

# Gel Electrophoresis Size Marker



Take the Pink Link!

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## Lyophilised markers

### Starting material

The DNA in our lyophilised length markers is amplified in low-nuclease host bacteria, restricted with quality enzymes, and is deproteinised. This ensures that they contain high-quality, low-protein or nuclease-free products with very good migration properties on agarose, agar and polyacrylamide gels.

### Quality control

Numerous gel separations of undigested plasmids and digested fragments form part of the manufacturing process. The fragment mass is determined using two calibrated photometers via conversion ( $1 \text{ OD}_{260 \text{ nm}} = 50 \mu\text{g dsDNA}$ ) and is aliquoted at 100 % (+2 %). Each batch of DNA and gel loading buffer is subject to a final quality check using gel electrophoresis.

### Stability

Lyophilisation of the DNA markers results in very stable products, without any significant impairment of quality at room temperature after transport (even at the height of summer, > 35°C for several days) or after long storage times (> 4 years at -20°C).

### Resuspension

Before use, lyophilised DNA markers can be dissolved in gel loading buffer or optional for end-labeling in sterile, bidistilled water. The lyophilised form allows you the highest degree of flexibility (labeling, concentration, intensity of staining bands).

### Legal note

The DNA ladders were manufactured by digestion of plasmids with *EcoR I*. The plasmids are legally protected. To produce copies apply for a permission from the manufacturer.



## Tips on the use of DNA length markers

### Correct storage

Deproteinised and lyophilised DNA samples are extremely stable (> 5 years). Problems do not usually occur unless DNA markers in solution are stored (> 6 weeks) at room temperature, they become contaminated with bacteria, or are frequently thawed and refrozen (> 20 times). After dissolution of the DNA, we therefore recommend aliquoting of the DNA marker in *ready-to-use* amounts for storage at -20°C (for 2 – 4 years). At +4°C, markers in solution are stable for several weeks or even months. Here, however, there is the risk of bacterial or nuclease contamination. This can be prevented by storage at -20°C.

### End-labeling

Thanks to their deproteinised and lyophilised form, these DNA markers are suitable for universal use for end-labeling with modified nucleotides. Labeling in four positions via the terminal *EcoR I* generated recessed ends is possible, especially with the DNA ladder 100 bp (A3470) and the DNA Ladder Mix 100 – 5000 (A3660). For the labeling of the DNA, the product is simply dissolved in TE buffer or bidistilled water.

### DNA staining with methylene blue

Occasionally, ethidium bromide is not suitable for staining DNA. An alternative is methylene blue. In such cases, however, it must be kept in mind that the mass of DNA used must be increased by about 30 % and that about 1.5 h more must be planned for destaining steps. With a methylene blue concentrate supplied by AppliChem, you achieve very good results, even for small fragments of about 200 bp.

i n t r o



## Mass calculations for single fragments

Using DNA markers of a defined origin, the calculation of the mass of single fragments is relatively easy. The amount loaded per lane, e.g. 1 µg/10 µl, is divided by the number of base pairs of the DNA used and is multiplied by the fragment size. For example: the 267 bp fragment of the pBR322 *Hae* III marker with a loading amount of 1 µg: 1 µg : 4361 bp (pBR322) = 0.229 ng/base pair x 267 bp of the fragment = 61.2 ng/267 fragment.

Assuming comparable staining (saturation with dye), the mass of unknown fragments can be determined in this way. If required, concentration gradients can be loaded.

## Less is often more

The different gel formats for agarose and polyacrylamide gel electrophoresis and the varying sensitivity of staining or detection mean that it is only possible to give an approximation of the recommended DNA amount to be loaded. Most DNA markers show the best separation with loading amounts of 0.5 – 1 µg on agarose gels. The general rule is: the lower the number of marker bands, the smaller the total amount needed. A low loading amount is also of advantage with short migration distances or very sensitive detection. When using polyacrylamide gels, generally only about 1/5 – 1/2 the amount required for agarose gels is necessary. For DNA markers with large fragments and a high mass (e.g. equimolar mixtures or lambda DNA markers), depending on the agarose concentration, a minimum separation distance is required to separate or completely distinguish between the dominant upper bands in terms of width. This separation distance can often be reduced by 10 – 15 % by reducing the marker amount. By using equalized markers, in addition to a marked reduction of the marker amount, the separation distance can be reduced by a further 10 – 15 %, from e.g. 70 to 50 mm, on a standard format gel, to obtain the best results.

## How to achieve results quickly

Especially deproteinised DNA length markers can be separated very well using high voltages, e.g. within 20 minutes with a migration distance of 70 mm on a 1.2 % agarose gel at 120 Volt. This can only be realized, however, with a high quality gel migration buffer (the water quality must be taken into account!) and an adequate amount of buffer (400 – 600 ml). Poor buffer quality results in overheating of the agarose gel at higher voltages and this therefore causes problems. A high buffer volume (the buffer can usually be reused 4 – 6 times in one week without problems) leads the heat off, provided the gel chamber for submersion is of adequate size.

## Staining front too intense?

In some cases, users who regularly perform assays with our products sometimes comment that the dye concentration in the gel loading buffer we supply is too high (only lyophilised markers). If this is the case, simply dissolve the DNA length marker in double concentration in the gel loading buffer and further dilute it with 1/2 volume TE buffer. Even when using a 50 % solution, there are no problems with the resulting 7 % glycerol concentration to increase the solution density.

## Plausibility of the results and ion concentrations:

Non-plausible results (e.g. unexpected fragment runs at 500 bp instead of 350 bp) may occur under relatively extreme conditions (separation of restriction or PCR samples with a very high salt content > 150 mM) or at very high voltages with relatively short separation distances. To identify errors, 1/10 volume restriction buffer can be added to the aliquot of the DNA marker, for example, or the restriction sample can be appropriately diluted with gel loading buffer (usually 1/2 volume). In many cases, lowering the voltage during separation is also helpful. The accurate determination of the size of fragments or PCR products may also be impaired, when salt fronts combined with local problems of leading off heat with conducting away heat and very high electrophoresis voltages, result in partial denaturation of the DNA fragments. These are conditions that theoretically may also occur when processing samples from Maxam-Gilbert sequencing in combination with sample buffers containing formamide.

d u c t i o n

Prod. No.	DNA Marker	Bands	Fragment Sizes [bp]							
A3470	DNA Ladder 100 bp (lyophilised)	11	1000	900	800	700	600	500	400	
A5191	DNA Ladder 100 bp	10	1000	900	800	700	600	500	400	
A3302	DNA Ladder 100 bp equalized (lyophilised)	11	1000	900	800	700	600	500	400	
A5216	DNA Ladder 100 bp plus	11	1500	1000	900	800	700	600	500	
A3660	DNA Ladder Mix 100 – 5000 (lyophilised)	17	5000	4000	3000	2500	2000	1500	1000	
A2667	DNA Ladder 1 kb (lyophilised)	11	10000	8000	6000	5000	4000	3000	2500	
A3982	DNA Ladder 250 bp (lyophilised)	16	8000	6000	5000	4000	3000	2750	2500	
A5207	DNA Ladder 1 kb	13	10000	8000	6000	5000	4000	3000	2500	
A6430	DNA Ladder 1 kb concatamer (lyophilised)	>25	1000	bp steps (1000 – approx. 25000)						
A7215	DNA Marker quick-run (lyophilised)	5	2500	2000	1500	1000	500			
A7222	DNA Marker quick-run extended (lyophilised)	9	6000	4000	25000	2000	1500	1000	500	
A4406	DNA Marker pBR322 – <i>Hae</i> III (lyophilised)	22	587	540	502	458	434	267	234	
A5229	DNA Marker pBR322 – <i>Hae</i> III	22	587	540	502	458	434	267	234	
A6927	DNA Marker pBR328 Mix (lyophilised)	12	2176	1766	1230	1033	653	517	453	
A5194	DNA Marker Phage Lambda <i>Sty</i> I	11	19329	7743	6223	4254	3472	2690	1882	
A4412	DNA Marker Phage Lambda <i>Bst</i> E II (lyophilised)	14	8454	7242	6369	5686	4822	4324	3675	
A5220	DNA Marker Phage Lambda <i>Bst</i> E II	14	8454	7242	6369	5686	4822	4324	3675	
A5589	DNA Marker Phage Lambda <i>Hind</i> III (lyophilised)	8	23130	9416	6557	4361	2322	2027	564	
A5223	DNA Marker Phage Lambda <i>Hind</i> III	8	23130	9400	6557	4361	2322	2027	564	
A5235	DNA Marker pUC19 – <i>Msp</i> I	12	501	489	404	331	242	190	147	
A3996	DNA Marker pUC19 – <i>Msp</i> I (lyophilised)	12	501	489	404	331	242	190	147	
<b>Protein Marker</b>										
A5238	Protein Marker I (14 – 116)	7	116.0	97.4	66.2	37.6	28.5	18.4	14.0	
A5418	Protein Marker II (6.5 – 200) prestained	8	200.0	116.0	68.0	43.0	30.0	20.0	14.4	
A4402	Protein Marker III (6.5 – 200)	8	200.0	116.0	68.0	43.0	30.0	20.0	14.4	
A3993	Protein Marker IV (10 – 150)	8	150	100	80	60	40	30	20	

