



# Valuation Multiples by Industry

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SIC Sector: **(2000-3999) Manufacturing**

Report Date: **29 June 2018**

Country: **United States of America (U.S.A.)**

## Industry Valuation Multiples

The table below provides a summary of median industry enterprise value (EV) valuation multiples, as at the Report Date. The data is grouped by industry SIC code:

	Max #	EV Multiple				
		Rev	EBITDA	EBIT	TotAss	TanAss
Food And Kindred Products (2000)	10	2.22	16.39	19.30	1.23	3.65
Canned, Frozen & Preservd Fruit, Veg & Food Specialties (2030)	5	3.00	-	-	0.93	4.80
Grain Mill Products (2040)	6	2.25	11.71	14.41	1.55	3.71
Sugar & Confectionery Products (2060)	5	1.68	-	13.68	-	-
Beverages (2080)	9	2.76	20.16	20.26	2.36	3.46
Malt Beverages (2082)	7	1.93	11.12	14.90	0.97	3.25
Bottled & Canned Soft Drinks & Carbonated Waters (2086)	8	1.68	11.82	24.80	3.00	3.90
Cigarettes (2111)	5	4.66	13.53	14.62	3.18	4.27
Apparel & Other Finishd Prods Of Fabrics & Similar Matl (2300)	11	2.11	11.84	14.03	1.58	2.86
Men'S & Boys' Furnishgs, Work Clothg, & Allied Garments (2320)	6	2.21	13.01	19.16	2.17	3.24
Lumber & Wood Products (No Furniture) (2400)	5	1.49	8.69	12.12	1.48	1.71
Millwood, Veneer, Plywood, & Structural Wood Members (2430)	5	1.24	10.75	15.41	1.46	3.33
Household Furniture (2510)	9	0.80	8.18	11.13	1.58	1.96
Paper Mills (2621)	9	1.21	9.88	17.27	0.71	0.76
Paperboard Containers & Boxes (2650)	5	1.35	10.09	19.27	1.21	1.72
Newspapers: Publishing Or Publishing & Printing (2711)	9	0.95	12.00	20.66	1.07	1.81
Commercial Printing (2750)	6	1.31	11.89	24.69	0.90	1.72
Chemicals & Allied Products (2800)	10	1.83	15.80	21.96	1.39	1.92
Industrial Inorganic Chemicals (2810)	10	1.53	10.98	14.01	0.96	1.12
Plastic Materials, Synth Resins & Nonvulcan Elastomers (2821)	10	1.82	11.03	15.64	1.33	1.92
Medicinal Chemicals & Botanical Products (2833)	10	1.57	6.38	11.63	2.83	3.13
Pharmaceutical Preparations (2834)	350	8.99	12.40	17.78	2.17	2.76
In Vitro & In Vivo Diagnostic Substances (2835)	20	4.45	22.09	40.13	2.14	2.50
Biological Products, (No Disgnostic Substances) (2836)	82	11.97	12.32	14.64	2.44	3.16
Soap, Detergents, Cleang Preparations, Perfumes, Cosmetics (2840)	6	3.39	10.86	14.57	2.15	4.19
Perfumes, Cosmetics & Other Toilet Preparations (2844)	11	2.22	16.47	16.92	1.54	2.64
Industrial Organic Chemicals (2860)	18	1.29	10.02	13.31	0.98	1.10
Agricultural Chemicals (2870)	11	2.82	13.94	26.29	1.04	1.27
Miscellaneous Chemical Products (2890)	8	1.87	13.66	21.38	1.93	2.39
Petroleum Refining (2911)	20	0.66	8.86	14.96	1.00	1.02



Industry Valuation Multiples

(continued)

	Max #	EV Multiple				
		Rev	EBITDA	EBIT	TotAss	TanAss
Fabricated Rubber Products, Nec (3060)	5	1.71	17.57	-	1.28	2.40
Plastics Products, Nec (3089)	12	1.07	12.25	16.87	1.06	2.01
Footwear, (No Rubber) (3140)	6	1.29	10.76	13.53	1.13	1.81
Cement, Hydraulic (3241)	5	1.17	5.88	9.56	0.55	0.70
Steel Works, Blast Furnaces & Rolling & Finishing Mills (3310)	7	1.13	9.93	12.95	0.73	0.77
Steel Works, Blast Furnaces & Rolling Mills (Coke Ovens) (3312)	15	0.68	8.43	11.57	0.76	0.77
Rolling Drawing & Extruding Of Nonferrous Metals (3350)	8	0.84	9.57	11.98	1.18	1.45
Cutlery, Handtools & General Hardware (3420)	9	0.96	9.77	12.60	0.98	1.46
Miscellaneous Fabricated Metal Products (3490)	12	1.86	11.50	14.13	1.14	1.88
Engines & Turbines (3510)	6	1.03	9.04	13.31	1.31	1.40
Farm Machinery & Equipment (3523)	5	1.20	11.50	16.50	1.18	1.27
Construction Machinery & Equip (3531)	8	1.40	13.53	18.61	1.26	1.43
Oil & Gas Field Machinery & Equipment (3533)	12	2.21	16.86	19.64	1.08	1.69
Metalworkg Machinery & Equipment (3540)	5	0.92	-	17.73	0.78	1.15
Special Industry Machinery (No Metalworking Machinery) (3550)	5	1.87	-	-	0.99	2.99
Special Industry Machinery, Nec (3559)	13	1.26	14.33	9.52	1.07	1.07
General Industrial Machinery & Equipment (3560)	7	2.63	16.25	25.89	1.35	2.87
Pumps & Pumping Equipment (3561)	8	1.92	17.70	20.47	1.33	2.08
Electronic Computers (3571)	9	2.06	18.51	42.92	1.78	1.95
Computer Storage Devices (3572)	5	1.68	12.05	15.58	1.99	2.39
Computer Communications Equipment (3576)	13	1.67	15.70	17.99	1.21	1.90
Computer Peripheral Equipment, Nec (3577)	16	1.61	13.67	22.40	1.86	2.45
Refrigeration & Service Industry Machinery (3580)	5	2.24	14.92	18.48	1.97	3.60
Electrical Industrial Apparatus (3620)	8	3.37	-	19.88	1.40	2.16
Motors & Generators (3621)	5	2.11	13.78	16.89	1.86	2.30
Household Appliances (3630)	5	2.10	17.27	20.81	2.92	3.11
Electric Lighting & Wiring Equipment (3640)	6	0.76	-	-	0.82	1.48
Household Audio & Video Equipment (3651)	6	0.80	-	-	0.98	1.54
Telephone & Telegraph Apparatus (3661)	16	0.92	17.72	22.91	1.09	1.31
Radio & Tv Broadcasting & Communications Equipment (3663)	31	1.44	18.09	23.51	1.06	1.52
Communications Equipment, Nec (3669)	14	1.74	15.91	25.99	1.37	2.58
Electronic Components & Accessories (3670)	11	1.55	12.66	16.71	1.16	1.70
Printed Circuit Boards (3672)	15	0.44	7.47	14.33	0.74	0.74
Semiconductors & Related Devices (3674)	92	2.42	13.00	18.04	1.59	2.02
Electronic Components, Nec (3679)	12	2.46	11.79	8.76	1.27	1.36
Miscellaneous Electrical Machinery, Equipment & Supplies (3690)	13	1.50	12.05	17.74	1.18	1.54
Motor Vehicles & Passenger Car Bodies (3711)	15	0.83	9.73	15.88	1.07	1.20
Motor Vehicle Parts & Accessories (3714)	34	0.77	8.66	11.09	0.97	1.15
Aircraft Parts & Auxiliary Equipment, Nec (3728)	7	1.60	14.29	19.42	1.19	1.47
Ship & Boat Building & Repairing (3730)	5	2.10	12.21	13.86	2.58	4.04
Railroad Equipment (3743)	6	2.29	9.45	16.06	0.80	0.84
Search, Detection, Navagation, Guidance, Aeronautical Sys (3812)	8	2.74	15.88	18.43	1.98	3.14
Industrial Instruments For Measurement, Display, And Control (3823)	16	3.13	16.66	20.65	1.85	3.01



Industry Valuation Multiples

(continued)

	Max #	EV Multiple				
		Rev	EBITDA	EBIT	TotAss	TanAss
Instruments For Meas & Testing Of Electricity & Elec Signals (3825)	11	1.24	10.95	16.33	1.24	1.73
Laboratory Analytical Instruments (3826)	18	4.00	23.25	24.17	2.07	3.72
Optical Instruments & Lenses (3827)	5	2.35	12.36	16.42	1.86	1.95
Measuring & Controlling Devices, Nec (3829)	10	2.28	16.10	18.53	1.66	2.44
Surgical & Medical Instruments & Apparatus (3841)	78	4.82	23.30	29.70	3.13	4.62
Orthopedic, Prosthetic & Surgical Appliances & Supplies (3842)	21	4.07	29.54	30.51	1.70	2.06
Electromedical & Electrotherapeutic Apparatus (3845)	22	3.45	16.96	21.38	1.76	2.39
Photographic Equipment & Supplies (3861)	5	0.98	-	-	1.42	1.50
Sporting & Athletic Goods, Nec (3949)	6	1.46	11.53	14.50	1.56	2.18
Miscellaneous Manufacturing Industries (3990)	9	1.65	11.60	18.55	1.49	1.69

## EV/Revenue Valuation Multiple

We provide additional data relating to industry EV/Revenue valuation multiples:

	#	Average	Median	Std. Dev.	Std. Err.
Food And Kindred Products (2000)	9	1.92	2.22	0.77	0.26
Canned, Frozen & Preservd Fruit, Veg & Food Specialties (2030)	5	2.80	3.00	1.28	0.57
Grain Mill Products (2040)	5	2.29	2.25	0.50	0.22
Sugar & Confectionery Products (2060)	5	2.22	1.68	1.15	0.51
Beverages (2080)	8	3.99	2.76	3.00	1.06
Malt Beverages (2082)	7	2.09	1.93	1.81	0.68
Bottled & Canned Soft Drinks & Carbonated Waters (2086)	8	2.99	1.68	3.20	1.13
Cigarettes (2111)	5	6.39	4.66	5.29	2.36
Apparel & Other Finishd Prods Of Fabrics & Similar Matl (2300)	11	2.63	2.11	2.25	0.68
Men'S & Boys' Furnishgs, Work Clothg, & Allied Garments (2320)	6	2.40	2.21	1.04	0.42
Millwood, Veneer, Plywood, & Structural Wood Members (2430)	5	1.47	1.24	0.49	0.22
Household Furniture (2510)	6	0.71	0.80	0.18	0.07
Paper Mills (2621)	9	1.23	1.21	0.66	0.22
Paperboard Containers & Boxes (2650)	5	1.48	1.35	0.30	0.13
Newspapers: Publishing Or Publishing & Printing (2711)	7	0.88	0.95	0.44	0.17
Commercial Printing (2750)	6	1.63	1.31	1.54	0.63
Chemicals & Allied Products (2800)	9	2.73	1.83	1.62	0.54
Industrial Inorganic Chemicals (2810)	9	1.69	1.53	0.61	0.20
Plastic Materials, Synth Resins & Nonvulcan Elastomers (2821)	10	1.94	1.82	1.00	0.31
Medicinal Chemicals & Botanical Products (2833)	8	17.84	1.57	29.90	10.57
Pharmaceutical Preparations (2834)	216	26.76	8.99	35.30	2.40
In Vitro & In Vivo Diagnostic Substances (2835)	15	9.31	4.45	9.44	2.44
Biological Products, (No Disgnostic Substances) (2836)	52	26.93	11.97	34.46	4.78
Soap, Detergents, Cleang Preparations, Perfumes, Cosmetics (2840)	6	2.88	3.39	1.12	0.46
Perfumes, Cosmetics & Other Toilet Preparations (2844)	10	2.65	2.22	1.77	0.56
Industrial Organic Chemicals (2860)	18	1.47	1.29	0.96	0.23
Agricultural Chemicals (2870)	9	5.36	2.82	6.54	2.18
Miscellaneous Chemical Products (2890)	8	2.79	1.87	2.11	0.74
Petroleum Refining (2911)	20	1.03	0.66	0.75	0.17
Fabricated Rubber Products, Nec (3060)	5	3.22	1.71	3.20	1.43
Plastics Products, Nec (3089)	10	1.10	1.07	0.53	0.17
Footwear, (No Rubber) (3140)	6	1.69	1.29	1.13	0.46
Steel Works, Blast Furnaces & Rolling & Finishing Mills (3310)	7	1.05	1.13	0.44	0.17
Steel Works, Blast Furnaces & Rolling Mills (Coke Ovens) (3312)	15	0.95	0.68	0.44	0.11
Rolling Drawing & Extruding Of Nonferrous Metals (3350)	7	0.83	0.84	0.15	0.06
Cutlery, Handtools & General Hardware (3420)	9	1.30	0.96	0.87	0.29
Miscellaneous Fabricated Metal Products (3490)	12	1.92	1.86	0.97	0.28
Engines & Turbines (3510)	6	1.02	1.03	0.26	0.11
Farm Machinery & Equipment (3523)	5	1.43	1.20	0.77	0.34
Construction Machinery & Equip (3531)	8	1.56	1.40	0.78	0.28
Oil & Gas Field Machinery & Equipment (3533)	10	2.27	2.21	1.16	0.37
Special Industry Machinery, Nec (3559)	11	1.35	1.26	0.84	0.25
General Industrial Machinery & Equipment (3560)	6	2.52	2.63	0.81	0.33
Pumps & Pumping Equipment (3561)	8	2.48	1.92	1.63	0.58
Electronic Computers (3571)	8	2.35	2.06	1.48	0.52
Computer Storage Devices (3572)	5	2.32	1.68	1.71	0.77
Computer Communications Equipment (3576)	13	2.12	1.67	1.57	0.44
Computer Peripheral Equipment, Nec (3577)	15	3.00	1.61	2.69	0.69
Electrical Industrial Apparatus (3620)	8	3.75	3.37	2.23	0.79
Household Appliances (3630)	5	2.05	2.10	1.30	0.58

(continued)

