A&D WEIGHING

Laboratory Instruments 2013

Balances

Pipette Management

Moisture Analyzers

Viscometers

www.andweighing.com

A&D
A&D Weighing
...Clearly a Better Value

Contents

Overview

On the following pages you will find an overview of the laboratory measurement and analysis instruments from A&D Weighing.

The products are divided into four categories:

- Balances
- Moisture Analyzers
- Pipette Test
- Viscometers

In each category, products with different features range from basic to sophisticated capabilities to match any application, need and budget.

About A&D Weighing

Founded in 1977 and inspired by innovations in Analog to Digital conversion, A&D is a global leader in advanced measurement instruments. A&D Weighing serves the Americas from our Silicon Valley headquarters in San Jose, CA, an area that is also home to many leading biotech firms. We are a trusted name in many markets including:

- Research
- Industrial Production
- Food Processing
- Jewelry

Quality and Corporate Responsibility

A&D adheres to ISO:9001-2008 and all the products found in this catalog are designed and manufactured in our own facilities in Japan and South Korea.

Warranty & Support

All balances in this catalog are backed by the best warranty in the industry- 5 years.

To Learn More

Details on each product family, including videos are found on our website:

www.andweighing.com

Contact us or your local A&D Weighing distribution partner who can also assist you with:

- After-sales service
- In-place calibration
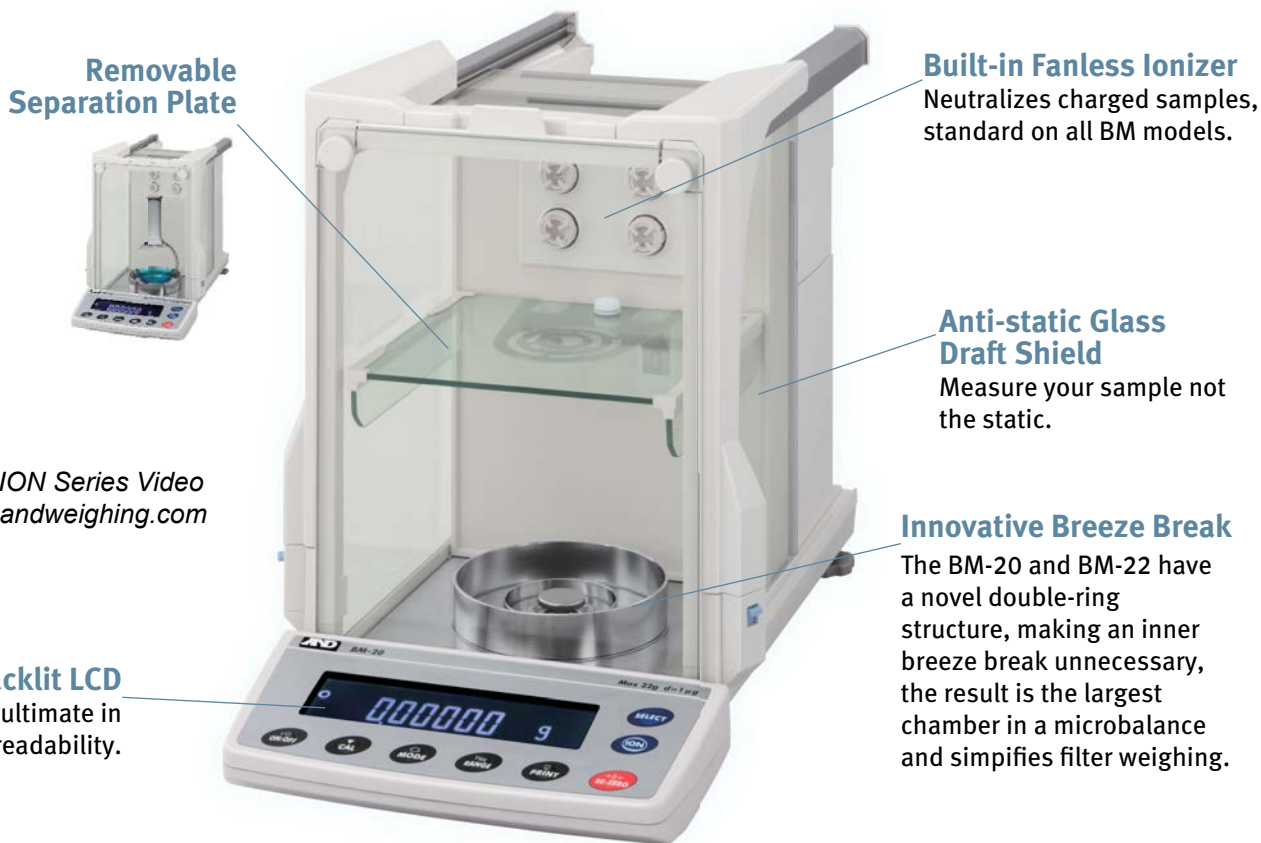
Ion Series
Microbalances and Analytical Balances

