Life is a great *Discovery*

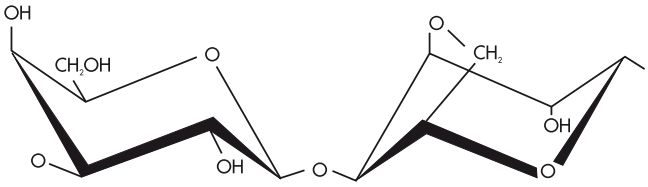
Agaroses Manual

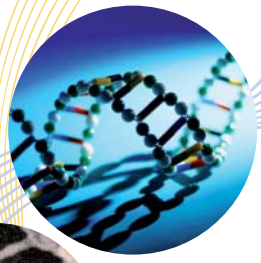
Agarose is a fraction extracted from agar-producing seaweeds and is mainly responsible for the agar's gelling power. It exhibits a high hysteresis (difference between melting and gelling temperatures), greater than any other hydrocolloid, making it ideal for separations such as electrophoresis and chromatography within the fields of Molecular Biology and Biochemistry.

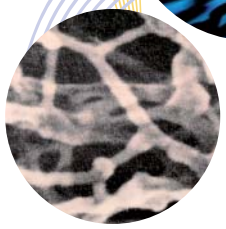
The structure of the polysaccharide is a galactan, formed by linking agarobioses 1-3 and 1-4, as shown in the illustration. This chemical structure gives agarose the capacity to form gels that are very resistant even at low concentrations. These gels have a macroreticular structure with a very open mesh which can be adjusted simply by varying the concentration of agarose.

The macroreticule of the agarose gel is formed by hydrogen bonds, which make the gel thermo-reversible, thus it melts after heating. Specifically, the gelling temperature range is 32 - 45°C, and the melting temperature range is normally 80 - 95°C, although these can be modified when preparing products for specific uses.

Agarose is a neutral and toxic-free material so it can be handled freely. In addition to its uses in gels, agarose can be used to form support structures such as beads, to which proteins, such as enzymes and antibodies, as well as other products, including dyes and antigens, can be fixed for separations. Agarose is an indispensable tool for Molecular Biology, Biochemistry, Cell Structure and Microbiology.







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Applications

All applications for agarose take advantage of the special characteristics of the macroreticular gel. It is used as a sieve or support through which biological macromolecules such as proteins or nucleic acids can pass. Larger particles, such as viruses and subcellular fragments, are also able to move through the gel network.

- **Immunodiffusion.** In this technique, macromolecules migrate and are precipitated in the gel by molecular diffusion.
- **Electrophoresis.** Agarose is suitable for the widest range of electrophoresis procedures as well as in immunoelectrophoresis and electrofocusing. Driven by electrostatic fields, the macromolecules migrate through the macroreticular structure.
- **Gel Chromatography, Affinity Chromatography and Ion Exchange Chromatography.** In these applications, the movement of macromolecules is caused by the displacement of a solvent along the gel formed in microspheres.
- **Supports for Biocatalysis.** Agarose is derivatized and activated by organic synthesis to make supports for molecules with enzymatic activity. The capacity of gel beads as an enzymatic support is much greater because enzymes can also be attached inside the beads. The structure is sufficiently open to allow the movement of coenzymes and substrates inside the gel.
- **Solid Culture Media.** Solid or semi-solid media are used to grow plant & cells and tissues. Culture media prepared with agarose (instead of agar) can be used for strict autotrophic bacteria.
- **Growth of Protein Crystals.** The agarose gel regulates the diffusion of the protein molecules, allowing the formation of crystals suitable for crystallographic study.

There are other scientific and technical applications.

Applications by agarose type

	Analytical separation ≥1000 bp	*Analytical separation ≤1000 bp*	*Preparative electrophoresis*	*PFGE*	*DNA typing*	*Blotting*	*Fine resolution*	*In-gel applications*	*Protein electrophoresis*
D1 LE	●				●	●			
D1 ME / D1 HE									●
D1 LE GQT	●		●		●	●			
D2	●								●
D5	●			●		●			
FP DNA	●				●	●			
LM	●								
LM GQT	●		●					●	
LM Sieve		●	●				●	●	
Novagel GQT		●	●				●	●	
MS4		●							●
MS6		●							●
MS8		●							●
MS12		●				●			

	STANDARD MELTING	*LOW MELTING*	*HIGH RESOLUTION*
DNA/RNA fragments ≥ 1000 bp	D-1 LE (regular applications and blotting) D-1 LE GQT (preparative) D-1 ME (regular applications) D-2 (regular applications) D-5 (high mobility) FP DNA (DNA typing)	LM LM GQT (preparative)	-
DNA/RNA fragments ≤ 1000 bp	-	LM SIEVE (preparative) NOVAGEL GQT (fine resolution)	MS-4 (fine resolution) MS-6 / Metagel MS-8 (fine resolution) MS-12 (regular applications and blotting)

Tips & Recommendations
for agarose gel preparation

Agarose selection

The choice of the most appropriate agarose depends on the *size of the DNA* to be analyzed and any subsequent manipulations required. Several issues must be considered:

- *Protein or nucleic acid?*
- *Standard or low melting?*
- *Molecular size*
- *Standard or GQT grade?*
- *Sieving capabilities*
- *Analytical or preparative?*
- *If preparative, Recovery or In-Gel?*

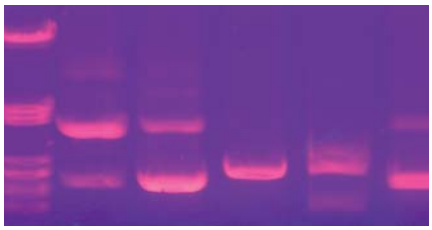
Agarose dissolution

1. **Dispersion:** separation of the particles by the buffer without clumping.
2. **Hydration:** individual particles are surrounded by the solution (water, buffer). Determinative for a good and easy dissolution process; it is advisable to allow hydration time before heating for melting and dissolution.
3. **Melting and dissolution:** solid particles pass into liquid state.

