In-Line Methods List for Automated Ion Analyzers

Flow Injection Analysis

10 June 2019

In-line Modules:

Method Number	Analyte	Lamp/Tubing	Heater/tubing
10-107-06-6-A	Ammonia	Not used	850cm Tefzel* (PN 41300L)
10-107-06-6-B	Ammonia	Not used	850cm Tefzel* (PN 41300L)
10-106-06-6-E	Ammonia	Not used	745cm 0.8mm i.d. (PN 50028)
12-140-39-5-A	Carbon	6W germicidal/810 zeus	1200 cm 0.8"i.d. (PN 50028)
10-204-00-2-C	Cyanide (total)	6W, BLB/ 750cm zeus	850cm Tefzel (PN 41300L)
10-204-00-2-D	Cyanide (total)	6W, BLB/ 750cm zeus	850cm Tefzel (PN 41300L)
10-204-00-2-E	Cyanide (total)	6W, BLB/ 810cm zeus	850cm Tefzel (PN 41300L)
10-204-00-2-G	Cyanide (total)	6W, BLB/ 700cm zeus	850cm Tefzel (PN 41300L)
10-204-00-2-H	Cyanide (total)	8W, BLB/550cm zeus	475cm 0.8mm i.d.* (PN 50028)
10-204-00-2-I	Cyanide (total)	6W, BLB/ 700cm zeus	850cm Tefzel (PN 41300L)
10-204-00-4-B	Cyanide (WAD)	Not used	1200 cm 0.8"i.d. (Adjacent channel) (PN 50028)
10-204-00-4-C	Cyanide (WAD)	Not used	1225 total cm 0.8"i.d.
12-204-00-2-A	Cyanide (Total)	6W, BLB/ 700cm zeus	850cm Tefzel (PN 41300L)
10-107-06-6-D	Kjeldahl Nitrogen**	Not used	850cm Tefzel* (PN 41300L)
10-107-04-3-A	Total Nitrogen	6W germicidal/650 zeus	1200 cm 0.8"i.d. (PN 50028)
10-107-04-3-B	Total Nitrogen	6W germicidal/650 zeus	1200 cm 0.8"i.d. (PN 50028)
10-107-04-3-C	Total Nitrogen	6W germicidal/650 zeus	1200 cm 0.8"i.d. (PN 50028)
10-107-04-3-D	Total Nitrogen	6W germicidal/650 zeus	1200 cm 0.8"i.d. (PN 50028)
10-107-04-3-E	Total Nitrogen	6W germicidal/850 zeus	1200 cm 0.8"i.d. (PN 50028)
10-107-04-3-P	Total Nitrogen	6W germicidal/650 zeus	1200 cm 0.8"i.d. (PN 50028)
12-107-04-3-B	Total Nitrogen	6W germicidal/810 zeus	1200 cm 0.8"i.d. (PN 50028)
12-107-04-3-C	Total Nitrogen	6W germicidal/810 zeus	1200 cm 0.8"i.d. (PN 50028)
31-107-04-3-A	Total Nitrogen	6W germicidal/650 zeus	1200 cm 0.8"i.d. (PN 50028)
31-107-04-3-B	Total Nitrogen	6W germicidal/650 zeus	1200 cm 0.8"i.d. (PN 50028)
10-115-01-3-A	Total Phosphorus	6W germicidal/650 zeus	1200 cm 0.8"i.d. (PN 50028)
10-115-01-3-B	Total Phosphorus	6W germicidal/850 zeus	1200 cm 0.8"i.d. (PN 50028)
10-115-01-3-D	Total Phosphorus	6W germicidal/550 zeus	780 cm 0.8"i.d. (PN 50028)
10-115-01-3-F	Total Phosphorus	6W germicidal/680 zeus	1200 cm 0.8"i.d. (PN 50028)
31-115-01-3-D	Total Phosphorus	6W germicidal/650 zeus	1200 cm 0.8"i.d. (PN 50028)
31-115-01-3-F	Total Phosphorus	6W germicidal/680 zeus	1200 cm 0.8"i.d. (PN 50028)

(*or for the QC8500 ONLY, on an adjacent heater) **Post digestion!