All Ion Series balances include a built-in ionizer to defeat static.
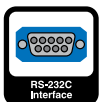
Microgram Measurements Made Simpler

The BM-20 and BM-22 microbalances have the features and standard accessories to simplify microgram measurements. Now microgram (µg) measurements are accessible to all researchers, even on a limited budget.

Better Analytical Balances

The other models of the Ion Series, including the BM-500 with its 520g x 0.1mg range, also have large weighing chambers with removable shelf which offers practical convenience.

Removable Separation Plate

Built-in Fanless Ionizer
Neutralizes charged samples, standard on all BM models.

Anti-static Glass Draft Shield
Measure your sample not the static.

See the ION Series Video at: www.andweighing.com

Innovative Breeze Break
The BM-20 and BM-22 have a novel double-ring structure, making an inner breeze break unnecessary, the result is the largest chamber in a microbalance and simpifies filter weighing.

Reverse Backlit LCD
The ultimate in readability.

| 5 YEAR WARRANTY | RS-232C Interface | Underhook | Internal Calibration | Software | GLP Compliant |

Model	Capacity	Resolution	Pan Size
BM-20	22 g	0.001 mg	25 mm (50 mm, 95 mm filter weighing pans)
BM-22	5.1 g	0.001 mg	
	22 g	0.01 mg	
BM-252	250 g	0.01 mg	90 mm
BM-200	220 g	0.1 mg	
BM-300	320 g	0.1 mg	
BM-500	520 g	0.1 mg	

Phoenix (GH) Series

Phoenix Series balances with internal calibration feature high-quality design and performance. These balances provide analytical resolution, are easy to use and calibrate, and adjust their settings in response to environmental changes.

- **Internal Calibration**
- **Balance ID Number**
- **Data Memory Function**
- **Auto "Power On" Function**
- **Underhook Capability**
- **5 Year Warranty**
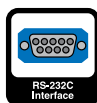
Gemini (GR) Series

Gemini Series balances offer a large weighing chamber yet occupy little space in comparison to conventional balances with rear-mounted motors. These analytical balances are easy to use and calibrate and they adjust their settings based on environmental changes.

- **Internal Calibration**
- **Balance ID Number**
- **Data Memory Function**
- **Auto "Power On" Function**
- **5 Year Warranty**
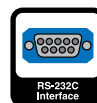
0.01 / 0.1mg Resolution		
Capacity (g)	Model	Pan Diameter
42 / 210	GR-202	85 mm
51 / 220	HR-202i	90 mm
51 / 220	GH-202	90 mm
101 / 250	GH-252	90 mm

|		
Capacity (g)	Model	Pan Diameter
60	HR-60	85 mm
60	HR-60-C	85 mm
102	HR-100A	90 mm
102	HR-100AZ	90 mm
120	GR-120	85 mm
120	HR-120	85 mm
120	HR-120-C	85 mm
120	GH-120	90 mm

Balances

Galaxy (HR-A) Series

New for 2013, the HR-A Series are entry-level Compact Analytical Balances with a shatterproof, anti-static draft shield. The rotary doors also give Galaxy balances the smallest footprint ever in an A&D analytical (0.1mg) balance.