- Different agarose types behave differently: no universal protocol for heating and dissolving agarose exists.
- Pore size is determined by the concentration and agarose type used. The appropriate agarose and concentration should be chosen for each application.

Tips for gel preparation

- ✓ Always use a beaker 2-4 times the volume of the solution.
- ✓ Add agarose powder slowly whilst stirring the buffer solution to avoid clumping.
- ✓ The buffer solution should be cool for a good dispersion; if the buffer is warm, possibilities of clumping are great.
- ✓ Allow agarose powder to hydrate in the solution for a few minutes before heating - this allows for a quicker and easier dissolution and reduces foaming.
- ✓ Adjust time and power settings according to your microwave output strength.
- ✓ Always wear appropriate protection: the microwaved solution can become overheated and foam when disturbed.
- ✓ To prevent overheating: reduce microwave power, remove beaker after 1 minute from the microwave and swirl it very gently and carefully. Place it back in the microwave and continue for the remaining 1 minute or so.
- ✓ For total agarose melting: boil the solution only enough to affect total dissolution. Check for “fish eyes” (incomplete dissolution). Overboiling can cause agarose hydrolysis and lower gel strength.
- ✓ To avoid bubble formation: cool to 60°C and pour carefully into the gel cassette.
- ✓ After pouring, allow the gel to cool gradually; rapid cooling will cause an irregular gel matrix and band distortion during electrophoresis.
- ✓ Low melt agarose gels need to sit for an additional 30 min or overnight at 4-8°C to allow a total gelling process.
- ✓ Low melting or low percentage gels: it is important to run electrophoresis in a cold buffer. High voltages can cause overheating of the buffer which can melt the gel.
- ✓ Buffer composition can be determinative in the gelling process: if agents that disrupt hydrogen bond formation are added to the buffer, melting temperature and gel strength will decrease, or even inhibit gel formation.
- ✓ Once the gel is set, flood with the buffer. The gel can be stored refrigerated for several days.
- ✓ Agarose gels can be remelted and repoured several times without damage so that a large volume of agarose can be prepared and smaller portions taken from time to time.



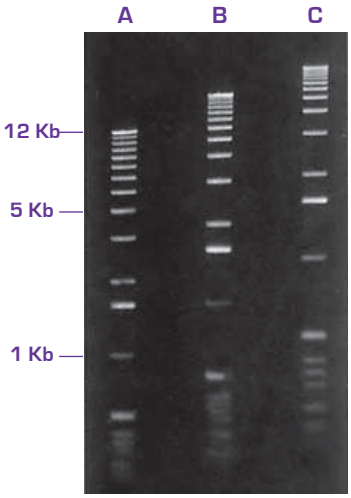
Standard Agaroses: D1

low, medium & high EEEO, low EEO GQT

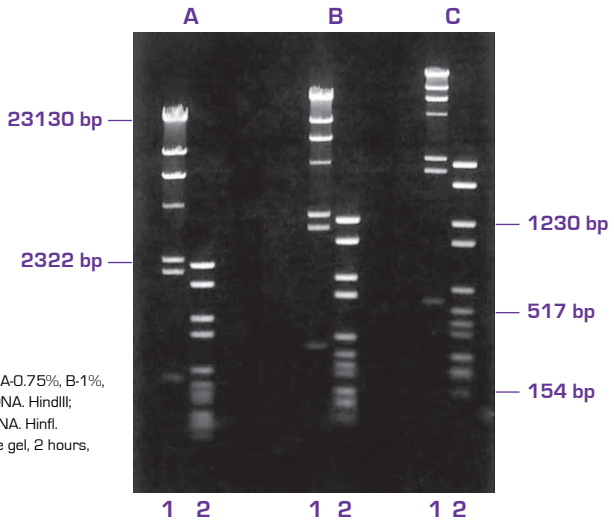
D-1 Agarose is available for different uses in 4 types: Low EEO (electroendosmosis), Medium EEO, High EEO, and D-1 LE GQT.

GQT Agarose is similar to D-1 LE, a standard gelling/melting temperature agarose with high gel strength. This agarose is GQT (Genetic Quality Tested) certified which ensures that preparative electrophoresis can be performed and DNA recovered without damaging its properties and structure. D-1 LE GQT gels can be used in Molecular Biology techniques.

- ✓ *More reliable and easier handling: extraordinary mechanical resistance*
- ✓ *Possibility of pore size variation in accordance with particle size to be separated by modifying gel concentration*
- ✓ *Easy gel preparation: simple dissolution in aqueous buffers by standard boiling or microwaving*
- ✓ *Greater thermal stability due to high hysteresis (difference between gelling and melting temperatures)*
- ✓ *Excellent gel transparency and visibility*
- ✓ *Exceptionally low absorption of staining agents*
- ✓ *Absence of toxicity (unlike polyacrylamide, which is toxic)*



D-1 LE Agarose gels in 1X TAE buffer A-0.75%, B-1%, C-1.25%. Marker: 1 Kb Ladder. Electrophoresis conditions: submarine gel, 2 hours, 4.5 V/cm in 1X TAE buffer.



D-1 LE Agarose gels in 1X TAE buffer A-0.75%, B-1%, C-1.25%. Markers: lane 1 - Lambda DNA. HindIII; lane 2 - pBR328DNA.BglI+pBR328DNA. HinfI. Electrophoresis conditions: submarine gel, 2 hours, 4.5 V/cm in 1X TAE buffer.

