

# GC

## OPTIMA<sup>®</sup> FFAPplus

New polar Nitroterephthalic acid modified polyethylene glycol column with innovative cross-linking!

- ✓ Improved temperature stability: operating range from 40 °C to 250 °C (isothermal), 260 °C for short periods of time during a temperature program
- ✓ Excellent solvent stability
- ✓ Extended column lifetime
- ✓ Low column bleed, better suited for MS than conventional FFAP columns
- ✓ Allows for injection of aqueous samples
- ✓ Enables the determination of free carboxylic acids without derivatization
- ✓ OPTIMA<sup>®</sup> FFAPplus follows USP G35

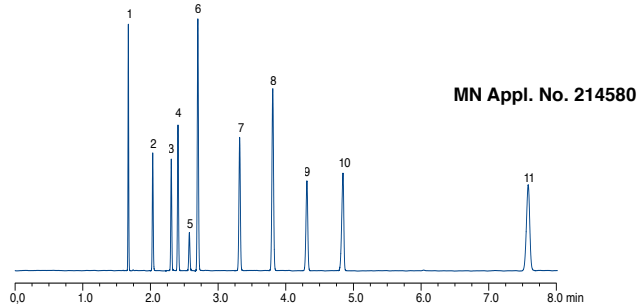
### Fields of application:

- Alcohols
- Solvents
- Fragrances
- FAMES
- Analysis of foods and natural substances
- BTEX analysis



## Solvents

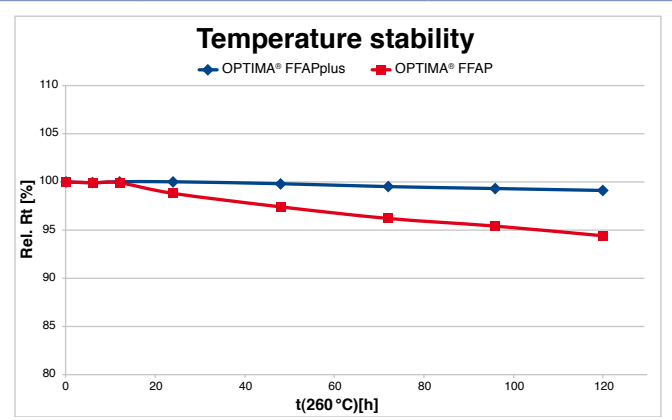
OPTIMA® FFAPplus, 30 m, 0.25 mm, 0.25 µm  
 Carrier gas pressure: 1.1 bar He  
 Injection volume: 0.1 µL hot needle injection, Split: 1:200  
 Injection temperature: 230 °C  
 Detector temperature: FID 260 °C  
 Oven temperature: 60 °C (8 min), 15 °C/min, 150 °C (10 min)



**Peaks:**  
 1 n-hexane, 2 acetone, 3 ethyl acetate, 4 methyl ethyl ketone (MEK),  
 5 dichloromethane, 6 benzene, 7 methyl isobutyl ketone (MIBK),  
 8 toluene, 9 n-butyl acetate, 10 undecane, 11 o-xylene

The columns are conditioned at T=260 °C for a longer period of time. At various times, the relative retention of methyl undecanoate is determined with a temperature gradient (80 °C → 240 °C). The relative retention time on the FFAP-plus decreases insignificantly, compared with the FFAP.

OPTIMA® FFAPplus, 30 m, 0.25 mm, 0.25 µm  
 Carrier gas pressure: 0.8 bar He  
 Injection volume: 1 µL, Split 1:50  
 Injection temperature: 260 °C  
 Detector temperature: FID 260 °C MN Appl. No. 214600