## DNA Ladder 100 bp (lyophilised)

**A3470**

DNA size standard for medium-sized fragments and PCR products

### Description

The fragments of this size marker occur in equimolar proportions, i.e. also all possible marking positions on the terminal *Eco*R I generated recessed ends. The band mass increases with fragment length. The DNA is deproteinized and lyophilized. This marker is particularly suitable for comparisons with medium-sized DNA fragments and PCR products. The 500 base pair band mass has been doubled for easier orientation on 1.5 – 2.0 agarose gels. The size and mass of plasmid insertions or PCR products can be determined precisely in the range of up to 1000 base pairs at intervals of 100 base pairs. An additional band with 150 base pairs has been included for the determination of smaller PCR products. The best results are achieved after a migration distance of approx. 70 – 80 mm on agarose gels. Each lane of a normal sized agarose gel (approx. 80 ml) should be loaded with approx. 0.4 – 0.8 µg of marker. Loading buffer is supplied separately.

### Number of bands

11

### Fragment sizes (bp)

1000, 900, 800, 700, 600, 500 (x2), 400, 300, 200, 150, 100

### Supplied with 1 ml loading buffer (1X)

10 mM Tris · HCl (pH 7.5); 5 mM sodium acetate; 2 mM EDTA; 10 % glycerol; 0.02 % bromophenol blue; 0.015 % xylene cyanol

### Storage

-20°C

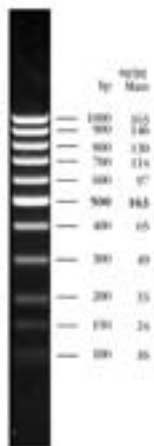
### Loading volume

0.4 – 0.8 µg per lane

### Package size

A3470,0050

50 µg



300	200	150	100											
300	200	100												
300	200	150	100											
400	300	200	100											
900	800	700	600	500	400	300	200	150	100					
2000	1500	1000	500											
2250	2000	1750	1500	1250	1000	750	500	250						
2000	1500	1000	750	500	250									

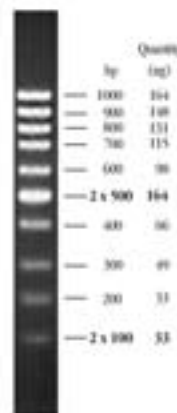
200	100													
213	192	184	124	123	104	89	80	64	57	51	21	18	11	8
213	192	184	124	123	104	89	80	64	57	51	21	18	11	8
394	298	234	220	154										
1489	925	421	74											
2323	1929	1371	1264	702	224	117								
2323	1929	1371	1264	702	224	117								
125														
125														
111	110	67	34	26										
111	110	67	34	26										

# selection guide

## DNA Ladder 100 bp

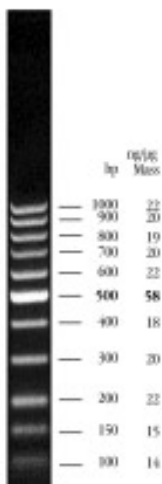
A5191

<b>Description</b>	100 bp DNA ladder is ideal for determining the size of double-stranded DNA from 100 to 1000 base pairs. The 100 bp and 500 bp fragments are present at increased intensity to allow easy identification. All fragments are blunt-ended.	
<b>Number of bands</b>	10	
<b>Fragment sizes (bp)</b>	1000, 900, 800, 700, 600, 500 x 2, 400, 300, 200, 100 x 2	
<b>Storage buffer</b>	10 mM Tris · HCl (pH 7.8), 10 mM NaCl, 1 mM EDTA	
<b>Concentration</b>	0.2 mg/ml	
<b>Storage</b>	-20°C	
<b>Loading volume</b>	1 µg per lane	
<b>Package sizes</b>	A5191,0005	0.05 mg (= 250 µl)
	A5191,0025	0.25 mg (= 1.25 ml)



Assay conditions:  
1.7 % agarose

The quality of this DNA sizing standard differs considerably from products offered by most other manufacturers thanks to the elaborate manufacturing method, which also fulfils the highest quality requirements! The digested DNA is not simply precipitated and resuspended, but also extracted in phenol. This guarantees the extremely long shelf-life without any loss of quality. Not only the prices should therefore be compared.



## DNA Ladder 100 bp equalized (lyophilised)

A3302

DNA size standard for medium-sized fragments and PCR products

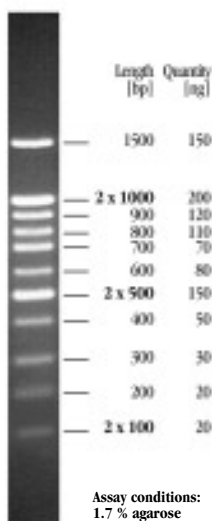
### Description

With this marker, the band mass of the larger fragments have been reduced and have been reinforced for the smaller fragments (as compared to marker A3470) by up to a factor or 4.5. The result is an even appearance in intensity of the individual bands. The mol number of the fragments decreases from the larger to the smaller fragments, as do the possible marking positions on the terminal *EcoR* I generated recessed ends. The 500 bp band, with an increase in mass of a factor of 3, enables rapid orientation on 1.5 – 2.0 % agarose gels. Thanks to the even distribution, a shorter migration distance is needed for the larger fragments, in order to achieve a clear distinction between the bands. The best results are achieved after a migration distance of approx. 60 – 80 mm on agarose gels. Each lane of a normal sized agarose gel (approx. 80 ml) should be loaded with approx. 0.2 – 0.5 μg of marker. The equalized 100 bp ladder is therefore very economical in use. Loading buffer is supplied separately.

<b>Number of bands</b>	11
<b>Fragment sizes (bp)</b>	1000, 900, 800, 700, 600, 500 (x3), 400, 300, 200, 150, 100
<b>Supplied with 1 ml loading buffer (1X)</b>	10 mM Tris · HCl (pH 7.5); 5 mM sodium acetate; 2 mM EDTA; 10 % glycerol; 0.02 % bromophenol blue; 0.015 % xylene cyanol
<b>Loading volume</b>	0.2 – 0.5 μg per lane
<b>Storage</b>	-20°C
<b>Package size</b>	A3302,0020 20 μg

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# DNA marker



## DNA Ladder 100 bp plus

A5216

### Description

100 bp + 1.5 kb DNA Ladder is suitable for sizing linear double-stranded DNA fragments from 0.1 to 1.5 kb. Use in combination with a loading buffer (please see our present catalog for a list of loading buffers).

