

ASSET™ EZ4 Dry Samplers for Isocyanates

First Class Sampling and Analysis



Two ASSET™ EZ4 Samplers Available

The ASSET™ EZ4 dry samplers for isocyanates are the easy-to-use dry samplers offering the ultimate sensitivity for collection and measurement of vapor phase and particulate isocyanates. The ASSET™ EZ4-NCO Dry Sampler collects the full range of isocyanate monomers and oligomers; while the ASSET™ EZ-ICA sampler is designed to collect isocyanic acid (ICA) and methyl isocyanate (MIC) at low levels.

The science behind the ASSET™ EZ4 Sampler is based on dibutylamine (DBA) impregnated glass fiber filters housed in a denuder and filter cassette. This ensures both the vapor phase and aerosol/particulate isocyanates are completely derivatized and form stable derivatives. The sampling method is fully validated – ISO 17734-1:2013.

Key Features and Benefits

- Easy to use and safe to wear
- Increases workplace productivity during IH sampling, as work shifts are not interrupted for sampler exchange
- Reduces the cost of analysis through a reduction in required samplers to cover a work shift
- Ability to achieve reliable, low detection limits, 50-100x below existing methods
- Only device to measure vapor phase and particulate isocyanates
- Fully supported by Certified Reference Material (CRM) analytical standards for LC/MS (calibration and internal standards available).
- No interferences, no field extraction
- Reduces shipping and handling charges
- 2-year shelf life



ASSET™ EZ4-NCO Dry Sampler



ASSET™ EZ4-ICA Dry Sampler

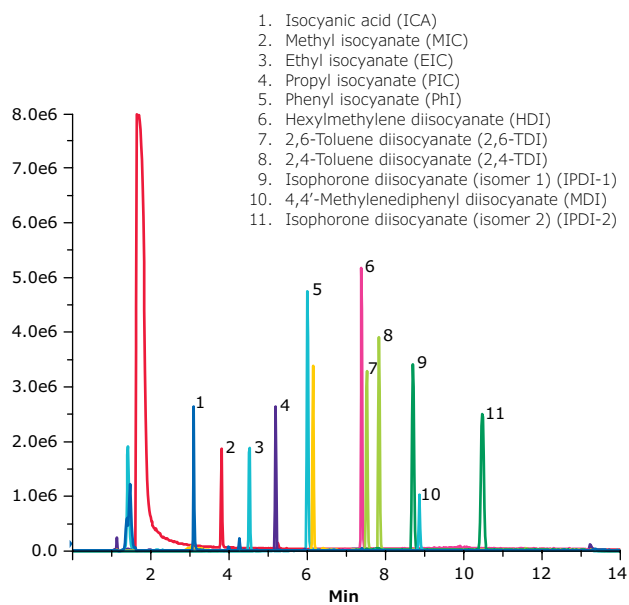
	ASSET™ EZ4-NCO Dry Sampler	ASSET™ EZ4-ICA Dry Sampler
Sampling Flow Rate	From 20 mL/min – 850 mL/min	From 20 mL/min – 200 mL/min
Sampling Time	From 5 minutes up to 12 hrs.	From 5 minutes up to 4 hrs.
Storage	Ambient (before and after sampling)	Refrigeration (before sampling); Ambient (after sampling)
Stability	4 weeks after sampling	2 weeks after sampling

In the News

- In 2013, several piperazine compounds, a common chemical used in the derivatization process of isocyanates in several existing sampling devices, were added to the banned substance list in the United Kingdom.
- Several common isocyanate sampling devices require the use of toluene, a Class 3 hazardous chemical, as a component of sampling, requiring the high cost of compliance shipping hazardous chemicals to the laboratory.

