

# Analytical Reference Materials





## Analytical Reference Materials

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**AJ Saclyn**  
Associate Product  
Marketing Manager

<b>Acetates</b>		<b>Deuterated</b>		<b>Hydrocarbons, cont'd</b>		<b>PAHs (Polyaromatic Hydrocarbons)</b>		<b>Petrochemicals</b>	
30477	466	30614	434,466	31489	497	31011	455,462,477,478	30096	440,488,506
30489	466	30624	472	31614	493	31264	455	30097	440,506
		30625	472	31674	499	31455	455	30098	440,506
<b>Acids, Chlorinated</b>		31006	457,467,474	31675	499	31458	492,494	30099	440,506
30498	433	31206	457,467,474	31678	486	31469	492,497	30436	440,506
32429	453,470	31810	478	31698	487	31622	469	31222	499
32430	453,470	31885	467,474	31814	496	31841	470	31223	499
32431	453,470	31886	467,474	31819	487,491	31843	470	31224	499
		31887	467,474	31830	493	31857	462	31613	499
<b>Acids, Haloacetic</b>		31888	467,474	31832	493	31869	484	31674	499
31644	453	31889	467,474	31838	432,488			31675	499
31645	453	33913	474	31839	435,488			31676	486
31646	453	33918	474	31877	437,493			31677	486
31647	453			31878	493	<b>PCBs, Aroclor</b>		31678	486
31896	452	<b>Esters, Nitrate</b>		31880	433,488,489,490,501	32006	429,457,469,481	31679	486
31897	452	31498	437,461,471,507	31882	493	32007	429,457,469,481	31680	486
		31600	438,461,471,507	31838	432,488	32008	429,457,469,481	31681	486
		31601	434,461,471,507	31839	435,488	32009	429,457,469,481	31682	486
<b>Acids, Organic</b>				31877	437,493	32010	429,457,469,481	31683	486
35080	511	<b>Esters, Phthalate</b>		31878	493	32011	429,457,469,481		
35081	511	31031	454	31880	433,488,489,490,501	32012	429,457,469,481	<b>Phenols</b>	
		31844	445	33906	517	32039	457,469,481	31008	477
<b>Alcohols</b>		31845	445	33908	517	32064	429,457,469,481	31027	458
30214	464	31849	460			32065	429,457,469,481	31029	454
30466	434,466,493	<b>Ethers</b>		<b>Hydrocarbons, Aromatic</b>		32066	429,457,469,481	31088	460
30467	436,466,493	30617	429,466	30001	472	32067	429,457,469,481	31089	460
				30035	454	32068	429,457,469,481	31208	478
<b>Amphetamines &amp; Metabolites</b>		<b>Ethers, Alcohol</b>		30051	459,464,489	32069	429,457,469,481	31209	478
34020	429,508	30626	466	30095	489,497	32070	429,457,469,481	31209	478
34021	436,508	30627	433,466	30488	459,464,489	32299	457,469,481	31494	476
		30628	434,466	30496	493	32409	429,457,469,481	31618	469
<b>Barbiturates</b>		30629	429,466	30213	459,464,489	32410	429,457,469,481	31694	450
34028	429,508	30631	429,466	30222	459	32456	457,469,481	31695	450
34029	429,508			<b>Hydrocarbons, Halogenated</b>				31697	450
34030	430,508	<b>Ethers-Haloethers</b>		30010	473,474	<b>PCB Congeners</b>		<b>Phenylurea</b>	
34031	430,508	30456	473	30020	456	32283	440,482	32433	451
34032	430,508	30475	465	30042	444,448,459,464,466,473	32284	439,482	<b>Semivolatiles</b>	
34033	435,508	31034	455	31035	455	32285	438,482	31625	468
34034	436,508	<b>Explosives</b>		<b>Hydrocarbons, Halogenated Polyaromatic</b>		32286	435,482	31806	468
34035	436,508	31450	471	31842	432,470	32287	435,482	31829	456
34036	438,508	31451	471	<b>Isocyanates</b>		32288	435,482	31850	468
34037	438,508	31607	461	33000	439,500	32289	432,446,479,482	31862	478
34038	439,508	31608	461	33001	439,500	32290	485		
34039	439,508	31690	429,461,471,507	33002	435,500	32293	438,482	<b>Solvents, OVI</b>	
34040	439,508	33204	471	33003	436,500	32294	482,485	36274	510