	D1 LE (low EEO)	*D1 ME (medium EEO)*	*D1 HE (high EEO)*	*D1 LE (low EEO) GQT*
Moisture	≤ 7%	≤ 7%	≤ 7%	≤ 7%
Ash	≤ 0.4%	≤ 0.5%	≤ 1.0%	≤ 0.4%
EEO (Electroendosmosis)	0.05 - 0.13	0.16 - 0.19	0.23 - 0.26	0.05 - 0.13
Sulfate	≤ 0.1%	≤ 0.14%	≤ 0.2%	≤ 0.1%
Clarity 1.5 % (NTU)	≤ 3	≤ 4	≤ 4	≤ 3
Gel Strength 1% (g/cm²)	≥ 1200	≥ 1000	≥ 750	≥ 1200
Gel Strength 1.5 % (g/cm²)	≥ 2500	≥ 2200	≥ 1200	≥ 2500
Gelling Temperature 1.5 % (°C)	36 ± 1.5			
Melting Temperature 1.5 % (°C)	88 ± 1.5			
DNAse/ RNAse activity	None detected			
DNA resolution ≥ 1000 bp	Finely resolved			
Gel background	Very low			
Applications	- High electrophoresis mobility. - Nucleic acids analytical and preparative electrophoresis. - Blotting assays. - Protein electrophoresis such as radial immunodiffusion.	- Nucleic acids electrophoresis. - Protein electrophoresis (serum protein and immunoelectrophoresis).	Used in techniques such as serum protein, immunoelectrophoresis and counterimmuno-electrophoresis.	- Analytical and preparative gel electrophoresis for nucleic acids ≥ 1000 bp. - Blotting assays. - Preparative electrophoresis.

Other standard agaroses: D2, D5 and FP DNA

ALL RNAse / DNAse FREE

D2 Agarose

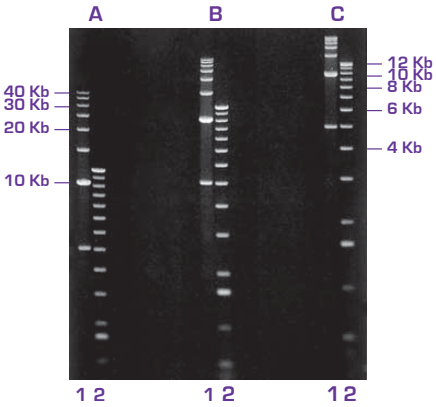
D-2 Agarose has a higher gelling temperature than D1 Agarose and Low EEO. This gives higher thermal stability to the gels.

- *Same features as D1 agaroses*
- *Excellent elasticity and flexibility of the gels*
- *Great derivatization and cross-linking capacity: allows coupling of enzymes, antigens and other substances to the gel structure*

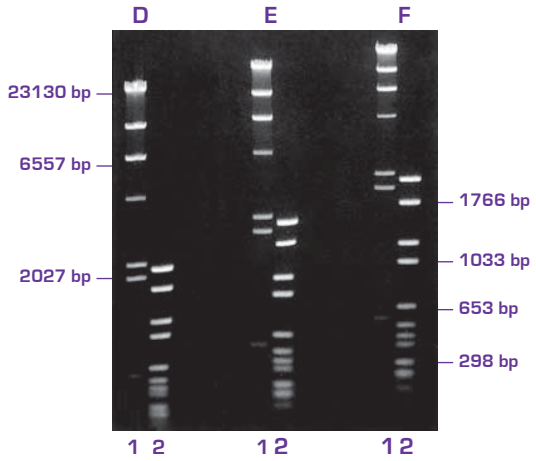
D5 Agarose

D-5 Agarose is a linear polymer with a very high molecular weight, giving gel structures unlike those of traditional agaroses. This characteristic, added to the very low sulfate content, produces a strong intercatenary interaction, yielding a gel with a very high strength and higher exclusion limit.

- *Extremely high gel strength: allowing for lower gel concentrations (0.3%), enabling it to be used not only with high molecular weight nucleic acids, including chromosomes, but also with large sized particles like viruses and ribosomes*
- *High electrophoretic mobility: DNA mobility is greater when compared with D-1LE. Electrophoresis times are reduced depending upon the buffer and agarose concentration used*
- *Easy gel preparation: simple dilution in aqueous buffers by standard boiling or microwaving*
- *Greater thermal stability due to high hysteresis*
- *Exceptionally low absorption of staining agents*
- *Absence of toxicity*



D-5 Agarose gels in 1X TAE. A-0.3%, B-05%, C-08%. Markers: lane 1-5 kb, lane 2-1 kb ladder. Electrophoresis conditions: submarine gel, 16 hours, 1 V/cm. in IXTAE buffer.



D-5 Agarose gels in 1X TAE. D-0.5%, E-1%, F-1.5%. Markers: lane 1-Lambda DNA. HindIII, lane-2-pBR328DNA. BgII+pBR328DNA. HindI. Electrophoresis conditions: submarine gel, 2 hours, 4.5 V/cm. in 1X TAE buffer.

FP DNA (Finger printing)

Finger Printing DNA Agarose is a powerful tool in laboratories performing forensic testing, paternity determination, cell line verification, tissue typing, etc. FP DNA Agarose meets all requirements for DNA identity applications.

- *Low EEO*
- *High gel strength, forming easy-to-handle gels*
- *No DNA binding and no gel background*
- *No variability in quality and performance between batches*
- *Clear and sharp bands*
- *High efficiency transfer for DNA (blotting)*
- *No smearing*