	#	Average	Median	Std. Dev.	Std. Err.
Electric Lighting & Wiring Equipment (3640)	6	0.94	0.76	0.52	0.21
Household Audio & Video Equipment (3651)	5	1.36	0.80	0.97	0.43
Telephone & Telegraph Apparatus (3661)	13	0.95	0.92	0.62	0.17
Radio & Tv Broadcasting & Communications Equipment (3663)	27	1.58	1.44	0.96	0.19
Communications Equipment, Nec (3669)	13	2.24	1.74	1.64	0.45
Electronic Components & Accessories (3670)	10	1.89	1.55	1.14	0.36
Printed Circuit Boards (3672)	13	0.49	0.44	0.22	0.06
Semiconductors & Related Devices (3674)	90	2.80	2.42	1.93	0.20
Electronic Components, Nec (3679)	12	2.94	2.46	2.45	0.71
Miscellaneous Electrical Machinery, Equipment & Supplies (3690)	13	1.85	1.50	1.06	0.29
Motor Vehicles & Passenger Car Bodies (3711)	14	1.03	0.83	0.69	0.19
Motor Vehicle Parts & Accessories (3714)	29	0.86	0.77	0.43	0.08
Aircraft Parts & Auxiliary Equipment, Nec (3728)	5	1.65	1.60	0.17	0.08
Railroad Equipment (3743)	6	1.96	2.29	1.14	0.47
Search, Detection, Navagation, Guidance, Aeronautical Sys (3812)	8	2.82	2.74	0.75	0.26
Industrial Instruments For Measurement, Display, And Control (3823)	15	3.61	3.13	2.86	0.74
Instruments For Meas & Testing Of Electricity & Elec Signals (3825)	10	1.27	1.24	0.42	0.13
Laboratory Analytical Instruments (3826)	13	4.07	4.00	1.38	0.38
Optical Instruments & Lenses (3827)	5	2.19	2.35	0.63	0.28
Measuring & Controlling Devices, Nec (3829)	10	2.30	2.28	1.27	0.40
Surgical & Medical Instruments & Apparatus (3841)	68	5.79	4.82	4.55	0.55
Orthopedic, Prosthetic & Surgical Appliances & Supplies (3842)	21	6.38	4.07	5.61	1.22
Electromedical & Electrotherapeutic Apparatus (3845)	21	4.16	3.45	3.58	0.78
Photographic Equipment & Supplies (3861)	5	1.02	0.98	0.61	0.27
Sporting & Athletic Goods, Nec (3949)	6	1.43	1.46	0.18	0.07
Miscellaneous Manufacturing Industries (3990)	9	2.59	1.65	2.39	0.80

## EV/EBITDA Valuation Multiple

We provide additional data relating to industry EV/EBITDA valuation multiples:

	#	Average	Median	Std. Dev.	Std. Err.
Food And Kindred Products (2000)	8	16.11	16.39	6.05	2.14
Beverages (2080)	7	20.89	20.16	14.73	5.57
Malt Beverages (2082)	6	11.00	11.12	9.34	3.81
Bottled & Canned Soft Drinks & Carbonated Waters (2086)	6	12.34	11.82	9.86	4.03
Apparel & Other Finishd Prods Of Fabrics & Similar Matl (2300)	9	12.35	11.84	6.51	2.17
Men'S & Boys' Furnishgs, Work Clothg, & Allied Garments (2320)	5	15.18	13.01	4.09	1.83
Lumber & Wood Products (No Furniture) (2400)	5	11.82	8.69	7.71	3.45
Household Furniture (2510)	8	8.87	8.18	2.83	1.00
Paper Mills (2621)	8	10.15	9.88	4.07	1.44
Newspapers: Publishing Or Publishing & Printing (2711)	7	15.35	12.00	12.25	4.63
Commercial Printing (2750)	6	12.78	11.89	6.86	2.80
Chemicals & Allied Products (2800)	9	14.16	15.80	6.03	2.01
Industrial Inorganic Chemicals (2810)	7	10.47	10.98	3.82	1.44
Plastic Materials, Synth Resins & Nonvulcan Elastomers (2821)	8	10.79	11.03	2.69	0.95
Pharmaceutical Preparations (2834)	65	11.09	12.40	8.84	1.10
In Vitro & In Vivo Diagnostic Substances (2835)	7	24.22	22.09	16.38	6.19
Biological Products, (No Disgnostic Substances) (2836)	13	16.15	12.32	14.53	4.03
Soap, Detergents, Cleang Preparations, Perfumes, Cosmetics (2840)	6	10.14	10.86	6.52	2.66
Perfumes, Cosmetics & Other Toilet Preparations (2844)	9	19.21	16.47	12.67	4.22
Industrial Organic Chemicals (2860)	16	10.26	10.02	4.29	1.07
Agricultural Chemicals (2870)	6	13.59	13.94	2.94	1.20
Miscellaneous Chemical Products (2890)	6	14.47	13.66	6.65	2.72
Petroleum Refining (2911)	19	8.68	8.86	3.59	0.82
Plastics Products, Nec (3089)	11	11.70	12.25	2.43	0.73
Footwear, (No Rubber) (3140)	5	18.28	10.76	14.39	6.43
Cement, Hydraulic (3241)	5	7.83	5.88	5.56	2.49
Steel Works, Blast Furnaces & Rolling & Finishing Mills (3310)	6	10.02	9.93	2.57	1.05
Steel Works, Blast Furnaces & Rolling Mills (Coke Ovens) (3312)	14	8.18	8.43	2.97	0.79
Rolling Drawing & Extruding Of Nonferrous Metals (3350)	8	10.42	9.57	4.06	1.43
Cutlery, Handtools & General Hardware (3420)	8	9.20	9.77	3.05	1.08
Miscellaneous Fabricated Metal Products (3490)	9	10.52	11.50	3.52	1.17
Construction Machinery & Equip (3531)	8	13.74	13.53	2.77	0.98
Oil & Gas Field Machinery & Equipment (3533)	8	26.48	16.86	20.88	7.38
Special Industry Machinery, Nec (3559)	11	23.95	14.33	22.65	6.83
Pumps & Pumping Equipment (3561)	8	16.86	17.70	4.66	1.65
Electronic Computers (3571)	6	18.54	18.51	7.27	2.97
Computer Communications Equipment (3576)	9	21.09	15.70	15.47	5.16
Computer Peripheral Equipment, Nec (3577)	9	24.63	13.67	23.81	7.94
Telephone & Telegraph Apparatus (3661)	10	18.75	17.72	9.73	3.08
Radio & Tv Broadcasting & Communications Equipment (3663)	21	19.13	18.09	11.83	2.58
Communications Equipment, Nec (3669)	7	37.25	15.91	53.99	20.41
Electronic Components & Accessories (3670)	8	15.03	12.66	7.57	2.68
Printed Circuit Boards (3672)	12	9.67	7.47	4.37	1.26
Semiconductors & Related Devices (3674)	63	14.62	13.00	10.01	1.26
Electronic Components, Nec (3679)	8	12.09	11.79	10.59	3.74
Miscellaneous Electrical Machinery, Equipment & Supplies (3690)	9	10.86	12.05	3.55	1.18
Motor Vehicles & Passenger Car Bodies (3711)	14	10.53	9.73	6.16	1.65
Motor Vehicle Parts & Accessories (3714)	32	8.76	8.66	3.20	0.57
Aircraft Parts & Auxiliary Equipment, Nec (3728)	5	14.16	14.29	2.01	0.90
Search, Detection, Navagation, Guidance, Aeronautical Sys (3812)	6	16.03	15.88	2.04	0.83

(continued)

	#	Average	Median	Std. Dev.	Std. Err.
Industrial Instruments For Measurement, Display, And Control (3823)	12	17.17	16.66	7.24	2.09
Instruments For Meas & Testing Of Electricity & Elec Signals (3825)	9	19.30	10.95	18.31	6.10
Laboratory Analytical Instruments (3826)	10	32.41	23.25	20.63	6.52
Measuring & Controlling Devices, Nec (3829)	9	17.21	16.10	9.17	3.06
Surgical & Medical Instruments & Apparatus (3841)	33	29.62	23.30	24.13	4.20
Orthopedic, Prosthetic & Surgical Appliances & Supplies (3842)	12	33.92	29.54	23.49	6.78
Electromedical & Electrotherapeutic Apparatus (3845)	12	16.32	16.96	11.06	3.19
Sporting & Athletic Goods, Nec (3949)	5	12.08	11.53	1.14	0.51
Miscellaneous Manufacturing Industries (3990)	7	12.22	11.60	3.03	1.14

## EV/EBIT Valuation Multiple

We provide additional data relating to industry EV/EBIT valuation multiples:

	#	Average	Median	Std. Dev.	Std. Err.
Food And Kindred Products (2000)	8	23.20	19.30	12.32	4.36
Beverages (2080)	6	19.29	20.26	10.50	4.29
Malt Beverages (2082)	6	18.64	14.90	19.16	7.82
Bottled & Canned Soft Drinks & Carbonated Waters (2086)	6	24.50	24.80	20.17	8.24
Apparel & Other Finishd Prods Of Fabrics & Similar Matl (2300)	9	14.34	14.03	7.75	2.58
Men'S & Boys' Furnishgs, Work Clothg, & Allied Garments (2320)	5	20.89	19.16	3.64	1.63
Lumber & Wood Products (No Furniture) (2400)	5	18.64	12.12	15.54	6.95
Millwood, Veneer, Plywood, & Structural Wood Members (2430)	5	16.72	15.41	4.91	2.20
Household Furniture (2510)	8	11.46	11.13	3.81	1.35
Paper Mills (2621)	6	18.30	17.27	5.61	2.29
Newspapers: Publishing Or Publishing & Printing (2711)	5	23.32	20.66	11.45	5.12
Commercial Printing (2750)	5	29.98	24.69	22.03	9.85
Chemicals & Allied Products (2800)	10	20.29	21.96	7.60	2.40
Industrial Inorganic Chemicals (2810)	7	15.04	14.01	9.19	3.48
Plastic Materials, Synth Resins & Nonvulcan Elastomers (2821)	8	14.87	15.64	3.29	1.16
Pharmaceutical Preparations (2834)	65	15.90	17.78	13.47	1.67
In Vitro & In Vivo Diagnostic Substances (2835)	7	34.92	40.13	23.41	8.85
Biological Products, (No Disgnostic Substances) (2836)	13	21.33	14.64	20.73	5.75
Soap, Detergents, Cleang Preparations, Perfumes, Cosmetics (2840)	6	13.14	14.57	8.78	3.59
Perfumes, Cosmetics & Other Toilet Preparations (2844)	7	16.93	16.92	8.27	3.13
Industrial Organic Chemicals (2860)	14	12.97	13.31	5.93	1.58
Agricultural Chemicals (2870)	5	26.88	26.29	11.34	5.07
Miscellaneous Chemical Products (2890)	6	24.94	21.38	14.69	6.00
Petroleum Refining (2911)	18	16.21	14.96	7.80	1.84
Plastics Products, Nec (3089)	10	17.88	16.87	5.06	1.60
Cement, Hydraulic (3241)	5	11.68	9.56	8.10	3.62
Steel Works, Blast Furnaces & Rolling & Finishing Mills (3310)	5	14.22	12.95	3.94	1.76
Steel Works, Blast Furnaces & Rolling Mills (Coke Ovens) (3312)	13	14.05	11.57	7.72	2.14
Rolling Drawing & Extruding Of Nonferrous Metals (3350)	7	15.23	11.98	8.59	3.25
Cutlery, Handtools & General Hardware (3420)	8	13.04	12.60	3.63	1.28
Miscellaneous Fabricated Metal Products (3490)	9	13.59	14.13	4.96	1.65
Construction Machinery & Equip (3531)	7	19.72	18.61	1.83	0.69
Special Industry Machinery, Nec (3559)	8	15.49	9.52	12.16	4.30
Pumps & Pumping Equipment (3561)	6	21.72	20.47	7.04	2.87
Electronic Computers (3571)	5	47.11	42.92	35.83	16.02
Computer Communications Equipment (3576)	8	35.85	17.99	35.90	12.69
Computer Peripheral Equipment, Nec (3577)	8	33.78	22.40	31.21	11.04
Telephone & Telegraph Apparatus (3661)	8	27.14	22.91	14.01	4.95
Radio & Tv Broadcasting & Communications Equipment (3663)	14	26.94	23.51	16.23	4.34
Communications Equipment, Nec (3669)	6	25.79	25.99	12.05	4.92
Electronic Components & Accessories (3670)	8	22.37	16.71	13.90	4.92
Printed Circuit Boards (3672)	12	18.29	14.33	9.19	2.65
Semiconductors & Related Devices (3674)	56	24.72	18.04	20.51	2.74
Electronic Components, Nec (3679)	7	18.18	8.76	24.43	9.23
Miscellaneous Electrical Machinery, Equipment & Supplies (3690)	10	18.42	17.74	8.74	2.76
Motor Vehicles & Passenger Car Bodies (3711)	13	17.56	15.88	10.85	3.01
Motor Vehicle Parts & Accessories (3714)	30	12.04	11.09	4.74	0.86
Aircraft Parts & Auxiliary Equipment, Nec (3728)	6	28.04	19.42	19.13	7.81
Ship & Boat Building & Repairing (3730)	5	14.86	13.86	2.97	1.33
Search, Detection, Navagation, Guidance, Aeronautical Sys (3812)	6	19.15	18.43	3.29	1.34



(continued)

	#	Average	Median	Std. Dev.	Std. Err.
Industrial Instruments For Measurement, Display, And Control (3823)	11	21.54	20.65	10.99	3.31
Instruments For Meas & Testing Of Electricity & Elec Signals (3825)	7	14.74	16.33	6.25	2.36
Laboratory Analytical Instruments (3826)	8	31.37	24.17	18.26	6.46
Measuring & Controlling Devices, Nec (3829)	7	19.82	18.53	10.84	4.10
Surgical & Medical Instruments & Apparatus (3841)	26	39.25	29.70	33.09	6.49
Orthopedic, Prosthetic & Surgical Appliances & Supplies (3842)	9	34.84	30.51	19.30	6.43
Electromedical & Electrotherapeutic Apparatus (3845)	10	25.00	21.38	22.91	7.24
Sporting & Athletic Goods, Nec (3949)	5	14.84	14.50	0.97	0.43
Miscellaneous Manufacturing Industries (3990)	6	19.46	18.55	5.03	2.05

## EV/Total Assets Valuation Multiple

We provide additional data relating to industry EV/Total Assets valuation multiples:

	#	Average	Median	Std. Dev.	Std. Err.
Food And Kindred Products (2000)	10	1.36	1.23	0.49	0.16
Canned, Frozen & Preservd Fruit, Veg & Food Specialties (2030)	5	2.20	0.93	2.17	0.97
Grain Mill Products (2040)	5	1.68	1.55	0.50	0.22
Beverages (2080)	9	2.41	2.36	1.53	0.51
Malt Beverages (2082)	6	0.90	0.97	0.80	0.33
Bottled & Canned Soft Drinks & Carbonated Waters (2086)	8	4.03	3.00	4.01	1.42
Apparel & Other Finishd Prods Of Fabrics & Similar Matl (2300)	10	1.60	1.58	0.93	0.29
Men'S & Boys' Furnishgs, Work Clothg, & Allied Garments (2320)	6	2.29	2.17	0.88	0.36
Household Furniture (2510)	9	1.40	1.58	0.69	0.23
Paper Mills (2621)	9	0.88	0.71	0.44	0.15
Newspapers: Publishing Or Publishing & Printing (2711)	9	0.98	1.07	0.54	0.18
Commercial Printing (2750)	6	1.58	0.90	1.23	0.50
Chemicals & Allied Products (2800)	10	1.72	1.39	0.94	0.30
Industrial Inorganic Chemicals (2810)	10	1.07	0.96	0.47	0.15
Plastic Materials, Synth Resins & Nonvulcan Elastomers (2821)	10	1.44	1.33	0.41	0.13
Medicinal Chemicals & Botanical Products (2833)	9	2.25	2.83	1.70	0.57
Pharmaceutical Preparations (2834)	350	2.63	2.17	1.87	0.10
In Vitro & In Vivo Diagnostic Substances (2835)	19	3.12	2.14	2.94	0.67
Biological Products, (No Disgnostic Substances) (2836)	82	3.06	2.44	2.39	0.26
Soap, Detergents, Cleang Preparations, Perfumes, Cosmetics (2840)	6	2.17	2.15	0.66	0.27
Perfumes, Cosmetics & Other Toilet Preparations (2844)	11	2.33	1.54	1.83	0.55
Industrial Organic Chemicals (2860)	18	1.38	0.98	0.99	0.23
Agricultural Chemicals (2870)	10	1.61	1.04	1.38	0.44
Miscellaneous Chemical Products (2890)	8	2.23	1.93	1.69	0.60
Petroleum Refining (2911)	19	0.96	1.00	0.26	0.06
Plastics Products, Nec (3089)	12	1.29	1.06	0.73	0.21
Footwear, (No Rubber) (3140)	5	1.22	1.13	0.34	0.15
Steel Works, Blast Furnaces & Rolling & Finishing Mills (3310)	6	0.83	0.73	0.34	0.14
Steel Works, Blast Furnaces & Rolling Mills (Coke Ovens) (3312)	11	0.76	0.76	0.16	0.05
Rolling Drawing & Extruding Of Nonferrous Metals (3350)	8	1.14	1.18	0.36	0.13
Cutlery, Handtools & General Hardware (3420)	8	0.97	0.98	0.49	0.17
Miscellaneous Fabricated Metal Products (3490)	12	1.17	1.14	0.56	0.16
Engines & Turbines (3510)	6	1.28	1.31	0.40	0.16
Farm Machinery & Equipment (3523)	5	1.23	1.18	0.56	0.25
Construction Machinery & Equip (3531)	8	1.21	1.26	0.50	0.18
Oil & Gas Field Machinery & Equipment (3533)	12	1.31	1.08	0.82	0.24
Special Industry Machinery (No Metalworking Machinery) (3550)	5	1.16	0.99	0.74	0.33
Special Industry Machinery, Nec (3559)	13	1.19	1.07	0.81	0.22
General Industrial Machinery & Equipment (3560)	6	1.48	1.35	0.44	0.18
Pumps & Pumping Equipment (3561)	7	1.51	1.33	0.95	0.36
Electronic Computers (3571)	9	1.65	1.78	0.67	0.22
Computer Storage Devices (3572)	5	1.84	1.99	0.96	0.43
Computer Communications Equipment (3576)	12	1.23	1.21	0.55	0.16
Computer Peripheral Equipment, Nec (3577)	16	2.15	1.86	1.43	0.36
Refrigeration & Service Industry Machinery (3580)	5	1.90	1.97	0.27	0.12
Electrical Industrial Apparatus (3620)	7	1.38	1.40	0.74	0.28
Motors & Generators (3621)	5	1.67	1.86	0.51	0.23
Household Appliances (3630)	5	2.10	2.92	1.34	0.60
Electric Lighting & Wiring Equipment (3640)	6	0.99	0.82	0.48	0.19
Household Audio & Video Equipment (3651)	5	1.16	0.98	0.39	0.17

(continued)

	#	Average	Median	Std. Dev.	Std. Err.
Telephone & Telegraph Apparatus (3661)	16	0.99	1.09	0.51	0.13
Radio & Tv Broadcasting & Communications Equipment (3663)	28	1.03	1.06	0.44	0.08
Communications Equipment, Nec (3669)	13	1.71	1.37	1.25	0.35
Electronic Components & Accessories (3670)	9	1.37	1.16	0.75	0.25
Printed Circuit Boards (3672)	15	0.90	0.74	0.46	0.12
Semiconductors & Related Devices (3674)	92	1.69	1.59	1.07	0.11
Electronic Components, Nec (3679)	12	1.63	1.27	1.18	0.34
Miscellaneous Electrical Machinery, Equipment & Supplies (3690)	11	1.08	1.18	0.51	0.15
Motor Vehicles & Passenger Car Bodies (3711)	15	1.01	1.07	0.62	0.16
Motor Vehicle Parts & Accessories (3714)	34	1.19	0.97	0.64	0.11
Aircraft Parts & Auxiliary Equipment, Nec (3728)	7	1.53	1.19	0.65	0.25
Ship & Boat Building & Repairing (3730)	5	2.98	2.58	1.69	0.76
Railroad Equipment (3743)	6	1.09	0.80	0.66	0.27
Search, Detection, Navigation, Guidance, Aeronautical Sys (3812)	8	1.86	1.98	0.57	0.20
Industrial Instruments For Measurement, Display, And Control (3823)	14	1.63	1.85	0.72	0.19
Instruments For Meas & Testing Of Electricity & Elec Signals (3825)	11	1.35	1.24	0.59	0.18
Laboratory Analytical Instruments (3826)	15	2.00	2.07	0.79	0.20
Optical Instruments & Lenses (3827)	5	1.79	1.86	0.33	0.15
Measuring & Controlling Devices, Nec (3829)	9	1.50	1.66	0.63	0.21
Surgical & Medical Instruments & Apparatus (3841)	78	3.67	3.13	2.87	0.32
Orthopedic, Prosthetic & Surgical Appliances & Supplies (3842)	20	2.01	1.70	1.54	0.34
Electromedical & Electrotherapeutic Apparatus (3845)	21	2.28	1.76	1.48	0.32
Sporting & Athletic Goods, Nec (3949)	6	1.58	1.56	0.31	0.13
Miscellaneous Manufacturing Industries (3990)	8	1.39	1.49	0.49	0.17

## EV/Tangible Assets Valuation Multiple

We provide additional data relating to industry EV/Tangible Assets valuation multiples:

	#	Average	Median	Std. Dev.	Std. Err.
Food And Kindred Products (2000)	8	3.35	3.65	0.63	0.22
Canned, Frozen & Preservd Fruit, Veg & Food Specialties (2030)	5	3.96	4.80	2.86	1.28
Grain Mill Products (2040)	6	3.88	3.71	1.85	0.76
Beverages (2080)	9	3.40	3.46	2.20	0.73
Malt Beverages (2082)	7	3.01	3.25	2.28	0.86
Bottled & Canned Soft Drinks & Carbonated Waters (2086)	8	5.22	3.90	5.00	1.77
Apparel & Other Finishd Prods Of Fabrics & Similar Matl (2300)	11	3.01	2.86	2.28	0.69
Men'S & Boys' Furnishgs, Work Clothg, & Allied Garments (2320)	6	3.74	3.24	1.74	0.71
Millwood, Veneer, Plywood, & Structural Wood Members (2430)	5	2.91	3.33	0.88	0.39
Household Furniture (2510)	9	1.81	1.96	1.03	0.34
Paper Mills (2621)	8	0.92	0.76	0.54	0.19
Paperboard Containers & Boxes (2650)	5	1.85	1.72	0.55	0.24
Newspapers: Publishing Or Publishing & Printing (2711)	9	1.76	1.81	0.97	0.32
Commercial Printing (2750)	6	3.02	1.72	2.82	1.15
Chemicals & Allied Products (2800)	9	2.06	1.92	0.98	0.33
Industrial Inorganic Chemicals (2810)	10	1.20	1.12	0.56	0.18
Plastic Materials, Synth Resins & Nonvulcan Elastomers (2821)	10	2.00	1.92	0.51	0.16
Medicinal Chemicals & Botanical Products (2833)	10	3.35	3.13	3.31	1.05
Pharmaceutical Preparations (2834)	350	3.20	2.76	2.18	0.12
In Vitro & In Vivo Diagnostic Substances (2835)	20	4.48	2.50	4.25	0.95
Biological Products, (No Disgnostic Substances) (2836)	82	3.50	3.16	2.66	0.29
Soap, Detergents, Cleang Preparations, Perfumes, Cosmetics (2840)	5	4.08	4.19	1.82	0.81
Perfumes, Cosmetics & Other Toilet Preparations (2844)	11	3.56	2.64	2.23	0.67
Industrial Organic Chemicals (2860)	18	1.56	1.10	1.13	0.27
Agricultural Chemicals (2870)	11	2.28	1.27	2.01	0.61
Miscellaneous Chemical Products (2890)	7	2.29	2.39	1.30	0.49
Petroleum Refining (2911)	18	0.99	1.02	0.27	0.06
Fabricated Rubber Products, Nec (3060)	5	2.53	2.40	1.36	0.61
Plastics Products, Nec (3089)	12	1.80	2.01	1.03	0.30
Footwear, (No Rubber) (3140)	6	2.66	1.81	1.93	0.79
Steel Works, Blast Furnaces & Rolling & Finishing Mills (3310)	7	1.27	0.77	0.79	0.30
Steel Works, Blast Furnaces & Rolling Mills (Coke Ovens) (3312)	12	0.76	0.77	0.24	0.07
Rolling Drawing & Extruding Of Nonferrous Metals (3350)	8	1.38	1.45	0.47	0.17
Cutlery, Handtools & General Hardware (3420)	9	1.69	1.46	1.07	0.36
Miscellaneous Fabricated Metal Products (3490)	12	1.88	1.88	1.10	0.32
Engines & Turbines (3510)	6	1.40	1.40	0.44	0.18
Farm Machinery & Equipment (3523)	5	1.50	1.27	0.76	0.34
Construction Machinery & Equip (3531)	7	1.43	1.43	0.55	0.21
Oil & Gas Field Machinery & Equipment (3533)	12	1.75	1.69	0.75	0.22
Metalworkg Machinery & Equipment (3540)	5	1.37	1.15	0.82	0.36
Special Industry Machinery, Nec (3559)	13	1.49	1.07	1.01	0.28
General Industrial Machinery & Equipment (3560)	7	3.38	2.87	1.89	0.71
Pumps & Pumping Equipment (3561)	8	3.51	2.08	2.99	1.06
Electronic Computers (3571)	8	2.10	1.95	0.99	0.35
Computer Storage Devices (3572)	5	2.18	2.39	0.88	0.39
Computer Communications Equipment (3576)	11	1.61	1.90	0.69	0.21
Computer Peripheral Equipment, Nec (3577)	16	2.62	2.45	1.54	0.39
Refrigeration & Service Industry Machinery (3580)	5	4.20	3.60	1.91	0.85
Electrical Industrial Apparatus (3620)	8	2.35	2.16	1.64	0.58
Household Appliances (3630)	5	2.65	3.11	1.74	0.78

(continued)

	#	Average	Median	Std. Dev.	Std. Err.
Electric Lighting & Wiring Equipment (3640)	6	1.71	1.48	1.16	0.48
Household Audio & Video Equipment (3651)	6	1.64	1.54	1.15	0.47
Telephone & Telegraph Apparatus (3661)	16	1.47	1.31	1.00	0.25
Radio & Tv Broadcasting & Communications Equipment (3663)	31	1.77	1.52	0.94	0.17
Communications Equipment, Nec (3669)	14	2.66	2.58	1.93	0.51
Electronic Components & Accessories (3670)	11	2.85	1.70	2.22	0.67
Printed Circuit Boards (3672)	14	0.91	0.74	0.48	0.13
Semiconductors & Related Devices (3674)	92	2.30	2.02	1.61	0.17
Electronic Components, Nec (3679)	12	1.78	1.36	1.24	0.36
Miscellaneous Electrical Machinery, Equipment & Supplies (3690)	12	1.75	1.54	1.04	0.30
Motor Vehicles & Passenger Car Bodies (3711)	15	1.26	1.20	0.89	0.23
Motor Vehicle Parts & Accessories (3714)	33	1.48	1.15	0.88	0.15
Aircraft Parts & Auxiliary Equipment, Nec (3728)	6	1.62	1.47	0.56	0.23
Ship & Boat Building & Repairing (3730)	5	5.00	4.04	3.42	1.53
Railroad Equipment (3743)	6	1.48	0.84	1.23	0.50
Search, Detection, Navigation, Guidance, Aeronautical Sys (3812)	8	3.27	3.14	1.63	0.58
Industrial Instruments For Measurement, Display, And Control (3823)	16	4.16	3.01	3.82	0.96
Instruments For Meas & Testing Of Electricity & Elec Signals (3825)	11	1.87	1.73	0.90	0.27
Laboratory Analytical Instruments (3826)	18	4.40	3.72	2.26	0.53
Optical Instruments & Lenses (3827)	5	2.01	1.95	0.33	0.15
Measuring & Controlling Devices, Nec (3829)	10	3.01	2.44	2.11	0.67
Surgical & Medical Instruments & Apparatus (3841)	78	4.78	4.62	3.10	0.35
Orthopedic, Prosthetic & Surgical Appliances & Supplies (3842)	21	3.19	2.06	2.65	0.58
Electromedical & Electrotherapeutic Apparatus (3845)	22	3.27	2.39	2.25	0.48
Sporting & Athletic Goods, Nec (3949)	6	2.23	2.18	0.26	0.11
Miscellaneous Manufacturing Industries (3990)	9	2.93	1.69	2.25	0.75

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### *Background to Valuation Multiples*

The multiples method in corporate and business valuation is categorised as a market-based valuation approach. Establishing an indicative estimation of firm value using the multiples method involves applying a synthetic market valuation multiple (e.g. EV/Revenue or EV/EBITDA), to an associated value driver of the firm being valued (e.g. the target firm's Revenue or EBITDA). As a consequence of the role of financial structuring in private equity, the IPEV Guidelines recommends the use of Enterprise Value multiples in the determination of Fair Value: “... multiples should be used to derive an Enterprise Value for the Underlying Business.”

The EV/Revenue multiple (the “Revenue Multiple”) is generally useful for valuing firms with negative earnings. The multiple is less susceptible to accounting distortions and is not readily or easily available for manipulation by firm management. The traditional Revenue Multiple approach in valuation is typically useful for valuing cyclical businesses and firms operating in mature industries.