6W BLB Lamp: PN50717 8W BLB Lamp PN 50817 6W 254nm lamp: PN 50775 8W 312 nm lamp: PN9334400 Zeus tubing: PN50728

Comparison tables are available for all methods that are equivalent to NPDES methods

In the list of methods that follows:
Designation in the methods list means the method is EPA accepted as equivalent for NPDWR, NPDES, or both (Check the table above)
^ Designation in the methods list means the method is equivalent for NPDES reporting under the MUR

[R] Designation means the manifold is compliant with RoHS-2. (Verify with your sales person that the method can be sold into the EU.

Flow Injection Analysis

Ammonia

10-107-06-5-B[R]	0.10 – 1.0 1.0-10.0	0.01	mg N/L as NH_3	Waters	Gas diffusion method; low-flow method; ISO (11732) 590nm	19-Mar-04
10-107-06-5-J[R]^	0.01-1.0 0.1-20	0.002 0.02	mg N/Las NH_3	Waters	Gas Diffusion method. Salicylate/DCIC. May be used for TKN as well as brackish/saline samples. 660 nm. **Requires a standard heater**.	16-Jan-15
10-107-06-6-A[R] ^	0.25 – 20	0.13	mg N/L as NH_3	Waters	Sodium salicylate-based method; 660 nm. inline distillation method; **Requires a standard heater and in-line module for distillation step.** Samples w/ particulates not suitable. NPDES Equivalent (350.1);	24-Jul-08
10-107-06-6-B [R]^	0.25 – 10	0.066	mg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm. inline distillation method; low-flow method; **Requires a standard heater and an in-line module for the distillation.** Samples w/ particulates not suitable. NPDES Equivalent (350.1);	29-Jul-08
10-107-06-6-E[R]^	10-250	5 (pres.) 1 (un-pres.)	µg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm inline distillation method; **Requires a standard heater and an in-line module for the distillation.** Low-flow method; samples w/ particulates not suitable NPDES Equivalent (350.1);	15-Apr-11

Carbon (Total Dissolved)

12-140-39-5-A[R]	5-400	0.7	mg C/L	Soil Extracts	0.5M K2SO4 extracts. Phenol Red Method. 440 nm. Can measure TN from the same digest with method 12-107-04-3-C. Requires an in-line digestion module (One supplies both channels)	19-Dec-11

Cyanide

10-204-00-2-C	2 – 100	0.21	µg CN^-/L	Waters	**Total Cyanide**; inline method; low-flow method; NPDES Equivalent; Pyridine/barbituric acid, 570 nm**.** Samples w/ particulates not suitable **Inline module and Standard heater required.**	14-Sep-07
10-204-00-2-D	5 – 500	0.51	µg CN^-/L	Waters	**Total Cyanide**; inline method; low-flow method; Pyridine/barbituric acid, 570 nm**.** Samples w/ particulates not suitable **Inline module and Standard heater required.**	19-Sep-07
10-204-00-2-E^R	2 – 100	0.5	µg CN^-/L	Waters	**Total Cyanide**; inline method; low-flow method; lower recovery of ferricyanide; Pyridine/barbituric acid, 570 nm**.** Samples w/ particulates not suitable **Inline module, Standard heater required**	3-Dec-08
10-204-00-2-G^R	0.002 – 0.01 0.1 – 5.0	0.00016 0.015	mg CN^-/L	Waters	**Total Cyanide**; inline method; pyridine-free reagents; can be used w/ 10-204-00-2-H for free cyanide; 600 nm multi-range method; Samples w/ particulates not suitable. **In-line module and standard heater required.**	22-Jun-07
10-204-00-4-B^R	2.0 – 100	0.16	µg CN^-/L	Waters	**WAD Cyanide**; inline method; pyridine-free reagents; Isonicotinic/barbituric acid 600 nm. samples w/ particulates not suitable; **MANIFOLD ONLY**	27-Jul-07
10-204-00-4B52^R					DEDICATED 220V CHANNEL FOR QC8500 Isonicotinic/barbituric acid 600 nm. samples w/ particulates not suitable **Requires 2 channels, two heaters, one detector and one valve)**	
10-204-00-4-C^R	2.0 – 100	0.17	µg CN^-/L	Waters	**WAD Cyanide**; Low Flow Method. In line distillation method; pyridine-free reagents; Isonicotinic/barbituric acid 600 nm. Samples w/ particulates not suitable; **Requires an inline module and a standard heater.**	11-Mar-13