	D2	*D5*	*FP DNA*
Moisture	≤ 8%	≤ 7%	≤ 7%
Ash	≤ 0.4%	≤ 0.25%	≤ 0.4%
EEO (electroendosmosis)	≤ 0.14	≤ 0.12	≤ 0.13
Sulfate	≤ 0.2%	≤ 0.12%	≤ 0.14%
Clarity 1.5 % (NTU)	≤ 4	≤ 4	-
Gel Strength 1% (g/cm^2)	≥ 900	≥ 1800	≥ 1400
Gel Strength 1.5 % (g/cm^2)	≥ 1200	≥ 3200	-
Gelling Temperature 1.5 % (°C)	42 ± 1.5	36 ± 1.5	36 ± 1.5
Melting Temperature 1.5 % (°C)	87 ± 1.5	88 ± 1.5	88 ± 1.5
DNAse/ RNAse activity	None detected		
DNA resolution ≥ 1000 bp	Finely resolved	Finely resolved	Clean and sharp bands produced when a standard size DNA (23 kb) is electrophoresed, transferred and probed.
Gel background	Very low	Very low	-
Applications	- Nucleic acid electrophoresis. - Protein electrophoresis (immunoelectrophoresis and counterelectrophoresis). - Preparation of agarose beads.	- Conventional electrophoresis: used in a wide range of concentrations. - Pulsed Field Gel Electrophoresis: due to its higher exclusion limit, larger molecules can be separated. - Blotting. - Agarose beads preparation. - Cell and enzyme immobilization.	- Forensic testing - Paternity determination - Cell line verification - Tissue typing DNA binding: None detected DNA background: None detected

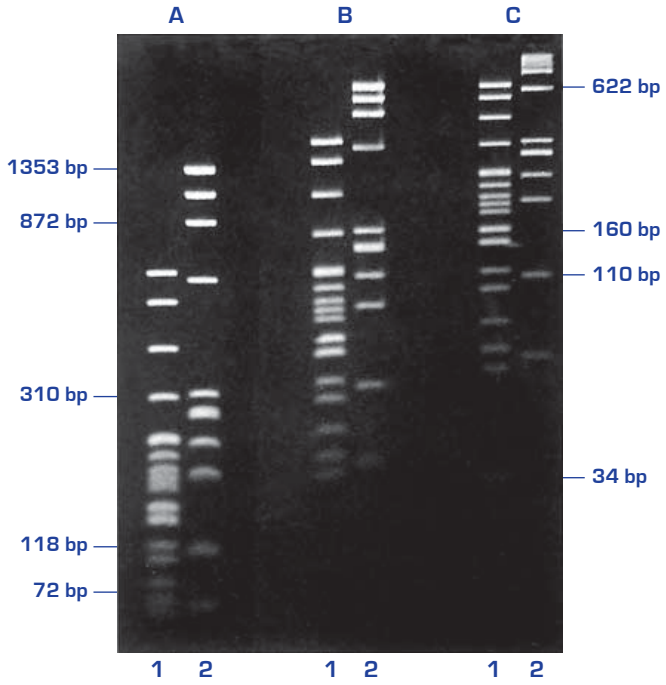
Low Melting Agaroses:
LM Sieve

LM SIEVE Agarose is a low melting temperature agarose with the highest resolving capacity for DNA fragments smaller than 1000 bp, especially PCR products ranging from 200 to 800 bp.

This agarose is GQT (Genetic Quality Tested) certified. This ensures that In-Gel applications can be performed in remelted agarose, avoiding difficult DNA extraction steps. LM SIEVE Agarose can be used at high concentrations, forming gels with excellent clarity and a higher sieving capacity than standard melting agaroses.

- ✓ *Easy recovery of small DNA fragments suitable for cloning or enzymatic processing as it is ideal for digestion by agarase enzymes*
- ✓ *High resolving capacity for DNA fragments ≤ 1000 bp*
- ✓ *High gel strength: easy gel handling even at concentrations as low as 2%*

	LM Sieve
Moisture	≤ 5%
Ash	≤ 0.3%
EEO (electroendosmosis)	≤ 0.10
Sulfate	≤ 0.12%
Gel Strength (g/cm²)	(4%) ≥ 1000
Gelling Temperature (°C)	(4%) ≤ 35
Melting Temperature (°C)	(4%) ≤ 65
DNAse/ RNAse activity	None detected
DNA resolution ≥ 1000 bp	Sharp bands and finely resolved
Gel background	Very low after Et. Br. staining
DNA binding	None detected
In-Gel enzymatic processing	Passes test
Enzymatic degradation by agarase	Passes test
Applications	- Electrophoresis of DNA fragments ≤1000 bp. - In-Gel enzymatic processing (digestion, ligation, PCR). - Preparative electrophoresis. - Analysis and recovery of small DNA fragments for further applications.



LM SIEVE Agarose gels in 1XTBE buffer A-2%, B-3%, C-4%. Markers: lane 1 - pBR322DNA.MspI; lane 2 - øX174DNA. HaeIII. Electrophoresis conditions: submarine gel, 2 hours 30 min., 4.5 V/cm in 1XTBE buffer.

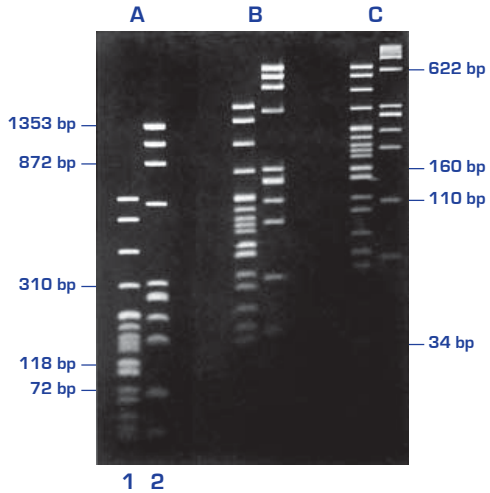
Other low melting agaroses: Novagel GQT

NovaGel is a low gelling/melting temperature, GQT grade certified agarose.

This agarose, with high resolution capacity, finely resolves nucleic acid fragments from 50 to 1000 bp, especially PCR products. Due to its low gelling/melting temperatures, NovaGel GQT is compatible with In-gel applications (enzymatic processing of nucleic acids directly in remelted agarose) thus, it is not necessary to recover DNA from agarose gels.

At lower concentrations (< 2%), gels are fragile and difficult to handle, so special care must be taken when working. The best concentration range for easy handling is 3 - 6%.