Chromatogram of DBA Standard (equivalent 0.20 µg/mL each underivatized monomer)

column: Ascentis® Express C18, 15 cm x 4.6 mm I.D., 2.7 µm particles (53829-U)
 mobile phase: (A) 5:95 acetonitrile:water w/ 0.05% formic acid; (B) 95:5 acetonitrile:water w/ 0.05% formic acid
 gradient: 40% to 70% B in 3 min; 70% to 90% B in 2 min; hold at 90% for 6 min, 90% to 40% in 0.1 min, hold at 40% for 3.9 min
 flow rate: 1 mL/min
 column temp.: 35 °C
 detector: AB3200 QTrap™ MS, ESI(+), SIM
 injection: 2 µL



Description	Qty.	Cat. No.
Sampling Device		
ASSET™ EZ4-NCO Dry Sampler	10	5027-U
	50	5028-U
Sample kit – Includes 2 samplers and fittings	2	5047-U
ASSET™ EZ4-ICA Dry Sampler	10	28517-U
	40	28518-U
Calibration Fitting	10	5048-U
HPLC Columns		
LC-MS-MS Ascentis® Express C18, 5 cm x 2.1 mm I.D., 2.7 µm	1	53822-U
LC-MS Ascentis® Express C18, 15 cm x 4.6 mm I.D., 2.7 µm	1	53829-U

Certified Reference Materials

Our isocyanate-dibutylamine (DBA) calibration standards and isocyanate-dibutylamine-d₉ internal standards were developed for use with the Supelco ASSET™ EZ4 Dry Samplers. These CRMs are produced in an ISO/IEC 17025 and ISO Guide 34 accredited lab and are traceable to a NIST Standard Reference Material (SRM). A certificate of analysis fulfilling the requirements of ISO Guide 31 is provided with each CRM.