The EV/EBITDA multiple (the “EBITDA Multiple”) is one of the most widely used valuation multiples, and probably the most commonly used enterprise value multiple. The EBITDA Multiple is frequently employed as an alternative to the Price/Earnings ratio (the “P/E” ratio), because EBITDA is regularly applied as an indicator of company financial performance and is generally viewed as an alternative to recorded earnings. EBITDA strips out the effects of a company's cost of debt, tax, depreciation and amortisation; consequently, EBITDA is useful for evaluating firms with different capital structures, tax rates and depreciation policies.

The EV/EBIT multiple (the “EBIT Multiple”) is similar to the EBITDA Multiple, although it includes the non-cash accounting effects of firm depreciation and amortisation. EBIT commonly assesses the earnings generated by a company from normal operations and is often used as a proxy for firm operating profit. EBIT represents a company's capacity to generate earnings from normal operations, by excluding the effects of taxation, interest expense, and capital structure.

The EV/Total Assets multiple (the “Total Asset Multiple”) is commonly utilised for industries which are asset-intensive; although, like the Revenue Multiple, the Total Asset Multiple is also useful for valuing firms with negative earnings. Using the Total Asset Multiple is particularly advantageous where a business is predominantly asset-driven, and where return-on-assets (ROA) is largely consistent, as this allows base assets to serve as a proxy and appropriate indicator of future cash flows.

The EV/Tangible Assets multiple (the “Tangible Asset Multiple”) is similar to the Total Asset Multiple; however, the Tangible Asset Multiple excludes recorded goodwill and other intangible assets from the denominator in its calculation. Tangible assets include customary fixed assets such as machinery, land and buildings; and also current assets, such as firm inventory. Utilising the Tangible Asset Multiple instead of the Total Asset Multiple can help remedy some of the drawbacks associated with the Total Asset Multiple, namely, the inclusion of goodwill and other identifiable intangible assets on the balance sheet.



## DATA OVERVIEW

### SIC Industries (SIC Code):

Food And Kindred Products (2000), Meat Packing Plants (2011), Sausages & Other Prepared Meat Products (2013), Poultry Slaughtering And Processing (2015), Dairy Products (2020), Ice Cream & Frozen Desserts (2024), Canned, Frozen & Preservd Fruit, Veg & Food Specialties (2030), Canned, Fruits, Veg, Preserves, Jams & Jellies (2033), Grain Mill Products (2040), Bakery Products (2050), Cookies & Crackers (2052), Sugar & Confectionery Products (2060), Fats & Oils (2070), Beverages (2080), Malt Beverages (2082), Bottled & Canned Soft Drinks & Carbonated Waters (2086), Miscellaneous Food Preparations & Kindred Products (2090), Tobacco Products (2100), Cigarettes (2111), Textile Mill Products (2200), Broadwoven Fabric Mills, Cotton (2211), Broadwoven Fabric Mills, Man Made Fiber & Silk (2221), Carpets & Rugs (2273), Apparel & Other Finishd Prods Of Fabrics & Similar Matl (2300), Men'S & Boys' Furnishgs, Work Clothg, & Allied Garments (2320), Women'S, Misses', And Juniors Outerwear (2330), Women'S, Misses', Children'S & Infants' Undergarments (2340), Lumber & Wood Products (No Furniture) (2400), Sawmills & Planting Mills, General (2421), Millwood, Veneer, Plywood, & Structural Wood Members (2430), Mobile Homes (2451), Household Furniture (2510), Wood Household Furniture, (No Upholstered) (2511), Office Furniture (2520), Office Furniture (No Wood) (2522), Public Bldg & Related Furniture (2531), Miscellaneous Furniture & Fixtures (2590), Pulp Mills (2611), Paper Mills (2621), Paperboard Mills (2631), Paperboard Containers & Boxes (2650), Converted Paper & Paperboard Prods (No Contaners/Boxes) (2670), Newspapers: Publishing Or Publishing & Printing (2711), Periodicals: Publishing Or Publishing & Printing (2721), Books: Publishing Or Publishing & Printing (2731), Miscellaneous Publishing (2741), Commercial Printing (2750), Manifold Business Forms (2761), Greeting Cards (2771), Blankbooks, Looseleaf Binders & Bookbindg & Relatd Work (2780), Service Industries For The Printing Trade (2790), Chemicals & Allied Products (2800), Industrial Inorganic Chemicals (2810), Plastic Material, Synth Resin/Rubber, Cellulos (No Glass) (2820), Plastic Materials, Synth Resins & Nonvulcan Elastomers (2821), Medicinal Chemicals & Botanical Products (2833), Pharmaceutical Preparations (2834), In Vitro & In Vivo Diagnostic Substances (2835), Biological Products, (No Disgnostic Substances) (2836), Soap, Detergents, Cleang Preparations, Perfumes, Cosmetics (2840), Specialty Cleaning, Polishing And Sanitation Preparations (2842), Perfumes, Cosmetics & Other Toilet Preparations (2844), Paints, Varnishes, Lacquers, Enamels & Allied Prods (2851), Industrial Organic Chemicals (2860), Agricultural Chemicals (2870), Miscellaneous Chemical Products (2890), Adhesives & Sealants (2891), Petroleum Refining (2911), Miscellaneous Products Of Petroleum & Coal (2990), Tires & Inner Tubes (3011), Rubber & Plastics Footwear (3021), Gaskets, Packg & Sealg Devices & Rubber & Plastics Hose (3050), Fabricated Rubber Products, Nec (3060), Miscellaneous Plastics Products (3080), Unsupported Plastics Film & Sheet (3081), Plastics Foam Products (3086), Plastics Products, Nec (3089), Leather & Leather Products (3100), Footwear, (No Rubber) (3140), Flat Glass (3211), Glass & Glassware, Pressed Or Blown (3220), Glass Containers (3221), Glass Products, Made Of Purchased Glass (3231), Cement, Hydraulic (3241), Structural Clay Products (3250), Pottery & Related Products (3260), Concrete, Gypsum & Plaster Products (3270), Concrete Products, Except Block & Brick (3272), Cut Stone & Stone Products (3281), Abrasive, Asbestos & Misc Nonmetallic Mineral Prods (3290), Steel Works, Blast Furnaces & Rolling & Finishing Mills (3310), Steel Works, Blast Furnaces & Rolling Mills (Coke Ovens) (3312), Steel Pipe & Tubes (3317), Primary Smelting & Refining Of Nonferrous Metals (3330), Primary Production Of Aluminum (3334), Secondary Smelting & Refining Of Nonferrous Metals (3341), Rolling Drawing & Extruding Of Nonferrous Metals (3350), Drawing & Insulating Of Nonferrous Wire (3357), Nonferrous Foundries (Castings) (3360), Miscellaneous Primary Metal Products (3390), Metal Cans (3411), Metal Shipping Barrels, Drums, Kegs & Pails (3412), Cutlery, Handtools & General Hardware (3420), Heating Equip, Except Elec & Warm Air; & Plumbing Fixtures (3430), Heating Equipment, Except Electric & Warm Air Furnaces (3433), Fabricated Structural Metal Products (3440), Metal Doors, Sash, Frames, Moldings & Trim (3442), Fabricated Plate Work (Boiler Shops) (3443), Prefabricated Metal Buildings & Components (3448), Bolts, Nuts, Screws, Rivets & Washers (3452), Metal Forgings & Stampings (3460), Coating, Engraving & Allied Services (3470), Ordnance & Accessories, (No Vehicles/Guided Missiles) (3480), Miscellaneous Fabricated Metal Products (3490), Engines & Turbines (3510), Farm Machinery & Equipment (3523), Lawn & Garden Tractors & Home Lawn & Gardens Equip (3524), Construction, Mining & Materials Handling Machinery & Equip (3530), Construction Machinery & Equip (3531), Oil & Gas Field Machinery & Equipment (3533), Industrial Trucks, Tractors, Trailors & Stackers (3537), Metalworkg Machinery & Equipment (3540), Machine Tools, Metal Cutting Types (3541), Special Industry Machinery (No Metalworking Machinery) (3550), Printing Trades Machinery & Equipment (3555), Special Industry Machinery, Nec (3559), General Industrial Machinery & Equipment (3560), Pumps & Pumping Equipment (3561), Ball & Roller Bearings (3562), Industrial & Commercial Fans & Blowers & Air Purifing Equip (3564), General Industrial Machinery & Equipment, Nec (3569), Computer & Office Equipment (3570), Electronic Computers (3571), Computer Storage Devices (3572), Computer Communications Equipment (3576), Computer Peripheral Equipment, Nec (3577), Calculating & Accounting Machines (No Electronic Computers) (3578), Office Machines, Nec (3579), Refrigeration & Service Industry Machinery (3580), Air-Cond & Warm Air Heatg Equip & Comm & Indl Refrig Equip (3585), Misc Industrial & Commercial Machinery & Equipment (3590), Electronic & Other Electrical Equipment (No Computer Equip) (3600), Power, Distribution & Specialty Transformers (3612), Switchgear & Switchboard Apparatus (3613), Electrical Industrial Apparatus (3620), Motors & Generators (3621), Household Appliances (3630), Electric Housewares & Fans (3634), Electric Lighting & Wiring Equipment (3640), Household Audio & Video Equipment (3651), Telephone & Telegraph Apparatus (3661), Radio & Tv Broadcasting & Communications Equipment (3663), Communications Equipment, Nec (3669), Electronic Components & Accessories (3670), Printed Circuit Boards (3672), Semiconductors & Related Devices (3674), Electronic Coils, Transformers & Other Inductors (3677), Electronic Connectors (3678), Electronic Components, Nec (3679), Miscellaneous Electrical Machinery, Equipment & Supplies (3690), Magnetic & Optical Recording Media (3695), Motor Vehicles & Passenger Car Bodies (3711), Truck & Bus Bodies (3713), Motor Vehicle Parts & Accessories (3714), Truck Trailers (3715), Motor Homes (3716), Aircraft & Parts (3720), Aircraft (3721), Aircraft Engines & Engine Parts (3724), Aircraft Parts & Auxiliary Equipment, Nec (3728), Ship & Boat Building & Repairing (3730), Railroad Equipment (3743), Motorcycles, Bicycles & Parts (3751), Guided Missiles & Space



Vehicles & Parts (3760), Miscellaneous Transportation Equipment (3790), Search, Detection, Navigation, Guidance, Aeronautical Sys (3812), Laboratory Apparatus & Furniture (3821), Auto Controls For Regulating Residential & Comml Environments (3822), Industrial Instruments For Measurement, Display, And Control (3823), Totalizing Fluid Meters & Counting Devices (3824), Instruments For Meas & Testing Of Electricity & Elec Signals (3825), Laboratory Analytical Instruments (3826), Optical Instruments & Lenses (3827), Measuring & Controlling Devices, Nec (3829), Surgical & Medical Instruments & Apparatus (3841), Orthopedic, Prosthetic & Surgical Appliances & Supplies (3842), Dental Equipment & Supplies (3843), X-Ray Apparatus & Tubes & Related Irradiation Apparatus (3844), Electromedical & Electrotherapeutic Apparatus (3845), Ophthalmic Goods (3851), Photographic Equipment & Supplies (3861), Watches, Clocks, Clockwork Operated Devices/Parts (3873), Jewelry, Silverware & Plated Ware (3910), Dolls & Stuffed Toys (3942), Games, Toys & Children'S Vehicles (No Dolls & Bicycles) (3944), Sporting & Athletic Goods, Nec (3949), Miscellaneous Manufacturing Industries (3990)