34041	439,508	33205	433,461,471,507	<b>Ketones-Aldehydes</b>		32416	461	36275	510
34058	435,508	33900	451	30006	464,466,473,474	32420	449		
		33901	433,451	30602	448	<b>Pesticides, Nitrogen/Phosphorus</b>			
<b>Benzidines</b>		33902	437,451	31808	470	32423	445,449	<b>Solvents, Residual</b>	
31030	454,467,469,477	33903	437,451	31833	431	33012	445,446,447,448,449	36271	509
31688	467,477	33904	440,451	31837	435,470	<b>Pesticides, Organochlorine</b>		36272	509
31834	454,467,469,476,477	33905	471	<b>Methadone &amp; Metabolites</b>		32454	479	36273	509
31835	433,477,478	<b>Glycols</b>		34005	436,508	32455	517	<b>Triazines</b>	
31852	467,477	30471	464,493,495	<b>Nitroaromatics</b>		33011	449	32445	432,485
		<b>Herbicides, Chlorinated Acids</b>		31033	455	<b>Pesticides, Organohalide</b>		32446	432,485
<b>Benzodiazepines</b>		32054	446,455,463	<b>Nitrosamines</b>		31012	477	32447	439,485
34042	429,508	32055	446,455,463	31032	454	32003	481	32448	438,485
34043	430,508	32056	432,447,453,455,463,470	31898	447	32004	481	32449	438,485
34044	431,508	32057	432,447,453,455,463	33009	450	32013	458	33007	450
34045	431,508	32058	455,463	33910	437,447	32022	454	<b>Volatiles</b>	
34046	431,508	32059	455,463	33911	437,447	32024	445	30431	444
34047	432,508	32061	447,463	<b>Opiates &amp; Metabolites</b>		32033	480	30432	444
34049	435,508	32062	447,463	34000	431,508	32034	480	30438	473
34050	435,508	32443	447,463	34002	435,508	32040	480	30475	465
34051	436,508	32444	447	34006	437,508	32094	446	30492	474
34053	437,508	<b>Herbicides, Paraquat/Diquat</b>		34007	437,508	32095	446	30497	456
34054	437,508	32437	452	34063	435,508	32096	446	30601	448
34055	438,508	<b>Herbicides, Phenoxyacid</b>		34065	437,508	32291	460,480	30603	443,444,445,446,447
34056	439,508	31868	484	<b>Organometallic/Organotin</b>		32292	460,480	<b>Other Exempted Drugs</b>	
34057	440,508	32014	458	31472	482	32297	480	34003	436,508
		32054	446,455,463	31473	482	32298	480	34004	436,508
<b>Cannabinoid &amp; Metabolites</b>		32055	446,455,463	31474	439,482	32415	449,460,468,480	34008	432,508
34010	431,508	32058	455,463	31475	439,482	32417	446,454,479	34009	439,508
34011	431,508	32059	455,463	31476	440,482	<b>Pesticides, Organophosphorus</b>		34022	430,508
		32429	453,470	31477	440,482	31623	469	34023	434,508
<b>Carbamates</b>		32430	453,470	31478	440,482	32277	462	34024	438,508
32273	451	32431	453,470	<b>Oxazoladines</b>		32278	462	34025	438,508
32435	451	<b>Hydrocarbons</b>		33004	435,500	32418	485	34026	438,508
		30604	494	<b>Oxygenates</b>		32419	468	34027	438,508
<b>Chlorinated Disinfection Biproducts</b>		30605	494	30619	448	32423	445,449	34059	436,508
30609	431,452	31064	497			32426	435,452	34060	437,508
30615	452	31214	492,495,496	<b>Organometallic/Organotin</b>		32427	435,452	34062	438,508
30616	452	31222	499	31472	482	32428	429,452	34064	436,508
		31266	492,493	31473	482	32436	437	34066	431,508
<b>Chlorinated Pesticides/Herbicides</b>		31459	494	31474	439,482	33008	450		
32438	452			31475	439,482	33013	445,446,447,448,449		
		<b>Hydrocarbons</b>		31476	440,482				
<b>Cocaine &amp; Metabolites</b>		30604	494	31477	440,482				
34015	431,508	30605	494	31478	440,482				
34016	430,508	31064	497	<b>Oxazoladines</b>					
34017	434,508	31214	492,495,496	33004	435,500				
34018	434,508	31222	499	<b>Oxygenates</b>					
		31266	492,493	30619	448				
		31459	494						