- ✓ *High resolution capacity*
- ✓ *Easy preparation of gels at high concentrations, even at 6%, due to its low viscosity*



Other low melting agaroses: LM & LM GQT

ALL RNAse / DNAse FREE

LM Agarose

Low Melting (LM) Agaroses are derivatized by organic synthesis which generates methoxylate groups from the basic agarose structure. The main properties of these agaroses are their low melting and gelling temperatures when compared with standard agaroses.

The low melting temperature allows for the recovery of undamaged nucleic acids at a temperature lower than their denaturing temperature. The low gelling temperature assures the agarose will be in a liquid state at a temperature range where In-Gel manipulations can be performed without prior extraction of the DNA from the gel slice.

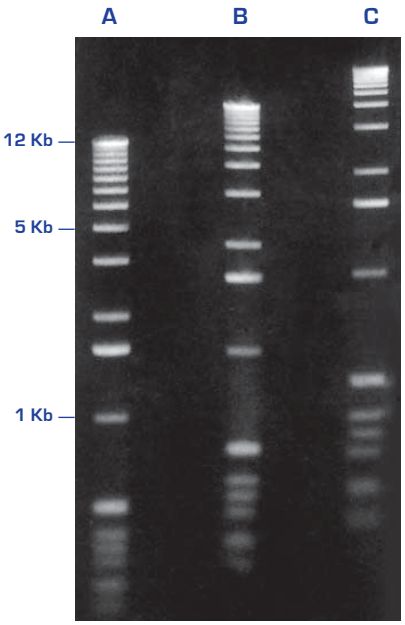
LM GQT Agarose

LM GQT Agarose is a low melting temperature agarose with the highest resolving capacity for large DNA fragments, ≥1000 bp, including PCR products.

This agarose is GQT (Genetic Quality Tested) certified. This ensures that In-Gel applications can be performed in remelted agarose, avoiding difficult DNA extraction steps.

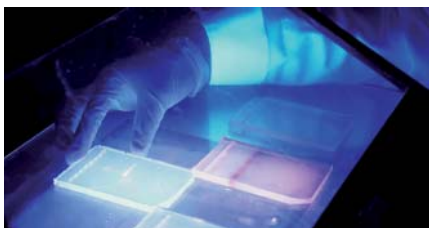
LM GQT Agarose is ideal for digestion by agarase enzymes, which makes it very easy to recover large DNA fragments suitable for cloning or enzymatic processing.

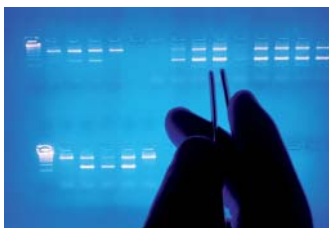
- ✓ *Lower gel strength than standard agaroses but easy handling of gels*
- ✓ *Higher clarity (gel transparency) than gels of standard agaroses*
- ✓ *Great sieving capacity*



LM GQT Agarose at different concentrations. A-0.75%, B-1% and C-1.25%. Marker: 1kb ladder, 0.5 µg/lane. Running conditions: 1X TAE buffer, 4,5V/cm, 2 hours 30 min.

	Novagel GQT	LM	LM GQT
Moisture	≤ 7%	≤ 7%	≤ 7%
Ash	≤ 0.45%	≤ 0.4%	≤ 0.4%
EEO (electroendosmosis)	≤ 0.13	≤ 0.12	≤ 0.12
Sulfate	≤ 0.12%	≤ 0.12%	≤ 0.12%
Clarity (NTU)	(4%) ≤ 6	(1.5%) ≤ 4	(1.5%) ≤ 4
Gel Strength (g/cm^2)	(4%) ≥ 800	(1.5%) ≥ 500	(1.5%) ≥ 500
Gelling Temperature (°C)	(4%) ≤ 35	(1.5%) 24 - 28	(1.5%) 24 - 28
Melting Temperature (°C)	(4%) ≤ 65	(1.5%) ≤ 65.5	(1.5%) ≤ 65.5
DNAse/ RNAse activity	None detected	None detected	None detected
DNA resolution ≥ 1000 bp	Finely resolved	Sharp bands and finely resolved	Sharp bands and finely resolved
Gel background	Very low after Et. Br. staining	Very low after Et. Br. staining	Very low after Et. Br. staining
DNA binding	None detected	-	None detected
In-Gel enzymatic processing	Passes test	-	Passes test
Enzymatic degradation by agarase	Passes test	-	Passes test
Applications	- Analytical and preparative gel electrophoresis of small DNA fragments. - In-Gel applications. - Analysis and recovery of small DNA fragments for further applications.	- Electrophoresis of DNA fragments ≥1000 bp. - In-Gel enzymatic processing (digestion, ligation, PCR). - Preparative electrophoresis. - Analysis and recovery of large DNA fragments for further applications.	



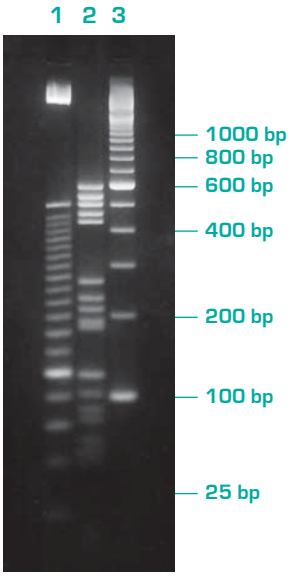


High DNA resolution Agaroses:
MS-6 Metagel

MS-6 Metagel Agarose is a high quality agarose especially formulated for molecular screening. With MS-6 Agarose brings you an agarose with an improved efficiency for resolution of small DNA fragments and PCR products.