#### Companies (Ticker):

AGILENT TECHNOLOGIES INC (A), ALCOA CORP (AA), APPLIED OPTOELECTRONICS, INC. (AAOI), AAON INC (AAON), APPLE INC (AAPL), AXON ENTERPRISE, INC. (AAXN), ABB LTD (Foreign) (ABB), ABBVIE INC. (ABBV), CAMBIUM LEARNING GROUP, INC. (ABCD), ABEONA THERAPEUTICS INC. (ABEO), AMBEV S.A. (Foreign) (ABEV), ABILITY INC. (Foreign) (ABIL), ARCA BIOPHARMA, INC. (ABIO), ABIOMED INC (ABMD), ABBOTT LABORATORIES (ABT), ARBUTUS BIOPHARMA CORP (ABUS), ACADIA PHARMACEUTICALS INC (ACAD), ACCO BRANDS CORP (ACCO), ACER THERAPEUTICS INC. (ACER), ALUMINUM CORP OF CHINA LTD (Foreign) (ACH), ACHILLION PHARMACEUTICALS INC (ACHN), ACHIEVE LIFE SCIENCES, INC. (ACHV), ACACIA COMMUNICATIONS, INC. (ACIA), AC IMMUNE SA (Foreign) (ACIU), AXCELIS TECHNOLOGIES INC (ACLS), ACM RESEARCH, INC. (ACMR), ACORDA THERAPEUTICS INC (ACOR), ACLARIS THERAPEUTICS, INC. (ACRS), ACELRX PHARMACEUTICALS INC (ACRX), ACASTI PHARMA INC. (Foreign) (ACST), ACME UNITED CORP (ACU), ADAPTIMMUNE THERAPEUTICS PLC (ADAP), ADVANCED EMISSIONS SOLUTIONS, INC. (ADES), ANALOG DEVICES INC (ADI), ARCHER DANIELS MIDLAND CO (ADM), ADMA BIOLOGICS, INC. (ADMA), ADAMIS PHARMACEUTICALS CORP (ADMP), ADAMAS PHARMACEUTICALS INC (ADMS), ADIENT PLC (ADNT), ADOMANI, INC. (ADOM), ADURO BIOTECH, INC. (ADRO), ADTRAN INC (ADTN), ADVERUM BIOTECHNOLOGIES, INC. (ADVM), ADVAXIS, INC. (ADXS), AEHR TEST SYSTEMS (AEHR), ADVANCED ENERGY INDUSTRIES INC (AEIS), AETHLON MEDICAL INC (AEMD), AERIE PHARMACEUTICALS INC (AERI), AMERICAN ELECTRIC TECHNOLOGIES INC (AETI), AETERNA ZENTARIS INC. (Foreign) (AEZS), ARMSTRONG FLOORING, INC. (AFI), AFFIMED N.V. (Foreign) (AFMD), AGCO CORP (AGCO), AGENUS INC (AGEN), AGIOS PHARMACEUTICALS INC (AGIO), AEGLEA BIOTHERAPEUTICS, INC. (AGLE), ALLERGAN PLC (AGN), AGILE THERAPEUTICS INC (AGRX), PLAYAGS, INC. (AGS), APPLIED GENETIC TECHNOLOGIES CORP (AGTC), A. H. BELO CORP (AHC), ALLIED HEALTHCARE PRODUCTS INC (AHPI), ALTRA INDUSTRIAL MOTION CORP. (AIMC), AIMMUNE THERAPEUTICS, INC. (AIMT), ALBANY INTERNATIONAL CORP (AIN), PRECISION THERAPEUTICS INC. (AIPT), AAR CORP (AIR), AIRGAIN INC (AIRG), AIR INDUSTRIES GROUP (AIRI), AEROJET ROCKETDYNE HOLDINGS, INC. (AJRD), ACHAOPEN, INC. (AKAO), AKEBIA THERAPEUTICS, INC. (AKBA), AKCEA THERAPEUTICS, INC. (AKCA), AKERS BIOSCIENCES, INC. (AKER), AKORN INC (AKRX), AK STEEL HOLDING CORP (AKS), AKOUSTIS TECHNOLOGIES, INC. (AKTS), AKARI THERAPEUTICS PLC (Foreign) (AKTX), ALBEMARLE CORP (ALB), ALBIREO PHARMA, INC. (ALBO), ALDER BIOPHARMACEUTICALS INC (ALDR), ALDEYRA THERAPEUTICS, INC. (ALDX), ALAMO GROUP INC (ALG), ALIGN TECHNOLOGY INC (ALGN), ALIMERA SCIENCES INC (ALIM), ALKERMES PLC. (ALKS), ALLOT LTD. (Foreign) (ALLT), ALLENA PHARMACEUTICALS, INC. (ALNA), ALNYLAM PHARMACEUTICALS, INC. (ALNY), ASTRONOVA, INC. (ALOT), ALPINE IMMUNE SCIENCES, INC. (ALPN), ALLIQUA BIOMEDICAL, INC. (ALQA), AILERON THERAPEUTICS INC (ALRN), ALLISON TRANSMISSION HOLDINGS INC (ALSN), ALTIMMUNE, INC. (ALT), AUTOLIV INC (ALV), ALEXION PHARMACEUTICALS, INC. (ALXN), AMAG PHARMACEUTICALS INC. (AMAG), APPLIED MATERIALS INC (AMAT), AMBARELLA INC (AMBA), ADVANCED MICRO DEVICES INC (AMD), AMETEK INC (AME), AMGEN INC (AMGN), AMKOR TECHNOLOGY, INC. (AMKR), ALLIED MOTION TECHNOLOGIES INC (AMOT), AMPIO PHARMACEUTICALS, INC. (AMPE), AMPHASTAR PHARMACEUTICALS, INC. (AMPH), AMERI HOLDINGS, INC. (AMRH), AMARIN CORP PLC (AMRN), AMYRIS, INC. (AMRS), AMNEAL PHARMACEUTICALS, INC. (AMRX), AMERICAN SUPERCONDUCTOR CORP (AMSC), AEMETIS, INC (AMTX), AMERICAN WOODMARK CORP (AMWD), ANAPTYSBIO INC (ANAB), ARISTA NETWORKS, INC. (ANET), AMIRA NATURE FOODS LTD. (Foreign) (ANFI), ANGIODYNAMICS INC (ANGO), ANIKA THERAPEUTICS, INC. (ANIK), ANI PHARMACEUTICALS INC (ANIP), AMERICAN OUTDOOR BRANDS CORP (AOBC), SMITH A O CORP (AOS), ALPHA & OMEGA SEMICONDUCTOR LTD (AOSL), AMPCO PITTSBURGH CORP (AP), AIR PRODUCTS & CHEMICALS INC (APD), APOLLO ENDOSURGERY, INC. (APEN), AMPHENOL CORP (APH), AMPLIPHI BIOSCIENCES CORP (APHB), APELLIS PHARMACEUTICALS, INC. (APLS), APOGEE ENTERPRISES, INC. (APOG), CELLECT BIOTECHNOLOGY LTD. (Foreign) (APOP), APRICUS BIOSCIENCES, INC. (APRI), ALPHA PRO TECH LTD (APT), APTOSE BIOSCIENCES INC. (Foreign) (APTO), APTIV PLC (APTIV), APTEVO THERAPEUTICS INC. (APVO), ASIA PACIFIC WIRE & CABLE CORP LTD (Foreign) (APWC), APERGY CORP (APY), AQUANTIA CORP (AQ), AQUA METALS, INC. (AQMS), EVOQUA WATER TECHNOLOGIES CORP. (AQUA), AQUINOX PHARMACEUTICALS, INC (AQXP), ACCURAY INC (ARAY), ARCTURUS THERAPEUTICS LTD. (Foreign) (ARCT), ARC GROUP WORLDWIDE, INC. (ARCW), ARDAGH GROUP S.A. (Foreign) (ARD), ARADIGM CORP (ARDM), ARDELYX, INC. (ARDX), ARGENX SE (Foreign) (ARGX), AMERICAN RAILCAR INDUSTRIES, INC. (ARII), ARENA PHARMACEUTICALS INC (ARNA), ARCONIC INC. (ARNC), ARQULE INC (ARQL), ARRIS INTERNATIONAL PLC (ARRS), ARRAY BIOPHARMA INC (ARRY), ARTS WAY MANUFACTURING CO INC (ARTW), AROTECH CORP (ARTX), ARROWHEAD PHARMACEUTICALS, INC. (ARWR), ADVANSIX INC. (ASIX), ASLAN PHARMACEUTICALS

LTD (Foreign) (ASLN), ASSEMBLY BIOSCIENCES, INC. (ASMB), ASML HOLDING NV (Foreign) (ASML), ASCENDIS PHARMA A (Foreign) (ASND), ARSANIS, INC. (ASNS), ASTERIAS BIOTHERAPEUTICS, INC. (AST), ASTROTECH CORP (ASTC), ASTEC INDUSTRIES INC (ASTE), ASV HOLDINGS, INC. (ASV), ASE TECHNOLOGY HOLDING CO., LTD. (Foreign) (ASX), AMTECH SYSTEMS INC (ASYS), ALPHATEC HOLDINGS, INC. (ATEC), A10 NETWORKS, INC. (ATEN), ATHERSYS, INC (ATHX), ALLEGHENY TECHNOLOGIES INC (ATI), ATKORE INTERNATIONAL GROUP INC. (ATKR), ACTINIUM PHARMACEUTICALS, INC. (ATNM), ATHENEX, INC. (ATNX), ATOMERA INC (ATOM), ATOSSA GENETICS INC (ATOS), APTARGROUP INC (ATR), ATARA BIOTHERAPEUTICS, INC. (ATRA), ATRICURE, INC. (ATRC), ATRION CORP (ATRI), ASTRONICS CORP (ATRO), ANTARES PHARMA, INC. (ATRS), ACTUANT CORP (ATU), AVENUE THERAPEUTICS, INC. (ATXI), AUDIOCODES LTD (Foreign) (AUDC), AU OPTRONICS CORP (Foreign) (AUO), AURINIA PHARMACEUTICALS INC. (Foreign) (AUPH), AEROVIRONMENT INC (AVAV), AMERICAN VANGUARD CORP (AVD), AVADEL PHARMACEUTICALS PLC (AVDL), AVEO PHARMACEUTICALS INC (AVEO), BROADCOM INC. (AVGO), AVINGER INC (AVGR), AVIAT NETWORKS, INC. (AVNW), AVON PRODUCTS INC (AVP), AVX CORP (AVX), AVERY DENNISON CORP (AVY), AVAYA HOLDINGS CORP. (AVYA), ARMSTRONG WORLD INDUSTRIES INC (AWI), ACCELERATE DIAGNOSTICS, INC (AXDX), AXOGEN, INC. (AXGN), AMERICAN AXLE & MANUFACTURING HOLDINGS INC (AXL), AXOVANT SCIENCES LTD. (AXON), AMREP CORP. (AXR), AXSOME THERAPEUTICS, INC. (AXSM), AXALTA COATING SYSTEMS LTD. (AXTA), AXT INC (AXTI), ACUITY BRANDS INC (AYI), AYTU BIOSCIENCE, INC (AYTU), ASTRAZENCA PLC (Foreign) (AZN), AZURRX BIOPHARMA, INC. (AZRX), AZZ INC (AZZ), BARNES GROUP INC (B), BOEING CO (BA), NATUS MEDICAL INC (BABY), BRASKEM SA (Foreign) (BAK), BAXTER INTERNATIONAL INC (BAX), BLACKBERRY LTD (Foreign) (BB), BLACK BOX CORP (BBOX), BRUNSWICK CORP (BC), BRAINSTORM CELL THERAPEUTICS INC. (BCLI), BALCHEM CORP (BCPC), BIOCRYST PHARMACEUTICALS INC (BCRX), BELDEN INC. (BDC), BLONDER TONGUE LABORATORIES INC (BDR), BIODELIVERY SCIENCES INTERNATIONAL INC (BDSI), BECTON DICKINSON & CO (BDX), BEL FUSE INC (BELFA), BERRY GLOBAL GROUP INC (BERY), BIOFRONTERA AG (Foreign) (BFRA), BUNGE LTD (BG), BRIGGS & STRATTON CORP (BGG), BEIGENE, LTD. (BGNE), B&G FOODS, INC. (BGS), BENCHMARK ELECTRONICS INC (BHE), BAKER HUGHES A GE CO (BHGE), BIOHAVEN PHARMACEUTICAL HOLDING CO LTD. (BHVN), BIOGEN INC. (BIIB), BIO-RAD LABORATORIES, INC. (BIO), BIOLASE, INC (BIOL), BK TECHNOLOGIES, INC. (BKTI), BIO KEY INTERNATIONAL INC (BKYI), BLUE BIRD CORP (BLBD), BELLICUM PHARMACEUTICALS, INC (BLCM), BALLARD POWER SYSTEMS INC. (Foreign) (BLDP), BIOLIFE SOLUTIONS INC (BLFS), BALL CORP (BLL), BELLEROPHON THERAPEUTICS, INC. (BLPH), BIOLINERX LTD. (Foreign) (BLRX), BLUEBIRD BIO, INC. (BLUE), BADGER METER INC (BMI), BIOMERICA INC (BMRA), BIOMARIN PHARMACEUTICAL INC (BMRN), BEMIS CO INC (BMS), BRISTOL MYERS SQUIBB CO (BMY), BONSO ELECTRONICS INTERNATIONAL INC (Foreign) (BNSO), BENITEC BIOPHARMA LTD (Foreign) (BNTC), AUDENTES THERAPEUTICS, INC. (BOLD), DMC GLOBAL INC. (BOOM), CHINA NEW BORUN CORP (Foreign) (BORN), BOS BETTER ONLINE SOLUTIONS LTD (Foreign) (BOSC), BOXLIGHT CORP (BOXL), BP PLC (Foreign) (BP), BLUEPRINT MEDICINES CORP (BPMC), BIO-PATH HOLDINGS INC (BPTH), BRADY CORP (BRC), CRAFT BREW ALLIANCE, INC. (BREW), BRF S.A. (Foreign) (BRFS), BRIDGFORD FOODS CORP (BRID), BRUKER CORP (BRKR), BROOKS AUTOMATION INC (BRKS), GLOBAL BRASS & COPPER HOLDINGS, INC. (BRSS), BASSETT FURNITURE INDUSTRIES INC (BSET), BIOSPECIFICS TECHNOLOGIES CORP (BSTC), BOSTON SCIENTIFIC CORP (BSX), BIOXCEL THERAPEUTICS, INC. (BTAI), BRITISH AMERICAN TOBACCO P.L.C. (Foreign) (BTI), BALLANTYNE STRONG, INC. (BTN), BIOTIME INC (BTX), ANHEUSER-BUSCH INBEV SA (Foreign) (BUD), BOVIE MEDICAL CORP (BVX), BIONDVAX PHARMACEUTICALS LTD. (Foreign) (BVXV), BABCOCK & WILCOX ENTERPRISES, INC. (BW), BORGWARNER INC (BWA), BROADWIND ENERGY, INC. (BWEN), BWX TECHNOLOGIES, INC. (BWXT), BEYONDSRING INC. (Foreign) (BYSI), CHINA AUTOMOTIVE SYSTEMS INC (CAAS), CAE INC (Foreign) (CAE), CONAGRA BRANDS INC. (CAG), CANON INC (Foreign) (CAJ), CALERES INC (CAL), CALITHERA BIOSCIENCES, INC. (CALA), CALAMP CORP. (CAMP), CAMTEK LTD (Foreign) (CAMT), CAN-FITE BIOPHARMA LTD. (Foreign) (CANF), CAPRICOR THERAPEUTICS, INC. (CAPR), CARA THERAPEUTICS, INC. (CARA), CASA SYSTEMS INC (CASA), CASI PHARMACEUTICALS, INC. (CASI), CAS MEDICAL SYSTEMS INC (CASM), CATERPILLAR INC (CAT), CATABASIS PHARMACEUTICALS INC (CATB), CCA INDUSTRIES INC (CAW), CYMABAY THERAPEUTICS, INC. (CBAY), CATALYST BIOSCIENCES, INC. (CBIO), CAMBREX CORP (CBM), CELLULAR BIOMEDICINE GROUP, INC. (CBMG), CHINA BIOLOGIC PRODUCTS HOLDINGS, INC. (Foreign) (CBPO), CONTINENTAL BUILDING PRODUCTS, INC. (CBPX), CABOT CORP (CBT), CHEMOURS CO (CC), CHINA CERAMICS CO., LTD (Foreign) (CCCL), CHASE CORP (CCF), CROWN HOLDINGS INC (CCK), CABOT MICROELECTRONICS CORP (CCMP), COMPANIA CERVECERIAS UNIDAS S.A. (Foreign) (CCU), CHEMOCENTRYX, INC. (CCXI), AVID BIOSERVICES, INC. (CDMO), CDTI ADVANCED MATERIALS, INC. (CDTI), CIDARA THERAPEUTICS, INC. (CDTX), CHROMADEX CORP. (CDXC), CODEXIS INC (CDXS), CELANESE CORP (CE), CECO ENVIRONMENTAL CORP (CECE), CELGENE CORP (CELG), CELSIUS HOLDINGS, INC. (CELH), CHEMBIO DIAGNOSTICS, INC. (CEMI), CENTURY ALUMINUM CO (CENX), CERECOR INC. (CERC), CERUS CORP (CERS), CEMTREX INC (CETX), CEVA INC (CEVA), CF INDUSTRIES HOLDINGS, INC. (CF), CONFORMIS INC (CFMS), CONTRAFECT CORP (CFRX), COLFAX CORP (CFX), CHINA GREEN AGRICULTURE, INC. (CGA), CANOPY GROWTH CORP (Foreign) (CGC), COMPUGEN LTD (Foreign) (CGEN), COGNEX CORP (CGNX), CHURCH & DWIGHT CO INC (CHD), CHECK-CAP LTD (Foreign) (CHEK), CHF SOLUTIONS, INC. (CHFS), CHEROKEE INC (CHKE), CHIAMA, INC (CHMA), COHERUS BIOSCIENCES, INC. (CHRS), CIENA CORP (CIEN), CIRCOR INTERNATIONAL INC (CIR), COMPIX INTERNATIONAL INC (CIX), CHINA JO-JO DRUGSTORES, INC. (CJJD), CHECKPOINT THERAPEUTICS, INC. (CKPT), COLGATE PALMOLIVE CO (CL), CLARUS CORP (CLAR), CELLDEX THERAPEUTICS, INC. (CLDX), CLEARFIELD, INC. (CLFD), COLLPLANT HOLDINGS LTD. (Foreign) (CLGN), CLEARSIGN COMBUSTION CORP (CLIR), CELLECTIS S.A. (Foreign) (CLLS),

