Dr. Maisch

Any Column, Any Size, Any Media

REPROSHELL®

Core-Shell columns

MADE BY DR. MAISCH

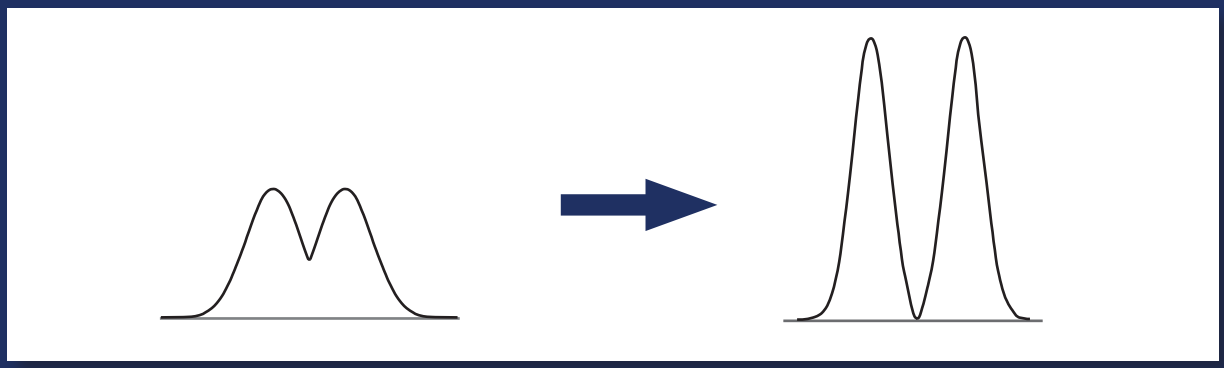
CONTENT

REPROSHELL MADE BY DR. MAISCH

From one of the largest **H**igh-**P**erformance **L**iquid **C**hromatography (HPLC) - Column Manufacturers in Europe.

Core - Shell pharticles

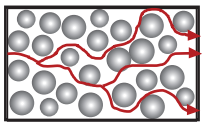
Core-Shell particles consist of a solid (non-porous) core surrounded by a porous layer (shell). They exhibit the same back pressure but higher efficiency compared to fully porous particles of the same particle size.



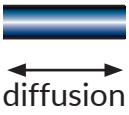
ReproShell – van Deemter Equation

HETP = A + B/u + Cu (Van Deemter Equation)

Eddy diffusion



Molecular diffusion in longitudinal direction in a column.



diffusion

Mass transfer between mobile and stationary phase.

Mobile phase

$C \alpha d_p^{\,2}/D$

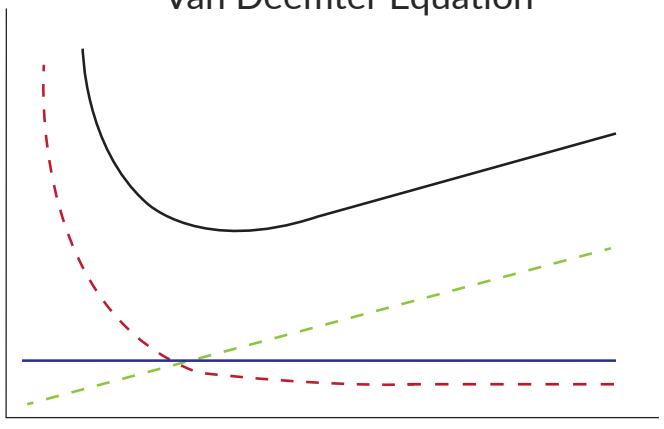
D = Diffusion coefficient

d_p = Particle diameter

Porous particle

van Deemter Plot

HETP = A + B/u + Cu
Van Deemter Equation

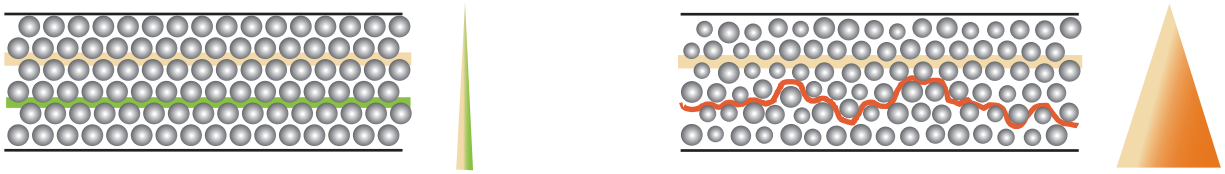


A = Eddy diffusion (Multi-Path Effect)

