

Acute Phase Response
Cancer
Cardiovascular Disease
Cytokines, Chemokines,
Growth Factors
Diabetes
Gene Expression
Genotyping
Immunoglobulin Isotyping
Signal Transduction
Toxicology

Bio-Plex Pro™ Diabetes Assay Panels

MAGNETIC SEPARATION ENABLED

Adiponectin, Adipsin, C-peptide, Ghrelin, GIP, GLP-1, Glucagon, Insulin, Leptin, PAI-1, Resistin, Visfatin

- Fast time to results
- Convenient kit formats
- Mixable with Bio-Plex Pro cytokine, chemokine, and growth factor assays
- Available in human, non-human primate, mouse, and rat models



Reliable Multiplex Measurement of Diabetes and Obesity Markers

Bio-Plex Pro diabetes assays deliver accurate and reproducible measurements of 12 markers of diabetes and obesity in serum plasma and tissue culture supernatant samples. These magnetic bead-based multiple assays offer best-in-class performance in a single experiment, using as little as 12.5 μ l of sample. These assays have been developed to deliver accurate and reproducible measurements with complete flexibility to meet all your research needs.

- Increased productivity — measure up to 12 diabetes and obesity markers in 3 hours
- Simplified workflow — option to prepare assays with magnetic wash steps
- Flexible ordering options — order a premixed kit or select only desired biomarkers to multiplex
- Broad assay ranges
- Expanded biomarker profile — option to multiplex with Bio-Plex Pro cytokine, chemokine, and growth factor assays
- Tested for robustness in serum and plasma matrices
- Available for multiple species: human, non-human primate, mouse, and rat

Assay Performance Definitions

Assay working range — the range of concentrations within which the assay is precise and accurate. Boundaries of the assay working range are defined by the lower limit of quantitation (LLOQ) and the upper limit of quantitation (ULOQ)

Precision — the coefficient of variation (%CV) at concentrations within the assay working range

Accuracy — ratio of the observed concentration versus the expected concentration of a known amount of spiked analyte within the assay working range

Sensitivity (limit of detection, LOD) — the concentration of analyte for which the fluorescence intensity signal is two standard deviations above the background signal

Benefits of Magnetic Bead-Based Assays

Magnetic bead-based assays allow optional magnetic separation during wash steps by using an automated magnetic bead washer. This innovation greatly simplifies assay processing, eliminating the need for a vacuum manifold. Many users also see significantly improved reproducibility.

BIO-RAD

Table 1. Human assays – representative assay performance.

Targets	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Assay Precision	
	LLOQ	ULOQ	LOD	Intra-assay %CV	Inter-assay %CV
2-Plex Assays					
Adiponectin*	160	218,485	32.7	4	2
Adipsin*	43	14,513	17.0	6	4
10-Plex Assays					
C-peptide	22.4	10,031	14.5	5	4
Ghrelin	16.6	8,502	1.2	4	2
GIP	11.2	22,895	0.8	3	4
GLP-1	31.3	16,000	5.3	6	3
Glucagon	15.7	3,500	4.9	5	6
Insulin	1.7	3,541	1.0	3	5
Leptin	11.5	129,107	3.1	3	4
PAI-1	8.8	47,850	2.2	5	4
Resistin	2.3	4,739	1.3	3	4
Visfatin	51.3	280,266	37.1	4	3

The LLOQ, ULOQ, LOD, and inter-assay precision %CV are mean data determined from three independent multiplex assays in a serum-based matrix. Intra-assay %CV is derived from one representative assay. LLOQ and ULOQ are defined as the boundary standard curve points for which the performance specifications of individual standard points were met for 10% intra-assay CV, 15% inter-assay CV, and a recovery range of 80–120%. An exception for GLP-1 showed one point exhibiting 12% intra-assay CV and one standard point of leptin exhibited 17% inter-assay CV. Data were generated using the magnetic workflow with the Bio-Plex Pro II wash station.

* Due to a different dilution scheme, adiponectin and adipsin were assayed as a 2-plex assay.

