



**Molecular  
Dimensions**

A CALIBRE SCIENTIFIC COMPANY



# Data Sheet

**Morpheus® Fusion Additive Screen**  
**Soluble Proteins**

## **Morpheus Fusion Additive Screen** **MD1-135 and MD1-135-FX**

### **Key Info**

The Morpheus Fusions Additive Screen is a new 96-condition additive screen, containing an extensive library of Additives.

MD1-135 is presented as 96 x 1mL conditions and MD1-135-FX is presented as 96 x 100ul conditions

- Optimise your crystallisation condition
- 19 different Morpheus Additive solutions in 96 unique combinations
- 81 additives spread across the 19 additive mixes.

### **Introduction**

The Morpheus® crystallisation screen family has been designed and developed by Dr Fabrice Gorrec in collaboration with the scientists at the Medical Research Council Laboratory of Molecular Biology (LMB) at Cambridge and is manufactured exclusively under license by Molecular Dimensions Limited.

Morpheus Fusion uses the most efficient components taken from Morpheus I, II and III using an incomplete factorial formulation to increase the chemical space sampled during crystallisation trials. This additive screen is prepared using the pre-existing stock solutions of Morpheus Fusion. The 19 additive stock solutions used are systemically sampled across the screen, at higher concentrations than other additive screens, or two additive mixes per condition. This screen is ideal for optimising initial crystal hits which either do not diffract or are fragile when fished out of the well.





# Data Sheet

## Morpheus® Fusion Additive Screen Soluble Proteins

### Morpheus Fusion Additive Screen MD1-135 and MD1-135-FX

#### Formulation Notes

Morpheus Fusion Additive reagents are formulated using ultrapure water (>18.0 MΩ) and are sterile filtered using 0.22 µm filters. No preservatives are added. Final pH may vary from datasheet specification. Molecular Dimensions is happy to discuss the precise formulation of individual reagents. Individual reagents and stock solutions for optimisation are available from Molecular Dimensions.

#### Ordering Information

| PN:        | Description:                                | Pack Size: |
|------------|---------------------------------------------|------------|
| MD1-129    | Morpheus Fusion                             | 96 x 10 mL |
| MD1-130    | Morpheus Fusion HT-96                       | 96 x 1 mL  |
| MD1-135    | Morpheus Fusion Additive Screen             | 96 x 1mL   |
| MD1-135-FX | Morpheus Fusion Additive Screen<br>FX plate | 96 x 100µL |