B = Random molecular diffusion

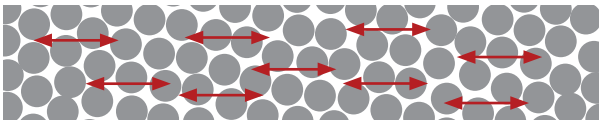
C = Mass transfer within particle caused by mobile phase

A-TERM (EDDY DIFFUSION, MULTI-PATH EFFECT)

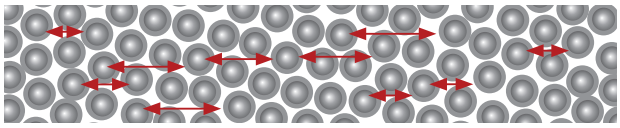


Core-Shell particles have a tighter particle size distribution which leads to a more uniform, organised bed structure. This reduces the impact of the multi-path effect.

B-Term (Longitudinal Diffusion)

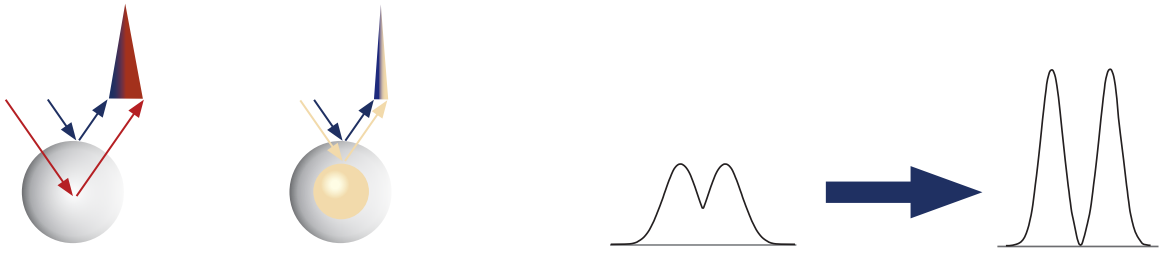


Fully porous particles:
Diffusion takes place within the porous particle as well as in the interstitial space



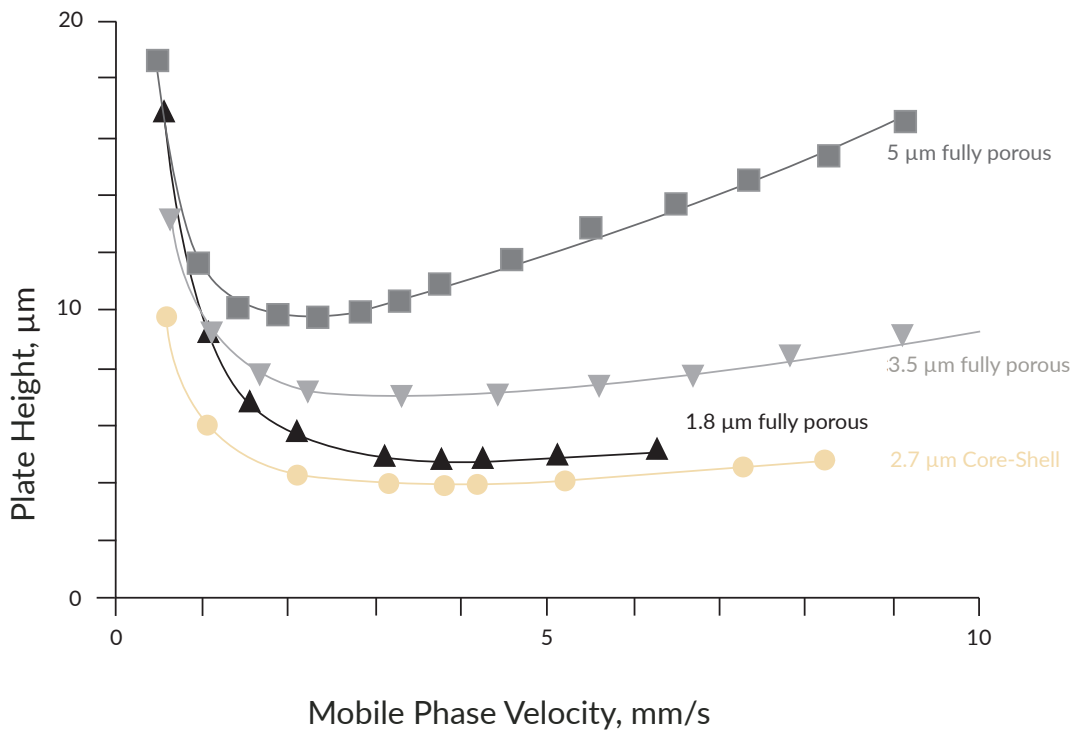
Core-Shell particles:
Non-porous core blocks longitudinal diffusion