Table 2. Non-human primate assays – representative assay performance.

Targets	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Assay Precision	
	LLOQ	ULOQ	LOD	Intra-assay %CV	Inter-assay %CV
Singleplex Assay					
Adiponectin*	29	462,305	25	3	13
11-Plex Assays					
Adipsin	12	95,744	8	5	3
C-peptide	7	2,028	2	5	6
Ghrelin	24	24,353	8	6	9
GIP	2	21,920	2	3	4
GLP-1	5	3,658	4	4	3
Glucagon	12	15,840	7	3	3
Insulin	7	7,308	7	6	5
Leptin	12	189,018	6	3	6
PAI-1	4	17,662	1	3	8
Resistin	2	6,298	0.4	2	4
Visfatin	83	680,247	72	3	7

The LLOQ, ULOQ, LOD, and inter-assay precision %CV are the mean data determined from three independent multiplex assays in a serum-based matrix. Intra-assay %CV is derived from one representative assay. LLOQ and ULOQ are defined as the boundary standard curve points for which the performance specifications of individual standard points were met for 10% intra-assay CV, 15% inter-assay CV, and a recovery range of 80–120%. Data were generated using the magnetic workflow with the Bio-Plex Pro II wash station.

* Due to a different dilution scheme, adiponectin was assayed as a single assay.

Table 3. Mouse assays – representative assay performance.

Targets	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Assay Precision	
	LLOQ	ULOQ	LOD	Intra-assay %CV	Inter-assay %CV
Singleplex Assay					
Adiponectin*	38.0	62,043	8.4	4	3
8-Plex Assays					
Ghrelin	3.1	7,296	0.8	5	4
GIP	13.4	14,999	2.3	4	10
GLP-1	3.4	1,969	0.8	6	11
Glucagon	24.0	3,067	7.0	6	6
Insulin	93.4	47,815	22.0	6	4
Leptin	17.1	69,900	6.2	4	3
PAI-1	0.7	2,922	0.5	5	2
Resistin	125.9	257,870	32.0	4	4

The LLOQ, ULOQ, LOD, and inter-assay precision %CV are the mean data determined from three independent multiplex assays in a serum-based matrix. Intra-assay %CV is derived from one representative assay. LLOQ and ULOQ are defined as the boundary standard curve points for which the performance specifications of individual standard points were met for 10% intra-assay CV, 15% inter-assay CV, and a recovery range of 80–120%. Data were generated using the magnetic workflow with the Bio-Plex Pro II wash station.

* Due to a different dilution scheme, adiponectin was assayed as a single assay.

Table 4. Rat assays – representative assay performance.

Targets	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Assay Precision	
	LLOQ	ULOQ	LOD	Intra-assay %CV	Inter-assay %CV
Singleplex Assays					
Ghrelin	1	16,152	0.3	4	4
GLP-1	4	6,062	3	8	6
Glucagon	6	4,443	6	3	4
Leptin	24	130,465	5	4	3
PAI-1	49	66,888	27	5	3

The LLOQ, ULOQ, LOD, and inter-assay precision %CV are the mean data determined from three independent multiplex assays in a serum-based matrix. Intra-assay %CV is derived from one representative assay. LLOQ and ULOQ are defined as the boundary standard curve points for which the performance specifications of individual standard points were met for 10% intra-assay CV, 15% inter-assay CV, and a recovery range of 80–120%. Data were generated using the magnetic workflow with the Bio-Plex Pro II wash station.

