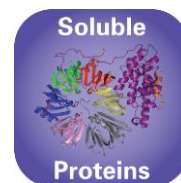
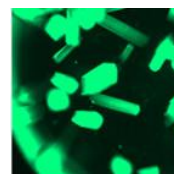


Molecular
Dimensions



PACT *premier*[™] Green Screen

MD1-55

PACT *premier* is a pH, Anion, Cation crystallization trial devised to test pH within a PEG/Ion screen environment with fluorescent dye added for superb UV performance.

MD1-55 contains 96 x 10 mL reagents.

Features of PACT *premier*[™]:

- A modern, comprehensive PEG/ion screen ready-to-use with fluorescent dye added for superb UV performance.
- This 96-well screen is really 3 screens in one:
 - 24-well pH/PEG screen
 - 24-well cation/PEG screen
 - 48-well anion/PEG screen

Rationale for a new PEG/Ion screen

The first step in crystallization is often to reach for a commercially available “sparse matrix” kit, and hope that one of the conditions produces something that looks harvestable, or optimizable. If no obvious leads come out of the screen, it is hard to learn anything from the negative (precipitate and clear) results.

There are a few screens that try to test crystallization space in a more rational manner – for example, the Clear Strategy[™] Screen and The Solubility Tool Kit.

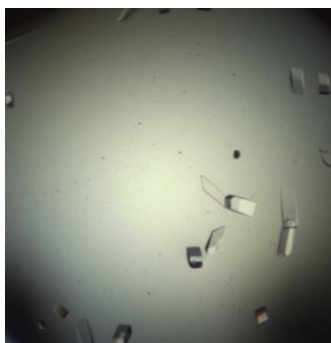
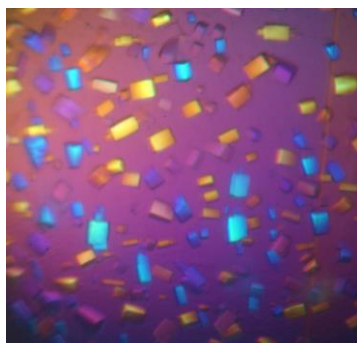
Traditional PEG/Ion screens provide a logical test of seven cations and eleven anions using PEG 3350 as the precipitation agent. However, the user has no control over pH and hence cannot determine the affect of one cation or anion over another.

For this reason the PEG/ION/pH (PACT) screen has been developed to systematically test the effect of pH, anions and cations, using PEG as the precipitant. This screen has been implemented very successfully at the Netherlands Cancer Institute (NKI), and at the Oxford Protein Production Facility (OPPF).

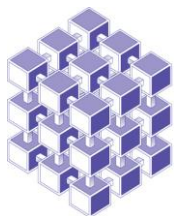
PACT *premier*[™]

pH/PEG screen

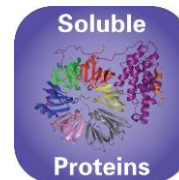
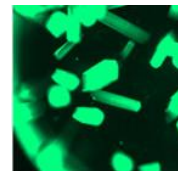
This consists of four broad range buffer systems (1) versus PEG 1500. These buffers allow one to scan the pH range from 4 to 9, without changing the chemistry of the system, so effectively isolating the effect of pH from the effect of the buffer that causes the change in pH.



Protein crystals grown successfully with PACT *premier*[™].



Molecular
Dimensions



PACT *premier*[™]

Cation/PEG screen

This is made up of six cations (all with chloride counter ions) that are combined with PEG 6000 at four different pHs: Acetate pH 5.0, MES pH 6.0, HEPES pH 7.0 and Tris pH 8.0. The cations tested are Na⁺, NH₄⁺, Li⁺, Mg²⁺, Ca²⁺ and Zn²⁺. The zinc ion is tested at lower concentration than the other cations in the screen (0.01 M vs. 0.2 M)

Anion/PEG screen

This is made up of 12 anions, with either sodium or potassium counter ions, which are tested at 0.2 M against PEG 3350. The anions include fluoride, bromine, iodide, thiocyanate, nitrate, formate, acetate, sulfate, tartrate, phosphate, citrate and malonate. The phosphate solution is tested at a concentration of 0.02 M. Chloride is not included here as it is the counter ion in the cation screen. Three sets of reagents are tested at pH 6.5, 7.5, and 8.5 with the Bis-Tris propane buffer system whilst one set of reagents is tested without buffering.