CALUMET SPECIALTY PRODUCTS PARTNERS, L.P. (CLMT), CELLECTAR BIOSCIENCES, INC. (CLRB), CLEARONE INC (CLRO), CELESTICA INC (Foreign) (CLS), CLEARSIDE BIOMEDICAL, INC. (CLSD), CELSION CORP (CLSN), CLOVIS ONCOLOGY, INC. (CLVS), CLEARWATER PAPER CORP (CLW), CLOROX CO (CLX), CALYXT, INC. (CLXT), COMMERCIAL METALS CO (CMC), COLUMBUS MCKINNON CORP (CMCO), CANTEL MEDICAL CORP (CMD), CUMMINS INC (CMI), CIMPRESS N.V. (CMPR), CHIMERIX INC (CMRX), CORE MOLDING TECHNOLOGIES INC (CMT), CLEMENTIA PHARMACEUTICALS INC. (Foreign) (CMTA), COMTECH TELECOMMUNICATIONS CORP (CMTL), CONATUS PHARMACEUTICALS INC. (CNAT), CONCERT PHARMACEUTICALS, INC. (CNCE), CNH INDUSTRIAL N.V. (Foreign) (CNHI), CONMED CORP (CNMD), COCRYSTAL PHARMA, INC. (COCF), CODA OCTOPUS GROUP, INC. (CODA), COMPASS DIVERSIFIED HOLDINGS (CODI), CO-DIAGNOSTICS, INC. (CODX), COHERENT INC (COHR), COHU INC (COHU), COCA COLA BOTTLING CO CONSOLIDATED (COKE), COLLEGIUM PHARMACEUTICAL, INC (COLL), COLUMBIA SPORTSWEAR CO (COLM), COMMSCOPE HOLDING COMPANY, INC. (COMM), COOPER COMPANIES INC (COO), CONOCOPHILLIPS (COP), CORCEPT THERAPEUTICS INC (CORT), CORREVIO PHARMA CORP. (Foreign) (CORV), COTT CORP (COT), COTY INC. (COTY), CEMENTOS PACASMAYO SAA (Foreign) (CPAC), CAMPBELL SOUP CO (CPB), CHINA PHARMA HOLDINGS, INC. (CPHI), CUMBERLAND PHARMACEUTICALS INC (CPIX), CATALYST PHARMACEUTICALS, INC. (CPRX), COOPER-STANDARD HOLDINGS INC. (CPS), CPS TECHNOLOGIES CORP (CPH), CAPSTONE TURBINE CORP (CPST), CRANE CO (CR), CRAY INC (CRAY), CORBUS PHARMACEUTICALS HOLDINGS, INC. (CRBP), CREE INC (CREE), CRH PUBLIC LTD CO (Foreign) (CRH), CRH MEDICAL CORP (Foreign) (CRHM), CARTERS INC (CRI), CURIS INC (CRIS), CORMEDIX INC. (CRMD), CERAGON NETWORKS LTD (Foreign) (CRNT), CRONOS GROUP INC. (Foreign) (CRON), CROCS, INC. (CROX), CARBO CERAMICS INC (CRR), CARPENTER TECHNOLOGY CORP (CRS), CRISPR THERAPEUTICS AG (CRSP), CIRRUS LOGIC INC (CRUS), CORVUS PHARMACEUTICALS, INC. (CRVS), CROWN CRAFTS INC (CRWS), CRYOLIFE INC (CRY), CHAMPIONS ONCOLOGY, INC. (CSBR), CISCO SYSTEMS, INC. (CSCO), CARDIOVASCULAR SYSTEMS INC (CSII), CANADIAN SOLAR INC. (Foreign) (CSIQ), CARLISLE COMPANIES INC (CSL), CSS INDUSTRIES INC (CSS), CAESARSTONE LTD. (Foreign) (CSTE), CONSTELLIUM N.V. (Foreign) (CSTM), CSW INDUSTRIALS, INC. (CSWI), CINTAS CORP (CTAS), COOPER TIRE & RUBBER CO (CTB), CHARLES & COLVARD LTD (CTHR), CTI INDUSTRIES CORP (CTIB), CTI BIOPHARMA CORP (CTIC), CATALENT, INC. (CTLT), CYTOMX THERAPEUTICS, INC. (CTMX), CONTROL4 CORP (CTRL), CONTRAVIR PHARMACEUTICALS, INC. (CTRV), CTS CORP (CTS), CYTOSORBENTS CORP (CTSO), CITIUS PHARMACEUTICALS, INC. (CTXR), CUBIC CORP (CUB), CUE BIOPHARMA, INC. (CUE), CULP INC (CULP), CONTINENTAL MATERIALS CORP (CUO), NEURALSTEM, INC. (CUR), CUTERA INC (CUTR), CAVCO INDUSTRIES INC. (CVCO), COMMERCIAL VEHICLE GROUP, INC. (CVGI), CVR ENERGY INC (CVI), CEL SCI CORP (CVM), CHICAGO RIVET & MACHINE CO (CVR), CVR REFINING, LP (CVRR), CORINDUS VASCULAR ROBOTICS, INC. (CVRS), CPI AEROSTRUCTURES INC (CVU), CVD EQUIPMENT CORP (CVV), CHEVRON CORP (CVX), CURTISS WRIGHT CORP (CW), COHBAR, INC. (CWBR), CEMEX SAB DE CV (Foreign) (CX), CHINA XD PLASTICS CO LTD (CXDC), CYPRESS SEMICONDUCTOR CORP (CY), CELYAD S.A. (Foreign) (CYAD), CYANOTECH CORP (CYAN), CYBEROPTICS CORP (CYBE), CYCLACEL PHARMACEUTICALS, INC. (CYCC), CHINA YUCHAI INTERNATIONAL LTD (Foreign) (CYD), CRYOPORT, INC. (CYRX), CYTOKINETICS INC (CYTK), CYTRX CORP (CYTR), CYTORI THERAPEUTICS, INC. (CYTX), COSAN LTD. (Foreign) (CZZ), DATA I/O CORP (DAIO), DAKTRONICS INC (DAKT), DANA INC (DAN), DARLING INGREDIENTS INC. (DAR), DARE BIOSCIENCE, INC. (DARE), DIEBOLD NIXDORF, INC (DBD), DBV TECHNOLOGIES S.A. (Foreign) (DBVT), DONALDSON CO INC (DCI), DUCOMMUN INC (DCO), DECIPHERA PHARMACEUTICALS, INC. (DCPH), DEERE & CO (DE), DECKERS OUTDOOR CORP (DECK), DIAGEO PLC (Foreign) (DEO), DERMIRA, INC. (DERM), DEAN FOODS CO (DF), DIFFUSION PHARMACEUTICALS INC. (DFFN), DIGI INTERNATIONAL INC (DGII), DIGITAL ALLY INC (DGLY), DANAHER CORP (DHR), DIODES INC (DIOD), DAILY JOURNAL CORP (DJCO), DELEK US HOLDINGS, INC. (DK), DELPHI TECHNOLOGIES PLC (DLPH), DELUXE CORP (DLX), DELMAR PHARMACEUTICALS, INC. (DMPI), DENALI THERAPEUTICS INC. (DNLI), NOW INC. (DNOW), DOGNESS (INTERNATIONAL) CORP (Foreign) (DOGZ), MASONITE INTERNATIONAL CORP (DOOR), DORMAN PRODUCTS, INC. (DORM), DOVER CORP (DOV), DOVA PHARMACEUTICALS INC. (DOVA), DPW HOLDINGS, INC. (DPW), DAQO NEW ENERGY CORP. (Foreign) (DQ), DIGIRAD CORP (DRAD), DARIOHEALTH CORP. (DRIO), DICERNA PHARMACEUTICALS INC (DRNA), DRIL-QUIP INC (DRQ), DURECT CORP (DRRX), DSP GROUP INC (DSPG), DOCUMENT SECURITY SYSTEMS INC (DSS), DESWELL INDUSTRIES INC (Foreign) (DSWL), DYNAVAX TECHNOLOGIES CORP (DVAX), DELL TECHNOLOGIES INC (DVMT), DOWDUPONT INC. (DWDP), DEXCOM INC (DXCM), DUNXIN FINANCIAL HOLDINGS LTD (Foreign) (DXF), DIXIE GROUP INC (DXYN), DYNATRONICS CORP (DYNT), DYNASIL CORP OF AMERICA (DYSL), DASAN ZHONG SOLUTIONS INC (DZSI), GRAFTECH INTERNATIONAL LTD (EAF), AURIS MEDICAL HOLDING AG (Foreign) (EARS), EASTSIDE DISTILLING, INC. (EAST), ENNIS, INC. (EBF), EMERGENT BIOSOLUTIONS INC. (EBS), ECOLAB INC. (ECL), ENDOCYTE INC (ECYT), EDAP TMS SA (Foreign) (EDAP), EDGE THERAPEUTICS, INC. (EDGE), EDITAS MEDICINE, INC. (EDIT), ELECTRONICS FOR IMAGING INC (EFII), ENERGY FOCUS, INC (EFOI), EAGLE PHARMACEUTICALS, INC. (EGRX), EIGER BIOPHARMACEUTICALS, INC. (EIGR), EKSO BIONICS HOLDINGS, INC. (EKSO), ESTEE LAUDER COMPANIES INC (EL), E.L.F. BEAUTY, INC. (ELF), ENDOLOGIX INC (ELGX), ELECTROMED, INC. (ELMD), ELECTRO SENSORS INC (ELSE), ELTEK LTD (Foreign) (ELTK), CALLAWAY GOLF CO (ELY), EMAGIN CORP (EMAN), EMCORE CORP (EMKR), EASTERN CO (EML), EASTMAN CHEMICAL CO (EMN), EMERSON ELECTRIC CO (EMR), ENDO INTERNATIONAL PLC (ENDP), ENPHASE ENERGY, INC. (ENPH), ENERGIZER HOLDINGS, INC. (ENR), ENANTA PHARMACEUTICALS INC (ENTA), ENTEGRIS INC (ENTG), EVOLUS, INC. (EOLS), EDGEWELL PERSONAL CARE CO (EPC), ESSA PHARMA INC. (Foreign) (EPIX), EPIZYME, INC. (EPZM), EQUINOR ASA (Foreign) (EQNR), ERICSSON LM TELEPHONE CO (Foreign) (ERIC), ENERGY RECOVERY, INC. (ERII), EMBRAER S.A. (Foreign) (ERJ), ERYTECH