<b>Number of bands</b>	11
<b>Fragment sizes (bp)</b>	1500, 1000 (x2), 900, 800, 700, 600, 500 (x2), 400, 300, 200, 100 (x2). The 500 bp and 1 kb bands are brighter than the other bands in the ladder.
<b>Concentration</b>	The marker is supplied in a concentration of 0.2 mg/ml in 10 mM Tris · HCl (pH 8.0), 1 mM EDTA, 10 mM NaCl.
<b>Storage</b>	Store at -20°C. Prepare small aliquots to prevent repeated freeze & thawing!
<b>Loading</b>	We recommend loading of 0.4 – 0.6 μg (2 – 3 μl) per lane.
<b>Package sizes</b>	A5216,0005 0.05 mg (= 250 μl)
	A5216,0025 0.25 mg (= 1.25 ml)

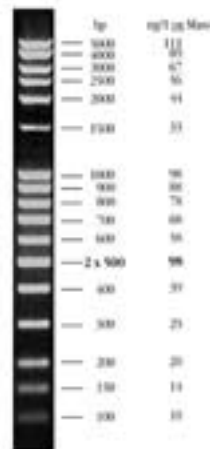
## DNA Ladder Mix 100 – 5000 (lyophilised)

A3660

DNA size standard for the determination of the size of medium-sized fragments and plasmids

**Description** The 100 bp ladder (A3470) was extended with fragments in the size range of 1500 – 5000. The extension by 40 % mass in the larger fragments means easy orientation from 1500 bp upwards on 1.2 – 1.5 % agarose gels. In addition to small and large plasmid insertions and PCR products, the size and quantity of plasmid vectors can also be determined. The best results are achieved after a migration distance of 80 – 90 mm on agarose gels with loading volumes of 0.5 – 0.8 µg per lane on standard sized gels.

<b>Number of bands</b>	17
<b>Fragment sizes (bp)</b>	5000, 4000, 3000, 2500, 2000, 1500, 1000, 900, 800, 700, 600, 500 (x2), 400, 300, 200, 150, 100.
<b>Supplied with 1 ml loading buffer (1X)</b>	10 mM Tris · HCl (pH 7.5); 5 mM sodium acetate; 2 mM EDTA; 10 % glycerol; 0.02 % bromophenol blue; 0.015 % xylene cyanol
<b>Loading volume</b>	0.5 – 0.8 µg per lane (for good staining properties with ethidium bromide)
<b>Migration distance</b>	Best results are achieved after a migration distance of 70 – 90 mm.
<b>Storage</b>	-20°C. Avoid repeated thawing and refreezing. Portioning in small aliquots is recommended. The lyophilised product is stable for many weeks even at room temperature!
<b>Package size</b>	A3660,0050 50 µg



This sizing standard was manufactured using digestion of 7 plasmids with *EcoR* I. The plasmids are legally protected. Permission to produce copies must be sought from the manufacturer. The DNA was deproteinised, precipitated and lyophilised after digestion with phenol/chloroform. If the fragments are to be labeled, the marker should be dissolved in distilled water (10 minutes at room temperature, shaking occasionally).

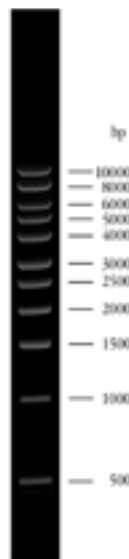
The quality of this DNA sizing standard differs considerably from products offered by most other manufacturers thanks to the elaborate manufacturing method, which also fulfils the highest quality requirements! The digested DNA is not simply precipitated and resuspended, but also extracted in phenol. This guarantees the extremely long shelf-life without any loss of quality. Not only the prices should therefore be compared.

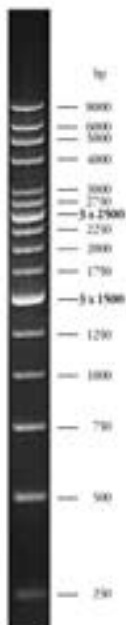
## DNA Ladder 1 kb (lyophilised)

A2667

**Description** The size of medium-sized plasmids and fragments can be determined with 11 DNA bands between 10,000 and 500 base pairs. Unlike the equimolar distribution of the bands in other DNA markers and the long migration distance necessary with these for the separation of large fragments, the mass of the larger bands of the 1 kbp DNA ladder has been reduced. This permits relatively short separation distances for a 1 kbp DNA ladder (approx. 70 mm on 1.2 % agarose gels) and means that it is very economical in use (0.4 – 0.6 µg per lane, or 400 separations) on normal sized gels. Loading buffer is supplied separately. The fragments have terminal *EcoR* I generated recessed ends. The DNA is deproteinized and lyophilized.

<b>Number of bands</b>	11
<b>Fragment sizes (bp):</b>	10000, 8000, 6000, 5000, 4000, 3000, 2500, 2000, 1500, 1000, 500
<b>Supplied with 1 ml loading buffer (1X)</b>	10 mM Tris · HCl (pH 7.5); 5 mM sodium acetate; 2 mM EDTA; 10 % glycerol; 0.02 % bromophenol blue; 0.015 % xylene cyanol
<b>Loading volume</b>	0.4 – 0.6 µg per lane
<b>Storage</b>	-20°C
<b>Package size</b>	A2667,0050 50 µg A2667,0200 4 x 50 µg





## DNA Ladder 250 bp (lyophilised)

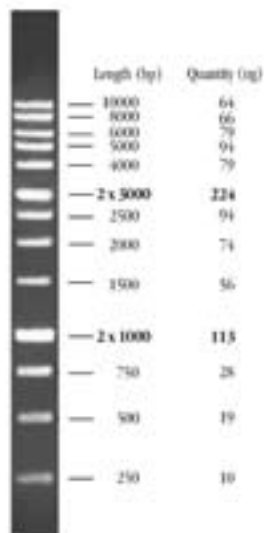
A3982

Universal DNA size standard for the determination of the size of plasmids and their DNA insertions

<b>Description</b>	With its two clearly reinforced bands at 2500 and 1500 base pairs, the 250 bp ladder enables rapid orientation on 1.0 – 1.2 % agarose gels. Using gel electrophoresis, with intervals of 250 base pairs in a range of 250 – 3000 base pairs, it is possible after restriction to determine clearly and precisely, for example, large plasmid insertions, and vector plasmids above 3000 base pairs with intervals of 1 – 2 kb. In comparison to DNA markers with equimolar band distribution, the mass of the smaller bands of this 250 bp ladder up to 1000 bp has been reinforced and the larger bands above 3000 bp have been reduced. This means that optimum results are already achieved after a migration distance of 60 – 80 mm on agarose gels and that small amounts of about 0.7 µg per lane can be used with standard sized agarose gels (80 ml).	
<b>Number of bands</b>	16	
<b>Fragment sizes (bp)</b>	8000, 6000, 5000, 4000, 3000, 2750, 2500 (x3), 2250, 2000, 1750, 1500 (x3), 1250, 1000, 750, 500, 250	
<b>Supplied with 1 ml loading buffer (1X)</b>	10 mM Tris · HCl (pH 7.5); 5 mM sodium acetate; 2 mM EDTA; 10 % glycerol; 0.02 % bromophenol blue; 0.015 % xylene cyanol	
<b>Loading volume</b>	0.4 – 0.8 µg per lane (for good staining properties with ethidium bromide)	
<b>Migration distance</b>	Best results are achieved after a migration distance of 75 – 85 mm.	
<b>Storage</b>	-20°C. Avoid repeated thawing and refreezing. Portioning in small aliquots is recommended. The lyophilised product is stable for many weeks even at room temperature!	
<b>Package size</b>	A3982,0050	50 µg

This sizing standard was manufactured using digestion of plasmids with *EcoR* I. The plasmids are legally protected. Permission to produce copies must be sought from the manufacturer. The DNA was deproteinised, precipitated and lyophilised after digestion with phenol/chloroform. If the fragments are to be labeled, the marker should be dissolved in distilled water (10 minutes at room temperature, shaking occasionally).