Description	Concentration	Synonym	Pkg.	Cat. No.
Single-component Solutions				
m-TMX-diisocyanate-2(di-n-butylamine)	100 µg/mL in methanol		1 x 1 mL	CRM40613
m-TMX-diisocyanate-2(di-n-butylamine-d ₉)	100 µg/mL in methanol		1 x 1 mL	CRM40614
4,4'-HMDI-2(di-n-butyl amine)	100 µg/mL in methanol		1 x 1 mL	CRM40609
4,4'-HMDI-2(di-n-butyl amine-d ₉)	100 µg/mL in methanol		1 x 1 mL	CRM40612
Mixtures				
DBA Isocyanate Monomers Mix	in acetonitrile:methanol (99:1) (varied conc.)* Isocyanic acid-di-n-butylamine Ethyl isocyanate-di-n-butylamine 1,6-Hexamethylene diisocyanate-2(di-n-butylamine) Isophorone isocyanate-2(di-n-butyl amine) isomer 1 Isophorone isocyanate-2(di-n-butyl amine) isomer 2 4,4'-Methylenediphenyl diisocyanate-2(di-n-butylamine) Methyl isocyanate-di-n-butylamine Phenyl isocyanate-di-n-butylamine Propyl isocyanate-di-n-butylamine 2,4-Toluene diisocyanate-2(di-n-butylamine) 2,6-Toluene diisocyanate-2(di-n-butylamine)	ICA-DBA EIC-DBA HDI-2(DBA) IPDI-2(DBA) IPDI-2(DBA) 4,4'-MDI-2(DBA) MIC-DBA PhI-DBA PIC-DBA 2,4-TDI-2(DBA) 2,6-TDI-2(DBA)	1 x 1 mL	CRM40569
d ₉ -DBA Isocyanate Monomers Internal Standard Mix	in acetonitrile:methanol (99:1) (varied conc.)* Isocyanic acid-di-n-butylamined ₉ Ethyl isocyanate-di-n-butylamine-d ₉ 1,6-Hexamethylene diisocyanate-2(di-n-butylamine-d ₉) Isophorone diisocyanate-2(di-n-butylamine-d ₉) isomer 1 Isophorone diisocyanate-2(di-n-butylamine-d ₉) isomer 2 4,4'-Methylenediphenyl diisocyanate-2(di-n-butylamine-d ₉) Methyl isocyanate-di-n-butylamine-d ₉ Phenyl isocyanate-di-n-butylamine-d ₉ Propyl isocyanate-di-n-butylamine-d ₉ 2,4-Toluene diisocyanate-2(di-n-butylamine-d ₉) 2,6-Toluene diisocyanate-2(di-n-butylamine-d ₉)	ICA-DBA-d ₉ IC-DBA-d ₉ HDI-2(DBA-d ₉) IPDI-2(DBA-d ₉) IPDI-2(DBA-d ₉) 4,4'-MDI-2(DBA-d ₉) MIC-DBA-d ₉ PhI-DBA-d ₉ PIC-DBA-d ₉ 2,4-TDI-2(DBA-d ₉) 2,6-TDI-2(DBA-d ₉)	1 x 1 mL	CRM40570
HDI-DBA Oligomers Standard	in methanol (varied conc.) HDI-Monomer di-n-butylamine HDI-Uretdione di-n-butylamine HDI-Biuret di-n-butylamine HDI-Isocyanurate di-n-butylamine		1 x 1 mL	CRM40589
HDI-DBA-d ₉ Oligomers Standard	in methanol (varied conc.) HDI-Monomer di-n-butylamine-d ₉ HDI-Uretdione di-n-butylamine-d ₉ HDI-Biuret di-n-butylamine-d ₉ HDI-Isocyanurate di-n-butylamine-d ₉		1 x 1 mL	CRM40590
MDI-DBA Oligomers Standard	in methanol (varied conc.) 4,4'-MDI-monomer-di-n-butylamine 2,4-MDI-monomer-di-n-butylamine MDI-trimer-di-n-butylamine MDI-tetramers-di-n-butylamine		1 x 1 mL	CRM40603
MDI-DBA-d ₉ Oligomers Standard	in methanol (varied conc.) 4,4'-MDI monomer-di-n-butylamine-d ₉ 2,4-MDI monomer-di-n-butylamine- d ₉ MDI-trimer-di-n-butylamine- d ₉ MDI-tetramers-di-n-butylamine- d ₉		1 x 1 mL	CRM40604
IPDI-DBA Oligomers Standard	in methanol (varied conc.) IPDI-Monomer-di-n-butylamine (isomer 1) IPDI-Monomer-di-n-butylamine (isomer 2) IPDI-Isocyanurate-di-n-butylamines oligomers		1 x 1 mL	CRM40605
IPDI-DBA-d ₉ Oligomers Standard	in methanol (varied conc.) IPDI-Monomer-di-n-butylamine-d ₉ (Isomer 1) IPDI-Monomer-di-n-butylamine-d ₉ (Isomer 2) IPDI-Isocyanurate-di-n-butylamine-d ₉ (Oligomers)		1 x 1 mL	CRM40606

*Target is 100 µg/mL for individual components, with the exception of the mixes having isomer 1 and isomer 2. For isomers, the sum of the isomers should be 100 µg/mL. Factual concentration will be given in the lot specific certificate of analysis.

References

1. ISO 17734-1:2013, Determination of organonitrogen compounds in air using liquid chromatography and mass spectrometry — Part 1: Isocyanates using dibutylamine derivatives.
2. ISO 17734-2:2013, Determination of organonitrogen compounds in air using liquid chromatography and mass spectrometry — Part 2: Amines and aminoisocyanates using dibutylamine and ethyl chloroformate derivatives.
3. In a technical ISO report, the technology is described as the only methodology that covers all situations. ISO/TR 17737:2007, Workplace air — Guidelines for selecting analytical methods for sampling and analyzing isocyanates in air.
4. Brady J. M., et al. *Environ. Sci. Technol.* 2014, 48, 11405-11412
5. http://www.esrl.noaa.gov/news/2011/Isocyanic_Acid.html, accessed 12/2/2015
6. Karlsson, D., Dalene, M., Scarping, G., Marand, A. J. *Environ. Monit.* 2001, 3, 432-436.
7. HSE, WATCH/2008/4, ANNEX 2 "Assessment of the Potential for Isocyanic Acid and Other Monoisocyanates to Cause Respiratory Irritation and Sensitation"



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