References:

(1) Newman *et al* (2005). Towards rationalization of crystallization screening for small- to medium-sized academic laboratories: the PACT/JCSG+ strategy. *Acta Cryst.* **D61**, 1426-1431.

Formulation Notes

PACT *premier*[™] reagents are formulated using ultrapure water (>18.0 MΩ) and are sterile-filtered using 0.22 μm filters. No preservatives are added.

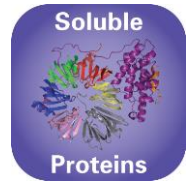
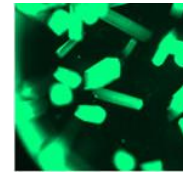
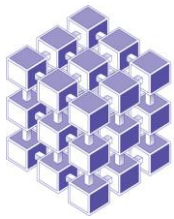
Final pH may vary from that specified on the datasheet. Molecular Dimensions will be happy to discuss the precise formulation of individual reagents.

Individual reagents and stock solutions for optimization are available from Molecular Dimensions.

Enquiries regarding **PACT *premier*[™]** formulation, interpretation of results or optimization strategies are welcome. Please e-mail, fax or phone your query to Molecular Dimensions.

Contact and product details can be found at www.moleculardimensions.com

PACT *premier*[™], when used together with JCSG-*plus*[™] as a primary screening strategy, is an extremely powerful and successful combination, (i.e. a combination of a modern sparse matrix approach and an information yielding systematic trial).

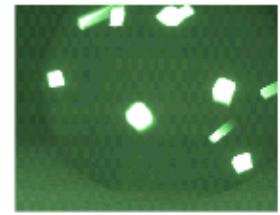
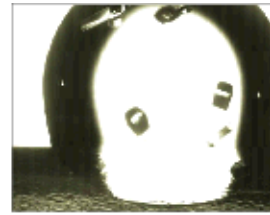


Rationale behind Green Screens

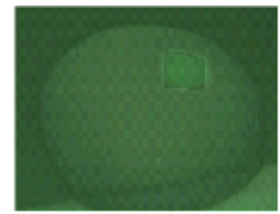
In recent years UV fluorescence imaging has become an established method for protein/salt crystal discrimination. Whilst the majority of proteins contain at least one tryptophan residue there remain a number that fluoresce weakly or not at all, yielding a false negative. **Green Screens** contain a non-covalent fluorescent dye (1) which conveys fluorescence on most proteins when illuminated with UV light. This not only increases the signal-to-noise ratio (important for very small crystals), but also allows the identification of protein crystals lacking intrinsic fluorescence that would otherwise remain ambiguous. Green screens are available in three of our most successful screens, **PACT premier™**, **JCSG-plus™** and **MemGold™**. Use these screens together with UV transparent plates (MD11-00U-100) and ClearVue sheets (MD6-01S) for optimum UV performance.

Reference:

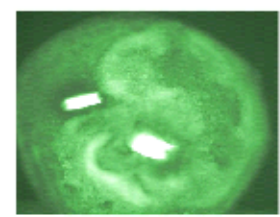
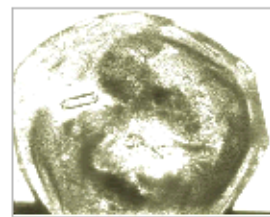
Groves et al (2007). A method for the general identification of protein crystals in crystallization experiments using a non-covalent fluorescent dye. *Acta Cryst.* **D63**, 526-535.