# 12 CRITICAL STEPS

in reference materials production that separate Restek from the rest!

## 1. Review Method Requirements

We carefully review the method to determine compound requirements and stock concentrations needed to produce working solutions. We confirm the required purity of raw materials and documentation needed to meet method compliance are important aspects of this review.

## 2. Verify Compatibility and Stability

We review chemical compatibility with a goal of long-term stability. We specify raw material purity and mixture composition, and test experimental batches.

## 3. Thoroughly Characterize Raw Materials

We perform chromatographic analyses on each solvent and mixture component to confirm identity and determine purity. For selected compounds, purity is confirmed by using nonchromatographic techniques to detect water, residual catalysts or surfactants, or inorganic contaminants not detected by chromatographic techniques.

## 4. Calibrate Balances

Calibration of all analytical balances is verified at seven mass levels each day, using NIST-traceable weights. Balances are serviced and certified by an outside organization, using NIST weights.

## 5. Deactivate Glassware and Ampuls

Weight/volume mixtures are prepared in ASTM Class A volumetric flasks, using Class A pipettes. Glassware, ampuls, and vials used in product preparation and packaging are deactivated for selected products to prevent loss of target analytes through adsorption to glass surfaces.

## 6. Prepare Two Independent Lots

Two independent preparers, using two independently calibrated analytical balances, prepare two lots of a mixture. Details of preparation are annotated on the certificate.

## 7. Assay to Assure Quality

Ampuls from each new lot are analyzed and data are compared to previous lots. Consistent relative response factors for difficult mixtures demonstrate that our production processes are accurate, consistent, reliable, and well controlled.

## 8. Assign Real-Time Expiration Dates

Expiration dates are assigned to a lot of material based on real-time expiration studies. We retain sample ampuls from each lot of material, and compare data from the earlier lots against data from the newest lot. For new formulations, we make these comparisons every 6 months for 2 years. We continue this study until we determine the shelf life of the product.

## 9. Use Customer-Friendly Product Packaging

Restek ampuls are packaged so you can see the contents. We include an ampul breaker, a deactivated screw-top vial to store unused solution, an extra product label to attach to the vial or your lab notebook, and a hazard card summarizing special precautions.

## 10. Prepare Documentation

Our data packs contain every record, from raw material identity verification and purity data through final testing. Free data packs for our catalog mixtures are available on our website at [www.restek.com/datapacks](http://www.restek.com/datapacks). A certificate and an MSDS are included for all mixtures.

## 11. Comply with ISO 9001:2000 Registration

You can have complete confidence in our documented procedures, and in the accurate, reproducible reference materials we produce.

## 12. Offer a Custom Reference Materials Program

Contact us with your special requirements, and join the thousands of chromatographers worldwide who use Restek custom mixtures. A form for ordering custom materials is on page 427 of this catalog—or at [www.restek.com/solutions](http://www.restek.com/solutions).





## Custom Standards

Restek is your #1 source for custom analytical reference materials!

- **Made to your exact specifications.**
- **Quick quotations.**
- **Most orders shipped within 5–10 working days.**

Call our reference materials department, use the form on **page 427**, or contact your Restek representative for more information.