The quality of this DNA sizing standard differs considerably from products offered by most other manufacturers thanks to the elaborate manufacturing method, which also fulfils the highest quality requirements! The digested DNA is not simply precipitated and resuspended, but also extracted in phenol. This guarantees the extremely long shelf-life without any loss of quality. Not only the prices should therefore be compared.



## DNA Ladder 1 kb

A5207

<b>Description</b>	1 kb DNA Ladder is a convenient marker for determining the size of double-stranded DNA from 250 to 10,000 base pairs. The 1,000 and 3,000 bp fragments have increased intensity relative to the other bands on ethidium bromide-stained agarose gels, and serve as reference indicators. All fragments are blunt-ended.	
<b>Number of bands</b>	13	
<b>Fragment sizes (kb)</b>	10.0, 8.0, 6.0, 5.0, 4.0, 3.0 (x2), 2.5, 2.0, 1.5, 1.0 (x2), 0.75, 0.5, 0.25	
<b>Storage buffer</b>	10 mM Tris · HCl (pH 7.8), 10 mM NaCl, 1 mM EDTA	
<b>Concentration</b>	0.2 mg/ml	
<b>Storage</b>	-20°C	
<b>Package sizes</b>	A5207,0005	0.05 mg (= 250 µl)
	A5207,0025	0.25 mg (= 1.25 ml)

DNA marker



## DNA Ladder 1 kb concatamer (lyophilised)

A6430

DNA size marker as alternative to irregular  $\lambda$ -fragments (from 1 to approx. 25 kb)

**Description** A partial ligation of 1000 bp Hind III fragments results in a DNA ladder ranging from 1000 to approx. 22000 bp in 0.8 to 1% gels using standard agarose (Prod.-No. A2114; separation range up to approx. 25 kbp). The upper limit of the fragment ligation results in the main mass of the ligation products in the separation range optimal for standard agaroses (agar). For a better orientation, the 3000 bp and 10,000 bp bands are brighter. Optimal results will be achieved after a distance of approximately 80-100 mm in agarose gels and a loading volume of approximately 1  $\mu$ g per lane in normal-sized gels. This 1000 bp concatamer ladder may be applied either in reduced loading volumes (for a separation range e.g. < 10000 bp) or in increased volumes (> 15000 bp). Even under optimized ligation conditions, an intramolecular religation may occur, especially with smaller fragments. Therefore, at high gel loading volumes, ligation products (closed circles) have been observed between the 1000 and 3000 bp bands. For a better orientation, the 3000 bp band is brighter.

<b>Number of bands</b>	> 25
<b>Fragment sizes (bp)</b>	1 000 bp steps (1000 - approx. 25000)
<b>Supplied with 1 ml loading buffer (1X)</b>	10 mM Tris · HCl (pH 7.5); 5 mM sodium acetate; 2 mM EDTA; 10 % glycerol; 0.02 % bromophenol blue; 0.015 % xylene cyanol
<b>Loading volume</b>	approx. 1.0 $\mu$ g per lane
<b>Migration distance</b>	Optimum results after a distance of 15 – 25 mm only.
<b>Storage</b>	-20°C.
<b>Package size</b>	A6430,0050 50 $\mu$ g



The mass of the smaller fragments of this marker is larger, in contrast to those of digested plasmids, while those of the upper bands is lower. This marker has been designed as an alternative for irregular DNA fragment markers, for the separation in standard low endoosmosis agarose (Prod.-No. A2114; separation range 70 bp to approximately 25 kbp). In comparison to other concatamer markers, it has a reduced mass in the non-separating range (high molecular weight range), resulting in a better resolution (good readings up to 24 kbp). For applications requiring a good separation in the high molecular weight range pulsed-field electrophoresis is recommended. Due to the production procedure (ligation of 1000 bp Hind III fragments), it is impossible to determine the specific mass of a single band. The DNA of this marker (50  $\mu$ g sufficient for approximately 100 loadings) is deproteinised, lyophilised and is supplied with 1 ml of the 1 x gel loading buffer.

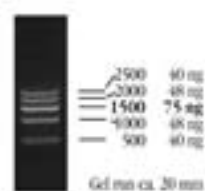
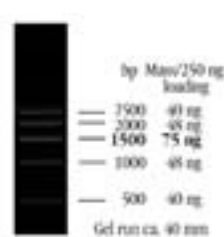
## DNA Marker quick-run (lyophilised)

A7215

DNA size standard for determination of DNA fragments after short gel runs (15 - 25 mm)

**Description** This marker is ideal for use with mini gels, since its bands are separated very well even after very short gel runs as short as 15 – 25 mm in an e. g. 1.5 – 1.8 % agarose gel. The single bands have been equalized in terms of their mass. The 1500 bp fragment has an increased mass for better orientation. Optimum results are achieved in a 1.5 – 1.8 % agarose gel with as little as 0.25  $\mu$ g of the marker per lane (normal sized mini gel). Please note that the DNA fragments have to be saturated with ethidium bromide in the running buffer during the separation.

<b>Number of bands</b>	5
<b>Fragment sizes (bp)</b>	2500, 2000, 1500 *, 1000, 500 The mass of the marked fragment* has been increased for better orientation.
<b>Supplied with 1 ml loading buffer (1X)</b>	10 mM Tris · HCl (pH 7.5); 5 mM sodium acetate; 2 mM EDTA; 10 % glycerol; 0.015 % bromophenol blue
<b>Loading volume</b>	0.25 $\mu$ g per lane (for a good detection with ethidium bromide)
<b>Migration distance</b>	Optimum results after a distance of 15 – 25 mm only.
<b>Storage</b>	-20°C. Prevent repeated freezing and thawing (> 20x). We recommend to prepare small aliquots. The lyophilised form is stable even for weeks at ambient temperature
<b>Package size</b>	A7215,0050 50 $\mu$ g

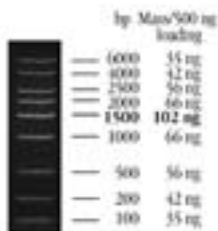


This marker is made of plasmids with specific mutagenesis sites. The Eco RI-digested DNA has been deproteinized with phenol/chloroform, desalted, precipitated and lyophilised. Resuspend the DNA in the sterile-filtered gel loading buffer (supplied with the marker) by incubation for 10 minutes at room temperature with occasional shaking.

## DNA Marker quick-run extended (lyophilised)

A7222

DNA size standard for determination of DNA fragments after short gel runs (35 mm)



**Description** This marker is ideal for use with mini or midi gels, since its bands are separated very well even after very short gel runs as short as 35 mm in an e. g. 1.2 % agarose gel. The single bands have been equalized in terms of their mass. The 1500 bp fragment has an increased mass for better orientation. Optimum results are achieved with as little as 0.3 – 0.5 µg of the marker per lane (normal-sized mini/midi gel).

**Number of bands** 9

**Fragment sizes (bp)** 6000, 4000, 2500, 2000, 1500\*, 1000, 500, 200, 100  
The mass of the marked fragment\* has been increased for better orientation.

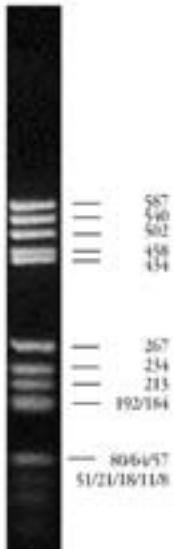
**Supplied with 1 ml loading buffer (1X)** 10 mM Tris · HCl (pH 7.5); 5 mM sodium acetate; 2 mM EDTA; 10 % glycerol; 0.015 % bromophenol blue

**Loading volume** 0.3 - 0.5 µg per lane  
(for a good detection with ethidium bromide in a mini or midi gel)

**Storage** -20°C. Prevent repeated freezing and thawing (> 20x). We recommend to prepare small aliquots. The lyophilised form is stable even for weeks at ambient temperature!

**Package size** A7222,0050 50 µg

This marker is made of plasmids with specific mutagenesis sites. The *Eco* RI-digested DNA has been deproteinized with phenol/chloroform, desalted, precipitated and lyophilised. Resuspend the DNA in the sterile-filtered gel loading buffer (supplied with the marker) by incubation for 10 minutes at room temperature with occasional shaking.