C-Term (Mass transfer)



The non-porous core leads to a shorter diffusion path

COMPARISON CORE-SHELL VS. FULLY POROUS PARTICLES



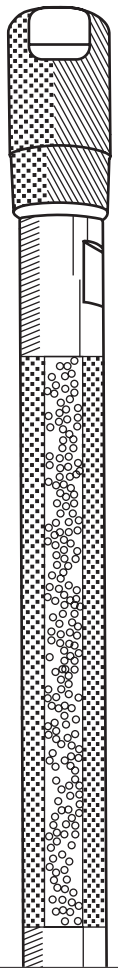
REPROSHELL

ReproShell – Available phases

Particle sizes 2.7 µm and 5 µm

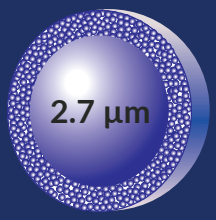
UPLC PERFORMANCE WITH STANDARD HPLC INSTRUMENT
AND BACKPRESSURE
VARIOUS SELECTIVITIES

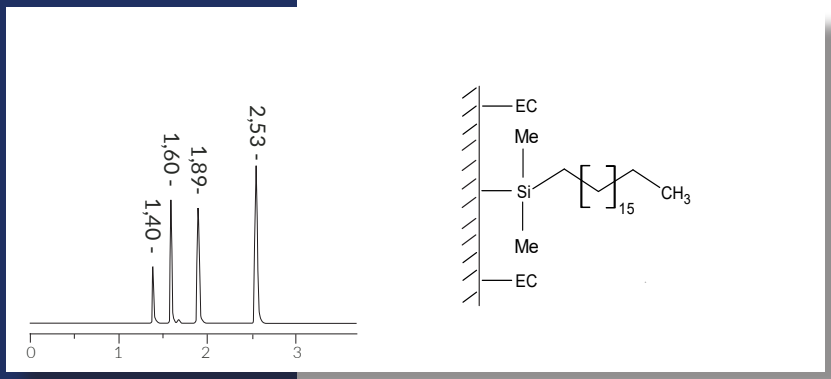
- ODS-1 (highly retentive C18)
- ODS-3 (trifunctional C18)
- C8
- Biphenyl
- Phenylhexyl
- PFP (Penta fluoro phenyl)
- Silica
- HILIC



