



## Tecan AC Extraction Plate™ for sample preparation

Ensuring reproducible extraction performance via routine Quality Control

### The Tecan AC Extraction Plate

Prior to the analysis of biological samples (like blood, serum or plasma) by specific analytical detection systems like e.g. LC-MS/MS, an effective clean-up step is generally necessary to remove proteins, phospholipids, carbohydrates or salts. Tecan's innovative AC Extraction Plate featuring wells with a proprietary coating can efficiently extract small molecule analytes from such samples. The extraction process is a particularly convenient process, simply consisting of "pipette and shake" steps and can thus be automated with an automated liquid handling platform. The AC Extraction Plate simplifies and accelerates the entire sample preparation process for downstream quantitative analysis, as it does not require filtration, centrifugation and solvent evaporation steps.

### Workflow

The AC Extraction Plate is a 96-deepwell microtiter plate containing wells with a proprietary immobilized coating. Each well can be used as an extraction vessel for one matrix sample. A general sample extraction workflow with the AC Extraction Plate is described below and depicted graphically in Figure 1.

A sample aliquot is dispensed into a well of the AC Extraction Plate, followed by addition of modifier and internal standard. Shaking results in diffusion of the analyte into the coating of the well. The supernatant containing the matrix constituents such as proteins, salts and phospholipids is discarded. After a wash step the analyte is eluted and transferred to a sample vial for injection into a detection device.

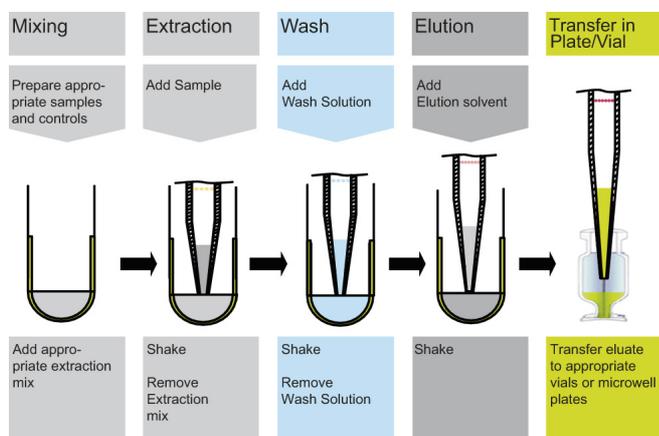


Figure 1 Typical sample preparation workflow using the AC Extraction Plate.

In order to ensure reproducible extraction performance of the AC Extraction Plate, each lot is subjected to several quality control investigations following production. These quality control measures include testing the extraction properties with three different reference small molecule analytes. Naproxen and Ibuprofen are both nonsteroidal anti-inflammatory drugs (NSAID), whereas Triphenylamine is an organic compound used in organic light-emitting diodes (OLEDs) as hole-transporters. These selected analytes represent the broad range of AC Extraction plate usage, with LogP values for Naproxen, Ibuprofen and Triphenylamine of 2.8, 3.8 and 5.3, respectively.

The data obtained for each lot is available to the customer via the Certificate of Analysis (CoA) which is included with each plate.

## Experimental

The analytes are first dissolved in an appropriate water / MeOH mixture at a defined concentration and the absorbance at an analyte specific wavelength is measured using a Tecan Infinite 200 PRO Reader. In a second step, 200 µl of analyte solution is added to a well of the AC Extraction Plate. After 10 minutes of shaking the remaining supernatant in the well is removed and the absorbance of the supernatant liquid measured at the specific wavelength.

## Results & Discussion

### Analysis of extraction performance

OD values of the analyte solution before and after extraction are determined by UV-spectroscopy as described above and used to calculate the partition ratio (LogK). The partition ratio is a coefficient reflecting the different solubility of an analyte between two phases. More information about the partition ratio can be found in the white paper, describing more details about the AC Extraction Plate [1].

The results of four AC Extraction Plate lots are summarized in Table 1. Every analyte was tested in eight different wells per plate.

As can be seen from Table 1, the results on the different plate lots show low variability, demonstrating that the performance from lot-to-lot is consistent and reproducible, with CV values < 5%.

Plate Lot Nr.	LogK Naproxen	CV %	LogK Ibuprofen	CV%	LogK Triphenyl- amine	CV%
2012120301	1.56	0.4	1.50	0.7	1.65	0.4
2012120401	1.52	1.9	1.44	3.5	1.59	1.7
2012120501	1.53	0.7	1.44	1.4	1.64	0.6
2013012301	1.54	2.8	1.59	4.5	1.69	2.0

Table 1 Average LogK and CV values for three analytes measured on four AC Extraction Plate lots.



Figure 2 Infinite® 200 Pro reader used for quality control of the AC Extraction Plate.

## Conclusion

In this technical note part of Tecan's quality control procedures for ensuring reproducible plate lot to plate lot performance have been described for four different lots. The results show that the AC Extraction Plate delivers very reproducible extraction performance with low CV values, indicating a stable production process and reproducible performance of the plate. Consequently, the Tecan AC Extraction Plate can be considered as a valuable sample preparation tool for analyses by specific analytical detection systems like e.g. LC-MS/MS.

## References

1. White paper – Technical background to the Tecan AC Extraction Plate – available on: [www.tecan.com/consumables](http://www.tecan.com/consumables)

---

**Australia** +61 3 9647 4111 **Austria** +43 62 46 89 33 **Belgium** +32 15 42 13 19 **China** +86 21 2206 3206 **Denmark** +45 70 23 44 50 **France** +33 4 72 76 04 80  
**Germany** +49 79 51 94 170 **Italy** +39 02 92 44 790 **Japan** +81 44 556 73 11 **Netherlands** +31 18 34 48 174 **Singapore** +65 644 41 886 **Spain** +34 93 490 01 74  
**Sweden** +46 31 75 44 000 **Switzerland** +41 44 922 89 22 **UK** +44 118 9300 300 **USA** +1 919 361 5200 **Other countries** +41 44 922 8125

---

For research use only - not for clinical diagnostics.

Tecan Group Ltd. makes every effort to include accurate and up-to-date information within this publication; however, it is possible that omissions or errors might have occurred. Tecan Group Ltd. cannot, therefore, make any representations or warranties, expressed or implied, as to the accuracy or completeness of the information provided in this publication. Changes in this publication can be made at any time without notice. For technical details and detailed procedures of the specifications provided in this document please contact your Tecan representative. This publication may contain reference to applications and products which are not available in all markets. Please check with your local sales representative.

All mentioned trademarks are protected by law. In general, the trademarks and designs referenced herein are trademarks, or registered trademarks, of Tecan Group Ltd., Männedorf, Switzerland. A complete list may be found at [www.tecan.com/trademarks](http://www.tecan.com/trademarks). Product names and company names that are not contained in the list but are noted herein may be the trademarks of their respective owners.

© 2013, Tecan Trading AG, Switzerland, all rights reserved. For disclaimer and trademarks please visit [www.tecan.com](http://www.tecan.com)

[www.tecan.com](http://www.tecan.com)