- ✓ *High resolution capacity: close to the resolution of polyacrylamide gels*
- ✓ *Improved clarity of the gel, enhancing visualization, even at high concentrations*
- ✓ *High gel strength: easy gel handling even at low concentrations*

	MS-6 Metagel
Moisture	≤ 7%
Ash	≤ 0.3%
EEO (electroendosmosis)	≤ 0.12
Sulfate	≤ 0.1%
Clarity (NTU)	(3%) ≤ 4
Gel Strength (g/cm^2)	(3%) ≥ 800
Gelling Temperature (°C)	(3%) ≤ 35
Melting Temperature (°C)	(3%) ≤ 75
DNAse/ RNAse activity	None detected
DNA resolution ≥ 1000 bp	Sharp bands and finely resolved
Gel background	Very low after Et. Br. staining
DNA binding	Very low
Applications	- Molecular screening. - High resolution gels for <1000 bp fragments.



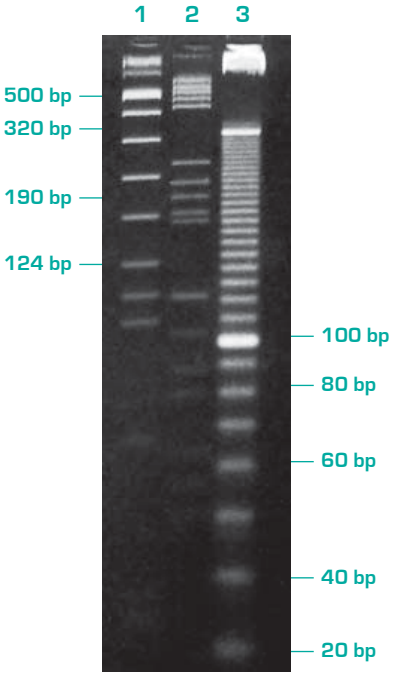
MS-6 3% Agarose gel in 1XTAE buffer. Markers: lane 1 – 25 bp ladder; lane 2 – Molecular weight marker V.; lane 3 - 100 bp ladder. Electrophoresis conditions: submarine gel, 2h 30 min, 4.5 V/cm in 1XTAE buffer.

Other high DNA resolution agaroses: MS-4

A molecular screening agarose for improved resolution of DNA fragments with 500 bp or less, especially sized–primer fragments.

At 3 % concentration, MS-4 Agarose gives a resolution of DNA fragments similar to gels made with polyacrylamide at concentrations of 8 %. While MS-4 may be dissolved carefully by microwaving, gels are best prepared by autoclaving.

- ✓ *Excellent resolution of DNA fragments lower than 500 bp, especially smaller sized–primer fragments*
- ✓ *Very clear, transparent gels even at concentrations of ≥ 5%*
- ✓ *Efficient mechanical handling at all concentrations: chances of gel breaking or cracking when handled are greatly minimized*



MS-4 Agarose gel, 4% in 0.5X TBE buffer. Markers: lane 1- Molecular weigth marker VIII (Roche); lane 2 - Molecular weigth marker V (Roche); lane 3 - 10 bp ladder. Electrophoresis conditions: submarine gel, 2 hours 30 min., 4.5 V/cm in 0.5X TBE buffer.

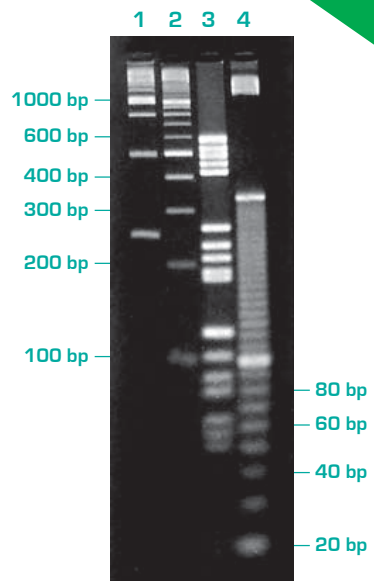
Other high DNA resolution agaroses: MS-8, MS-12

ALL RNAse / DNAse FREE

MS-8 Agarose

An agarose for molecular screening that improves resolution of small DNA fragments and PCR products. MS-8 Agarose is for applications that require efficient separation of small DNA fragments and PCR products.

- ✓ *High resolution of short PCR and DNA fragments*
- ✓ *Improved clarity of the gel, enhancing visibility*
- ✓ *Better handling than similar products: stronger gel structure and higher gel strength. Chances of gels breaking or cracking when handled are greatly minimized, even at low agarose concentrations*
- ✓ *High gel strength allows use in blotting*

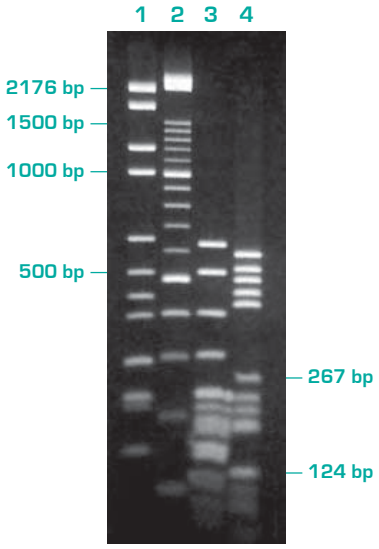


MS-8 Agarose gel, 3% concentration in 1X TAE buffer. Markers: lane 1- 250 bp ladder; lane 2-100 bp ladder; lane 3-molecular weight marker V (Roche); lane 4-10 bp ladder. Electrophoresis conditions: submarine gel, 2 hours, 4.5 V/cm in 1X TAE buffer.

MS-12 Agarose

This molecular screening agarose is designed to have a larger gel network than MS-8 and is recommended for the separation of DNA fragments smaller than 1500 bp. The gel is exceptionally firm but still flexible when handled, minimizing the danger of cracking or breaking. This agarose is recommended for all analytical applications, especially when DNA is recovered for subsequent use in enzymatic procedures.