## DNA Marker pBR322 – *Hae* III (lyophilised)

A4406

DNA size standard for high-percentage agarose gels and polyacrylamide gels

**Description** Plasmid pBR322 was digested with *Hae* III, deproteinized and lyophilised. This marker is particularly suited to comparisons with small PCR fragments and DNA from restriction samples on polyacrylamide gels or high-percentage agarose gels (> 2.2 %). The best results are achieved after a migration distance of approx. 70 – 80 mm on agarose gels or 100 mm on 6 – 8 % polyacrylamide gels. Each lane of a normal sized gel (approx. 80 ml) should be loaded with approx. 1 µg of marker for agarose gels or 0.5 µg for PAA gels. Loading buffer is supplied separately.

**Number of bands** 22

**Fragment sizes (bp)** 587, 540, 502, 458, 434, 267, 234, 213, 192, 184, 124, 123, 104, 89, 80, 64, 57, 51, 21, 18, 11, 8

**Supplied with 1 ml loading buffer (1X)** 10 mM Tris · HCl (pH 7.5); 5 mM sodium acetate; 2 mM EDTA; 10 % glycerol; 0.02 % bromophenol blue; 0.015 % xylene cyanol

**Loading volume** 0.5 – 1.0 µg per lane

**Storage** -20°C

**Package size** A4406,0050 50 µg

**Please note!** Extremely small fragments can only be visualized on high-percentage PAA gels.

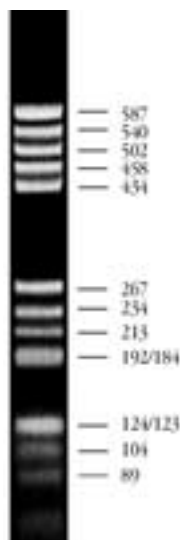


## DNA Marker pBR322 – *Hae* III

A5229

<b>Description</b>	This marker is generated by digestion of the plasmid pBR322 with <i>Hae</i> III.	
<b>Number of bands</b>	22	
<b>Fragment sizes (bp)</b>	587, 540, 502, 458, 434, 267, 234, 213, 192, 184, 124, 123, 104, 89, 80, 64, 57, 51, 21, 18, 11, 8	
<b>Storage buffer</b>	10 mM Tris · HCl (pH 7.8), 10 mM NaCl, 1 mM EDTA	
<b>Concentration</b>	0.2 mg/ml	
<b>Storage</b>	-20°C	
<b>Package sizes</b>	A5229,0005	0.05 mg (= 250 µL)
	A5229,0025	0.25 mg (= 1.25 ml)

Assay conditions:  
1.7 % agarose



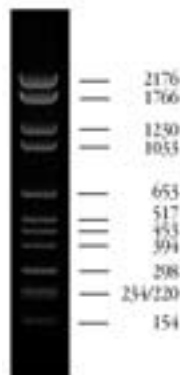
## DNA Marker pBR328 Mix (lyophilised)

A6927

DNA size standard for middle-sized fragments and PCR products

**Description** Plasmid pBR328 was digested with *Hinf* I and *Bgl* I, respectively, deproteinised and lyophilised. The fragments have been mixed in an equimolar ratio. This marker is particularly suitable for comparison with PCR fragments (e.g. food diagnostics) and DNA from restriction samples on agarose gels with sizes between 150 and 2000 base pairs. The concise distribution of fragments of the marker makes this product ideal for long and short gel runs with running distances of 70 – 80 mm (1.5 % agarose gel). Load 1 µg of the marker per lane of a normal sized agarose gel (approx. 80 ml Loading buffer is supplied separately).

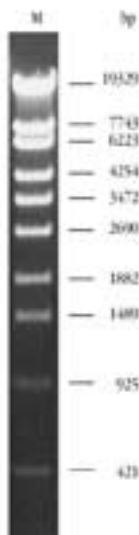
<b>Number of bands</b>	12	
<b>Fragment sizes (bp)</b>	2176; 1766; 1230; 1033; 653; 517; 453; 394; 298; 234; 220; 154	
<b>Supplied with 1 ml loading buffer (1X)</b>	10 mM Tris · HCl (pH 7.5); 5 mM sodium acetate; 2 mM EDTA; 10 % glycerol; 0.02 % bromophenol blue; 0.015 % xylene cyanol	
<b>Loading volume</b>	1.0 µg per lane	
<b>Storage</b>	-20°C. Prevent repeated freezing and thawing (> 20x). We recommend to prepare small aliquots. The lyophilised form is stable even for weeks at ambient temperature!	
<b>Package sizes</b>	A6927,0050	50 µg



Resuspend the DNA in the sterile-filtered gel loading buffer (supplied with the marker) for 10 minutes at room temperature by occasional shaking.

# DNA marker

The quality of this DNA sizing standard differs considerably from products offered by most other manufacturers thanks to the elaborate manufacturing method, which also fulfils the highest quality requirements! The digested DNA is not simply precipitated and resuspended, but also extracted in phenol. This guarantees the extremely long shelf-life without any loss of quality. Not only the prices should therefore be compared.

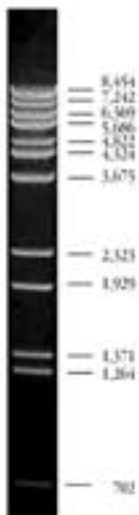


## DNA Marker Phage Lambda – *Sty* I

A5194

<b>Description</b>	Lambda DNA (cI857 Sam 7) <i>Sty</i> I markers are prepared by digesting Lambda DNA with <i>Sty</i> I, followed by inactivation of the enzyme. The DNA fragments are then ethanol-precipitated and resuspended in the storage buffer.	
<b>Number of bands</b>	11	
<b>Fragment sizes (bp)</b>	19329*; 7743; 6223; 4254*; 3472; 2690; 1882; 1489; 925; 421; 74	
<b>Storage buffer</b>	10 mM Tris · HCl (pH 8.0), 1 mM EDTA	
<b>Concentration</b>	0.2 – 0.5 µg/µl	
<b>Storage</b>	-20°C	
<b>Package sizes</b>	A5194,0005	0.05 mg (= 250 µl)
	A5194,0025	0.25 mg (= 1.25 ml)

**Please note!** The cohesive ends of fragments 1 and 4 (\*) may cause the formation of an extra band (23583 bp). The fragments may be separated by heating to 65°C for 3 minutes before loading the sample onto the gel.



## DNA Marker Phage Lambda – *BstE* II (lyophilised)

A4412

DNA size standard made of phage λ DNA for the determination of large DNA fragments (digestion of genomic DNA)

<b>Description</b>	Natural lambda DNA was digested with <i>BstE</i> II, deproteinized and lyophilized. This marker is suitable for comparisons with fragment sizes between 8400 and 700 base pairs. The best results are achieved after a migration distance of approx. 80 – 90 mm on 1.0 – 1.2 % agarose gels. Each lane of a normal sized gel (approx. 80 ml) should be loaded with approx. 1 µg of marker. Loading buffer is supplied separately.	
<b>Number of bands</b>	14	
<b>Fragment sizes (bp)</b>	8454*, 7242, 6369, 5686*, 4822, 4324, 3675, 2323, 1929, 1371, 1264, 702, 224, 117	
<b>Supplied with 1 ml loading buffer (1X)</b>	10 mM Tris · HCl (pH 7.5); 5 mM sodium acetate; 2 mM EDTA; 10 % glycerol; 0.02 % bromophenol blue; 0.015 % xylene cyanol	
<b>Loading volume</b>	1.0 µg per lane	
<b>Storage</b>	-20°C	
<b>Package size</b>	A4412,0100	2 x 50 µg

**Please note!** The cohesive ends of fragments 1 and 4 (\*) may form an additional band (14140 bp). Before loading onto the gel, the fragments can be separated by heating to 65°C for 5 minutes with subsequent incubation on ice.