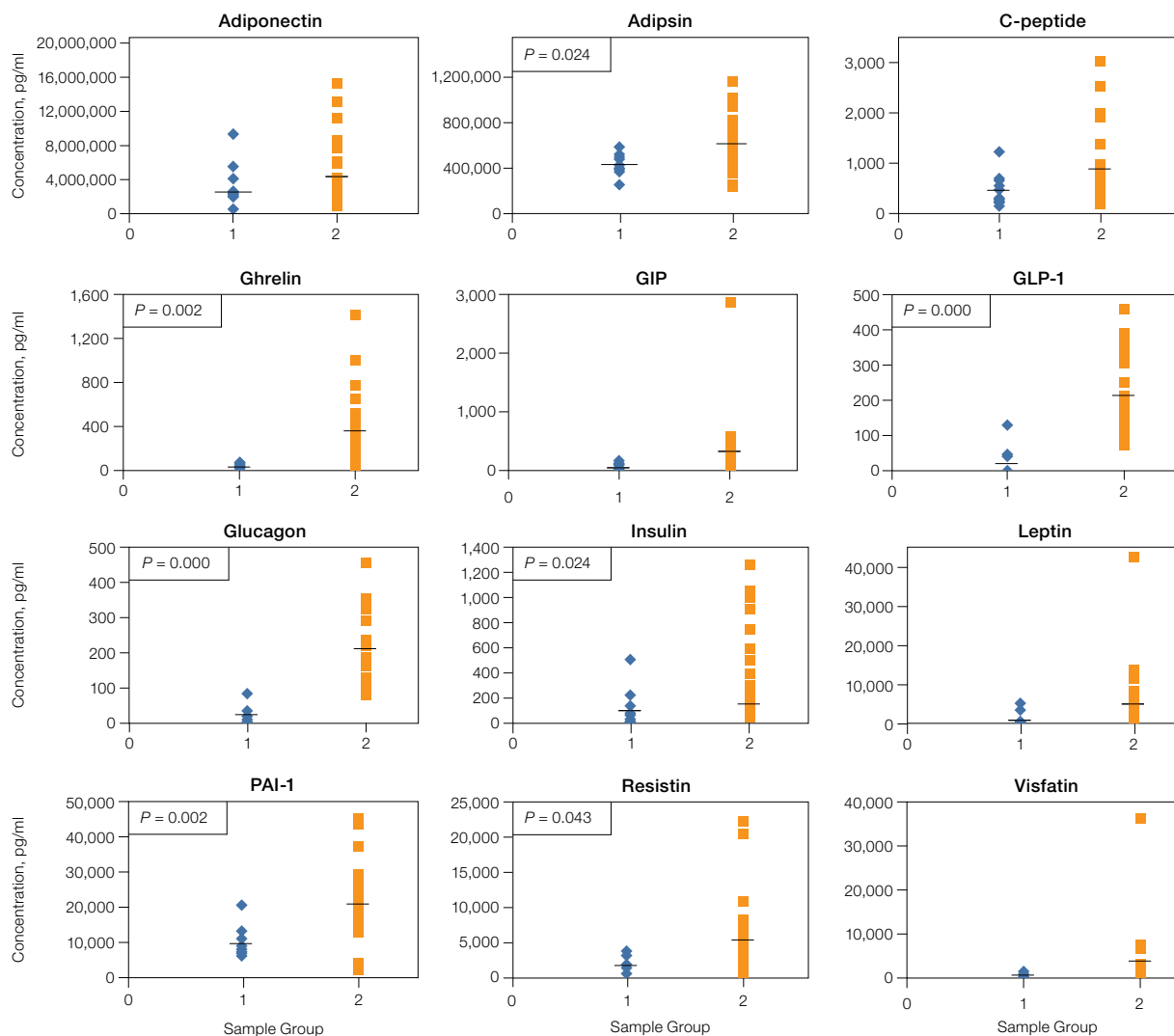


Fig. 1. Levels of biomarkers in human sera of normal (◆) and type II diabetic (■) groups. A Student's *t*-test was used to determine statistical significance between groups. Black lines denote mean values. *P*-values are indicated for markers that were significantly different from normal samples ($P < 0.05$).