- **Compact Size**
- **Internal Calibration (HR-AZ Models)**
- **Shatterproof anti-static draft shield with rotary doors**
- **Auto "Power On" Function**
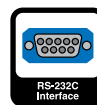- **5 Year Warranty**

See the Galaxy Series Video at: www.andweighing.com
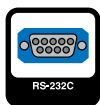
Orion (HR) Series

The Orion Series is A&D's classic balance and can be found in hundreds of laboratories worldwide. Easy to use, durable and flexible, this family offers solid reliability.

- •**Data Memory Function**
- •**Auto "Power On" Function**
- •**5 Year Warranty**

0.1mg Resolution					
Capacity (g)	Model	Pan Diameter	Capacity (g)	Model	Pan Diameter
152	HR-150A	90 mm	310	GR-300	85 mm
152	HR-150AZ	90 mm	320	HR-300i	90 mm
210	GR-200	85 mm	320	GH-300	90 mm
210	HR-200	85 mm			
210	HR-200-C	85 mm			
220	GH-200	85 mm			
252	HR-250A	90 mm			
252	HR-250AZ	90 mm			

MC Series

The MC Series is A&D's most capable high precision balance. An extended resolution version of the GX, it is equipped with enhanced functions and options so it can be used as a mass comparator as well. The extended resolution enables measurement of minute weight changes of heavy objects and small variations in the presence of heavy tare containers.

- **Manage ASTM & OIML Weights**
- **Auto-centering Pan Options**
- **Automatic Internal Calibration**
- **Balance ID Number**
- **Time and Date Function**
- **Underhook Capability**
- **Density mode**
- **Comparator function**
- **Counting mode**
- **% mode**

Software | Underhook | GLP Compliant | RS-232C Interface

GX Series

The GX Series adds internal calibration to the GF. Our patented Super Hybrid Sensor (SHS) technology improves response speed and minimizes maintenance costs. SHS combines the best of magnetic force restoration and single point load sensing technologies.

- **Automatic Internal Calibration**
- **Time and Date Function**
- **Balance ID Number**
- **Quick Reference Card attached**
- **Underhook Capability**
- **Density mode**
- **Comparator function**
- **Counting mode**
- **% mode**

Underhook | Software | GLP Compliant | RS-232C Interface

GF Series

Fast measurements and high precision make the GF ideal for bench-top and automated use. With its performance, robust design and minimum maintenance cost, the GF also finds use in OEM and automated systems. The GF Series offers larger pan sizes and higher capacities beyond the FX-i Series.

- **Balance ID Number**
- **Quick Reference Card attached**
- **Underhook Capability**
- **Density mode**
- **Comparator function**
- **Counting mode**
- **% mode**

Software | Underhook | GLP Compliant | RS-232C Interface

0.0001g Resolution

Capacity (g)	Model	Pan Size
1100	MC-1000	5 x 5 in.

Units of Measure

All models : g, mg, oz, troy oz, ct, dwt, GN, mom, t, TL.

Select models also have above plus: kg, lb, lb-oz.

