

Seplife[®] Enzyme Carriers



SEPLIFE

Driving the innovation
SUNRESIN
STOCK CODE SZ 300487

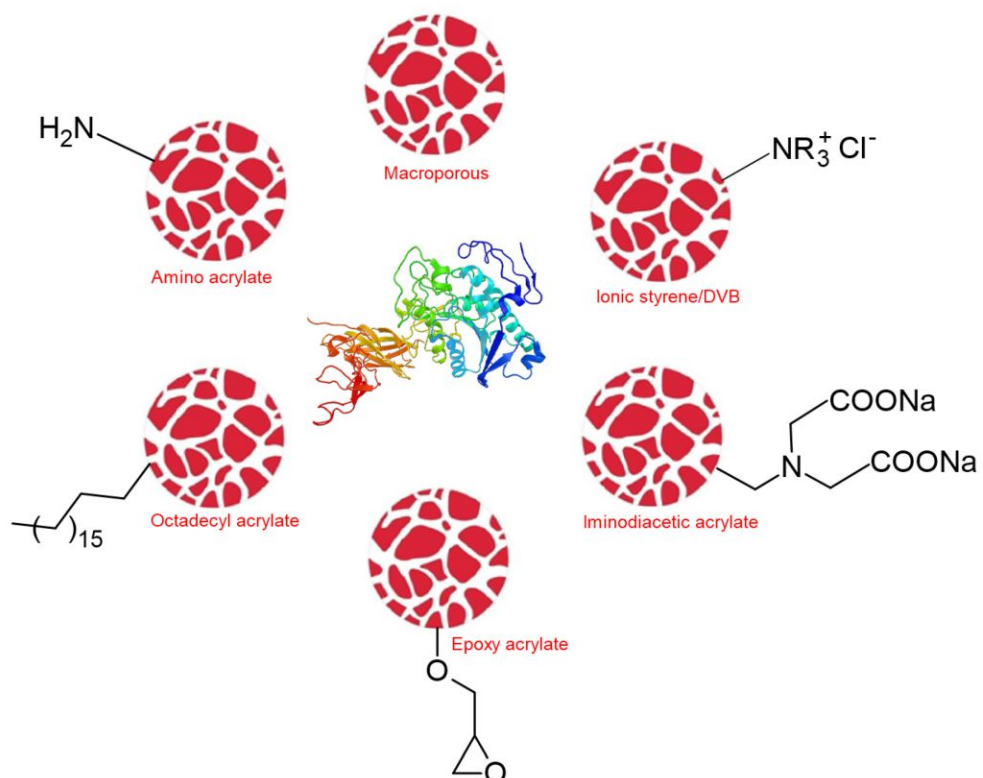
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The Seplife[®] Enzyme Carrier Portfolio

Large scale manufacturing capabilities:

- Customization (particle size, porosity, functional group)
- Short lead times (45-60 days manufacturing time)
- Manufactured in GMP-like conditions
- Food grade
- Compliant with EU, USA, China, India regulations



Epoxy Resins

Epoxy-activated resins enable simple and fast immobilization of enzymes by multi-point covalent binding between the enzyme and resin.

Seplife epoxy resins are porous, robust and hydrophilic (Table 1). All epoxy acrylate resins are designed to form very stable covalent linkages with different protein groups (amino, thiol, phenolic) under very mild experimental conditions of pH and temperature.

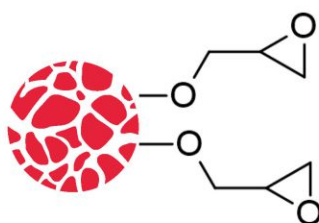


Table 1. Seplife epoxy acrylate resins

Product	Type	Functional group	Immobilization	Pore diameter (Å)	Particle size (micron) ¹	Total moisture (%)
Seplife EMC7014	Epoxy acrylate	Epoxy	Covalent	400-600	150-350	58-68
Seplife EMC7025	Epoxy acrylate	Epoxy	Covalent	300-500	150-350	58-68
Seplife EMC7038	Epoxy acrylate	Epoxy	Covalent	400-600	125-350	60-70
Seplife EMC7040	Epoxy acrylate	Epoxy	Covalent	500-800	125-350	60-70
Seplife EMC7042M	Epoxy acrylate	Epoxy	Covalent	800-1200	300-700	58-68
Seplife EMC7032	Epoxy/butyl acrylate	Epoxy	Covalent	200-400	150-350	55-65

¹ Customization of particle size is available

Epoxy-activated resins are available with differing degrees of mechanical stability and hydrophilicity. The final immobilized biocatalysts can be used in either stirred tank or packed bed reactors (Table 2).