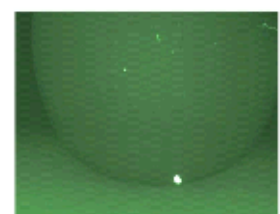
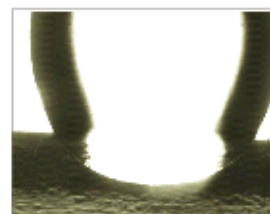
Protein



Salt



Protein

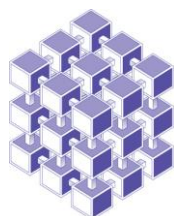


Microcrystal Protein

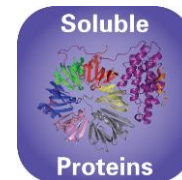
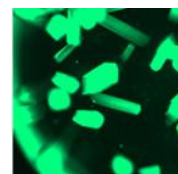
Images kindly provided by Matthew Groves, EMBL Outstation- Hamburg.

Features of the Green Screens:

- **Non-covalent** – binds in channels and not observed to affect crystallization or diffraction quality in any of the proteins tested*.
- **Increased crystal contrast** – observe protein crystals <30 μ M and also those lacking significant intrinsic fluorescence.
- **Improved signal-to-noise** – on average quantum yield ratio of fluorescence is increased from 0.2 to 0.7.
- **Easy-to-use** – available in three proven to be successful screens - **PACT premier™**, **JCSG-plus™** and **MemGold™**.
- **Standard format** – for all automated systems – 1 mL HT-96 block (10 mL kits available on request).



Molecular
Dimensions

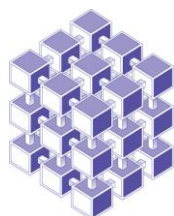


PACT premier™ Green Screen

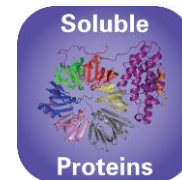
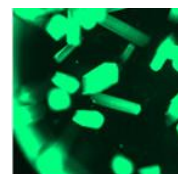
Conditions 1-48 (Box 1)

MD1-55

Tube #	Conc.	Salt	Conc.	Buffer	pH	Conc.	Precipitant	Dye concentration
1-1			0.1 M	SPG	4.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-2			0.1 M	SPG	5.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-3			0.1 M	SPG	6.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-4			0.1 M	SPG	7.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-5			0.1 M	SPG	8.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-6			0.1 M	SPG	9.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-7	0.2 M	Sodium chloride	0.1 M	Sodium acetate	5.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-8	0.2 M	Ammonium chloride	0.1 M	Sodium acetate	5.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-9	0.2 M	Lithium chloride	0.1 M	Sodium acetate	5.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-10	0.2 M	Magnesium chloride hexahydrate	0.1 M	Sodium acetate	5.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-11	0.2 M	Calcium chloride dihydrate	0.1 M	Sodium acetate	5.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-12	0.01 M	Zinc chloride	0.1 M	Sodium acetate	5.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-13			0.1 M	MIB	4.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-14			0.1 M	MIB	5.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-15			0.1 M	MIB	6.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-16			0.1 M	MIB	7.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-17			0.1 M	MIB	8.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-18			0.1 M	MIB	9.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-19	0.2 M	Sodium chloride	0.1 M	MES	6.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-20	0.2 M	Ammonium chloride	0.1 M	MES	6.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-21	0.2 M	Lithium chloride	0.1 M	MES	6.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-22	0.2 M	Magnesium chloride hexahydrate	0.1 M	MES	6.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-23	0.2 M	Calcium chloride dihydrate	0.1 M	MES	6.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-24	0.01 M	Zinc chloride	0.1 M	MES	6.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-25			0.1 M	PCTP	4.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-26			0.1 M	PCTP	5.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-27			0.1 M	PCTP	6.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-28			0.1 M	PCTP	7.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-29			0.1 M	PCTP	8.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-30			0.1 M	PCTP	9.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-31	0.2 M	Sodium chloride	0.1 M	HEPES	7.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-32	0.2 M	Ammonium chloride	0.1 M	HEPES	7.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-33	0.2 M	Lithium chloride	0.1 M	HEPES	7.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-34	0.2 M	Magnesium chloride hexahydrate	0.1 M	HEPES	7.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-35	0.2 M	Calcium chloride dihydrate	0.1 M	HEPES	7.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-36	0.01 M	Zinc chloride	0.1 M	HEPES	7.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-37			0.1 M	MMT	4.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-38			0.1 M	MMT	5.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-39			0.1 M	MMT	6.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-40			0.1 M	MMT	7.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-41			0.1 M	MMT	8.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-42			0.1 M	MMT	9.0	25 % w/v	PEG 1500	100µM 1,8-ANS
1-43	0.2 M	Sodium chloride	0.1 M	Tris	8.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-44	0.2 M	Ammonium chloride	0.1 M	Tris	8.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-45	0.2 M	Lithium chloride	0.1 M	Tris	8.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-46	0.2 M	Magnesium chloride hexahydrate	0.1 M	Tris	8.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-47	0.2 M	Calcium chloride dihydrate	0.1 M	Tris	8.0	20 % w/v	PEG 6000	100µM 1,8-ANS
1-48	0.002 M	Zinc chloride	0.1 M	Tris	8.0	20 % w/v	PEG 6000	100µM 1,8-ANS