PHARMA S.A. (Foreign) (ERYP), ESCALADE INC (ESCA), ESCO TECHNOLOGIES INC (ESE), ELECTRO SCIENTIFIC INDUSTRIES INC (ESIO), ESTERLINE TECHNOLOGIES CORP (ESL), ELBIT SYSTEMS LTD (Foreign) (ESLT), ESPEY MFG & ELECTRONICS CORP (ESP), ESPERION THERAPEUTICS, INC. (ESPR), ETHAN ALLEN INTERIORS INC (ETH), EATON CORP PLC (ETN), ENVIVA PARTNERS, LP (EVA), EVOFEM BIOSCIENCES, INC. (EVFM), EVOGENE LTD. (Foreign) (EVGN), EVER-GLORY INTERNATIONAL GROUP, INC. (EVK), EVELO BIOSCIENCES, INC. (EVLO), EVOKE PHARMA INC (EVOK), EDWARDS LIFESCIENCES CORP (EW), EXFO INC. (Foreign) (EXFO), EAGLE MATERIALS INC (EXP), EXTREME NETWORKS INC (EXTR), NATIONAL VISION HOLDINGS, INC. (EYE), EYEGATE PHARMACEUTICALS INC (EYEG), EYENOVIA, INC. (EYEN), SECOND SIGHT MEDICAL PRODUCTS INC (EYEM), EYEPOINT PHARMACEUTICALS, INC. (EYPT), FORD MOTOR CO (F), FARMMI, INC. (Foreign) (FAMI), FARMER BROTHERS CO (FARM), FARO TECHNOLOGIES INC (FARO), FATE THERAPEUTICS INC (FATE), FORTRESS BIOTECH, INC. (FBIO), FIBRIA CELULOSE S.A. (Foreign) (FBR), FIAT CHRYSLER AUTOMOBILES N.V. (Foreign) (FCAU), FUELCELL ENERGY INC (FCEL), FIBROCELL SCIENCE, INC. (FCSC), FREQUENCY ELECTRONICS INC (FEIM), FRANKLIN ELECTRIC CO INC (FELE), FENNEC PHARMACEUTICALS INC. (FENC), FORUM ENERGY TECHNOLOGIES, INC. (FET), FIREEYE, INC. (FEYE), FUTUREFUEL CORP. (FF), FUWEI FILMS (HOLDINGS), CO. LTD. (Foreign) (FFHL), F5 NETWORKS INC (FFIV), FIBROGEN INC (FGEN), FITBIT INC (FIT), HOMOLOGY MEDICINES, INC. (FIXX), NATIONAL BEVERAGE CORP (FIZZ), FLUIDIGM CORP (FLDM), FLEX LTD. (FLEX), FLIR SYSTEMS INC (FLIR), FLEX PHARMA, INC. (FLKS), FLOWERS FOODS INC (FLO), SPX FLOW, INC. (FLOW), FLOWSERVE CORP (FLS), FLEXION THERAPEUTICS INC (FLXN), FLEXSTEEL INDUSTRIES INC (FLXS), FMC CORP (FMC), MEXICAN ECONOMIC DEVELOPMENT INC (Foreign) (FMX), FABRINET (FN), FUNKO, INC. (FNKO), FINISAR CORP (FNSR), FERRO CORP (FOE), AMICUS THERAPEUTICS INC (FOLD), FOAMIX PHARMACEUTICALS LTD. (FOMX), FONAR CORP (FONR), FORWARD INDUSTRIES, INC. (FORD), FULING GLOBAL INC. (Foreign) (FORK), FORMFACTOR INC (FORM), FOSSIL GROUP, INC. (FOSL), FOX FACTORY HOLDING CORP (FOXF), FIVE PRIME THERAPEUTICS INC (FPRX), FRIEDMAN INDUSTRIES INC (FRD), FRESHPET, INC. (FRPT), FORTERRA, INC. (FRTA), FORESCOUT TECHNOLOGIES, INC (FSCT), FLEXIBLE SOLUTIONS INTERNATIONAL INC (FSI), FIRST SOLAR, INC. (FSLR), FEDERAL SIGNAL CORP (FSS), FUEL TECH, INC. (FTEK), FUTURE FINTECH GROUP INC. (FTFT), TECHNIPFMC PLC (FTI), FLOTEK INDUSTRIES INC (FTK), FORTINET INC (FTNT), FORTIVE CORP (FTV), FULLER H B CO (FUL), ARCIMOTO INC (FUV), FORWARD PHARMA A (Foreign) (FWP), GALECTIN THERAPEUTICS INC (GALT), GLOBAL BLOOD THERAPEUTICS, INC. (GBT), GREENBRIER COMPANIES INC (GBX), GANNETT CO., INC. (GCI), GCP APPLIED TECHNOLOGIES INC. (GCP), GENERAL DYNAMICS CORP (GD), GARDNER DENVER HOLDINGS, INC. (GDI), GENERAL ELECTRIC CO (GE), GREIF INC (GEF), GEMPHIRE THERAPEUTICS INC. (GEMP), GENCOR INDUSTRIES INC (GENC), GENETIC TECHNOLOGIES LTD (Foreign) (GENE), GEOSPACE TECHNOLOGIES CORP (GEOS), GERON CORP (GERN), GUESS INC (GES), GEVO, INC. (GEVO), GRIFFON CORP (GFF), GERDAU S.A. (Foreign) (GGB), GRACO INC (GGG), GRAHAM CORP (GHM), GULF ISLAND FABRICATION INC (GIFI), G III APPAREL GROUP LTD (GIII), GILDAN ACTIVEWEAR INC. (Foreign) (GIL), GILEAD SCIENCES INC (GILD), GILAT SATELLITE NETWORKS LTD (Foreign) (GILT), GENERAL MILLS INC (GIS), GLAUKOS CORP (GKOS), GALMED PHARMACEUTICALS LTD. (Foreign) (GLMD), GALAPAGOS NV (Foreign) (GLPG), GLATFELTER P H CO (GLT), CORNING INC (GLW), GLYCOMIMETICS INC (GLYC), GENERAL MOTORS CO (GM), GLOBUS MEDICAL INC (GMED), GENOCEA BIOSCIENCES, INC. (GNCA), GENMARK DIAGNOSTICS, INC. (GNMK), AEVI GENOMIC MEDICINE, INC. (GNMX), GENPREX, INC. (GNPX), GENERAC HOLDINGS INC. (GNRC), GENTEX CORP (GNTX), ACUSHNET HOLDINGS CORP. (GOLF), CANADA GOOSE HOLDINGS INC. (Foreign) (GOOS), GAMING PARTNERS INTERNATIONAL CORP (GPIC), GRAPHIC PACKAGING HOLDING CO (GPK), GREEN PLAINS PARTNERS LP (GPP), GREEN PLAINS INC. (GPRE), GOPRO, INC. (GPRO), W R GRACE & CO (GRA), GORMAN RUPP CO (GRC), GRIFOLS SA (Foreign) (GRFS), GARMIN LTD (GRMN), GSI TECHNOLOGY INC (GSIT), GLAXOSMITHKLINE PLC (Foreign) (GSK), FERROGLOBE PLC (Foreign) (GSM), GOODYEAR TIRE & RUBBER CO (GT), GATES INDUSTRIAL CORP PLC (GTES), G1 THERAPEUTICS, INC. (GTHX), CHART INDUSTRIES INC (GTL), GTX INC (GTXI), GULF RESOURCES, INC. (GURE), GW PHARMACEUTICALS PLC (Foreign) (GWPH), HAEMONETICS CORP (HAE), HAIN CELESTIAL GROUP INC (HAIN), RESTORATION ROBOTICS, INC. (HAIR), HALOZYME THERAPEUTICS INC (HALO), HASBRO INC (HAS), HAYNES INTERNATIONAL INC (HAYN), HAMILTON BEACH BRANDS HOLDING CO (HBB), HARVARD BIOSCIENCE INC (HBIO), HC2 HOLDINGS, INC. (HCHC), HUTCHISON CHINA MEDITECH LTD (Foreign) (HCM), TURTLE BEACH CORP (HEAR), HEMISPHERX BIOPHARMA INC (HEB), HEBRON TECHNOLOGY CO., LTD (Foreign) (HEBT), HEICO CORP (HEI), HELEN OF TROY LTD (HELE), HESS CORP (HES), HOLLYFRONTIER CORP (HFC), HILLENBRAND, INC. (HI), HIGHWAY HOLDINGS LTD (Foreign) (HIHO), HUNTINGTON INGALLS INDUSTRIES, INC. (HII), HIMAX TECHNOLOGIES, INC. (Foreign) (HIMX), HANCOCK JAFFE LABORATORIES, INC. (HJLI), HARMONIC INC (HLIT), HONDA MOTOR CO LTD (Foreign) (HMC), HOUGHTON MIFFLIN HARCOURT CO (HMHC), HUAMI CORP (Foreign) (HMI), HNI CORP (HNI), HOOKER FURNITURE CORP (HOFT), HARLEY DAVIDSON INC (HOG), HOLLYSYS AUTOMATION TECHNOLOGIES, LTD. (Foreign) (HOLI), HOLOGIC INC (HOLX), HONEYWELL INTERNATIONAL INC (HON), HEWLETT PACKARD ENTERPRISE CO (HPE), HIGHPOWER INTERNATIONAL, INC. (HPJ), HP INC (HPQ), HANWHA Q CELLS CO., LTD. (Foreign) (HQCL), HILL-ROM HOLDINGS, INC. (HRC), HORMEL FOODS CORP (HRL), HARRIS CORP (HRS), HERON THERAPEUTICS, INC. (HRTX), HARSCO CORP (HSC), HELIUS MEDICAL TECHNOLOGIES, INC. (HSDT), HISTOGENICS CORP (HSGX), HESKA CORP (Hska), HERSHEY CO (HSY), HEAT BIOLOGICS, INC. (HTBX), HTG MOLECULAR DIAGNOSTICS, INC (HTGM), HUBBELL INC (HUBB), HUNTSMAN CORP (HUN), HURCO COMPANIES INC (HURC), HEXCEL CORP (HXL), HYSTER-YALE MATERIALS HANDLING, INC. (HY), HYDROGENICS CORP (Foreign) (HYGS), HORIZON GLOBAL CORP (HZN), HORIZON PHARMA PLC (HZNP), INTEGRA LIFESCIENCES HOLDINGS CORP (IART), INDUSTRIAS BACHOCO S.A.B. DE C.V. (Foreign) (IBA), IBIO,



INC. (IBIO), INTERNATIONAL BUSINESS MACHINES CORP (IBM), ICAD INC (ICAD), IMMUCELL CORP (ICCC), ICHOR HOLDINGS, LTD. (ICHR), ISRAEL CHEMICALS LTD (Foreign) (ICL), ICONIX BRAND GROUP, INC. (ICON), INTERCEPT PHARMACEUTICALS, INC. (ICPT), ICU MEDICAL INC (ICUI), IDERA PHARMACEUTICALS, INC. (IDRA), ID SYSTEMS INC (IDSY), INTEGRATED DEVICE TECHNOLOGY INC (IDTI), INTERPACE DIAGNOSTICS GROUP, INC. (IDXG), IDEXX LABORATORIES INC (IDXX), IEC ELECTRONICS CORP (IEC), ICAHN ENTERPRISES L.P. (IEP), IDEX CORP (IEX), INTERNATIONAL FLAVORS & FRAGRANCES INC (IFF), INFLARX N.V. (Foreign) (IFRX), INSTEEL INDUSTRIES INC (IIN), INTRICON CORP (IIN), II-VI INC (IIVI), IKONICS CORP (IKNX), ILLUMINA INC (ILMN), IMAX CORP (IMAX), IMMUNE DESIGN CORP. (IMDZ), IMMUNOGEN INC (IMGN), INTERMOLECULAR INC (IMI), IMMUTEP LTD (Foreign) (IMMP), IMMERSION CORP (IMMR), IMMUNOMEDICS INC (IMMU), IMPRIMIS PHARMACEUTICALS, INC. (IMMY), IMPERIAL OIL LTD (IMO), CHIPMOS TECHNOLOGIES INC (Foreign) (IMOS), IMMURON LTD (Foreign) (IMRN), INTEGRATED MEDIA TECHNOLOGY LTD (Foreign) (IMTE), INFINITY PHARMACEUTICALS, INC. (INFI), INFINERA CORP (INFN), INFUSYSTEM HOLDINGS, INC (INFU), INOGEN INC (INGN), INGREDION INC (INGR), INNOVATE BIOPHARMACEUTICALS, INC. (INNT), INOVIO PHARMACEUTICALS, INC. (INO), INTELLIGENT SYSTEMS CORP (INS), INSEEGO CORP. (INSG), INSMED INC (INSM), INSPIRE MEDICAL SYSTEMS, INC. (INSP), INSYS THERAPEUTICS, INC. (INSY), INTEL CORP (INTC), INTEST CORP (INTT), INNOVIVA, INC. (INVA), IDENTIV, INC. (INVE), INNERWORKINGS INC (INWK), IONIS PHARMACEUTICALS INC (IONS), INNOSPEC INC. (IOSP), ADESTO TECHNOLOGIES CORP (IOTS), IOVANCE BIOTHERAPEUTICS, INC. (IOVA), INTERNATIONAL PAPER CO (IP), INTER PARFUMS INC (IPAR), INTELLIPHARMACEUTICS INTERNATIONAL INC. (Foreign) (IPCI), IPG PHOTONICS CORP (IPGP), INPHI CORP (IPHI), IDEAL POWER INC. (IPWR), INGERSOLL-RAND PLC (IR), IROBOT CORP (IRBT), IRIDIUM COMMUNICATIONS INC. (IRDM), IRIDEX CORP (IRIX), IRADIMED CORP (IRMD), IRHYTHM TECHNOLOGIES, INC. (IRTC), IRONWOOD PHARMACEUTICALS INC (IRWD), ISSUER DIRECT CORP (ISDR), IMAGE SENSING SYSTEMS INC (ISNS), ISORAY, INC. (ISR), INTUITIVE SURGICAL INC (ISRG), INTRA-CELLULAR THERAPIES, INC. (ITCI), INTEGER HOLDINGS CORP (ITGR), ITERIS, INC. (ITI), ITRON INC (ITRI), ITERUM THERAPEUTICS PLC (ITRM), ITT INC. (ITT), ILLINOIS TOOL WORKS INC (ITW), INTEVAC INC (IVAC), INVACARE CORP (IVC), JAGUAR HEALTH, INC. (JAGX), JAKKS PACIFIC INC (JAKK), JASON INDUSTRIES, INC. (JASN), JAZZ PHARMACEUTICALS PLC (JAZZ), JABIL INC (JBL), SANFILIPPO JOHN B & SON INC (JBSS), JOHN BEAN TECHNOLOGIES CORP (JBT), COMMUNICATIONS SYSTEMS INC (JCS), JEFFERIES FINANCIAL GROUP INC. (JEF), JELD-WEN HOLDING, INC. (JELD), JAMES HARDIE INDUSTRIES PLC (Foreign) (JHX), J.JILL, INC. (JILL), J&J SNACK FOODS CORP (JJSF), JINKOSOLAR HOLDING CO., LTD. (Foreign) (JKS), JOUNCE THERAPEUTICS, INC. (JNCE), JOHNSON & JOHNSON (JNJ), JUNIPER NETWORKS INC (JNPR), JOHNSON OUTDOORS INC (JOUT), JERASH HOLDINGS (US), INC. (JRSH), KELLOGG CO (K), KADANT INC (KAI), KALA PHARMACEUTICALS, INC. (KALA), KAISER ALUMINUM CORP (KALU), KALVISTA PHARMACEUTICALS, INC. (KALV), KIMBALL INTERNATIONAL INC (KBAL), KADMON HOLDINGS, INC. (KDMN), KIMBALL ELECTRONICS, INC. (KE), KEMET CORP (KEM), KEWAUNEE SCIENTIFIC CORP (KEQU), KERYX BIOPHARMACEUTICALS INC (KERX), KEYSIGHT TECHNOLOGIES, INC. (KEYS), KRAFT HEINZ CO (KHC), ORTHOPEDIATRICS CORP (KIDS), KINDRED BIOSCIENCES, INC. (KIN), KELSO TECHNOLOGIES INC (Foreign) (KIQ), KLA TENCOR CORP (KLAC), KULICKE & SOFA INDUSTRIES INC (KLIC), KIMBERLY CLARK CORP (KMB), KAMADA LTD (Foreign) (KMDA), KEMPHARM, INC (KMPH), KENAMETAL INC (KMT), KNOWLES CORP (KN), KANDI TECHNOLOGIES GROUP, INC. (KNDI), KNOLL INC (KNL), KINIKSA PHARMACEUTICALS, LTD. (KNSA), COCA COLA CO (KO), EASTMAN KODAK CO (KODK), COCA COLA FEMSA SAB DE CV (Foreign) (KOF), CESCO THERAPEUTICS INC. (KOOL), KOPPERS HOLDINGS INC. (KOP), KOPIN CORP (KOPN), MICHAEL KORS HOLDINGS LTD (KORS), KOSS CORP (KOSS), KARYOPHARM THERAPEUTICS INC. (KPTI), KRATON CORP (KRA), KORNIT DIGITAL LTD. (Foreign) (KRNT), KRONOS WORLDWIDE INC (KRO), KRYSAL BIOTECH, INC. (KRYS), KEY TRONIC CORP (KTCC), KRATOS DEFENSE & SECURITY SOLUTIONS, INC. (KTOS), KITOV PHARMA LTD. (Foreign) (KTOV), KURA ONCOLOGY, INC. (KURA), KVH INDUSTRIES INC (KVHI), QUAKER CHEMICAL CORP (KWR), KAZIA THERAPEUTICS LTD (Foreign) (KZIA), MULTI COLOR CORP (LABL), LAKELAND INDUSTRIES INC (LAKE), LANCASTER COLONY CORP (LANC), NLIGHT, INC. (LASR), LIBBEY INC (LBY), LANNETT CO INC (LCI), LCI INDUSTRIES (LCII), LIFETIME BRANDS, INC (LCUT), LYDALL INC (LDL), LEAR CORP (LEA), LINCOLN ELECTRIC HOLDINGS INC (LECO), SEMILEDS CORP (LEDS), LEE ENTERPRISES, INC (LEE), LEGGETT & PLATT INC (LEG), PRESBIA PLC (LENS), LEVEL BRANDS, INC. (LEVB), LITTELFUSE INC (LFUS), LIFEVANTAGE CORP (LFVN), LGL GROUP INC (LGL), LIGAND PHARMACEUTICALS INC (LGND), ATYR PHARMA INC (LIFE), LENNOX INTERNATIONAL INC (LII), INTERLINK ELECTRONICS INC (LINK), LIQTECH INTERNATIONAL INC (LIQT), LUMENTUM HOLDINGS INC. (LITE), LIVANOVA PLC (LIVN), LA JOLLA PHARMACEUTICAL CO (LJPC), LSC COMMUNICATIONS, INC. (LKSD), LIANLUO SMART LTD (Foreign) (LLIT), L3 TECHNOLOGIES, INC. (LLL), LILLY ELI & CO (LLY), LEMAITRE VASCULAR INC (LMAT), LUMINEX CORP (LMNX), LOCKHEED MARTIN CORP (LMT), LANDEC CORP (LNDC), LINDSAY CORP (LNN), LANTHEUS HOLDINGS, INC. (LNTH), LOGITECH INTERNATIONAL SA (LOGI), LOMA NEGRA COMPANIA INDUSTRIAL ARGENTINA SOCIEDAD ANONIMA (Foreign) (LOMA), LORAL SPACE & COMMUNICATIONS INC. (LORL), LOXO ONCOLOGY, INC. (LOXO), LIPOCINE INC. (LPCN), LG DISPLAY CO., LTD. (Foreign) (LPL), LIGHTPATH TECHNOLOGIES INC (LPTH), LEAP THERAPEUTICS, INC. (LPTX), LOUISIANA-PACIFIC CORP (LPX), LRAD CORP (LRAD), LAM RESEARCH CORP (LRCX), LATTICE SEMICONDUCTOR CORP (LSSC), LANTRONIX INC (LTRX), LULULEMON ATHLETICA INC. (LULU), LAMB WESTON HOLDINGS, INC. (LW), LIFEWAY FOODS, INC. (LWAY), LUXFER HOLDINGS PLC (Foreign) (LXFR), LEXICON PHARMACEUTICALS, INC. (LXRX), LSB INDUSTRIES INC (LXU), LYONDELLBASELL INDUSTRIES N.V. (LYB), LSI INDUSTRIES INC (LYTS), LA-Z-BOY INC (LZB), MERRIMACK PHARMACEUTICALS INC (MACK), MAGAL SECURITY SYSTEMS LTD (Foreign) (MAGS), MASCO CORP (MAS), MASIMO CORP (MASI), MAT-