5 YEAR WARRANTY — A&D Weighing

All Precision Balances are covered with a 5 Year Warranty

0.001g Resolution

Capacity (g)	Model	Pan Size	Capacity (g)	Model	Pan Size
120	FZ-120i	Ø5.1 in.	*320*	*FX-300iWP*	*Ø5.1 in.*
120	*FZ-120iWP*	*Ø5.1 in.*	410	GF-400	5 x 5 in.
120	FX-120i	Ø5.1 in.	410	GX-400	5 x 5 in.
120	*FX-120iWP*	*Ø5.1 in.*	520	FZ-500i	Ø5.1 in.
210	GF-200	5 x 5 in.	520	FX-500i	Ø5.1 in.
210	GX-200	5 x 5 in.	610	GF-600	5 x 5 in.
220	FZ-200i	Ø5.1 in.	610	GX-600	5 x 5 in.
220	*FZ-200iWP*	*Ø5.1 in.*	800	GF-800	5 x 5 in.
220	FX-200i	Ø5.1 in.	800	GX-800	5 x 5 in.
220	*FX-200iWP*	*Ø5.1 in.*	1000	GF-1000	5 x 5 in.
310	GF-300	5 x 5 in.	1000	GX-1000	5 x 5 in.
320	FZ-300i	Ø5.1 in.	6100	MC-6100	6.5 x 6.5 in.
320	*FZ-300iWP*	*Ø5.1 in.*	10100	MC-10K	10.6 x 8.2 in.
320	FX-300i	Ø5.1 in.			

Balances

FZ-i Series

The FZ-i Series adds internal calibration to the functionality of the FX-i Series. Both the FZ-i and FX-i take advantage of the Compact Super-Hybrid Sensor (SHS) to provide quick (one second) readings with high precision. The Statistical Calculation Function (SCF) provides statistical data display or output of weighed samples.

- Internal Calibration
- RS-232C Standard
- USB option
- SCF-Statistical Calculation Function
- Comparator Function
- GLP/GMP/GCP/ISO Compliant

Quick USB | Statistical Calculation | Comparator Function

FX-i Series

Functionality and performance of the FZ-i Series but with external calibration only. As such, seven models of the FX-i are also available in Legal-for-Trade versions.

- RS-232C standard
- USB option
- SCF-Statistical Calculation Function
- Comparator Function
- GLP/GMP/GCP/ISO Compliant

Quick USB | Statistical Calculation | Comparator Function

Waterproof FX-i / FZ-i

A&D applied its expertise in the design of waterproof scales to develop the world's first IP-65 rated 1 mg balance. Think of the FX-iWP and The FZ-iWP as "accident-proof" balances at home in environments that would render other balances inoperable.

Waterproof models in blue in table below

- Waterproof versions of the FX-i & FZ-i
- Internal Calibration (FZ-iWP models)
- IP65 rated dustproof and waterproof
- RS-232C standard
- GLP/GMP/GCP/ISO Compliant

External Calibration | Statistical Calculation | IP65

0.01g Resolution					
Capacity (g)	Model	Pan Size	Capacity (g)	Model	Pan Size
1210	GF-1200	6.5 x 6.5 in.	3200	FX-3000i	Ø5.9 in.
1220	FZ-1200i	Ø5.9 in.	*3200*	*FX-3000iWP*	*Ø5.9 in.*
1220	*FZ-1200iWP*	*Ø5.9 in.*	4100	GF-4000	6.5 x 6.5 in.
1220	FX-1200i	Ø5.9 in.	4100	GX-4000	6.5 x 6.5 in.
1220	*FX-1200iWP*	*Ø5.9 in.*	5200	FZ-5000i	Ø5.9 in.
2100	GF-2000	6.5 x 6.5 in.	5200	FX-5000i	Ø5.9 in.
2100	GX-2000	6.5 x 6.5 in.	6100	GF-6100	6.5 x 6.5 in.
2200	FZ-2000i	Ø5.9 in.	6100	GX-6100	6.5 x 6.5 in.
2200	*FZ-2000iWP*	*Ø5.9 in.*	6100	GF-6000	6.5 x 6.5 in.
2200	FX-2000i	Ø5.9 in.	6100	GX-6000	6.5 x 6.5 in.
2200	*FX-2000iWP*	*Ø5.9 in.*	8100	GF-8000	6.5 x 6.5 in.
3100	GF-3000	6.5 x 6.5 in.	8100	GX-8000	6.5 x 6.5 in.
3200	FZ-3000i	Ø5.9 in.	31000	MC-30K	10.6 x 8.2 in.
3200	*FZ-3000iWP*	*Ø5.9 in.*			

12 additional models available for Legal-for-Trade requirements. Consult website.