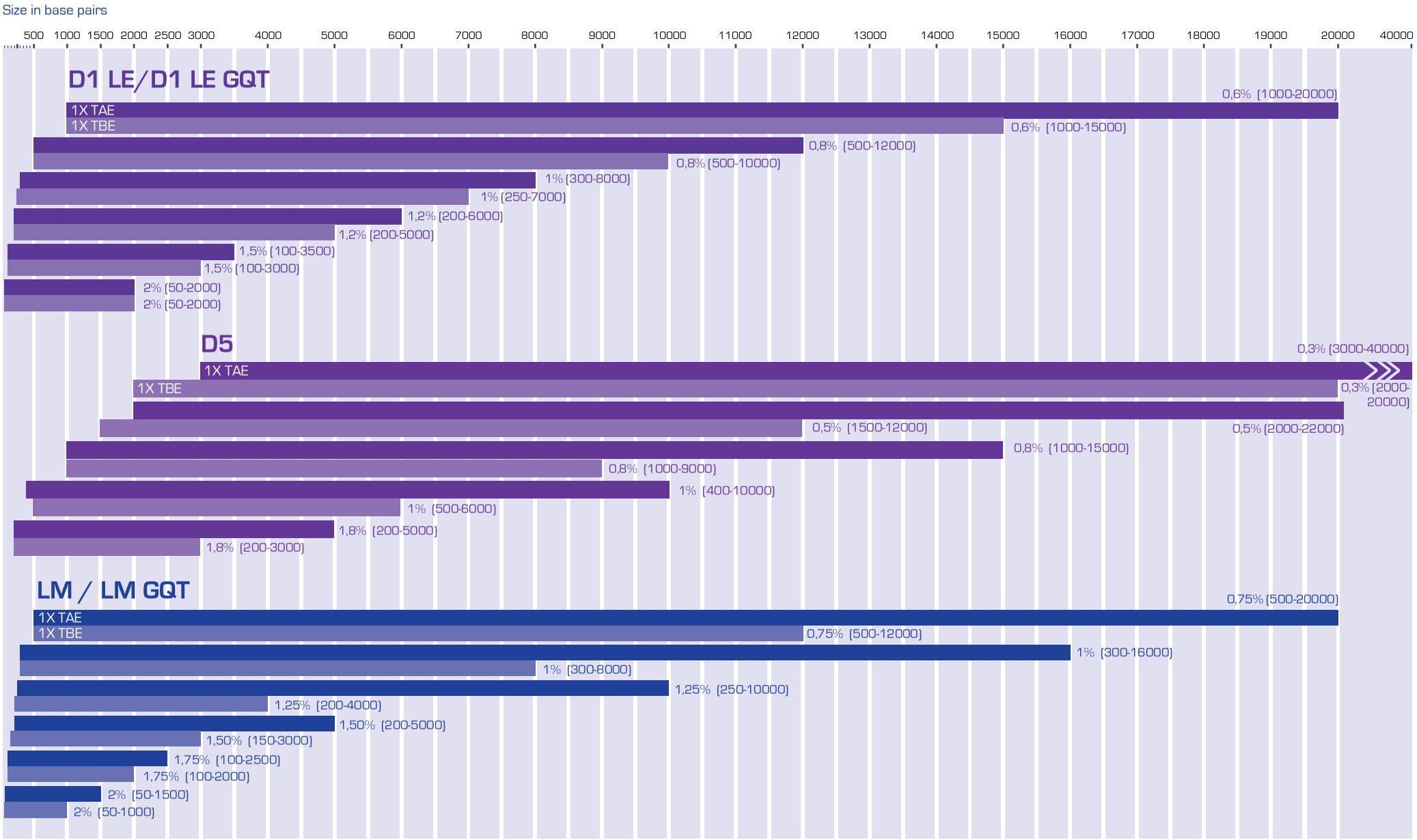
- ✓ *Higher gel strength than competing products*
- ✓ *Faster and easier preparation of gels: same melting and gelling temperature as regular agaroses*
- ✓ *Excellent resolution at ≤ 1% concentrations*