#### Notes

| Mix name                                                | Composition                                                                                                                                               | Catalogue Number<br>(100 mL) | Catalogue Number<br>(250 mL) |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------------------------|
| Divalent cations 1                                      | 0.3M Magnesium chloride hexahydrate; 0.3M Calcium chloride dihydrate                                                                                      | MD2-100-70                   | MD2-250-70                   |
| Divalent cations 2                                      | 0.005M Manganese(II) chloride tetrahydrate, 0.005M Cobalt(II) chloride hexahydrate, 0.005M Nickel(II) chloride hexahydrate, 0.005M Zinc acetate dihydrate | MD2-100-232                  | MD2-250-232                  |
| NPS*                                                    | 0.3M Sodium nitrate, 0.3 Sodium phosphate dibasic, 0.3M Ammonium sulfate                                                                                  | MD2-100-72                   | MD2-250-72                   |
| Carboxylic acids                                        | 0.2M Sodium formate; 0.2M Ammonium acetate; 0.2M Sodium citrate tribasic dihydrate; 0.2M Potassium sodium tartrate tetrahydrate; 0.2M Sodium oxamate      | MD2-100-76                   | MD2-250-76                   |
| Amino acids                                             | 0.2M DL-Glutamic acid monohydrate; 0.2M DL-Alanine; 0.2M Glycine; 0.2M DL-Lysine monohydrochloride; 0.2M DL-Serine                                        | MD2-100-77                   | MD2-250-77                   |
| LiNaK                                                   | 0.3 M Lithium sulfate, 0.3 M Sodium sulfate, 0.3 M Potassium sulfate                                                                                      | MD2-100-231                  | MD2-250-231                  |
| Halides                                                 | 0.3M Sodium fluoride; 0.3M Sodium bromide; 0.3M Sodium iodide                                                                                             | MD2-100-71                   | MD2-250-71                   |
| Alkalies                                                | 0.01M Rubidium chloride, 0.01M Strontium acetate, 0.01M Cesium acetate, 0.01M Barium acetate                                                              | MD2-100-233                  | MD2-250-233                  |
| Oxometalates                                            | 0.005M Sodium chromate tetrahydrate, 0.005M Sodium molybdate dihydrate, 0.005M Sodium tungstate dihydrate, 0.005M Sodium orthovanadate                    | MD2-100-234                  | MD2-250-234                  |
| Vitamins*                                               | 3% w/v Sodium-L ascorbate, 3% w/v Choline Chloride, 3% v/v D-Panthenol, 3% w/v Pyridoxine hydrochloride, 3% w/v Thiamine hydrochloride                    | MD2-50-314                   | MD2-100-314                  |
| Polyamines<br>(provided as<br>powder for 10mL<br>kits)* | 0.1M Spermine tetrahydrochloride, 0.1M Spermidine trihydrochloride, 0.1M 1,4-Diaminobutane dihydrochloride, 0.1M DL-Ornithine monohydrochloride           | MD2-100-238                  | MD2-250-238                  |
| Anesthetic<br>alkaloids                                 | 2% w/v Lidocaine hydrochloride monohydrate, 2% w/v Procaine hydrochloride, 2% w/v Proparacaine hydrochloride, 2% w/v tetracaine hydrochloride             | MD2-50-320                   | MD2-100-320                  |
| Alcohols                                                | 0.2M 1,6-Hexanediol; 0.2M 1-Butanol<br>0.2M 1,2-Propanediol; 0.2M 2-Propanol; 0.2M 1,4-Butanediol; 0.2M 1,3-Propanediol                                   | MD2-100-73                   | MD2-250-73                   |
| Ethylene glycols                                        | 0.3M Diethylene glycol; 0.3M Triethylene glycol; 0.3M Tetraethylene glycol; 0.3M Pentaethylene glycol                                                     | MD2-100-74                   | MD2-250-74                   |
| Monosaccharides 1                                       | 0.2M D-Glucose; 0.2M D-Mannose; 0.2M D-Galactose; 0.2M L-Fucose; 0.2M D-Xylose; 0.2M N-Acetyl-D-Glucosamine                                               | MD2-100-75                   | MD2-250-75                   |
| Monosaccharides 2                                       | 0.2 M xylitol, 0.2 M D-(-)-fructose, 0.2 M D-sorbitol, 0.2 M myo-inositol, 0.2 M L-rhamnose monohydrate                                                   | MD2-100-236                  | MD2-250-236                  |
| Cholic Acids                                            | 3% w/v CHAPS, 3% w/v CHAPSO, 3% w/v sodium glycocholate hydrate, 3% w/v taurocholic acid sodium salt hydrate                                              | MD2-100-319                  | MD2-250-319                  |
| Cryo-polyols                                            | 5% w/v 1,2,4-butanetriol, 5% w/v 1,2,6-hexanetriol, 5% w/v 1,5-pentanediol, 5% w/v 1,1,1-tris(hydroxymethyl)propane, 5% w/v meso-erythritol               | MD2-100-400                  | MD2-250-400                  |
| NDSBs                                                   | 3% w/v NDSB 195, 3% w/v NDSB 201, 3% w/v NDSB 211, 3% w/v NDSB 221, 3% w/v NDSB 256                                                                       | MD2-100-401                  | MD2-250-401                  |

\*NPS; Nitrate Phosphate Sulfate

Table 1: Mixes of additives used in Morpheus Fusion

Manufacturer's safety data sheets are available from our website.