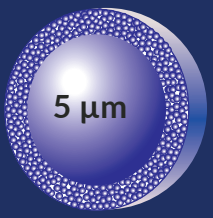
REPROSHELL - EFFICIENCY

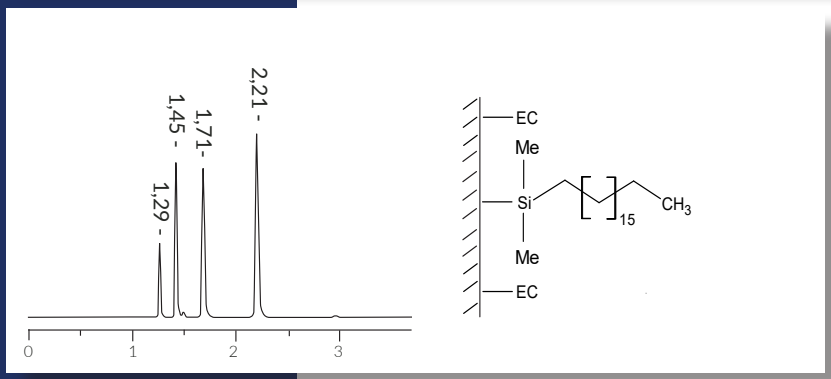
ReproShell ODS -1
2.7µm



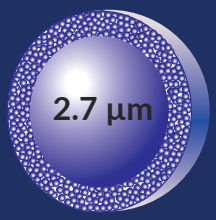


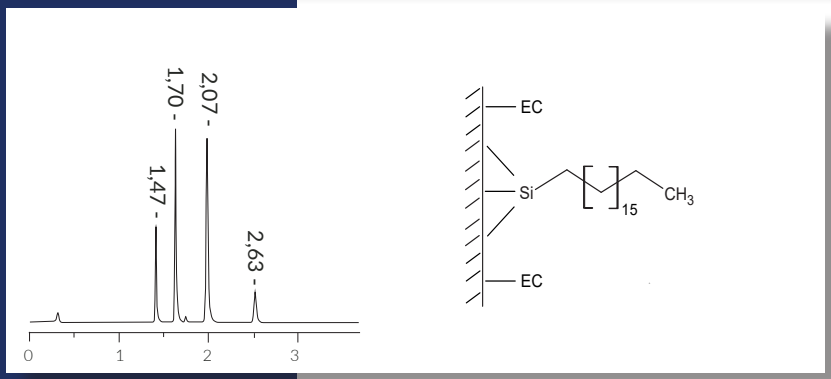
ReproShell ODS - 1
5 µm



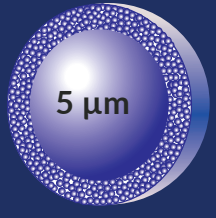


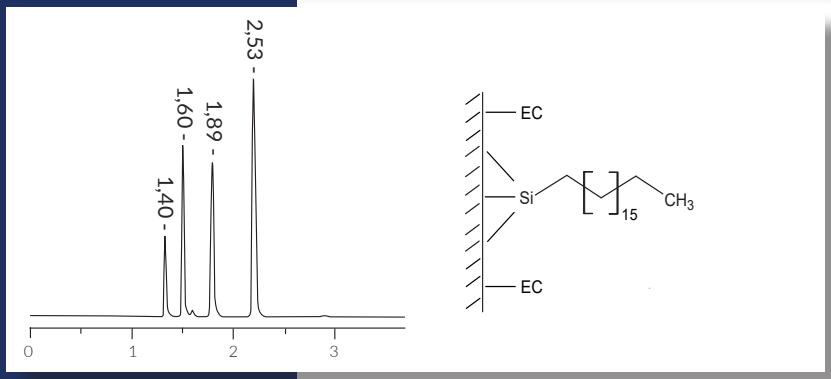
ReproShell ODS - 3
2.7 µm





ReproShell ODS - 3
3 µm





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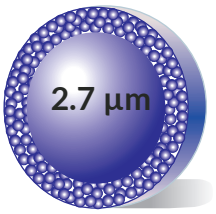
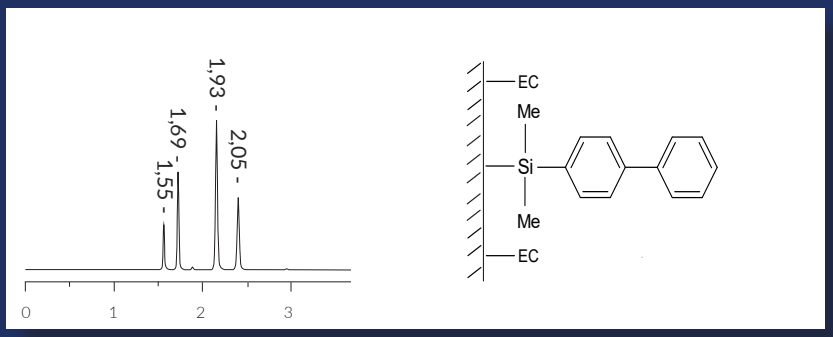
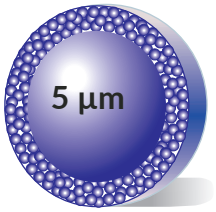
REPROSHELL - EFFICIENCY

