max.	1.0 max.
Additional Properties				
Alcohol content	[wt. %]	98 min.	90 min.	80 min.
Molecular weight	[g/mol]	approx. 368	approx. 410	approx. 470
Hydroxyl number	[mg KOH/g]	145 to 157	125 to 140	95 to 120
Carbonyl number	[mg KOH/g]	0.3 max.	0.3 max.	1.0 max.
Density	[g/ml, 20 °C]	approx. 0.850	—	—
Refraction index	[nD]	—	approx. 1.455 (40 °C)	approx. 1.447 (60 °C)
Kin. viscosity	[cSt, 20 °C]	approx. 146	—	—
Surface tension	[mN/m, 20 °C]	approx. 31	—	—
Pour point	[°C]	approx. -36	—	—
Boiling range	[°C]	> 370	—	—
Melting range	[°C]	—	32 to 39	44 to 49
Flash point	[°C]	—	approx. 240	approx. 266

6. Viscosity and Density

Viscosity is a measure of a fluid’s ability to resist flow under gravity. The kinematic viscosity of a fluid is defined as the ratio of absolute or dynamic viscosity to its density.

The viscosity of a fluid is highly temperature-dependant. Higher temperatures will make kinematic viscosity decrease for liquids and increase for gases.

The temperature-dependant kinematic viscosity of **ISOFOL** alcohols is shown in Figure 5.

Density is a measure of how much mass is contained in a given unit volume. The formal definition of density is mass per unit volume. Usually the density is expressed in grams per ml. In general, density can be changed by adjusting either the pressure or the temperature. Increasing the pressure will always increase the density of a material. Increasing the temperature generally decreases the density, but there are notable exceptions to this generalisation.

The temperature-dependant kinematic viscosity of **ISOFOL** alcohols is shown in Figure 6.