Compact Balances

Everest (EK-i) Series

EK-i compact balances provide a wide selection of capacities and resolutions. Versatile features include full digital calibration and a large LCD, back-lit display. Its small footprint, optional carrying case and rechargeable NiCd battery make it convenient and portable.

- **RS-232C Standard**
- **Counting function**
- **Auto Power Off Function**
- **Rechargeable NiCd battery option**
- **Comparator function**
- **Underhook Capability**
- **Durable metal case**

5 YEAR WARRANTY
A&D Weighing

| LCD Backlight | RS-232C Interface | Comparator Function | Rechargeable Battery | Percentage Function | GLP Compliant |

Newton (EJ) Series

EJ Series "Newton" are entry-level precision compact balances and offer features for a diverse variety of weighing applications. The Newton provides the performance that users have come to expect from A&D at a value price point.

- **RS-232C interface optional**
- **USB interface option**
- **Battery or AC operation**
- **Check-Weighing function**
- **Underhook Capability**

5 YEAR WARRANTY
A&D Weighing

| LCD Backlight | Quick USB | Normal Battery | Percentage Function | GLP Compliant |

0.01g Resolution			0.1g Resolution			1g Resolution		
Capacity (g)	Model	Pan Size (Inches)	Capacity (g)	Model	Pan Size (Inches)	Capacity (g)	Model	Pan Size (Inches)
120	EJ-120	Ø4.3	600	EK-600i	5.2 x 6.7	6000	EK-6000i	5.2 x 6.7
120	EK-120i	Ø4.3	1200	EK-1200i	5.2 x 6.7	12kg	EK-12Ki	5.2 x 6.7
210	EJ-200	Ø4.3	1500	EJ-1500	5 x 5.5			
200	EK-200i	Ø4.3	2100	EJ-2000	5 x 5.5			
310	EJ-300	Ø4.3	2000	EK-2000i	5.2 x 6.7			
300	EK-300i	Ø4.3	3100	EJ-3000	5 x 5.5			
410	EJ-410	Ø4.3	3000	EK-3000i	5.2 x 6.7			
400	EK-410i	Ø4.3	4100	EJ-4100	5 x 5.5			
610	EJ-610	Ø4.3	4000	EK-4100i	5.2 x 6.7			
600	EK-610i	Ø4.3	6100	EJ-6100	5 x 5.5			
			6000	EK-6100i	5.2 x 6.7			

4 models of the EK-i are also Legal-for-Trade (NTEP / Measurement Canada certified). Consult website.

Moisture Analyzers
MS / MX / MF / ML Series

WinCT-Moisture software offers real-time graphical data display and determines the optimum heating temperature for samples. Included with MS/MX models.

RsTemp function tracks % moisture and drying rate vs. time.

- **Fast, uniform heating with halogen lamp up to 200°C in 4 heating modes:**

    - **Standard**
    - **Quick**
    - **Step**
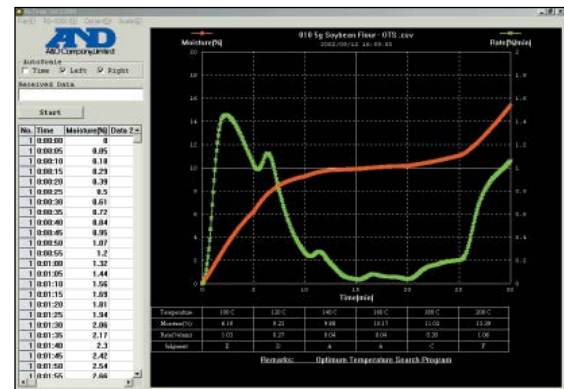   - **Ramp**