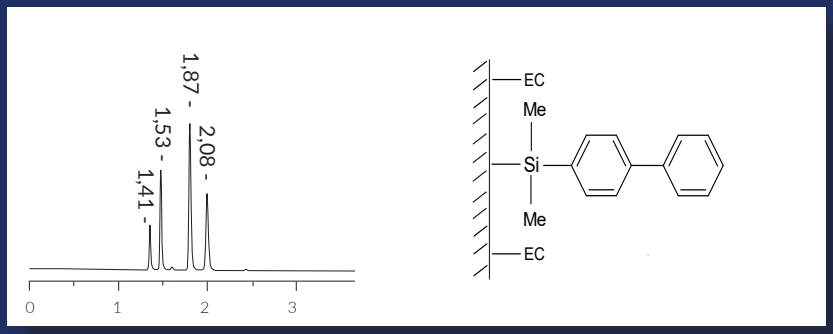
ReproShell Biphenyl,
2.7µm



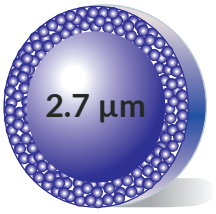


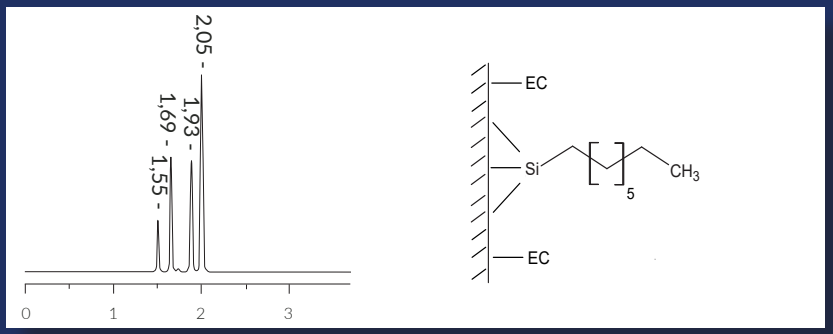
ReproShell Biphenyl,
5 µm



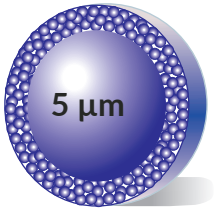


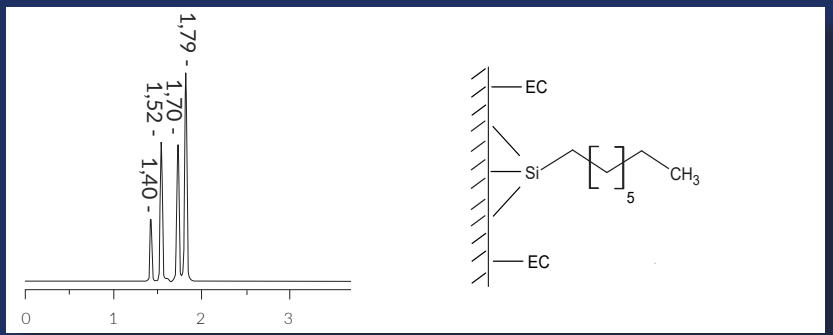
ReproShell C8,
2.7 µm





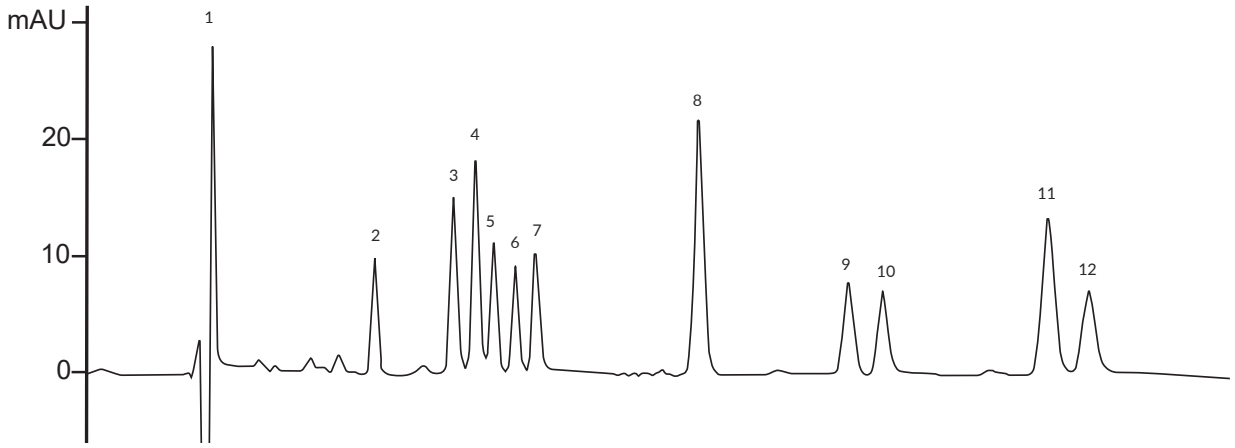
ReproShell C8,
5 µm





REPROSHELL - EFFICIENCY

HPLC-UV quantitation of 11 cannabinoids



1 - THCA
2 - D9 THC
3 - D8 THC
4 - THCV
5 - CBGA
6 - CBG
7 - CBDA
8 - CBD
9 - CBDV
10 - CBN
11 - CBC

Column:	Reproshell ODS-1, 2.7 µm um, 150 x 4,6 mm
Mobile Phase A:	Acetonitrile w / 0.1 % formic acid
Mobile Phase B:	Water w / 0.1 % formic acid
Mobile Phase Composition:	75/25 - A/B - Iscocratic
Flow rate:	2 mL/min
Back pressure:	220-230 bar
Detection:	228 nm
Run Time:	7 minutes
Reference Standard:	Cayman Chemical, Prod No. 32842

Chromatogramme and method courtesy of www.seedlessanalytical.com

AVAILABLE COLUMNS

Coreshell RP-Phase with nonporous core and porous shell

Particle size 5µm	20 x 2 mm	30 x 2 mm	50 x 2 mm
ReproShell ODS-1	cs15.91.s0202	cs15.91.s0302	cs15.91.s0502
ReproShell ODS-3	cs15.93.s0202	cs15.93.s0302	cs15.93.s0502
ReproShell C8	cs15.8e.s0202	cs15.8e.s0302	cs15.8e.s0502
ReproShell Biphenyl	cs15.bpe.s0202	cs15.bpe.s0302	cs15.bpe.s0502
ReproShell Phenylhexyl	cs15.ph.s0202	cs15.ph.s0302	cs15.ph.s0502
ReproShell PFP	cs15.pfp.s0202	cs15.pfp.s0302	cs15.pfp.s0502
ReproShell Silica	cs15.00.s0202	cs15.00.s0302	cs15.00.s0502

Particle size 2,7 µm	20 x 3 mm	30 x 3 mm	50 x 3 mm