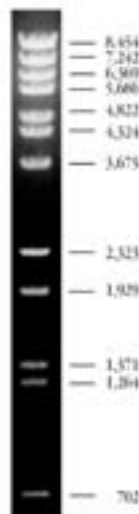
The quality of this DNA sizing standard differs considerably from products offered by most other manufacturers thanks to the elaborate manufacturing method, which also fulfils the highest quality requirements! The digested DNA is not simply precipitated and resuspended, but also extracted in phenol. This guarantees the extremely long shelf-life without any loss of quality. Not only the prices should therefore be compared.

## DNA Marker Phage Lambda – *BstE* II

A5220

<b>Description</b>	Phage Lambda (cI857 Sam 7)DNA/ <i>BstE</i> II markers are prepared by digesting Lambda DNA with <i>BstE</i> II, followed by inactivation of the enzyme. The DNA fragments are then ethanol-precipitated and resuspended in the storage buffer.	
<b>Number of fragments</b>	14	
<b>Fragment sizes (bp)</b>	8454*, 7242, 6369, 5686*, 4822, 4324, 3675, 2323, 1929, 1371, 1264, 702, 224, 117	
<b>Storage buffer</b>	10 mM Tris · HCl (pH 8.0), 1 mM EDTA	
<b>Concentration</b>	0.2 – 0.5 µg/µl	
<b>Storage</b>	Store at -20°C	
<b>Package sizes</b>	A5220,0005	0.05 mg (= 250 µl)
	A5220,0025	0.25 mg (= 1.25 ml)

**Please note!** The cohesive ends of fragments 1 and 4 (\*) may cause the formation of an extra band (14140 bp). The fragments may be separated by heating to 65°C for 3 minutes before loading the sample onto the gel.



## DNA Marker Phage Lambda – *Hind* III (lyophilised)

A5589

DNA size standard made of phage λ DNA for the determination of large DNA fragments (digestion of genomic DNA)

<b>Description</b>	Natural lambda DNA was digested with <i>Hind</i> III, deproteinized and lyophilized. This marker is suitable for comparisons with large to medium-sized fragments between 23,000 and 600 base pairs. The best results are achieved after a migration distance of approx. 80 – 90 mm on 1.0 – 1.2% agarose gels. Each lane of a normal sized gel (approx. 80 ml) should be loaded with approx. 0.5 – 0.8 µg of marker. Loading buffer is supplied separately.	
<b>Number of bands</b>	8	
<b>Fragment sizes (bp)</b>	23130*, 9416; 6557; 4361*; 2322; 2027; 564; 125	
<b>Supplied with 1 ml loading buffer (1X)</b>	10 mM Tris · HCl (pH 7.5); 5 mM sodium acetate; 2 mM EDTA; 10 % glycerol; 0.02 % bromophenol blue; 0.015 % xylene cyanol	
<b>Loading volume</b>	0.5 – 0.8 µg per lane	
<b>Storage</b>	-20°C	
<b>Package size</b>	A5589,0100	2 x 50 µg

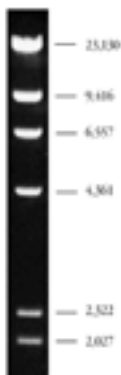
**Please note!** The cohesive ends of fragments 1 and 4 (\*) may form an additional band (27491 bp). Before loading onto the gel, the fragments can be separated by heating to 65°C for 5 minutes with subsequent incubation on ice.



# DNA marker

## DNA Marker Phage Lambda – *Hind* III

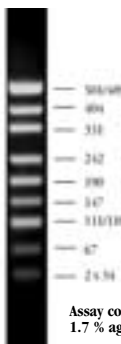
A5223



<b>Description</b>	Lambda DNA (cI857 Sam 7)/ <i>Hind</i> III markers are prepared by digesting Lambda DNA with <i>Hind</i> III, followed by heat-inactivation of the enzyme. The DNA fragments are then ethanol-precipitated and resuspended in storage buffer.	
<b>Number of bands</b>	8	
<b>Fragment sizes (bp)</b>	23130*; 9400; 6557; 4361*; 2322; 2027; 564; 125	
<b>Storage buffer</b>	10 mM Tris · HCl (pH 8.0), 1 mM EDTA	
<b>Concentration</b>	0.2 – 0.5 µg/µl	
<b>Storage</b>	-20°C	
<b>Package sizes</b>	A5223,0005	0.05 mg (= 250 µl)
	A5223,0025	0.25 mg (= 1.25 ml)
<b>Please note!</b>	The cohesive ends of fragments 1 and 4 (*) may cause formation of an extra band (27491 bp). The fragments may be separated by heating to 65°C for 3 minutes before loading the sample onto the gel.	

## DNA Marker pUC19 – *Msp* I

A5235



<b>Description</b>	Digestion of the pUC19 plasmid yields 12 fragments.	
<b>Number of bands</b>	12 (9 visible)	
<b>Fragment sizes (bp)</b>	501, 489, 404, 331, 242, 190, 147, 111, 110, 67, 34x2, 26	
<b>Storage buffer</b>	10 mM Tris · HCl (pH 7.8), 10 mM NaCl, 1 mM EDTA	
<b>Concentration</b>	0.2 mg/ml	
<b>Storage</b>	-20°C	
<b>Package sizes</b>	A5235,0005	0.05 mg (= 250 µl)
	A5235,0025	0.25 mg (= 1.25 ml)

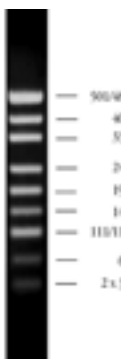
Assay conditions:  
1.7 % agarose

DNA marker

## DNA Marker pUC19 – *Msp* I (lyophilised)

A3996

DNA size standard for high-percentage agarose gels and polyacrylamide gels

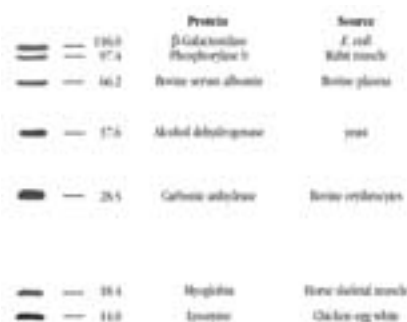


<b>Description</b>	Plasmid pUC19 was digested with <i>Msp</i> I, deproteinized and lyophilized. This marker is particularly suitable for comparisons with small PCR fragments and DNA from restriction samples on polyacrylamide gels or high-percentage agarose gels. The bands at 501/489 bp and 111/110 bp have approx. double mass and provide rapid orientation after a short migration distance on 2.0 – 2.2 % agarose gels. The best results are achieved after a migration distance of approx. 50 – 70 mm on agarose gels or 100 mm on 6 – 8 % polyacrylamide gels. Each lane of a normal sized agarose gel (approx. 80 ml) should be loaded with approx. 0.5 – 1.0 µg of marker. Loading buffer is supplied separately.	
<b>Number of bands</b>	12	
<b>Fragment sizes (bp)</b>	501, 489, 404, 331, 242, 190, 147, 111, 110, 67, 34, 26	
<b>Supplied with 1 ml loading buffer (1X)</b>	10 mM Tris · HCl (pH 7.5); 5 mM sodium acetate; 2 mM EDTA; 10 % glycerol; 0.02 % bromophenol blue; 0.015 % xylene cyanol	
<b>Loading volume</b>	0.5 – 1.0 µg per lane	
<b>Storage</b>	-20°C	
<b>Package size</b>	A3996,0050	50 µg
<b>Please note!</b>	Extremely small fragments can only be visualized using high-percentage and high-quality agarose gels (> 2.2 %) with large mass of fragments.	