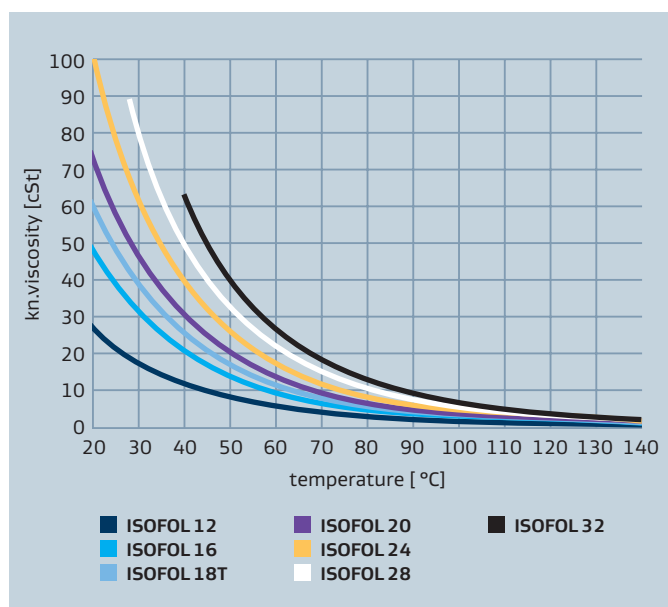


Figure 5: ISOFOL alcohol viscosity vs temperature

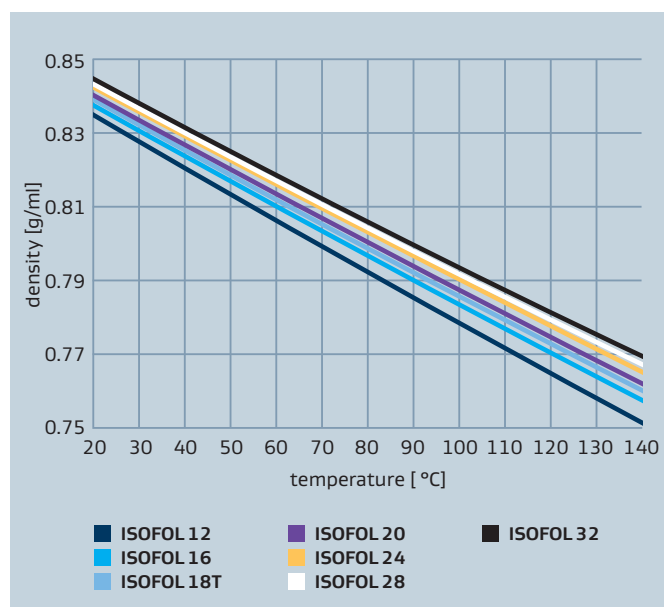


Figure 6: ISOFOL alcohol density vs temperature

7. Analytical Methods

			Sasol Method	With Reference To
Acid number			600-31	DIN EN 14 104
Alcohol composition			600-12	Gas chromatographic method
Boiling range			600-21	DIN EN ISO 3409
Carbonyl number			600-34	ASTM E 411
Colour			600-40	EN ISO 6271
Density			600-23	DIN EN ISO 12 185
Ester number				600-33
Flash point	Pensky-Martens Cleveland	70 °C to 165 °C > 165 °C	600-26 b 600-26 c	EN ISO 2719 ISO 2592
Hydroxyl number			600-30	DIN 53 240
Iodine number			600-39	DIN EN 14 111
Melting range			600-22 c	Ph. Eur. 2.2.14
Molecular weight			600-19	
Pour point			61-EE-19	ASTM D97
Purity			600-12	Gas chromatographic method
Refraction index			600-24	DIN 51 423
Surface tension			61-EE-14	DIN EN 14210
Viscosity			600-25	ASTM D 7042
Water content			600-37	DIN 51 777



8. Packaging and Delivery

Bulk Loading

All products can be delivered in bulk

- **Road**
 - 27 t per delivery for intermodal transportation
 - 24 t per delivery for conventional tankers

Filled Products

- Delivery of alcohols with chain lengths of C₁₂ to C₃₂ as well as all liquid products
- Special packaging upon request
- Disposable packaging
- Please protect against direct sunlight and environmental influences

1. In steel drums

- Filling quantity: 160 to 180 kg/drum (depending on product)
- Pallet capacity: 4 drums (screw-cap or screw-lid drums) on a CP3 pallet covered by stretch hood*
- Covered under a nitrogen blanket

2. In intermediate bulk containers (IBCs)

- Capacity of approximately 1 m³
- Pallet capacity: 1 container securely mounted onto a CPI pallet

* TÜV-Nord certified

9. Handling and Storage

Storage temperature of alcohols C₁₄₊

5 < T < 30 °C
41 < T < 86 °F

Storage temperature of all goods shipped in barrels or drums

5 < T < 30 °C
41 < T < 86 °F

- Plant production equipment that comes into contact with the product such as pumps, pipes and tank containers should be made of stainless steel where possible; aluminium plant equipment is unsuitable; petrol-resistant hose connections can be used and should be rinsed thoroughly after use
- In the case of tank storage, inert gas blanketing is required
- Tank heating is required in the case of alcohols exceeding C₁₂; the tank temperature must not exceed 25 °C above the setting point of the product; the wall temperature of the heating coils must not exceed 100 °C
- To prevent the product from overheating at the heating coils, a stirring device must be used in the tank

10. Sasol Performance Chemicals Alcohol Portfolio

LIAL Mixture of linear and mono-branched alcohols from C ₉ to C ₁₇	Sasol Italy S.p.A. Augusta
ALCHEM Linear alcohol mono-cuts and blends from C ₉ to C ₁₇	Sasol Italy S.p.A. Augusta
ISALCHEM Mono-branched alcohol mono-cuts and blends from C ₉ to C ₁₇	Sasol Italy S.p.A. Augusta
NACOL Pure cuts of linear alcohols C ₆ to C ₂₂	Sasol Germany GmbH Brunsbüttel
NAFOL Blends of linear alcohols C ₈ to C ₂₈	Sasol Germany GmbH Brunsbüttel
ISOFOL Defined branched Guerbet alcohols C ₁₂ to C ₃₂	Sasol Germany GmbH Brunsbüttel
SAFOL Mixture of linear and branched alcohols C ₁₂ to C ₁₃	Sasol Ltd Secunda
ALFOL Pure cuts and blends of linear Ziegler alcohols C ₆ to C ₂₂	Sasol Chemicals (USA) LLC Lake Charles

11. Registration

For registration status, please refer to the material safety data sheet or contact us at:

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Our Global Footprint

- Sasol Performance Chemicals headquarters
- Sasol Performance Chemicals locations, including sales offices and laboratories



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