ReproShell ODS-1	cs27.91.s0203	cs27.91.s0303	cs27.91.s0503
ReproShell ODS-3	cs27.93.s0203	cs27.93.s0303	cs27.93.s0503
ReproShell C8	cs27.8e.s0203	cs27.8e.s0303	cs27.8e.s0503
ReproShell Biphenyl	cs27.bpe.s0203	cs27.bpe.s0303	cs27.bpe.s0503
ReproShell Phenylhexyl	cs27.ph.s0203	cs27.ph.s0303	cs27.ph.s0503
ReproShell PFP	cs27.pfp.s0203	cs27.pfp.s0303	cs27.pfp.s0503
ReproShell Silica	cs27.00.s0203	cs27.00.s0303	cs27.00.s0503

AVAILABLE COLUMNS

75 x 2 mm	100 x 2 mm	125 x 2 mm	150 x 2 mm	5 x 2 mm 3/pck
cs15.91.s0702	cs15.91.s1002	cs15.91.s1202	cs15.91.s1502	cs15.91.v0002
cs15.93.s0702	cs15.93.s1002	cs15.93.s1202	cs15.93.s1502	cs15.93.v0002
cs15.8e.s0702	cs15.8e.s1002	cs15.8e.s1202	cs15.8e.s1502	cs15.8e.v0002
cs15.bpe.s0702	cs15.bpe.s1002	cs15.bpe.s1202	cs15.bpe.s1502	cs15.bpe.v0002
cs15.ph.s0702	cs15.ph.s1002	cs15.ph.s1202	cs15.ph.s1502	cs15.ph.v0002
cs15.pfp.s0702	cs15.pfp.s1002	cs15.pfp.s1202	cs15.pfp.s1502	cs15.pfp.v0002
cs15.00.s0702	cs15.00.s1002	cs15.00.s1202	cs15.00.s1502	cs15.00.v0002

75 x 3 mm	100 x 3 mm	125 x 3 mm	150 x 3 mm	5 x 3 mm 3/pck
cs27.91.s0703	cs27.91.s1003	cs27.91.s1203	cs27.91.s1503	cs27.91.v0003
cs27.93.s0703	cs27.93.s1003	cs27.93.s1203	cs27.93.s1503	cs27.93.v0003
cs27.8e.s0703	cs27.8e.s1003	cs27.8e.s1203	cs27.8e.s1503	cs27.8e.v0003
cs27.bpe.s0703	cs27.bpe.s1003	cs27.bpe.s1203	cs27.bpe.s1503	cs27.bpe.v0003
cs27.ph.s0703	cs27.ph.s1003	cs27.ph.s1203	cs27.ph.s1503	cs27.ph.v0003
cs27.pfp.s0703	cs27.pfp.s1003	cs27.pfp.s1203	cs27.pfp.s1503	cs27.pfp.v0003
cs27.00.s0703	cs27.00.s1003	cs27.00.s1203	cs27.00.s1503	cs27.00.v0003