# MD1-135 and MD1-135-FX

## Conditions A1 to D12

| Well # | Conc. | Units | Buffer                             | Conc. | Units | Chemical 1                            |
|--------|-------|-------|------------------------------------|-------|-------|---------------------------------------|
| A1     | 0.3   | M     | Morpheus - Divalents Mix           | 0.60  | M     | Morpheus® - Alcohols Mix              |
| A2     | 0.01  | M     | Morpheus® II - Divalents 2 Mix     | 0.60  | M     | Morpheus® - Alcohols Mix              |
| A3     | 0.45  | M     | Morpheus® - NPS Mix                | 0.60  | M     | Morpheus® - Alcohols Mix              |
| A4     | 0.5   | M     | Morpheus® - Carboxylic Acids Mix   | 0.60  | M     | Morpheus® - Alcohols Mix              |
| A5     | 0.5   | M     | Morpheus® - Amino Acids Mix        | 0.60  | M     | Morpheus® - Alcohols Mix              |
| A6     | 0.45  | M     | Morpheus® II - LiNaK Mix           | 0.60  | M     | Morpheus® - Alcohols Mix              |
| A7     | 0.45  | M     | Morpheus® - Halogens Mix           | 0.60  | M     | Morpheus® - Alcohols Mix              |
| A8     | 0.02  | M     | Morpheus® II - Alkalis Mix         | 0.60  | M     | Morpheus® - Alcohols Mix              |
| A9     | 0.01  | M     | Morpheus® II - Oxometalates Mix    | 0.60  | M     | Morpheus® - Alcohols Mix              |
| A10    | 7.50  | %     | Morpheus® III Vitamins Mix         | 0.60  | M     | Morpheus® - Alcohols Mix              |
| A11    | 0.20  | M     | Morpheus® II - Polyamines Mix      | 0.60  | M     | Morpheus® - Alcohols Mix              |
| A12    | 4.00  | %     | Morpheus® III Anesthetic alkaloids | 0.60  | M     | Morpheus® - Alcohols Mix              |
| B1     | 0.3   | M     | Morpheus - Divalents Mix           | 0.60  | M     | Morpheus® - Ethylene Glycols Mix      |
| B2     | 0.01  | M     | Morpheus® II - Divalents 2 Mix     | 0.60  | M     | Morpheus® - Ethylene Glycols Mix      |
| B3     | 0.45  | M     | Morpheus® - NPS Mix                | 0.60  | M     | Morpheus® - Ethylene Glycols Mix      |
| B4     | 0.5   | M     | Morpheus® - Carboxylic Acids Mix   | 0.60  | M     | Morpheus® - Ethylene Glycols Mix      |
| B5     | 0.5   | M     | Morpheus® - Amino Acids Mix        | 0.60  | M     | Morpheus® - Ethylene Glycols Mix      |
| B6     | 0.45  | M     | Morpheus® II - LiNaK Mix           | 0.60  | M     | Morpheus® - Ethylene Glycols Mix      |
| B7     | 0.45  | M     | Morpheus® - Halogens Mix           | 0.60  | M     | Morpheus® - Ethylene Glycols Mix      |
| B8     | 0.02  | M     | Morpheus® II - Alkalis Mix         | 0.60  | M     | Morpheus® - Ethylene Glycols Mix      |
| B9     | -     | -     | -                                  | 1.20  | M     | Morpheus® - Ethylene Glycols Mix      |
| B10    | 7.50  | %     | Morpheus® III Vitamins Mix         | 0.60  | M     | Morpheus® - Ethylene Glycols Mix      |
| B11    | 0.20  | M     | Morpheus® II - Polyamines Mix      | 0.60  | M     | Morpheus® - Ethylene Glycols Mix      |