- **5 measurement programs:**

    - **Standard**
    - **Quick**
    - **Automatic**
    - **Timer**
    - **Manual**

- **Standard RS-232C**

- **GMP / GCP / ISO / Date & Time**

See the Moisture Video at: www.andweighing.com
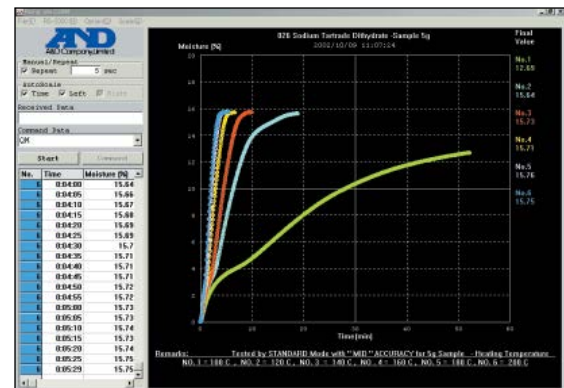
RsFig measuring the Sodium Tartrate standard provided with all analyzers. Graph demonstrates excellent repeatability as moisture values converge when tested at different temperatures.

Model	Max Sample Capacity	Resolution	Moisture Resolution	Accuracy	Drying Temperature
MS-70	71g	0.0001g	0.001%	0.01%	30 - 200°C
MX-50	51g	0.001g	0.01%	0.02%	50 - 200°C
MF-50	51g	0.002g	0.05%	0.05%	50 - 200°C
ML-50	51g	0.005g	0.1%	0.1%	50 - 200°C

Note: WinCT-Moisture standard for MS, MX. Option for MF.

Viscometers

A&D Viscometers use a highly sensitive tuning-fork vibration technique. A pair of thin sensor plates are driven in the sample liquid, which can be as little as 2 ml. This innovative vibration viscometer approach is suitable for measuring Newtonian fluids and has already been accredited by the National Institute of Technology & Evaluation of Japan along with the capillary and rotational viscometer techniques.

Common characteristics of A&D viscometers:

✓ Simple operation
✓ Wide measurement range
✓ 1% repeatability over full scale

✓ 15 second initial measurement time
✓ Real-time display.

SV10/100 Series

SV1A/10A/100A Series

- 2 ml sample (SV-1A)
- 10 ml sample (SV-10A/100A)
- Water jacket included
- Measure as low as 0.3 cP
- RS-232C standard
- 2 Year Warranty

- Measure as low as 0.3 cP
- RS-232C standard
- 2 Year Warranty

Model	Viscosity Measurement Range
SV-10	0.3 cP - 10,000 cP
SV-100	1,000 cP - 100,000 cP (10 P - 1,000 P)

Model	Viscosity Measurement Range
SV-1A	0.8 cP - 1000 cP
SV-10A	0.3 cP - 10,000 cP
SV-100A	1,000 cP - 100,000 cP (10 P - 1,000 P)

Pipette Management

A&D pipette testers comply with ISO 8655 and support techniques based on the gravimetric method. These products are the basis for our 2-step approach to verify pipette integrity and accuracy:

AD-1690   ## AD-4212A-PT   ## FX-300i-PT

1. **Leak test.** Most failures are due to damaged seals, O-rings, pistons or tip-holders. The AD-1690 tests by creating and measuring a vacuum. No contaminants or dust enters the pipette because air is evacuated from the pipette.

- Tests in 5 seconds
- Replaceable air filter
- 4 attachments for tips from 1 µL to 10 ml

2. **Volume measurement.** Three dedicated pipette accuracy testers and the BM-14 Pipette Accuracy Kit are available, all with WinCT-Pipette software to speed data collection and management.

- Evaporation trap and thermometer ensure precise measurements.
- Calibration weight and tweezers included.
- Packed in a convenient carrying case.