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AVAILABLE COLUMNS

Particle size 2,7 µm	20 x 4 mm	30 x 4 mm	50 x 4 mm
ReproShell ODS-1	cs27.91.s0204	cs27.91.s0304	cs27.91.s0504
ReproShell ODS-3	cs27.93.s0204	cs27.93.s0304	cs27.93.s0504
ReproShell C8	cs27.8e.s0204	cs27.8e.s0304	cs27.8e.s0504
ReproShell Biphenyl	cs27.bpe.s0204	cs27.bpe.s0304	cs27.bpe.s0504
ReproShell Phenylhexyl	cs27.ph.s0204	cs27.ph.s0304	cs27.ph.s0504
ReproShell PFP	cs27.pfp.s0204	cs27.pfp.s0304	cs27.pfp.s0504
ReproShell Silica	cs27.00.s0204	cs27.00.s0304	cs27.00.s0504

Particle size 2,7 µm	20 x 4.6 mm	30 x 4.6 mm	50 x 4.6 mm
ReproShell ODS-1	cs27.91.s0246	cs27.91.s0346	cs27.91.s0546
ReproShell ODS-3	cs27.93.s0246	cs27.93.s0346	cs27.93.s0546
ReproShell C8	cs27.8e.s0246	cs27.8e.s0346	cs27.8e.s0546
ReproShell Biphenyl	cs27.bpe.s0246	cs27.bpe.s0346	cs27.bpe.s0546
ReproShell Phenylhexyl	cs27.ph.s0246	cs27.ph.s0346	cs27.ph.s0546
ReproShell PFP	cs27.pfp.s0246	cs27.pfp.s0346	cs27.pfp.s0546
ReproShell Silica	cs27.00.s0246	cs27.00.s0346	cs27.00.s0546

AVAILABLE COLUMNS

75 x 4 mm	100 x 4 mm	125 x 4 mm	150 x 4 mm	5 x 4 mm 3/pck
cs27.91.s0704	cs27.91.s1004	cs27.91.s1204	cs27.91.s1504	cs27.91.v0004
cs27.93.s0704	cs27.93.s1004	cs27.93.s1204	cs27.93.s1504	cs27.93.v0004
cs27.8e.s0704	cs27.8e.s1004	cs27.8e.s1204	cs27.8e.s1504	cs27.8e.v0004
cs27.bpe.s0704	cs27.bpe.s1004	cs27.bpe.s1204	cs27.bpe.s1504	cs27.bpe.v0004
cs27.ph.s0704	cs27.ph.s1004	cs27.ph.s1204	cs27.ph.s1504	cs27.ph.v0004
cs27.pfp.s0704	cs27.pfp.s1004	cs27.pfp.s1204	cs27.pfp.s1504	cs27.pfp.v0004
cs27.00.s0704	cs27.00.s1004	cs27.00.s1204	cs27.00.s1504	cs27.00.v0004

75 x 4.6 mm	100 x 4.6 mm	125 x 4.6 mm	150 x 4.6 mm	5 x 4.6 mm 3/pck
cs27.91.s0746	cs27.91.s1046	cs27.91.s1246	cs27.91.s1546	cs27.91.v0046
cs27.93.s0746	cs27.93.s1046	cs27.93.s1246	cs27.93.s1546	cs27.93.v0046
cs27.8e.s0746	cs27.8e.s1046	cs27.8e.s1246	cs27.8e.s1546	cs27.8e.v0046
cs27.bpe.s0746	cs27.bpe.s1046	cs27.bpe.s1246	cs27.bpe.s1546	cs27.bpe.v0046
cs27.ph.s0746	cs27.ph.s1046	cs27.ph.s1246	cs27.ph.s1546	cs27.ph.v0046
cs27.pfp.s0746	cs27.pfp.s1046	cs27.pfp.s1246	cs27.pfp.s1546	cs27.pfp.v0046
cs27.00.s0746	cs27.00.s1046	cs27.00.s1246	cs27.00.s1546	cs27.00.v0046

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