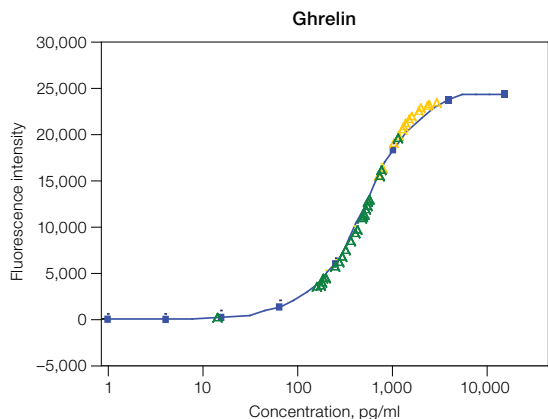


Fig. 2. Mouse assay working ranges. Data were analyzed using Bio-Plex Manager™ software, using the standard curve optimization function. Recovery range specification was set to 80–120%. A total of 39 serum and plasma samples, fasting and fed, from wild-type or diabetic mice, are shown. Standard points (■); diabetes samples (▲); normal samples (△). Result is shown for ghrelin.

Flexible Ordering Options

Bio-Plex Pro diabetes assays are available in multiple convenient configurations to best fit your needs.

Premixed Panels

One kit with everything you need to run an experiment.

Express Kit (You Mix)

Use the online Assay Builder tool to design your kit:

www.bio-rad.com/assaybuilder

The kit will then be shipped to you; mix prior to use.

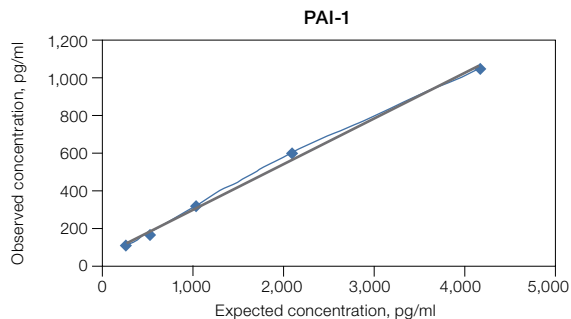


Fig. 3. Rat linearity of dilution. Linearity of analyte measurements in either serum or plasma (threefold) were measured using linear regression analysis. Result is shown for PAI-1 assay diluted in rat serum. R^2 value was 0.99 or higher within the assay working range for all assays in both serum and plasma.

Singleplex Set

Order any combination of singleplex sets then order just one reagent kit and standard to complete your experiment.

Ordering Information

Catalog # Description

Bio-Plex Pro Human Diabetes All-in-One Kits

171-A7001M	Bio-Plex Pro Human Diabetes 10-Plex Assay , 1 x 96-well, includes coupled magnetic beads, detection antibodies, standards, assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, filter plate, sealing tape, standard diluent, sample diluent for the detection of C-peptide, ghrelin, GIP, GLP-1, glucagon, insulin, leptin, PAI-1, resistin, visfatin
171-A7002M	Bio-Plex Pro Human Diabetes Adipsin and Adiponectin Assays , 1 x 96-well, includes coupled magnetic beads, detection antibodies, standards, assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, filter plate, sealing tape, serum-based diluent for the detection of adiponectin and adipsin
171-A7003M	Bio-Plex Pro Human Diabetes Adiponectin Assay , 1 x 96-well, includes coupled magnetic beads, detection antibodies, standards, assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, filter plate, sealing tape, serum-based diluent for the detection of adiponectin
171-A7004M	Bio-Plex Pro Human Diabetes Adipsin Assay , 1 x 96-well, includes coupled magnetic beads, detection antibodies, standards, assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, filter plate, sealing tape, serum-based diluent for the detection of adipsin

Bio-Plex Pro Human Diabetes Singleplex Sets*

171-B7003M	C-Peptide
171-B7004M	Ghrelin
171-B7005M	GIP
171-B7006M	GLP-1
171-B7007M	Glucagon
171-B7008M	Insulin
171-B7009M	Leptin
171-B7010M	PAI-1
171-B7011M	Resistin
171-B7012M	Visfatin

Bio-Plex Pro Human Diabetes Standards

Standards are for the detection of adiponectin, adipsin, C-peptide, ghrelin, GIP, GLP-1, glucagon, insulin, leptin, PAI-1, resistin, visfatin