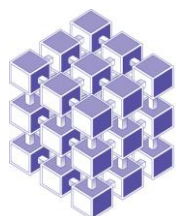
Molecular
Dimensions



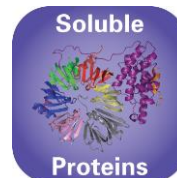
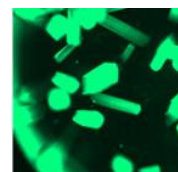
PACT premier™ Green Screen Conditions 1-48 (Box 2)

MD1-55

Tube #	Conc.	Salt	Conc.	Buffer	pH	Conc.	Precipitant	Dye concentration
2-1	0.2 M	Sodium fluoride				20 % w/v	PEG 3350	100µM 1,8-ANS
2-2	0.2 M	Sodium bromide				20 % w/v	PEG 3350	100µM 1,8-ANS
2-3	0.2 M	Sodium iodide				20 % w/v	PEG 3350	100µM 1,8-ANS
2-4	0.2 M	Potassium thiocyanate				20 % w/v	PEG 3350	100µM 1,8-ANS
2-5	0.2 M	Sodium nitrate				20 % w/v	PEG 3350	100µM 1,8-ANS
2-6	0.2 M	Sodium formate				20 % w/v	PEG 3350	100µM 1,8-ANS
2-7	0.2 M	Sodium acetate trihydrate				20 % w/v	PEG 3350	100µM 1,8-ANS
2-8	0.2 M	Sodium sulfate				20 % w/v	PEG 3350	100µM 1,8-ANS
2-9	0.2 M	Potassium sodium tartrate tetrahydrate				20 % w/v	PEG 3350	100µM 1,8-ANS
2-10	0.02 M	Sodium/potassium phosphate				20 % w/v	PEG 3350	100µM 1,8-ANS
2-11	0.2 M	Sodium citrate tribasic dihydrate				20 % w/v	PEG 3350	100µM 1,8-ANS
2-12	0.2 M	Sodium malonate dibasic monohydrate				20 % w/v	PEG 3350	100µM 1,8-ANS
2-13	0.2 M	Sodium fluoride	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-14	0.2 M	Sodium bromide	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-15	0.2 M	Sodium iodide	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-16	0.2 M	Potassium thiocyanate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-17	0.2 M	Sodium nitrate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-18	0.2 M	Sodium formate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-19	0.2 M	Sodium acetate trihydrate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-20	0.2 M	Sodium sulfate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-21	0.2 M	Potassium sodium tartrate tetrahydrate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-22	0.02 M	Sodium/potassium phosphate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-23	0.2 M	Sodium citrate tribasic dihydrate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-24	0.2 M	Sodium malonate dibasic monohydrate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-25	0.2 M	Sodium fluoride	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-26	0.2 M	Sodium bromide	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-27	0.2 M	Sodium iodide	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-28	0.2 M	Potassium thiocyanate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-29	0.2 M	Sodium nitrate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-30	0.2 M	Sodium formate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-31	0.2 M	Sodium acetate trihydrate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-32	0.2 M	Sodium sulfate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-33	0.2 M	Potassium sodium tartrate tetrahydrate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-34	0.02 M	Sodium/potassium phosphate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-35	0.2 M	Sodium citrate tribasic dihydrate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-36	0.2 M	Sodium malonate dibasic monohydrate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-37	0.2 M	Sodium fluoride	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-38	0.2 M	Sodium bromide	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-39	0.2 M	Sodium iodide	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-40	0.2 M	Potassium thiocyanate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-41	0.2 M	Sodium nitrate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-42	0.2 M	Sodium formate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-43	0.2 M	Sodium acetate trihydrate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-44	0.2 M	Sodium sulfate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-45	0.2 M	Potassium sodium tartrate tetrahydrate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-46	0.02 M	Sodium/potassium phosphate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-47	0.2 M	Sodium citrate tribasic dihydrate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350	100µM 1,8-ANS
2-48	0.2 M	Sodium malonate dibasic monohydrate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350	100µM 1,8-ANS