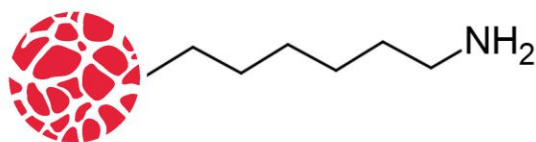
Table 2. Properties of Seplife epoxy acrylate resins

Carrier	Matrix	Mechanical strength	Hydrophilicity	Total moisture (%)	Porosity (Å)
Seplife EMC7014	Epoxy acrylate	++	++	58-68	400-600
Seplife EMC7025	Epoxy acrylate	+++	++	58-68	300-500
Seplife EMC7038	Epoxy acrylate	+++	++++	60-70	400-600
Seplife EMC7040	Epoxy acrylate	+++	+++	60-70	500-800
Seplife EMC7042M	Epoxy acrylate	+	+++	58-68	800-1200
Seplife EMC7032	Epoxy/butyl acrylate	+++++	+	44-65	200-400

Amino Resins

Seplife amino acrylate resins enable covalent enzyme immobilization. The resins are functionalized with primary amines, and the covalent immobilization is performed by pre-activation with glutaraldehyde.

Reaction of the aldehyde groups with amino groups of enzymes forms Schiff bases which are very stable in a pH range of 3-8 and provide the multi-point covalent binding. Seplife amino resins are porous, robust and hydrophilic. All amino acrylate resins are designed to form very stable covalent linkages with different protein groups (amino, thiol, phenolic) under very mild experimental conditions of pH and temperature. Amino acrylates can be used in either stirred tank or bed reactor.



Amino resins(long spacer C6)



Amino resins (short spacer C2)

Table 3. Seplife amino acrylate resins for enzyme immobilization

Product	Type	Functional	Immobilization	Pore diameter (Å)	Particle size (micron)	Total moisture (%)
Seplife EMC7120S	Amino acrylate	Amino (long spacer C6)	Covalent	200-400	100-300	50-60
Seplife EMC7120M	Amino acrylate	Amino (long spacer C6)	Covalent	200-400	300-700	50-60
Seplife EMC7225S	Amino acrylate	Amino (short spacer C2)	Covalent	500-700	100-300	60-70
Seplife EMC7225M	Amino acrylate	Amino (short spacer C2)	Covalent	500-700	300-700	60-70

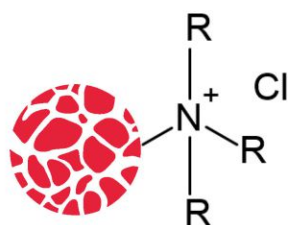
Affinity, Ionic and Adsorption Immobilization

Seplife enzyme carriers also include resins for:

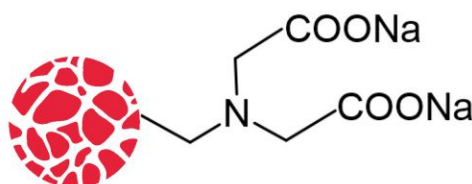
- **Adsorption:** Particularly useful for all enzymes that need to be used in oils and organic solvents.
- **Ionic immobilization:** Ionic interaction depends on the isoelectric point of the enzyme, its optimal pH of activity and the ionic strength of the immobilization buffer.
- **Affinity immobilization:** Suitable for recombinant enzymes that are manufactured containing a His-Tag.



