

# PRODUCT SELECTION FOR FOOD INDUSTRY LUBRICANTS



## A double challenge

The use of lubricants in the food processing industry constitutes a hygiene risk, and food contamination may have serious consequences, as illustrated by instances of expensive product recalls.

In addition, in some areas of food processing, high temperature conditions may be found. For instance, lubricants may be exposed to temperatures of up to 300°C in the bakery industry, which represents a technical challenge for proper lubrication of the equipment as well as for fire safety.

The National Sanitary Foundation (NSF) registers food grade lubricants and components, using the H1 (acceptable product as a lubricant with incidental food contact for use in and around food processing areas) and HX-1 (acceptable ingredient for use in H1 lubricants) categories.

NYCO's NSF registered synthetic products provide food safety as well as outstanding technical performance. They are also Kosher and Halal certified.

### SYNTHETIC NEOPOLYOL ESTERS

NYCO's synthetic neopolyol esters provide excellent performance features in terms of lubrication, cleanliness, behaviour in ultra-high or ultra-low temperature environment, and fire safety. The use of such products results in reduced maintenance costs and downtime.

NYCO's food grade synthetic product line offers HX-1 certified base fluids covering a wide range of viscosities and applications, and may be used in hydraulic oils, gear oils, compressor oils, chain oils and greases. NYCO also offers an ISO VG 220, H1 certified fully formulated high temperature chain oil for the food industry.

## ADVANTAGES AND BENEFITS

- Excellent lubricity
- Excellent low temperature behavior
- Resistance to high temperatures
  
- Low volatility
- High polarity

- › Added protection against friction and wear
- › Performance in food freezing applications
- › Increased lifetimes and improved cleanliness
- Reduce fire outbreaks
- › Better protection against wear and heat
- › Better and quicker water/oil and oil/air separation