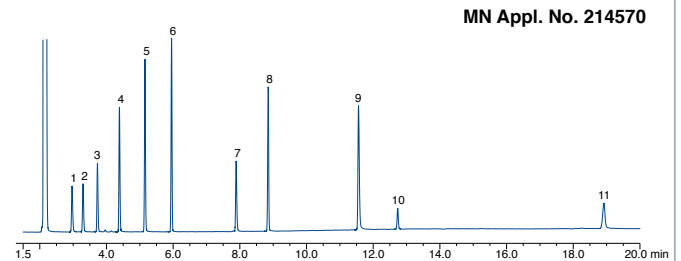


## Ordering information

REF	Phase	ID	FD	Length
726241.30	OPTIMA® FFAPplus	0,25 mm	0,25 µm	30 m
726241.60	OPTIMA® FFAPplus	0,25 mm	0,25 µm	60 m
726242.30	OPTIMA® FFAPplus	0,25 mm	0,50 µm	30 m
726242.60	OPTIMA® FFAPplus	0,25 mm	0,50 µm	60 m
726243.30	OPTIMA® FFAPplus	0,32 mm	0,25 µm	30 m
726243.60	OPTIMA® FFAPplus	0,32 mm	0,25 µm	60 m
726246.30	OPTIMA® FFAPplus	0,32 mm	0,50 µm	30 m
726246.60	OPTIMA® FFAPplus	0,32 mm	0,50 µm	60 m

## Carboxylic acids

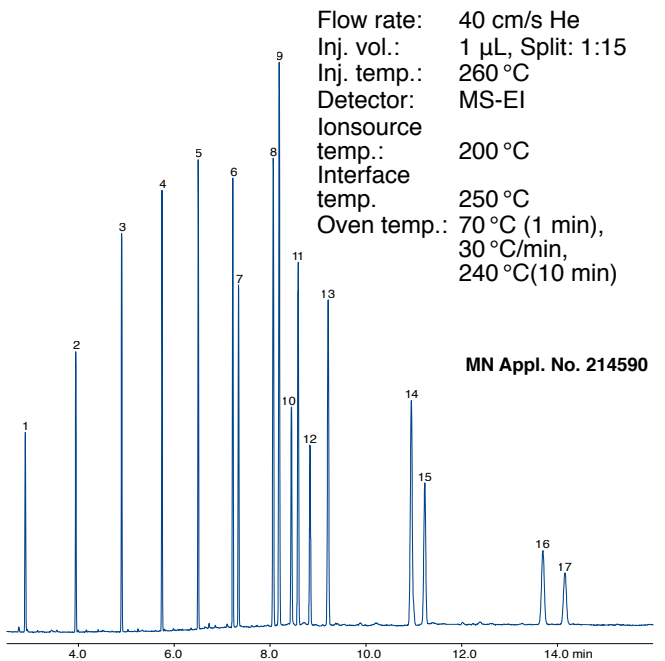
OPTIMA® FFAPplus, 30 m, 0.25 mm, 0.25 µm  
 Carrier gas pressure: 1.0 bar He  
 Injection volume: 1 µL Injection, Split: 1:50  
 Injection temperature: 230 °C  
 Detector temperature: FID 260 °C  
 Oven temperature: 150 °C, 10 °C/min, 260 °C (10 min)



**Peaks:**  
 1 acetic acid, 2 propionic acid, 3 butyric acid, 4 valeric acid,  
 5 caproic acid, 6 2-ethylcaproic acid, 7 sorbic acid, 8 capric acid,  
 9 hydratropic acid, 10 myristic acid, 11 stearic acid

## FAMES from biodiesel acc. DIN EN 14103:2011

OPTIMA® FFAPplus, 30 m, 0.25 mm, 0.25 µm



Flow rate: 40 cm/s He  
 Inj. vol.: 1 µL, Split: 1:15  
 Inj. temp.: 260 °C  
 Detector: MS-EI  
 Ion source temp.: 200 °C  
 Interface temp.: 250 °C  
 Oven temp.: 70 °C (1 min), 30 °C/min, 240 °C (10 min)

**Peaks:**  
 Methyl ester from:  
 1 caproic acid (C6:0), 2 caprylic acid (C8:0), 3 capric acid (C10:0),  
 4 lauric acid (C12:0), 5 myristic acid (C14:0),  
 6 palmitic acid (C16:0), 7 palmitoleic acid (C16:1),  
 8 stearic acid (C18:0), 9 oleic acid (C18:1 cis),  
 10 linoleic acid (C18:2 cis), 11 nonadecanoic acid (C19:0),  
 12 linolenic acid (C18:3), 13 arachidic acid (C20:0),  
 14 behenic acid (C22:0), 15 erucic acid (C22:1 cis),  
 16 lignoceric acid (C24:0), 17 nervonic acid (C24:1 cis)

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