| B12    | 4.00  | %     | Morpheus® III Anesthetic alkaloids | 0.60  | M     | Morpheus® - Ethylene Glycols Mix      |
| C1     | 0.3   | M     | Morpheus - Divalents Mix           | 0.50  | M     | Morpheus® - Monosaccharides Mix       |
| C2     | 0.01  | M     | Morpheus® II - Divalents 2 Mix     | 0.50  | M     | Morpheus® - Monosaccharides Mix       |
| C3     | 0.45  | M     | Morpheus® - NPS Mix                | 0.50  | M     | Morpheus® - Monosaccharides Mix       |
| C4     | 0.5   | M     | Morpheus® - Carboxylic Acids Mix   | 0.50  | M     | Morpheus® - Monosaccharides Mix       |
| C5     | 0.5   | M     | Morpheus® - Amino Acids Mix        | 0.50  | M     | Morpheus® - Monosaccharides Mix       |
| C6     | 0.45  | M     | Morpheus® II - LiNaK Mix           | 0.50  | M     | Morpheus® - Monosaccharides Mix       |
| C7     | 0.45  | M     | Morpheus® - Halogens Mix           | 0.50  | M     | Morpheus® - Monosaccharides Mix       |
| C8     | 0.02  | M     | Morpheus® II - Alkalis Mix         | 0.50  | M     | Morpheus® - Monosaccharides Mix       |
| C9     | 0.01  | M     | Morpheus® II - Oxometalates Mix    | 0.50  | M     | Morpheus® - Monosaccharides Mix       |
| C10    | 7.50  | %     | Morpheus® III Vitamins Mix         | 0.50  | M     | Morpheus® - Monosaccharides Mix       |
| C11    | 0.20  | M     | Morpheus® II - Polyamines Mix      | 0.50  | M     | Morpheus® - Monosaccharides Mix       |
| C12    | 4.00  | %     | Morpheus® III Anesthetic alkaloids | 0.50  | M     | Morpheus® - Monosaccharides Mix       |
| D1     | 0.3   | M     | Morpheus - Divalents Mix           | 0.50  | M     | Morpheus® II - Monosaccharides II Mix |
| D2     | 0.01  | M     | Morpheus® II - Divalents 2 Mix     | 0.50  | M     | Morpheus® II - Monosaccharides II Mix |
| D3     | 0.45  | M     | Morpheus® - NPS Mix                | 0.50  | M     | Morpheus® II - Monosaccharides II Mix |
| D4     | 0.5   | M     | Morpheus® - Carboxylic Acids Mix   | 0.50  | M     | Morpheus® II - Monosaccharides II Mix |
| D5     | 0.5   | M     | Morpheus® - Amino Acids Mix        | 0.50  | M     | Morpheus® II - Monosaccharides II Mix |
| D6     | 0.45  | M     | Morpheus® II - LiNaK Mix           | 0.50  | M     | Morpheus® II - Monosaccharides II Mix |
| D7     | 0.45  | M     | Morpheus® - Halogens Mix           | 0.50  | M     | Morpheus® II - Monosaccharides II Mix |
| D8     | 0.02  | M     | Morpheus® II - Alkalis Mix         | 0.50  | M     | Morpheus® II - Monosaccharides II Mix |
| D9     | 0.01  | M     | Morpheus® II - Oxometalates Mix    | 0.50  | M     | Morpheus® II - Monosaccharides II Mix |
| D10    | 7.50  | %     | Morpheus® III Vitamins Mix         | 0.50  | M     | Morpheus® II - Monosaccharides II Mix |
| D11    | 0.20  | M     | Morpheus® II - Polyamines Mix      | 0.50  | M     | Morpheus® II - Monosaccharides II Mix |
| D12    | 4.00  | %     | Morpheus® III Anesthetic alkaloids | 0.50  | M     | Morpheus® II - Monosaccharides II Mix |