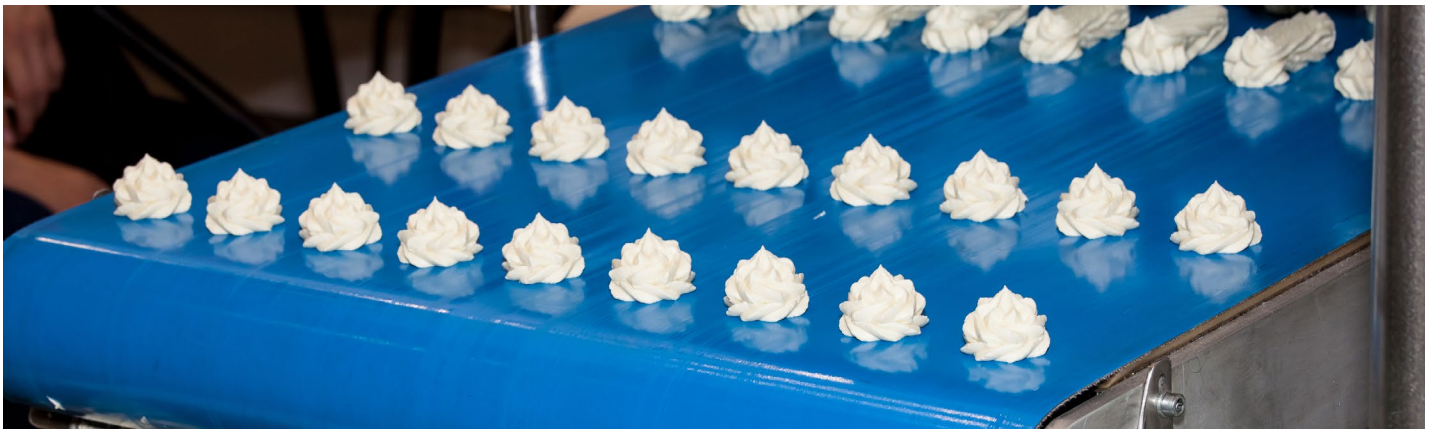




## SYNTHETIC NEOPOLYOL ESTERS

### REFERENCE

<b>Nycobase® 20307 FG</b>	Low viscosity ester, low temperature applications, polarity agent in PAO
<b>Nycobase® 30401 FG</b> <b>Nycobase® 30409 FG</b>	Multi-purpose synthetic esters with a balanced profile showing lubricity, thermo-oxidative stability and low evaporation
<b>Nycobase® 30502 FG</b>	Synthetic ester showing added lubricity
<b>Nycobase® 40810 FG</b>	ISO VG 46 complex ester
<b>Nycobase® 43203 FG</b>	ISO VG 320 complex ester, showing excellent thermo-oxidative stability and outstanding lubricity. Not compatible with PAO
<b>Nycobase® 43608 FG</b>	ISO VG 320 complex ester, with excellent lubricity.
<b>Nycobase® 32506 FG</b>	High viscosity synthetic ester, showing outstanding thermo-oxidative stability, cleanliness, and a high flash point. Particularly recommended for high temperature chain oils
<b>Nycobase® 45004 FG</b>	ISO VG 460 complex ester, with excellent lubricity
<b>Nycobase® 46115 FG</b>	Ultra-high viscosity complex ester, useful as a thickener. Outstanding lubricity



## Typical properties

RESULTS												
PROPERTIES	UNIT	Nycobase 20307 FG	Nycobase 30401 FG	Nycobase 30409 FG	Nycobase 30502 FG	Nycobase 40810 FG	Nycobase 43203 FG	Nycobase 43608 FG	Nycobase 32506 FG	Nycobase 45004 FG	Nycobase 46115 FG	TEST METHOD
NSF registration number		148533	141593	151776	141591	155470	141592	151777	148349	143760	146569	-
Limitation in mass %		5	None	None	None	None	None	None	None	None	None	-
Colour GARDNER	-	<1	<1	<1	<1	4	4	3	<1	4	3	ISO 4630
Density at 20°C	kg/dm <sup>3</sup>	0.913	0.942	0.942	0.938	0.941	1.013	0.950	0.963	0.949	0.957	ISO 12185
Flash point COC	°C	224	255	255	267	265	276	278	295	284	286	ISO 2592
Pour point	°C	-66	-45	-48	-36	-39	-33	-39	-20	-33	-6	ISO 3016
Acid number	mg KOH/g	0.05	0.05	0.03	0.05	0.02	0.05	0.10	0.05	0.10	0.10	ISO 6618
Kinematic viscosity @ 100°C	mm <sup>2</sup> /s	3.3	4.5	4.6	5.0	8.1	34.0	36.2	25.3	50.3	622	ISO 3104
		11.7	20.0	21.2	23.0	45.0	325	320	390	488	10077	
		193	455	498	547	1500	44500	-	-	63100	-	
Viscosity Index	-	164	143	141	150	157	147	160	89	163	243	ISO 2909
Evaporation loss 6 h - 200°C	%	12	2.2	2.3	1.5	-	2.8	1.2	2.2	1.1	0.9	ASTM D972
Iodine number	g I <sub>2</sub> /100 g	<1	<1	<1	2	13	<1	17	<1	20	22	ISO 3961
Water content	mg/kg	200	200	200	200	200	200	200	200	200	200	ASTM D1533
Biodegrada- bility	%	84	78	85	76	81	66	56	-	46	-	OECD 301B
Renewable carbon content	%	38	81	-	81	82	54	85	-	86	87	ASTM D6866

# FORMULATED PRODUCTS

## REFERENCE

**Nycolube® 5950 FG**

ISO VG 220 fully formulated high temperature chain oil suitable for use at temperatures of up to 280°C




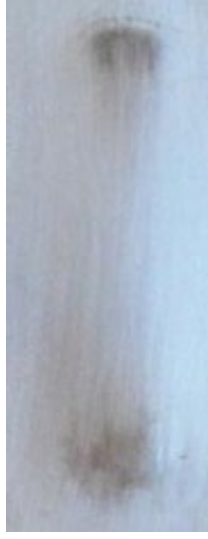




## Typical properties

PROPERTIES	UNIT	TYPICAL RESULT	TEST METHOD
NSF registration number	-	153215	-
Appearance	-	Clear, bright and free from sediments and other impurities*	Visual examination
Colour GARDNER	-		ISO 4630
Density at 20°C	kg/dm <sup>3</sup>	0.962	ISO 12185
Flash point COC	°C	296	ISO 2592
Pour point	°C	-21	ISO 3016
Kinematic viscosity at 100° at 40°C	mm <sup>2</sup> /s	18.7 219	ISO 3104
Viscosity Index	-	95	ISO 2909
Acid number (pH=11)	mg KOH/g	0.3	ISO 6619
Evaporation, 6 h – 200°C	%m	0.4	ASTM D972
Steel corrosion	-	Pass	ISO 7120A
Copper corrosion	-	1b	ISO 2160
4 ball Wear Scar 1 h – 392 N	mm	0.42	ASTM D4172
4 ball Weld Load	kg	126	ASTM D2783