Kjeldahl Nitrogen (TKN)

10-107-06-2-S^{R}	0.2-20	0.01	mg N/L	Waters	**Simplified TKN (s-TKN^{TM}).** 520 nm, cadmium reduction . Two channel method TN and NO_2+ NO_3. S-TKN by subtraction. **Requires an in-line module**	14-Jul-10
10-107-06-5-J^	0.1-5.0 0.25-20	0.02 0.05	mg N/L	Waters	Kjeldahl Digests, Salicylate/DCIC **660 nm. copper catalyst**. Gas diffusion method. Sea/brackish water. Can also be used for Ammonia. NPDES Equivalent	26-Sept-12
10-107-06-6-D^	0.5 – 20	0.25	mg N/L	Waters	Kjeldahl digests; **copper catalyst**; inline distillation method; NPDES Equivalent (351.2); samples w/ particulates not suitable. 660 nm. Can be used with brackish/seawater digests. **Requires an in-line module and a standard heater or two heated channels (with one heater non-standard).**	31-Jul-09

Nitrogen - Total Nitrogen

10-107-04-3-A^{R}*	200 – 2000	5.6	µg N/L	Waters	Sulfanilamide/NED Cadmium Reduction;540 nm. Total N; inline method; alkaline persulfate digestion; samples w/ particulates not suitable. **In-line sample prep module required. Nitrate/Nitrite support added**.	16-Nov-09
10-107-04-3-B ^{R}*	0.5 – 30.0	0.1	mg N/L	Waters	Sulfanilamide/NED imidazole buffer; Cadmium Reduction; 540 nm. Total N; inline method; alkaline persulfate digestion method; samples w/ particulates not suitable. **In-line sample prep module required. Nitrate/Nitrite support added**.	16-Nov-09

10-107-04-3-C[R]	0.5 – 10.0	0.011	mg N/L	Waters	Sulfanilamide/NED Cadmium Reduction; 540 nm. Total N; inline method; alkaline persulfate digestion method; samples w/ particulates not suitable **In-line sample prep module required.**	29-Jun-07
10-107-04-3-D[R]	0.05 – 5.0 0.2 – 20.0	0.003 0.008	mg N/L	Waters	Sulfanilamide/NED Cadmium Reduction; 540 nm. Total N; inline method; alkaline persulfate digestion; samples w/ particulates not suitable. **In-line sample prep module required. Nitrate/Nitrite support added**.	2-Dec-12
10-107-04-3-E[R]	0.05 – 10	0.005	mg N/L	Waters	Sulfanilamide/NED; Cadmium Reduction; 540 nm. Total N; inline method; alkaline persulfate digestion; samples w/ particulates not suitable **In-line sample prep module required.**	12-Nov-10
10-107-04-3-P[R]	0.2 – 10.0	0.05	mg N/L	Waters	Sulfanilamide/NED; Cadmium Reduction; 540 nm. Total N; inline method; alkaline persulfate digestion; follows Standard Methods (4500-N-B); samples w/ particulates not suitable.	29-Jun-07
12-107-04-3-B	0.2 – 30.0	0.04	mg N/L	Soil extracts	Sulfanilamide/NED Cadmium reduction. 540 nm. Total N; alkaline persulfate digestion; **0.5M K_2SO_4** extracts of soils; **inline module required**; samples w/ particulates not suitable.	13-Nov-09
12-107-04-3-C	0.375-30	0.05	mg N/L	Soil extracts	Sulfanilamide/NED Cadmium reduction ,. 540 nm. Total N; **0.5M K_2SO_4** extracts of soils; **inline module required**;; persulfate digestion; samples w/ particulates not suitable. Dissolved Organic Carbon may be measured in the same digest using 12-140-39-5-A	3-Feb-10

31-107-04-3-A[R]	25 – 1000 **1.79-71.43**	4.90	µg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cadmium reduction ,. 540 nm. Total N; alkaline persulfate inline digestion method; samples w/ particulates not suitable.	