5 YEAR WARRANTY — A&D Weighing

Model	Capacity	Resolution
AD-4212B-PT	110g / 31g / 5.1g	0.1mg / 0.01mg / 0.001mg
AD-4212A-PT	110g	0.1mg
FX-300i-PT	320g	1mg
BM-14	See page 3.	0.001mg
AD-1690	-20 kPa ±20% (Fixed)	+0.2 kPa / 10 seconds

Pipette Accuracy Tester Specifications in accordance with ISO 8655

Pipette Volume	ISO8655 Requirements				Minimum Weighing Value
	Permissible Error				
	Accuracy		Repeatability		
(µL)	±%	±µ	%	µL	mg
1	5.0	0.05	5.0	0.05	0.001
2	4.0	0.08	2.0	0.04	
5	2.5	0.125	1.5	0.075	
10	1.2	0.12	0.8	0.08	
20	1.0	0.2	0.5	0.1	0.01
50	1.0	0.5	0.4	0.2	
100	0.8	0.8	0.3	0.3	
200	0.8	1.6	0.3	0.6	0.1
500	0.8	4.0	0.3	1.5	
1000	0.8	8.0	0.3	3.0	
2000	0.8	16	0.3	6.0	
5000	0.8	40	0.3	15.0	
10,000	0.6	60	0.3	30.0	
Daily inspection, simplified verification					1.0

→ BM-14
→ AD-4212B-PT
→ AD-4212A-PT
→ FX-300i-PT

# AD-1688
Weighing Data Logger

Another first from A&D, the AD-1688 Weighing Data Logger is IP65-rated (water/dust resistant) and ideal for use in situations where a PC or printer cannot be placed near the balance or when there is a need to collect data from multiple balances in different locations.

Model	Description
AD-1688	Weighing Data logger

WinCT Software

Free to download from the A&D website, WinCT works with any A&D balance which has RS-232. It includes helpful tools such as RsKey, RsCom and RsWeight which allows weighing data to be retrieved from the balance and displayed in real-time. Maximum, minimum, average, standard deviation and coefficient of variation values of data are calculated and displayed.
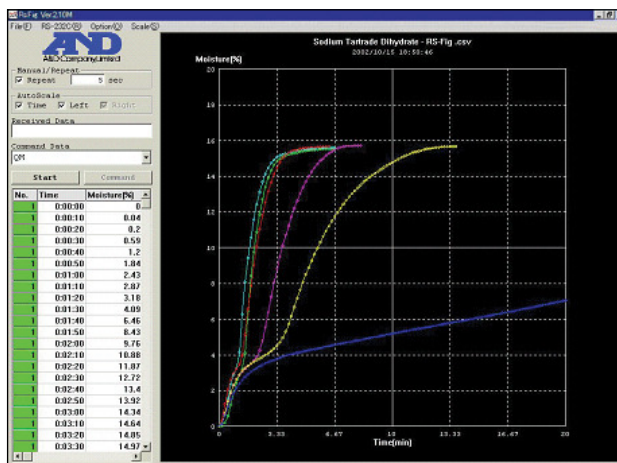
Model	Description	
WinCT	WinCT Software	**Free download on A&D Weighing website**

Looking for more?

Visit **www.andweighing.com** to learn about A&D's family of fifteen Production Weighing Systems with resolutions as low as 0.001 mg for use in glove boxes, fume hoods and automated systems. You'll also find more weighing solutions such as:

- Higher capacity industrial balances
- Benchtop scales
- Washdown scales

Approvals & Certifications

Legal-for-Trade (NTEP / Measurement Canada) versions of many of the balances in this catalog are also available. Visit the website to see why both buyers and sellers worldwide put their trust in A&D balances for such applications as:

- Pharmacy
- Laboratory supplies
- Forensics
- Customs / Border Protection
- Gems and precious metals.

Measurement Canada / **Mesures Canada**
An Agency of Industry Canada / Un organisme d'Industrie Canada