\*Colour may change from yellow to slightly red with no impact on product performance

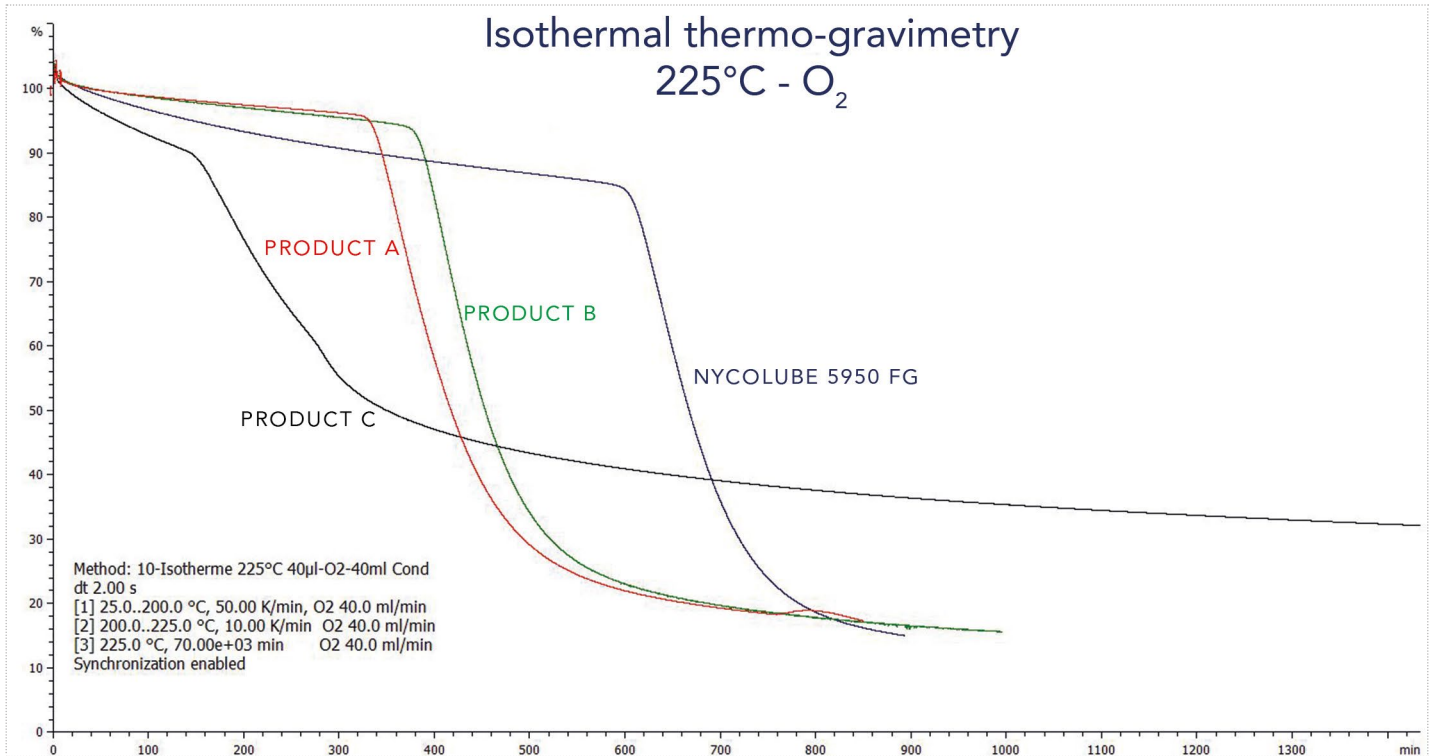
## PERFORMANCE TEST SUMMARY

In the below micro-coking test, **NYCOLUBE® 5950 FG** outperforms top tier products available on the market. It provides superior cleanliness properties, especially in the 230-280°C temperature range.