Phenol

10-210-00-3-A[R]	2 – 200	0.28	µg phenol/L	Waters	Volatile phenol; 4-amino antipyrene method; 500 nm. inline method; samples w/ particulates not suitable; This PN **manifold only**	20-Dec-06
10-210-00-3A51[R]					QC8500 115V dedicated channel	
10-210-00-3A52[R]					QC8500 220V dedicated channel	
10-210-00-3-C*^	2 – 200	0.61	µg phenol/L	Waters	Volatile phenol; 4-aminoantipyrene method; 500 nm. inline method; NPDES Equivalent (420.4); samples w/ particulates not suitable. This PN for the **manifold only**	15-Oct-08
10-210-00-3C51*^					QC8500 115V dedicated channel	
10-210-00-3C52*^					QC8500 220V dedicated channel	

Phosphorus, Total (Acidic Persulfate)

10-115-01-3-A[R]^	0.1 – 10.0	0.007	mg P/L	Waters	Total P; acidic persulfate digests; molybdate method, 880 follows Standard Methods (4500-P-I); samples w/ particulates not suitable. **Requires an in-line sample prep module**. Can also use for orthophosphorus over the same range.	18-Nov-09
10-115-01-3-B[R]*^	0.1 – 4.0	0.01	mg P/L	Waters	Total P; acidic persulfate digests; molybdate method; 880 nm; samples w/ particulates not suitable **Requires an in-line sample prep module.** Can also use for orthophosphorus over the same range.	18-Nov-09
10-115-01-3-C [R]*^	0.05 – 1.0	0.0011	mg P/L	Waters	Total P; acidic persulfate digests; molybdate method; 880 nm. Samples w/ particulates not suitable **Requires an in-line sample prep module.** Can also use for orthophosphorus over the same range.	18-Nov-09

10-115-01-3-E^{R}^	10 – 500	1.4	µg P/L	Waters	Total P; acidic persulfate digests; molybdate method; 880 nm. Samples w/ particulates not suitable **Requires an in-line sample prep module and standard heater.** Can also use for orthophosphorus over the same range.	5-Jul-07
10-115-01-3-F^{R}^	2 – 100	0.42	µg P/L	Waters	Total P; acidic persulfate digests; molybdate method; 880 nm method; samples w/ particulates not suitable **Requires an in-line sample prep module and non-standard heater.**	13-Nov-06
31-115-01-3-D^{R}	0.050 – 1.0 **1.63-32.36**	0.002	mg P/L **µM P/L**	Brackish / Seawaters	Total P; molybdate method; 880 nm. inline persulfate digestion; samples w/ particulates not suitable. glass calibration vials. **Requires an in-line sample prep module.**	5-Jul-07
31-115-01-3-F^{R}	2-100 **0.065-3.23**	0.59	µg P/L **µM P/L**	Brackish / Seawaters	Total P; molybdate based method; 880nm, inline persulfate digestion; samples w/ particulates not suitable **Requires glass standard and sample vials an in-line sample prep module, and non-standard heater.**	13-Oct-08

Sulfide

10-116-29-3-A^{R}	0.01 – 2.0	0.006	mg S/L	Waters	In line distillation method; 660 nm. **Requires two dedicated channels with one standard and one non-standard heater**; samples w/ particulates not suitable manifold only	4-Oct-07
10-116-29-3A51^{R}					Dedicated channels; QC8500 115V	
10-116-29-3A52^{R}					Dedicated channels; QC8500 220V	
10-116-29-3B52^{R}	1.0 – 10.0	0.2	mg S/L	Waters	In line distillation method; 660 nm. requires two dedicated channels; **Requires two dedicated channels with one standard and one non-standard heater** samples w/ particulates not suitable; Dedicated channels; QC8500 220V	5-Jul-07