## Protein Marker I (14 – 116)

A5238

<b>Description</b>	The bands of 3 µl marker are easily visualized with Coomassie staining in a polyacrylamide gel. Protein Marker I is a mixture of 7 purified proteins supplied in gel loading buffer for direct application to an SDS polyacrylamide gel.	
<b>Number of bands</b>	7	
<b>Fragment sizes (kd)</b>	116.0; 97.4; 66.2; 37.6; 28.5; 18.4; 14.0	
<b>Loading buffer</b>	50 mM Tris · HCl (pH 6.8), 100 mM dithiothreitol, 2 % SDS, 0.1% bromophenol blue, 10 % glycerol	
<b>Assay conditions</b>	3 µl/12 % PAGE	
<b>Package size</b>	A5235,0500	500 µl

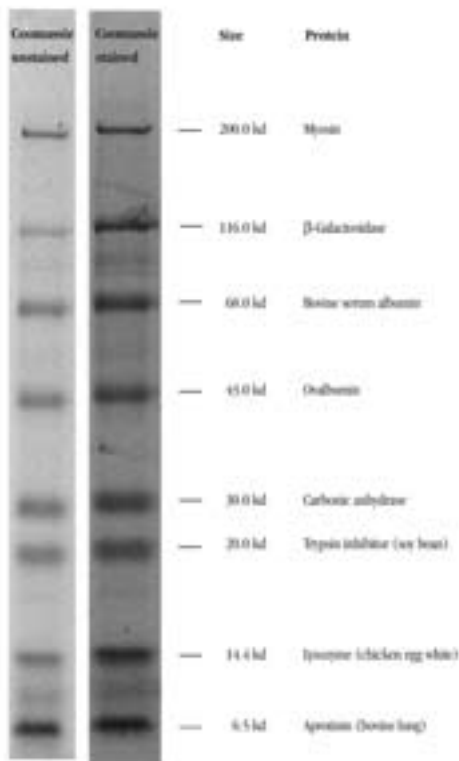


# protein marker

## Protein Marker II (6.5 – 200) prestained A5418

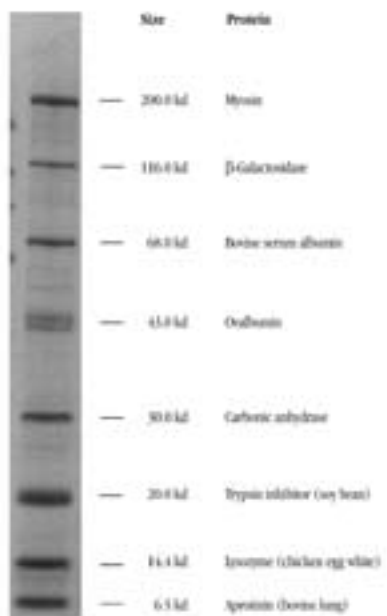
Prestained protein size marker for gel electrophoresis

<b>Description</b>	This is a <i>ready-to-use</i> marker containing covalent prestained proteins. The product contains formamide.	
<b>Number of bands</b>	8	
<b>Protein sizes (kd)</b>	200.0; 116.0; 68.0; 43.0; 30.0; 20.0; 14.4; 6.5	
<b>Assay conditions</b>	10 µl/4 – 20 % PAGE gradient gel Tris-Glycine; left lane prestained but not Coomassie-stained; right lane prestained and additional Coomassie staining.	
<b>Storage</b>	-20°C, if stored longer than 1 month. Please note that repeated freezing and thawing will reduce product quality. Pre- paration of small aliquots is recommended.	
<b>Package size</b>	A5418,0250	250 µl



**Application** ● The marker has to be “preheated” to room temperature to guarantee that all components are dissolved. ● Apply 5 µl of the marker to a mini-gel (10 x 10 cm, 1 – 0.75 mm thick, 7 mm slot). ● To minimize myosin aggregation, the aliquot to be loaded on the gel may be heated to 95°C for 1 – 2 minutes. ● Prestained markers are not recommended for the determination of the molecular weight since their behaviour during electrophoresis strongly depends on the electrophoresis conditions. ● The transfer of proteins during blotting depends on their size. Lysozyme is fully transferred after 30 minutes, while myosin requires 2.5 hours (1 V/cm<sup>2</sup>).

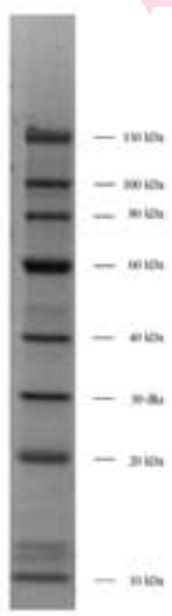
protein marker



This is a *ready-to-use* marker containing recombinant proteins. The product may contain residual iodoacetamide.

**Application**

- The marker has to be “pre-heated” to room temperature to guarantee that all components are dissolved.
- Apply 5  $\mu$ l of the marker to a mini-gel (10 x 10 cm, 1–0.75 mm thick, 7 mm slot). Use 1X Laemmli buffer to dilute the marker, if required.
- To minimize myosin aggregation, the aliquot to be loaded onto the gel may be heated to 95°C for 1–2 minutes.
- The transfer of proteins during blotting depends on their size. The 10 kDa protein is fully transferred after 30 minutes, the 150 kDa protein requires 2.5 hours (1 V/cm<sup>2</sup>).



**Protein Marker III (6.5 – 200) A4402**

<b>Description</b>	The bands of the 2.5 $\mu$ l marker are easily visualized with Coomassie staining in a polyacrylamide gel.	
<b>Number of bands</b>	8	
<b>Protein sizes (kd)</b>	200.0; 116.0; 68.0; 43.0; 30.0; 20.0; 14.4; 6.5	
<b>Assay conditions</b>	5 $\mu$ l/4 – 20 % SDS-PAGE gradient gel; Coomassie staining	
<b>Storage</b>	-20°C, if stored longer than 1 month. Please note that repeated freezing and thawing will reduce product quality. Preparation of small aliquots is recommended.	
<b>Package size</b>	A4402,0001	1.0 ml

This is a *ready-to-use* marker containing acylated proteins. The product may contain residual iodoacetamide.

**Application**

- The marker has to be “preheated” to room temperature, to guarantee that all components are dissolved.
- Apply 1 – 5  $\mu$ l of the marker to a mini-gel (10 x 10 cm, 1 – 0.75 mm thick, 7 mm slot). Use 1X Laemmli buffer to dilute this marker, if necessary.
- To minimize myosin aggregation, the aliquot to be loaded onto the gel may be heated to 95°C for 1 – 2 minutes.
- The transfer of proteins during blotting depends on their size. Lysozyme is fully transferred after 30 minutes, myosin requires 2.5 hours (1 V/cm<sup>2</sup>).

**Protein Marker IV (10 – 150) A3993**

Recombinant protein size marker for gel electrophoresis

<b>Description</b>	The bands of 2.5 $\mu$ l marker are easily visualized with Coomassie staining in a polyacrylamide gel.	
<b>Number of bands</b>	8	
<b>Protein sizes (kDa)</b>	150; 100; 80; 60; 40; 30; 20; 10	
<b>Assay conditions</b>	10 $\mu$ l/4 – 20 % SDS-PAGE gradient gel (Tris-Glycine); Coomassie staining	
<b>Storage</b>	-20°C, if stored longer than 1 month. Please note that repeated freezing and thawing will reduce product quality. Preparation of small aliquots is recommended. Thawed aliquots are stable for one week at +4°C.	
<b>Package size</b>	A3993,0500	500 $\mu$ l



## DNA-Dye Methylene blue

A5595

Nontoxic solution for the staining of nucleic acids in agarose gels

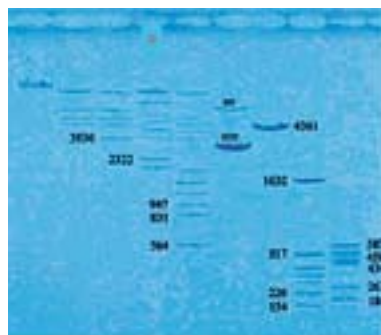
<b>Amount</b>	10 ml 200-fold methylene blue dye concentrate
<b>Storage</b>	+4°C
<b>Stability</b>	18 – 24 months (shake well before use)
<b>Package size</b>	A5595 10 ml

dyes

### Protocol for staining with DNA-Dye Methylene blue:

Approx. 50 ml 1X DNA-Dye Methylene blue staining solution are required to stain an agarose gel with the dimensions of approx. 80 x 60 mm (width x length) and a thickness of 3 – 4 mm. The gel should be trimmed down appropriately, with the edge of a ruler for example, to remove areas of the gel that were not used for DNA separation. The staining is performed in an adequately sized dish, in which the gel is floated to a depth of about 5 mm with dye solution. To prepare the DNA-Dye Methylene blue staining solution for use, 250 µl are dissolved in 50 ml water. The gel is left to stain for about 20 minutes and the dish is shaken occasionally. To reveal the bands (different staining intensities) the gel is destained with tap water several times for about 5 – 10 minutes. The blue-stained DNA bands are clearly visible in transmitted light and can be measured with a ruler or documented photographically.