171-D70001	Bio-Plex Pro Diabetes Standards , pkg of 1 vial, lyophilized mixture of 12 analytes
171-D70050	Bio-Plex Pro Diabetes Standards , pkg of 50 lot-matched vials, lyophilized mixture of 12 analytes. For use with Bio-Plex Pro Human diabetes assays

Bio-Plex Pro Reagent Kits**

171-304070	Bio-Plex Pro Reagent Kit , 1 x 96-well, includes assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, filter plate, sealing tape, standard diluent, sample diluent
171-304070M	Bio-Plex Pro Reagent Kit with Flat Bottom Plate , 1 x 96-well, includes flat bottom plate, assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, sealing tape, standard diluent, sample diluent, and instructions

Bio-Plex Pro Non-Human Primate Diabetes All-In-One Kits

171-W7001M	Bio-Plex Pro Non-Human Primate Diabetes 11-Plex Panel , 1 x 96-well, includes premixed coupled magnetic beads, detection antibodies, standard, reagents, flat bottom plate, and sealing tape for the detection of 11 diabetes biomarkers
171-W7002M	Bio-Plex Pro Non-Human Primate Diabetes Adiponectin Kit , 1 x 96-well, includes premixed coupled magnetic beads, detection antibodies, standard, reagents, flat bottom plate, and sealing tape for the detection of adiponectin

Bio-Plex Pro Non-Human Primate Diabetes Singleplex Sets

171-W7003M	Adipsin
171-W7004M	C-Peptide
171-W7005M	Ghrelin
171-W7006M	GIP
171-W7007M	GLP-1
171-W7008M	Glucagon
171-W7009M	Insulin
171-W7010M	Leptin
171-W7011M	PAI-1
171-W7012M	Resistin
171-W7013M	Visfatin

Bio-Plex Pro Non-Human Primate Diabetes Standards

Standards are for the detection of adiponectin, adipsin, C-peptide, ghrelin, GIP, GLP-1, glucagon, insulin, leptin, PAI-1, resistin, visfatin

171-D70001	Bio-Plex Pro Diabetes Standards , Pkg of 1 vial, lyophilized mixture of 11 analytes for use with Bio-Plex Pro non-human primate diabetes assays
------------	--

Bio-Plex Pro Reagent Kits**

171-304070	Bio-Plex Pro Reagent Kit , 1 x 96-well, includes assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, filter plate, sealing tape, standard diluent, sample diluent
171-304070M	Bio-Plex Pro Reagent Kit with Flat Bottom Plate , 1 x 96-well, includes flat bottom plate, assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, sealing tape, standard diluent, sample diluent, and instructions

* Singleplex sets include coupled beads and detection antibodies. Reagent kits and standards are required to run an assay.

** Same reagent kit can be used for both diabetes and cytokine assays.

***Required when using the Bio-Plex Pro wash station.

Catalog # Description

Bio-Plex Pro Mouse Diabetes All-in-One Kits

171-F7001M **Bio-Plex Pro Mouse Diabetes 8-Plex Assay**, 1 x 96-well, includes premixed coupled magnetic beads and detection antibodies, standards, assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, filter plate, sealing tape, standard diluent, sample diluent for the detection of ghrelin, GIP, GLP-1, glucagon, insulin, leptin, PAI-1, resistin

171-F7002M **Bio-Plex Pro Mouse Diabetes Adiponectin Assay**, 1 x 96-well, includes coupled magnetic beads, detection antibodies, standards, assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, filter plate, sealing tape, serum-based diluent for the detection of adiponectin

Bio-Plex Pro Mouse Diabetes Singleplex Sets*

171-G7002M Ghrelin
171-G7004M GLP-1
171-G7005M Glucagon
171-G7006M Insulin
171-G7007M Leptin
171-G7008M PAI-1
171-G7009M Resistin

Bio-Plex Pro Mouse Diabetes Standards

Standards are for the detection of adiponectin, ghrelin, GIP, GLP-1, glucagon, insulin, leptin, PAI-1, resistin

171-I70001 **Bio-Plex Pro Mouse Diabetes Standards**, pkg of 1 vial, lyophilized mixture of 9 analytes