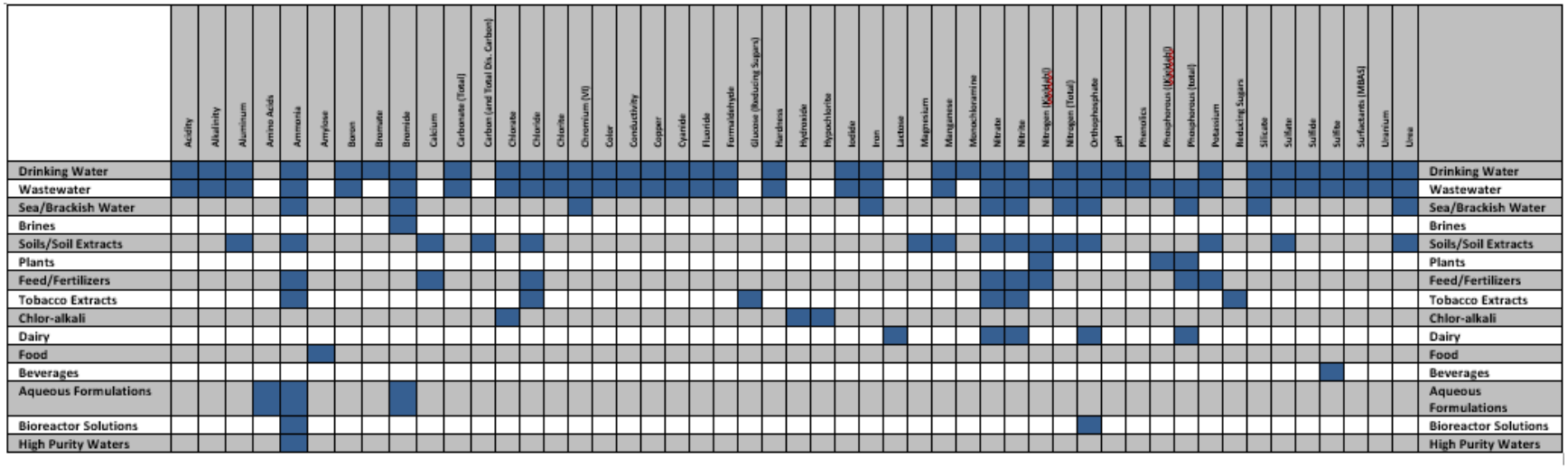
Sulfite

21-116-11-2-D[R]	0.5 – 30.0 25 -300.0	0.15 1.5	mg SO_3^{2-}/L mg SO_3^{2-}/L	Beer,Wine	Pararosanaline method; 560 nm **Requires a standard heater**	06-Oct-16
21-116-11-2-E[R]	0.5-20.0	0.05	mg SO_3^{2-}/L	Beverages	Pararosanaline method 560 nm. Determination in coconut water. **Requires a standard heater.**	30-Jan-15

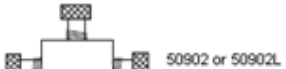
Surfactants (MBAS)

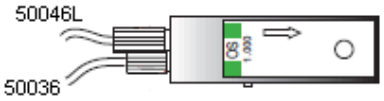
10-306-00-1-C[R]	0.025 – 2.0 0.010 – 1.0	0.004 0.0056	mg/L as LAS mg/L as SDS	Waters	Methylene blue method; 650 nm. dual extraction method. SDS or LAS. Glass calibration and standard vials must be used.	19-Dec-08
10-306-00-1-D[R]^	0.010 – 1.0	0.0024	mg SDS/L	Waters	Methylene blue method; 650 nm.single extraction method; NPDES Equivalent; follows Standard Methods (5540-C). SDS. Glass calibration and standard vials must be used.	25-Mar-08
10-306-00-1-E[R]	0.1 – 20.0	0.05	mg SDS/L	Waters	Methylene blue method; 650 nm. dual extraction method (SDS only). Glass calibration and standards vials must be used.	29-Sep-05
10-306-00-1-F	0.06-2.4	0.009	mg LAS/L	Waters	Methylene blue method; 650 nm. dual extraction method (LAS only). Glass calibration and standards vials must be used. SM5540C/ASTM2330-02	9-Apr-14

Method Matrix



Selected Parts. Please note this is NOT a complete listing






50237A Cadmium Column


50254 Cadmium Column Maintainence kit

50065 Flow cell flare, 13 cm
50067 Flow cell flare, 35 cm
31933 Flow cell, 10mm

Nipples

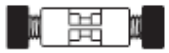
50015 Large
50015A Small
50014L Reducing
50019 Stainless Steel