Molecular
Dimensions



Abbreviations:

HEPES; N-(2-hydroxyethyl)-piperazine-N'-2-ethanesulfonic acid, **MES**; 2-(N-morpholino)ethanesulfonic acid, **PEG**; Polyethylene glycol, **Tris**; 2-Amino-2-(hydroxymethyl)propane-1,3-diol, **SPG buffer**; Succinic Acid, sodium phosphate monobasic monohydrate, Glycine, **MIB buffer**; Sodium malonate dibasic monohydrate, Imidazole, Boric acid, **PCTP buffer**; Sodium propionate, Sodium cacodylate trihydrate, Bis-Tris propane, **MMT buffer**; DL-Malic acid, MES monohydrate, Tris.

Manufacturer's safety data sheets are available from our website or by scanning the QR code here:



Re-Ordering details:

Catalogue Description	Pack size	Catalogue Code
PACT <i>premier</i> [™]	96 x 10 mL	MD1-29
PACT <i>premier</i> [™] HT-96	96 x 1 mL	MD1-36
PACT <i>premier</i> [™] FX-96	96 x 100 µL	MD1-36-FX
Eco Screens		
PACT <i>premier</i> [™] Eco Screen	96 x 10 mL	MD1-29-ECO
PACT <i>premier</i> [™] HT-96 Eco Screen	96 x 1 mL	MD1-36-ECO
Green Screens (contain fluorescent green dye - ideal for UV)		
PACT <i>premier</i> [™] Green Screen	96 x 10 mL	MD1-55
PACT <i>premier</i> [™] HT-96 Green Screen	96 x 1 mL	MD1-52
Combo Packs		
Super2 Combo Value Pack (JCSG- <i>plus</i> [™] + PACT <i>premier</i> [™])	2 x 96 x 10 mL	MD1-75
Super2 Combo HT-96 Value Pack (JCSG- <i>plus</i> [™] HT-96 + PACT <i>premier</i> [™] HT-96)	2 x 96 x 10 mL	MD1-75-HT
Single Reagents		
PACT <i>premier</i> [™] single reagents	100 mL	MDSR-29-tube number
PACT <i>premier</i> [™] HT-96 single reagents	100 mL	MDSR-36-well number

For PACT *premier*[™] stock solutions please visit the Optimization section on our website.