Methylene blue does not stain DNA permanently: depending on the thickness of the gel and the storage temperature, the DNA bands (especially smaller fragments) may lose their staining after some time.



The DNA marker Phage Lambda-*Hind* III (A5589) was loaded on the 4<sup>th</sup> lane (\*).

### Repeated use of the 1X staining solution

The prepared 1X methylene blue staining solution can be kept in a suitable brown-glass bottle at +4°C for 4 – 6 months and can be used several times. The staining period should be lengthened by about 20 % for the second use, and by the same again for the third use. After this, the staining capacity of the solution is largely exhausted and a new solution should be prepared.

### Sensitivity

The bands in a 1 kb ladder (loading amount 1 µg) can be stained with no problems. Small fragments (150 bp) can also be stained. The decisive factors in sensitivity are the thickness of the gel, the gel:staining solution ratio, and the destaining time. By varying the staining conditions, you can easily determine the best conditions for your system.

### Handling

A laboratory coat and gloves should be worn when handling the staining solution.

### Precaution

On contact with the skin or clothing, the area should be washed with large amounts of soap and water.

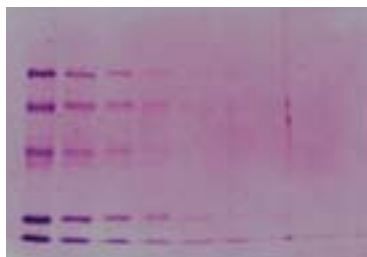
### Short protocol

1. Dilute DNA-Dye Methylene blue 200X concentrate down to 1X (250 µl DNA-Dye Methylene blue + 50 ml water)
2. Trim down the agarose gel to the smallest area possible.
3. Incubate the gel (dimensions approx. 80 x 60 mm) with 50 ml DNA-Dye Methylene blue for about 20 minutes; shake occasionally. The staining solution should cover the gel to a depth of about 5 mm.  
Please note: the staining solution can be used several times!
4. Destain repeatedly in water for 5 – 10 minutes.

## Proteo-Dye Blue-Vis

A6810

<b>Synonym</b>	Protein dye in the visible range
<b>Storage</b>	2 – 8°C protected from light
<b>HS-No.</b>	38220000
<b>Package size</b>	A6810,1000 1L 1 L is sufficient for approx. 30 minigels, since 3x reusable detection limit 3 – 5 ng/mm <sup>2</sup> reversible staining of proteins



### Protocol for staining of gels with Proteo-Dye Blue-Vis:

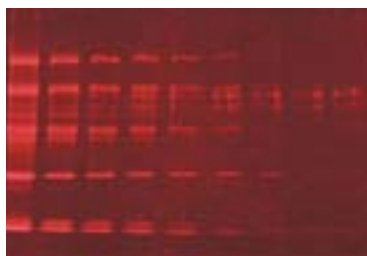
SDS-PAGE minigels (1 mm thickness, 10 % acrylamide, Tris-glycine buffer system) are treated for 1 hour with 30 % v/v methanol after electrophoresis to remove the excess of SDS and to fix the proteins in the gel matrix. The gels are stained for 2 hours in a volume of 100 ml Proteo-Dye Blue-Vis. After this, the gels are washed with acetate buffer (0.2 M; pH 4.5), containing 20 % v/v methanol for 90 - 120 minutes until the dark red background is reduced to a weak pink background in contrast to the blue protein bands. The gels are documented with the help of a video system (transilluminator 312 nm, white light plate) or on a scanner in the transmission mode.

dyes

## Proteo-Dye Red-Fluo

A6803

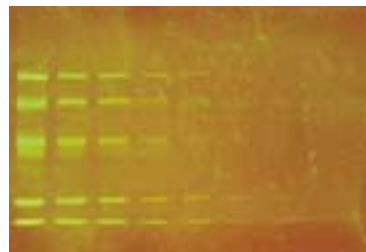
<b>Synonym</b>	Protein dye with red fluorescence
<b>Storage</b>	2 – 8°C protected from light
<b>HS-No.</b>	38220000
<b>Specification</b>	Emission maximum: 630 nm Excitation wave length: 312 nm
<b>Package size</b>	A6803,1000 1L 1 L is sufficient for approx. 30 minigels, since 3x reusable detection limit 1-3 ng/mm <sup>2</sup> reversible staining of proteins more sensitive than most other products available in the market



### Protocol for staining of gels with Proteo-Dye Red-Fluo:

SDS-PAGE minigels (5x8 cm, 1 mm thickness, 10 % acrylamide, Tris-glycine buffer system) are fixed for 30 minutes in a solution of 7.5 % v/v acetic acid, 20 % v/v ethanol. After this, the gels are stained with Proteo-Dye Red-Fluo (100 ml) for 2 - 3 hours. The background fluorescence can be removed by repeated washing with the fixation solution (7.5 % v/v acetic acid, 20 % v/v ethanol; 3 - 4 washing steps, 30 minutes each). The documentation of the gels is carried out with a video system (transilluminator 312 nm, adapting filter 590 nm).

<b>Synonym</b>	Protein dye with green fluorescence
<b>Storage</b>	2 – 8°C protected from light
<b>HS-No.</b>	38220000
<b>Specification</b>	Emission maximum: 520 nm Excitation wave length: 365 nm
<b>Package size</b>	A6794,1000 1L 1 L is sufficient for approx. 30 minigels, since 3x reusable detection limit 3 – 5 ng/mm <sup>2</sup> reversible staining of proteins suitable for gels and for blots



Proteo-Dye Green-Fluo is a fluorescence protein dye, based on a metal-chelate complex in conjunction with a detergent in submicellar concentration in an aqueous solution. This dye solution enables to detect very small amounts of proteins and the staining is fully reversible. Use the dye solution up to three times!

### Protocol for staining of gels with Proteo-Dye Green-Fluo:

SDS-PAGE minigels (5x8 cm; 1 mm thickness, 10% acrylamide, Tris-glycine buffer system) are postelectrophoretically treated for 30 minutes with a methanol solution (30 %, v/v) while gently shaking (100 rpm). After this, the gels are stained for 2 hours in a volume of 100 ml Proteo-Dye Green-Fluo. Reduction of the background fluorescence is achieved by repeated washing steps (3 – 4 times, 30 min. each) with 30 % v/v methanol. The gels are documented with a video system (transilluminator 365 nm, adapting filter 520 nm).

### Protocol for staining of blots with Proteo-Dye Green-Fluo:

By staining with Coomassie or silver the proteins in the gel become irreversibly denaturated and are difficult to transfer to blotting membranes. Metal chelate staining methods are reversible, resulting in good preconditions for the following blot transfer. Blots were performed by a typical semi-dry method. After the blotting process, the blots were washed in distilled water for 1 hour and dried at room temperature. Blots were then stained with Proteo-Dye Green-Fluo for 2 hours, briefly washed in 30 % v/v ethanol and dried again. Only in the dried state, intensely green fluorescent protein bands become visible in UV topleight (365 nm UV light) and are documented with a video system (adapting filter 420 nm). The stain may be easily and fastly removed just by rinsing in 30% v/v ethanol.

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