	PRODUCT A	PRODUCT B	PRODUCT C	NYCOLUBE 5950 FG
<b>GFC Lu-27-A-13, Micro-Coking Test, 230-280°C</b>				
<b>Deposit temperature</b>	246°C	273°C	230°C	>280°C
<b>Average merit</b>	9,20	9,78	9,14	10
				
<b>GFC Lu-27-A-13, Micro-Coking Test, 250-300°C</b>				
<b>Deposit temperature</b>	< 250°C	<250°C	<250°C	<250°C
<b>Average merit</b>	7,95	7,68	6,78	8,17
				

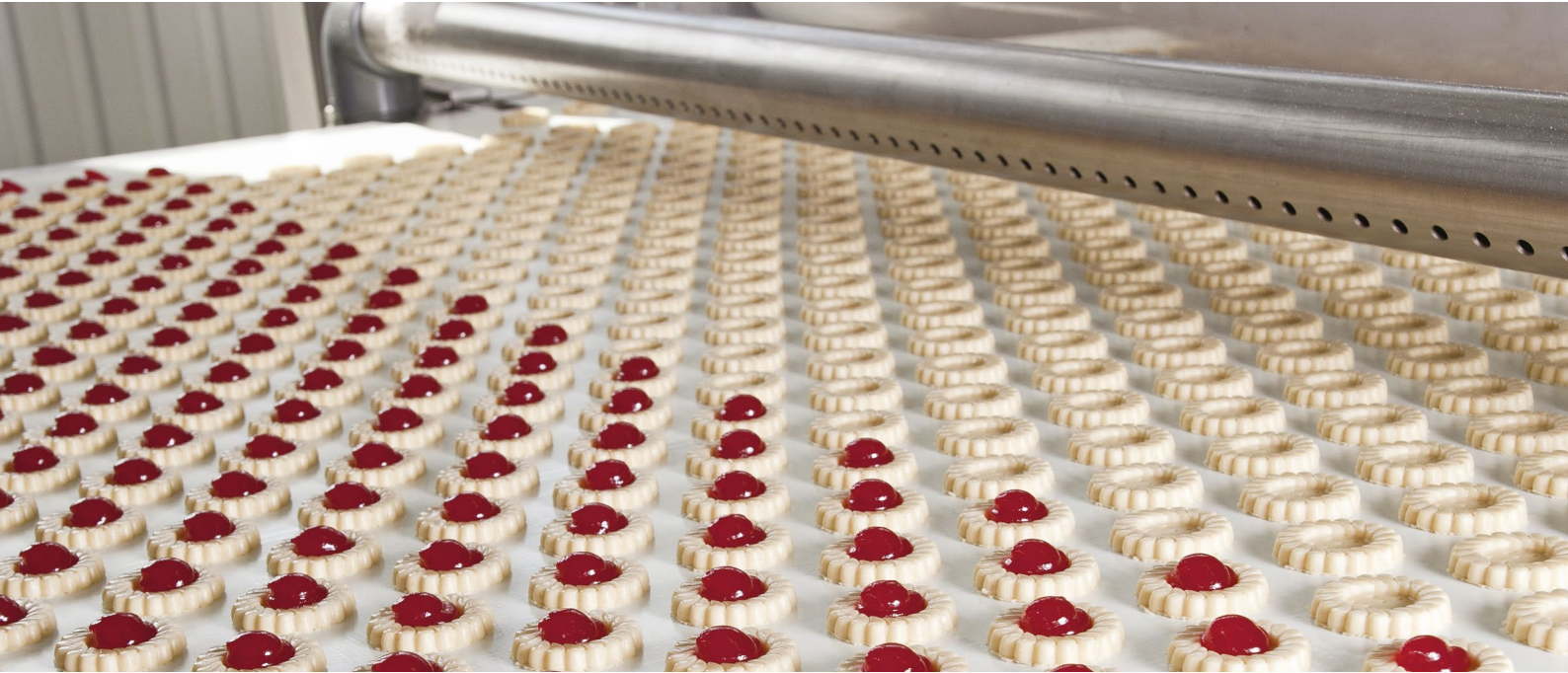
In the below mass loss test, high temperature chain oils tend to show evaporation phases followed by rapid decomposition, potentially leaving residue.

**NYCOLUBE® 5950 FG** shows moderate evaporation, and lasts significantly longer than other products, before decomposing cleanly, leaving little residue.





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