# MD1-135 and MD1-135-FX

## Conditions E1 to H12

| Well # | Conc. | Units | Buffer                             | Conc. | Units | Chemical 1                                |
|--------|-------|-------|------------------------------------|-------|-------|-------------------------------------------|
| E1     | 0.3   | M     | Morpheus - Divalents Mix           | 6.00  | %     | Morpheus® III Cholic acid derivatives Mix |
| E2     | 0.01  | M     | Morpheus® II - Divalents 2 Mix     | 6.00  | %     | Morpheus® III Cholic acid derivatives Mix |
| E3     | 0.45  | M     | Morpheus® - NPS Mix                | 6.00  | %     | Morpheus® III Cholic acid derivatives Mix |
| E4     | 0.5   | M     | Morpheus® - Carboxylic Acids Mix   | 6.00  | %     | Morpheus® III Cholic acid derivatives Mix |
| E5     | 0.5   | M     | Morpheus® - Amino Acids Mix        | 6.00  | %     | Morpheus® III Cholic acid derivatives Mix |
| E6     | 0.45  | M     | Morpheus® II - LiNaK Mix           | 6.00  | %     | Morpheus® III Cholic acid derivatives Mix |
| E7     | 0.45  | M     | Morpheus® - Halogens Mix           | 6.00  | %     | Morpheus® III Cholic acid derivatives Mix |
| E8     | 0.02  | M     | Morpheus® II - Alkalis Mix         | 6.00  | %     | Morpheus® III Cholic acid derivatives Mix |
| E9     | -     | -     | -                                  | 12.00 | %     | Morpheus® III Cholic acid derivatives Mix |
| E10    | 7.50  | %     | Morpheus® III Vitamins Mix         | 6.00  | %     | Morpheus® III Cholic acid derivatives Mix |
| E11    | 0.20  | M     | Morpheus® II - Polyamines Mix      | 6.00  | %     | Morpheus® III Cholic acid derivatives Mix |
| E12    | 4.00  | %     | Morpheus® III Anesthetic alkaloids | 6.00  | %     | Morpheus® III Cholic acid derivatives Mix |
| F1     | 0.3   | M     | Morpheus - Divalents Mix           | 12.50 | %     | Morpheus IV Cryo-polyols                  |
| F2     | 0.01  | M     | Morpheus® II - Divalents 2 Mix     | 12.50 | %     | Morpheus IV Cryo-polyols                  |
| F3     | 0.45  | M     | Morpheus® - NPS Mix                | 12.50 | %     | Morpheus IV Cryo-polyols                  |
| F4     | 0.5   | M     | Morpheus® - Carboxylic Acids Mix   | 12.50 | %     | Morpheus IV Cryo-polyols                  |
| F5     | 0.5   | M     | Morpheus® - Amino Acids Mix        | 12.50 | %     | Morpheus IV Cryo-polyols                  |
| F6     | 0.45  | M     | Morpheus® II - LiNaK Mix           | 12.50 | %     | Morpheus IV Cryo-polyols                  |
| F7     | 0.45  | M     | Morpheus® - Halogens Mix           | 12.50 | %     | Morpheus IV Cryo-polyols                  |
| F8     | 0.02  | M     | Morpheus® II - Alkalis Mix         | 12.50 | %     | Morpheus IV Cryo-polyols                  |
| F9     | 0.01  | M     | Morpheus® II - Oxometalates Mix    | 12.50 | %     | Morpheus IV Cryo-polyols                  |
| F10    | 7.50  | %     | Morpheus® III Vitamins Mix         | 12.50 | %     | Morpheus IV Cryo-polyols                  |
| F11    | 0.20  | M     | Morpheus® II - Polyamines Mix      | 12.50 | %     | Morpheus IV Cryo-polyols                  |
| F12    | 4.00  | %     | Morpheus® III Anesthetic alkaloids | 12.50 | %     | Morpheus IV Cryo-polyols                  |
| G1     | 0.3   | M     | Morpheus - Divalents Mix           | 7.50  | %     | Morpheus IV NDSBs                         |
| G2     | 0.01  | M     | Morpheus® II - Divalents 2 Mix     | 7.50  | %     | Morpheus IV NDSBs                         |
| G3     | 0.45  | M     | Morpheus® - NPS Mix                | 7.50  | %     | Morpheus IV NDSBs                         |
| G4     | 0.5   | M     | Morpheus® - Carboxylic Acids Mix   | 7.50  | %     | Morpheus IV NDSBs                         |
| G5     | 0.5   | M     | Morpheus® - Amino Acids Mix        | 7.50  | %     | Morpheus IV NDSBs                         |
| G6     | 0.45  | M     | Morpheus® II - LiNaK Mix           | 7.50  | %     | Morpheus IV NDSBs                         |
| G7     | 0.45  | M     | Morpheus® - Halogens Mix           | 7.50  | %     | Morpheus IV NDSBs                         |
| G8     | 0.02  | M     | Morpheus® II - Alkalis Mix         | 7.50  | %     | Morpheus IV NDSBs                         |
| G9     | -     | -     | -                                  | 15    | %     | Morpheus IV NDSBs                         |
| G10    | 7.50  | %     | Morpheus® III Vitamins Mix         | 7.50  | %     | Morpheus IV NDSBs                         |
| G11    | 0.20  | M     | Morpheus® II - Polyamines Mix      | 7.50  | %     | Morpheus IV NDSBs                         |
| G12    | 4.00  | %     | Morpheus® III Anesthetic alkaloids | 7.50  | %     | Morpheus IV NDSBs                         |
| H1     | 0.6   | M     | Morpheus - Divalents Mix           | -     | -     | -                                         |
| H2     | 0.02  | M     | Morpheus® II - Divalents 2 Mix     | -     | -     | -                                         |
| H3     | 0.9   | M     | Morpheus® - NPS Mix                | -     | -     | -                                         |
| H4     | 1     | M     | Morpheus® - Carboxylic Acids Mix   | -     | -     | -                                         |
| H5     | 1     | M     | Morpheus® - Amino Acids Mix        | -     | -     | -                                         |
| H6     | 0.9   | M     | Morpheus® II - LiNaK Mix           | -     | -     | -                                         |
| H7     | 0.9   | M     | Morpheus® - Halogens Mix           | -     | -     | -                                         |
| H8     | 0.04  | M     | Morpheus® II - Alkalis Mix         | -     | -     | -                                         |
| H9     | 0.02  | M     | Morpheus® II - Oxometalates Mix    | -     | -     | -                                         |
| H10    | 15    | %     | Morpheus® III Vitamins Mix         | -     | -     | -                                         |
| H11    | 0.40  | M     | Morpheus® II - Polyamines Mix      | -     | -     | -                                         |
| H12    | 8.00  | %     | Morpheus® III Anesthetic alkaloids | -     | -     | -                                         |