171-I70050 **Bio-Plex Pro Mouse Diabetes Standards**, pkg of 50 lot-matched vials, lyophilized mixture of 9 analytes

Bio-Plex Pro Reagent Kits**

171-304070 **Bio-Plex Pro Reagent Kit**, 1 x 96-well, includes assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, filter plate, sealing tape, standard diluent, sample diluent

171-304070M **Bio-Plex Pro Reagent Kit with Flat Bottom Plate**, 1 x 96-well, includes flat bottom plate, assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, sealing tape, standard diluent, sample diluent, and instructions

Bio-Plex Pro Rat Diabetes Singleplex Sets*

171-L7001M Ghrelin
171-L7003M GLP-1
171-L7004M Glucagon
171-L7006M Leptin
171-L7007M PAI-1

Bio-Plex Pro Rat Diabetes Standards*

Standards are for the detection of ghrelin, GLP-1, glucagon, leptin, PAI-1

171-NZ0001 **Bio-Plex Pro Rat Diabetes Standards**, pkg of 1 vial, lyophilized mixture of 31 analytes

171-NZ0501 **Bio-Plex Pro Rat Diabetes Standards**, pkg of 50 lot-matched vials, lyophilized mixture of 31 analytes

Bio-Plex Pro Reagent Kits**

171-304070 **Bio-Plex Pro Reagent Kit**, 1 x 96-well, includes assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, filter plate, sealing tape, standard diluent, sample diluent

171-304070M **Bio-Plex Pro Reagent Kit with Flat Bottom Plate**, 1 x 96-well, includes flat bottom plate, assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, sealing tape, standard diluent, sample diluent, and instructions

Bio-Plex Pro Wash Stations and Accessories

300-34376 **Bio-Plex Pro Wash Station**, includes magnetic plate carrier, waste bottle, 2 buffer bottles

300-34377 **Bio-Plex Pro II Wash Station**, includes magnetic plate carrier, vacuum manifold plate carrier, waste bottle, 2 buffer bottles

171-025001*** **Bio-Plex Pro Flat Bottom Plates**, 40 x 96-well plates

171-304500 **Bio-Plex Wash Buffer**, 1.5 L

171-020100 **Bio-Plex Handheld Magnetic Washer**, includes magnetic washer and adjustment hex tools for use in manual wash steps for all Bio-Plex magnetic assays

* Singleplex sets include coupled beads and detection antibodies. Reagent kits and standards are required to run an assay.

** Same reagent kit can be used for both diabetes and cytokine assays.

***Required when using the Bio-Plex Pro wash station.

The Bio-Plex suspension array system includes fluorescently labeled microspheres and instrumentation licensed to Bio-Rad Laboratories, Inc. by the Luminex Corporation.



**Bio-Rad
Laboratories, Inc.**

Life Science
Group

Web site www.bio-rad.com USA 800 424 6723 Australia 61 2 9914 2800 Austria 01 877 89 01 Belgium 09 385 55 11 Brazil 55 11 5044 5699
Canada 905 364 3435 China 86 21 6169 8500 Czech Republic 420 241 430 532 Denmark 44 52 10 00 Finland 09 804 22 00
France 01 47 95 69 65 Germany 089 31 884 0 Greece 30 210 9532 220 Hong Kong 852 2789 3300 Hungary 36 1 459 6100 India 91 124 4029300
Israel 03 963 6050 Italy 39 02 216091 Japan 03 6361 7000 Korea 82 2 3473 4460 Mexico 52 555 488 7670 The Netherlands 0318 540666
New Zealand 64 9 415 2280 Norway 23 38 41 30 Poland 48 22 331 99 99 Portugal 351 21 472 7700 Russia 7 495 721 14 04
Singapore 65 6415 3188 South Africa 27 861 246 723 Spain 34 91 590 5200 Sweden 08 555 12700 Switzerland 026 674 55 05
Taiwan 886 2 2578 7189 Thailand 800 88 22 88 United Kingdom 020 8328 2000