Octadecyl resins



Quaternary amine resins



Affinity IDA resins

Table 4. Seplife resins for adsorption, ionic and affinity immobilization

Product	Type	Functional group	Immobilization	Pore diameter (Å)	Particle size (micron)	Total moisture (%)
Seplife EMC7528	Octadecyl acrylate	Octadecyl (C18)	Adsorption	200-400	300-1000	55-65
Seplife EMC7435	Ionic styrene/DVB	Quaternary amine (Cl ⁻)	Ionic	500-700	315-1250	60-70
Seplife Chelex7350	Iminodiacetic acrylate	Iminodiacetic (Na ⁺) IDA	Affinity	800-1000	100-250	60-70

References

- 1) Metal Affinity Fusion Enzyme Immobilization: Batch Process Showcase for Cascading Alcohol Oxidation and Bayer–Villiger Oxidation in Microaqueous Media, G. Vernet, Y. Ma, S. Serban, A. Basso, N. Zhang, S. Kara, ACS Sustainable Chem. Eng. 2024,
- 2) Optimization of Metal Affinity Ketoreductase Immobilization for Application in Batch and Flow Processes, A. Basso, M. S. Brown, A. Cruz-Izquierdo, C. A. Martinez, S. Serban, <https://pubs.acs.org/doi/10.1021/acs.oprd.1c00483>, Org. Process Res. Dev., 2022, 26, 2075 - 2084.

Packaging Information

Packaging sizes available:

- 500g
- 1kg
- 5 kg
- 10kg
- 25kg

Industrial-Scale (25kg) Packaging Options

• Option 1

Seplife enzyme carriers are packed in PE bags as a primary package and in blue plastic kegs as a secondary package.



• Option 2

Seplife enzyme carriers are packed in PE FFS bags and stuck on a pallet very well protected for transportation. The packaging is Halal and Food Grade compliant.



Shelf Life and Storage Temperature

Product	Shelf life	Storage temperature (°C)
Epoxy resins	6 months	2-8
Amino resins	3 years	2-20
Octadecyl acrylate	3 years	2-20
Quaternary styrene/DVB	3 years	2-20
Iminodiacetic acrylate	3 years	2-20
Styrene/DVB	3 years	2-20

Ordering Information

PRODUCT	REF.NO	PACK SIZE
Seplife® EMC7014	PM014S01	500g
	PM014S02	1kg
	PM014S03	5kg
	PM014S04	10kg
	PM014S05	25kg
Seplife® EMC7032	PC013S01	500g
	PC013S02	1kg
	PC013S03	5kg
	PC013S04	10kg
	PC013S05	25kg
Seplife® EMC7120S	PM033S01	500g
	PM033S02	1kg
	PM033S03	5kg
	PM033S04	10kg
	PM033S05	25kg
Seplife® EMC7225S	PM025S01	500g
	PM025S02	1kg
	PM025S03	5kg
	PM025S04	10kg
	PM025S05	25kg

PRODUCT	REF.NO	PACK SIZE
Seplife® EMC7025	PC013M01	500g
	PC013M02	1kg
	PC013M03	5kg
	PC013M04	10kg
	PC013M05	25kg
Seplife® EMC7120M	PM033M01	500g
	PM033M02	1kg
	PM033M03	5kg
	PM033M04	10kg
	PM033M05	25kg
Seplife® EMC7225M	PM025M01	500g
	PM025M02	1kg
	PM025M03	5kg
	PM025M04	10kg
	PM025M05	25kg
Seplife® Chelex 7350	PM057S01	500g
	PM057S02	1kg
	PM057S03	5kg
	PM057S04	10kg
	PM057S05	25kg

PRODUCT	REF.NO	PACK SIZE
Seplife® EMC7435	PS066I01	500g
	PS066I02	1kg
	PS066I03	5kg
	PS066I04	10kg
	PS066I05	25kg
Seplife® EMC7038	PM014S01	500g
	PM014S02	1kg
	PM014S03	5kg
	PM014S04	10kg
	PM014S05	25kg
Seplife® EMC7042M	PM017M01	500g
	PM017M02	1kg
	PM017M03	5kg
	PM017M04	10kg
	PM017M05	25kg

PRODUCT	REF.NO	PACK SIZE
Seplife® EMC7528	PM042I01	500g
	PM042I02	1kg
	PM042I03	5kg
	PM042I04	10kg
	PM042I05	25kg
Seplife® EMC7040	PM018S01	500g
	PM018S02	1kg
	PM018S03	5kg
	PM018S04	10kg
	PM018S05	25kg



SEPLIFE



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