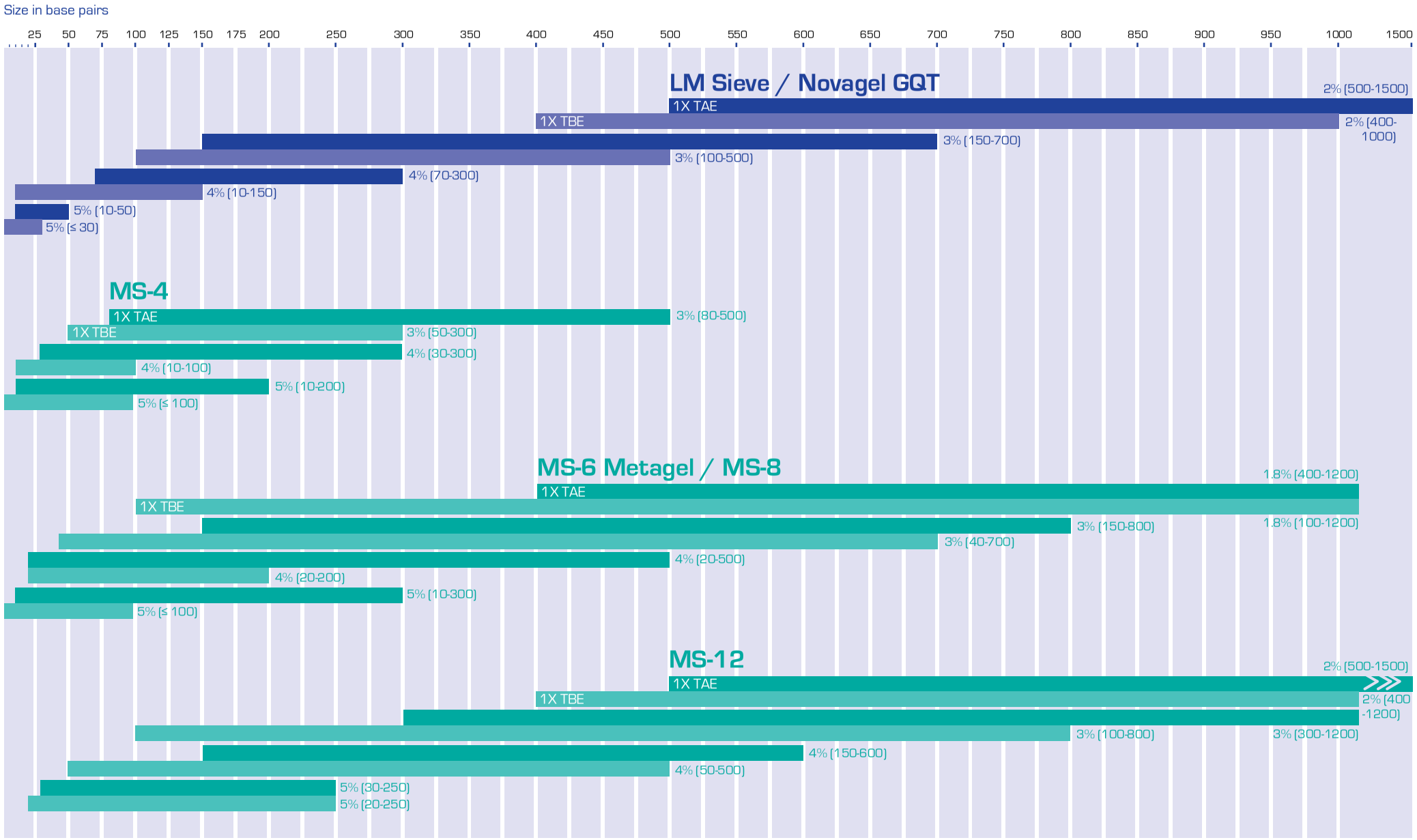
MS-12 Agarose gel, 2% concentration in 0.5X TBE buffer. Markers: lane 1- pBR328DNA. BglI+pBR328DNA. HinfI; lane 2 - 100 bp ladder; lane 3 - pBR322DNA. MspI; lane 4 - pBR322DNA. HaeIII. Electrophoresis conditions: submarine gel, 2 hours, 4.5 V/cm in 0.5X TBE buffer.

	MS-4	*MS-8*	*MS-12*
Moisture	≤ 7%	≤ 7%	≤ 7%
Ash	≤ 0.3%	≤ 0.35%	≤ 0.35%
EEO (electroendosmosis)	≤ 0.12	≤ 0.12	≤ 0.12
Sulfate	≤ 0.11%	≤ 0.11%	≤ 0.11%
Clarity (NTU)	(3%) ≤ 6	(1.5%) ≤ 5	(1.5%) ≤ 5
Gel Strength (g/cm^2)	(3%) ≥ 500 (5%) ≥ 1000	(1.5%) ≥ 600 (3%) ≥ 1500	(1.5%) ≥ 2000 (4%) ≥ 4200
Gelling Temperature (°C)	(3%) ≤ 31	(3%) ≤ 35.5	(4%) ≤ 40.5
Melting Temperature (°C)	(3%) ≤ 76	(3%) ≤ 80	(4%) ≤ 93
DNAse/ RNAse activity	None detected	None detected	None detected
DNA resolution ≥ 1000 bp	Sharp bands and finely resolved	Sharp bands and finely resolved	Sharp bands and finely resolved
Gel background	Very low after Et. Br. staining	Very low after Et. Br. staining	Very low after Et. Br. staining
DNA binding	Very low	Very low	Very low
Applications	- Molecular screening. - High resolution gels for < 500 bp fragments.	- Molecular screening. - High resolution gels for <1000 bp fragments.	- All analytical applications. - Blotting: very good transference for DNA fragments 154 - 2176 bp in 4% gels.

Agarose ranges of separation for Standard & Low Melting Agaroses



Agarose ranges of separation for Low Meting & High DNA Resolution Agaroses



Notes

D1 low EEO

Cat. No. 8012	100 g
Cat. No. 8014	250 g
Cat. No. 8016	500 g
Cat. No. 8008	1.000 g

D1 low EEO GQT

Cat. No. 8017	100 g
Cat. No. 8018	250 g
Cat. No. 8015	500 g

D1 medium EEO

Cat. No. 8020	100 g
Cat. No. 8021	250 g
Cat. No. 8022	500 g
Cat. No. 8023	1.000 g

D1 high EEO

Cat. No. 8025	100 g
Cat. No. 8026	250 g
Cat. No. 8027	500 g
Cat. No. 8028	1.000 g

D2 high gelling temperature

Cat. No. 8033	100 g
Cat. No. 8034	250 g
Cat. No. 8038	500 g

D5 high gel strength

Cat. No. 8045	100 g
Cat. No. 8046	250 g
Cat. No. 8047	500 g

FP DNA

Cat. No. 8089	100 g
Cat. No. 8092	250 g
Cat. No. 8093	500 g

LM

Cat. No. 8050	100 g
Cat. No. 8051	250 g
Cat. No. 8052	500 g

LM GQT

Cat. No. 8087	100 g
Cat. No. 8094	250 g

LM Sieve

Cat. No. 8085	100 g
Cat. No. 8084	250 g
Cat. No. 8096	500 g

Novagel GQT

Cat. No. 9021	100 g
Cat. No. 9022	250 g
Cat. No. 9023	500 g

MS-4

Cat. No. 8075	100 g
Cat. No. 8076	250 g
Cat. No. 8077	500 g

MS-6 Metagel

Cat. No. 8002	100 g
Cat. No. 8003	250 g
Cat. No. 8004	500 g

MS-8

Cat. No. 8065	100 g
Cat. No. 8066	250 g
Cat. No. 8064	500 g

MS-12

Cat. No. 8067	100 g
Cat. No. 8068	250 g
Cat. No. 8069	500 g

Life is a great *Discovery*