Interference Filters
89### ### indicates the wavelength

24927 Switching Valve
50962 Flare Kit for Nitrate
50963 Flare Kit for Sulfate
24012 Connector, Amber
24015 Washer

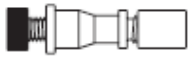
Union Fitting


50913


50901

Small Pump Tube Adapter


50906


85287 for QC8500

Large Pump Tube Adapter


85293 for QC8500


50907

PumpTube Adapter

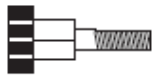

50905


85269 for QC8500

50009
Tube Connector, Amber

31077 for QC8000 Valve
Valve Connector, White

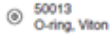
85245
One-piece fitting
for QC8500 valve



28051L
Rheodyne Nut & Ferrule

28058 Rheodyne Ferrule

28057
Upchurch Nut & Ferrule


50013
O-ring, Viton

50024L
Large Clip, Gray

50023L
Small Clip, Gray

50913 Teflon
Union Fitting

(ultem nuts)


50007 or 85258 for QC8500
Large Collar, Black

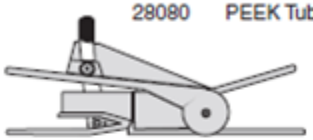

50006 or 85257 for QC8500
Small Collar, White


50060
O-ring Probe


50100L
Degassing Tube


50031
Scalpel

28081
Blades for PEEK Tubing Cutter



28080 PEEK Tubing Cutter

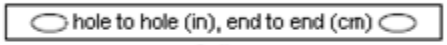
50021
Transmission Tubing, PVC, 0.030" ID

50029
Transmission Tubing, PVC, 0.060" ID

Teflon Tubing

50927 Manifold, 0.022" ID, Green
50928 Manifold, 0.032" ID
41300L Tefzel Tubing, 0.040" ID x 0.060" OD
30928 Zeus Tubing, 0.032" ID

50091 Microloop Tubing, Teflon, 16 cm
50092 Microloop Tubing, Teflon, 12.5 cm



Coils

Size	Coil Support Only	Wrapped, Teflon 0.022" ID	Wrapped, Teflon 0.032" ID
1" or 4.5 cm	50016L	50981	50916
2" or 7cm	50018L	50982	50918
2.5" or 8 cm	50017	50983	50917
4" or 12cm	50020	50984	50920
8" or 22 cm	50022L	N/A	50922

Alternating Coils 12 cm

Coil Support Only	Wrapped, Teflon 0.022" ID	Wrapped, Teflon 0.032" ID
50039	50985	50921

Pump Tubing

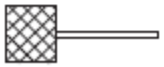
534XX PVC
544XX Duraprene
494XX Silicone
654XX Acidflex

XX is the number that specifies the pump tube color:

05 Orange-Yellow, 0.020" ID
06 Orange-White, 0.025" ID
07 Black-Black, 0.030" ID
08 Orange-Orange, 0.035" ID
09 White-White, 0.040" ID
10 Red-Red, 0.045" ID
11 Gray-Gray, 0.051" ID
12 Yellow-Yellow, 0.056" ID
13 Blue-Blue, 0.065" ID
14 Green-Green, 0.073" ID
15 Purple-Purple, 0.081" ID
16 Purple-Black, 0.090" ID
17 Purple-Orange, 0.100" ID
18 Purple-White, 0.110" ID
19 Yellow-Blue, 0.060" ID

Bottles

28193L Glass Bottle, 1000 mL
35102 Glass Bottle, 2000 mL
43915 Glass Bottle, 100 mL (includes cap)



50012
O-ring Remover

50062
Drill Bit

28101L
End Plug

Lit 2839 June 10 2019 Rev. 2

Lachat Instruments Brand Loveland, Colorado USA
United States: 800-247-7613 tel | 970-669-3050 tel | 970-461-3915 fax | sales@lachatinstruments.com | techhelp@hach.com
Outside United States: Contact the Lachat office or distributor serving you. | sales@lachatinstruments.com | intltech@hach.com
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