TEL INC (MAT), MATTHEWS INTERNATIONAL CORP (MATW), MAXAR TECHNOLOGIES LTD. (Foreign) (MAXR), MARRONE BIO INNOVATIONS INC (MBII), MUSTANG BIO, INC. (MBIO), MICROBOT MEDICAL INC. (MBOT), MOLECULIN BIOTECH, INC. (MBRX), MALIBU BOATS, INC. (MBUU), MASTERCRAFT BOAT HOLDINGS, INC. (MCFT), MICROCHIP TECHNOLOGY INC (MCHP), SERES THERAPEUTICS, INC. (MCRB), MILACRON HOLDINGS CORP. (MCRN), MEDICINES CO (MDCO), MADRIGAL PHARMACEUTICALS, INC. (MDGL), MEDIGUS LTD. (Foreign) (MDGS), MONDELEZ INTERNATIONAL, INC. (MDLZ), MEREDITH CORP (MDP), MCDERMOTT INTERNATIONAL INC (MDR), MEDTRONIC PLC (MDT), MEDIWOUND LTD. (Foreign) (MDWD), MEDIFAST INC (MED), METHODE ELECTRONICS INC (MEI), MEI PHARMA, INC. (MEIP), METHANEX CORP (Foreign) (MEOH), MERCER INTERNATIONAL INC. (MERC), MESOBLAST LTD (Foreign) (MESO), MAGNA INTERNATIONAL INC (Foreign) (MGA), MACROGENICS INC (MGNX), MOHAWK INDUSTRIES INC (MHK), MICRON SOLUTIONS INC (MICR), MICT, INC. (MICT), MIDDLEBY CORP (MIDD), MOBILE MINI INC (MINI), MITEK SYSTEMS INC (MITK), MCCORMICK & CO INC (MKC), MKS INSTRUMENTS INC (MKSI), MESA LABORATORIES INC (MLAB), MILLER HERMAN INC (MLHR), MUELLER INDUSTRIES INC (MLI), MELINTA THERAPEUTICS, INC. (MLNT), MELLANOX TECHNOLOGIES, LTD. (MLNX), MILLER INDUSTRIES INC (MLR), MILESTONE SCIENTIFIC INC. (MLSS), 3M CO (MMM), MERIT MEDICAL SYSTEMS INC (MMSI), MAGNEGAS APPLIED TECHNOLOGY SOLUTIONS, INC. (MNGA), MCCLATCHY CO (MNI), MALLINCKRODT PLC (MNK), MANNKIND CORP (MNKD), MENLO THERAPEUTICS INC. (MNLO), MEDICINOVA INC (MNOV), MONSTER BEVERAGE CORP (MNST), MOMENTA PHARMACEUTICALS INC (MNTA), MANITEX INTERNATIONAL, INC. (MNTX), ALTRIA GROUP, INC. (MO), MODINE MANUFACTURING CO (MOD), MORPHOSYS AG (Foreign) (MOR), MOSAIC CO (MOS), MOSYS, INC. (MOSY), MOTUS GI HOLDINGS, INC. (MOTS), MOVADO GROUP INC (MOV), MOTORCAR PARTS AMERICA INC (MPAA), MARATHON PETROLEUM CORP (MPC), MONOLITHIC POWER SYSTEMS INC (MPWR), MARINE PRODUCTS CORP (MPX), EVERSPIN TECHNOLOGIES INC (MRAM), MERCURY SYSTEMS INC (MRCY), MERCK & CO., INC. (MRK), MARINUS PHARMACEUTICALS INC (MRNS), MERSANA THERAPEUTICS, INC. (MRSN), MIRATI THERAPEUTICS, INC. (MRTX), MERUS N.V. (Foreign) (MRUS), MARVELL TECHNOLOGY GROUP LTD (MRVL), MSA SAFETY INC (MSA), MOTOROLA SOLUTIONS, INC. (MSI), EMERSON RADIO CORP (MSN), MISONIX INC (MSON), ARCELORMITTAL (Foreign) (MT), METTLER TOLEDO INTERNATIONAL INC (MTD), MOLECULAR TEMPLATES, INC. (MTEM), MANNATECH INC (MTEX), MOTIF BIO PLC (Foreign) (MTFB), MECHEL PAO (Foreign) (MTL), MATINAS BIOPHARMA HOLDINGS, INC. (MTNB), MERITOR INC (MTOR), MIDATECH PHARMA PLC (Foreign) (MTP), MATERION CORP (MTRN), MTS SYSTEMS CORP (MTSC), MACOM TECHNOLOGY SOLUTIONS HOLDINGS, INC. (MTSI), MER TELEMANAGEMENT SOLUTIONS LTD (Foreign) (MTSL), MANITOWOC CO INC (MTW), MINERALS TECHNOLOGIES INC (MTX), MICRON TECHNOLOGY INC (MU), MICROVISION, INC. (MVIS), MUELLER WATER PRODUCTS, INC. (MWA), MAGNACHIP SEMICONDUCTOR CORP (MX), MAXIM INTEGRATED PRODUCTS INC (MXIM), MAXLINEAR INC (MXL), MAXWELL TECHNOLOGIES INC (MXWL), MYERS INDUSTRIES INC (MYE), MYRIAD GENETICS INC (MYGN), MYLAN N.V. (MYL), MYOMO INC (MYO), MYOKARDIA INC (MYOK), MYOS RENS TECHNOLOGY INC. (MYOS), MYOVANT SCIENCES LTD. (MYOV), MY SIZE, INC. (MYSZ), MAZOR ROBOTICS LTD. (Foreign) (MZOR), NATURAL ALTERNATIVES INTERNATIONAL INC (NAII), NAKED BRAND GROUP LTD (NAKD), NANOMETRICS INC (NANO), NANOVIBRONIX, INC. (NAOV), NATURES SUNSHINE PRODUCTS INC (NATR), NAVISTAR INTERNATIONAL CORP (NAV), NAVIDEA BIOPHARMACEUTICALS, INC. (NAVB), NEW AGE BEVERAGES CORP (NBEV), NEUROCRINE BIOSCIENCES INC (NBIX), NABRIVA THERAPEUTICS PLC (NBRV), NOVABAY PHARMACEUTICALS, INC. (NBY), NACCO INDUSTRIES INC (NC), NUCANA PLC (Foreign) (NCNA), NCR CORP (NCR), NCI BUILDING SYSTEMS INC (NCS), ENDRA LIFE SCIENCES INC. (NDRA), NORDSON CORP (NDSN), NEOGEN CORP (NEOG), NEONODE INC. (NEON), NEOS THERAPEUTICS, INC. (NEOS), NEPTUNE WELLNESS SOLUTIONS INC. (Foreign) (NEPT), MINERVA NEUROSCIENCES, INC. (NERV), NEWMARKET CORP (NEU), NEW MEDIA INVESTMENT GROUP INC. (NEWM), NF ENERGY SAVING CORP (NFEC), INGEVITY CORP (NGVT), NICE LTD. (Foreign) (NICE), NIGHTSTAR THERAPEUTICS PLC (Foreign) (NITE), NANTKWEST, INC. (NK), NIKE INC (NKE), NEKTAR THERAPEUTICS (NKTR), NL INDUSTRIES INC (NL), NEWLINK GENETICS CORP (NLNK), NAUTILUS, INC. (NLS), NEMAURA MEDICAL INC. (NMRD), NN INC (NNBR), NANO DIMENSION LTD. (Foreign) (NNDM), NORTHROP GRUMMAN CORP (NOC), NOKIA CORP (Foreign) (NOK), NOMAD FOODS LTD (Foreign) (NOMD), NATIONAL OILWELL VARCO INC (NOV), NOVAN, INC. (NOVN), NOVANTA INC (NOVT), NEENAH INC (NP), NATIONAL PRESTO INDUSTRIES INC (NPK), ENPRO INDUSTRIES, INC (NPO), NEOPHOTONICS CORP (NPTN), NEWPARK RESOURCES INC (NR), INSPIREMD, INC. (NSPR), NAPCO SECURITY TECHNOLOGIES, INC (NSSC), NANOSTRING TECHNOLOGIES INC (NSTG), NORTECH SYSTEMS INC (NSYS), NETAPP, INC. (NTAP), INTEC PHARMA LTD. (Foreign) (NTEC), NETGEAR, INC (NTGR), NORTHERN TECHNOLOGIES INTERNATIONAL CORP (NTIC), INTELLIA THERAPEUTICS, INC. (NTLA), NAM TAI PROPERTY INC. (Foreign) (NTP), NATUZZI S P A (Foreign) (NTZ), NUCOR CORP (NUE), NEUROMETRIX, INC. (NURO), NUVASIVE INC (NUVA), NOVAVAX INC (NVAX), NEOVASC INC (Foreign) (NVCN), NOVOCURE LTD (NVCR), NVIDIA CORP (NVDA), NVE CORP (NVEC), NOVA LIFESTYLE, INC. (NVFY), INVIVO THERAPEUTICS HOLDINGS CORP. (NVIV), NOVELION THERAPEUTICS INC. (NVLN), NOVA MEASURING INSTRUMENTS LTD (Foreign) (NVMI), NOVUME SOLUTIONS, INC. (NVMM), NOVO NORDISK A S (Foreign) (NVO), NEVRO CORP (NVRO), NOVARTIS AG (Foreign) (NVS), NVENT ELECTRIC PLC (NVT), NUVECTRA CORP (NVTR), NOVUS THERAPEUTICS, INC. (NVUS), NEWELL BRANDS INC (NWL), NORTHWEST PIPE CO (NWPX), NEWS CORP (NWSA), QUANEX BUILDING PRODUCTS CORP (NX), NEXEO SOLUTIONS, INC. (NXEO), NXP SEMICONDUCTORS N.V. (Foreign) (NXPI), NXSTAGE MEDICAL, INC. (NXTM), NYMOX PHARMACEUTICAL CORP (Foreign) (NYMX), NEW YORK TIMES CO (NYT), OASMA PHARMACEUTICAL AB (Foreign) (OASM), OCEAN BIO CHEM INC (OBCH), OBALON THERAPEUTICS INC (OBLN), OBSEVA SA (Foreign) (OBSV), OWENS CORNING (OC), OPTICAL CABLE CORP (OCC), OCLARO, INC. (OCLR), OCULAR THERAPEUTIX,

INC (OCUL), ONCOCYTE CORP (OCX), OIL-DRI CORP OF AMERICA (ODC), ODONATE THERAPEUTICS, INC. (ODT), ORION ENGINEERED CARBONS S.A. (Foreign) (OEC), ORION ENERGY SYSTEMS, INC. (OESX), ORTHOFIX MEDICAL INC. (OFIX), OMEGA FLEX, INC. (OFLX), ORAGENICS INC (OGEN), ONE HORIZON GROUP, INC. (OHGI), OHR PHARMACEUTICAL INC (OHRP), OWENS ILLINOIS INC (OI), O2MICRO INTERNATIONAL LTD (Foreign) (OIIM), OIL STATES INTERNATIONAL, INC (OIS), UNIVERSAL DISPLAY CORP (OLED), OLIN CORP (OLN), OMNICELL, INC (OMCL), ONCOMED PHARMACEUTICALS INC (OMED), OMEROS CORP (OMER), OMNOVA SOLUTIONS INC (OMN), ON SEMICONDUCTOR CORP (ON), SPARK THERAPEUTICS, INC. (ONCE), ONCOSEC MEDICAL INC (ONCS), ONCOLYTICS BIOTECH INC (Foreign) (ONCY), ONCOBIOLOGICS, INC. (ONS), ONCONOVA THERAPEUTICS, INC. (ONTX), ORGANOVO HOLDINGS, INC. (ONVO), OPHTHOTECH CORP. (OPHT), OPKO HEALTH, INC. (OPK), OPIANT PHARMACEUTICALS, INC. (OPNT), OPTINOSE, INC. (OPTN), ORBOTECH LTD (Foreign) (ORBK), ORGENESIS INC. (ORGS), ORAMED PHARMACEUTICALS INC. (ORMP), BIOBLAST PHARMA LTD. (Foreign) (ORPN), NORBORD INC. (Foreign) (OSB), OSI SYSTEMS INC (OSIS), OSHKOSH CORP (OSK), OSSEN INNOVATION CO. LTD. (Foreign) (OSN), ONE STOP SYSTEMS, INC. (OSS), ORASURE TECHNOLOGIES INC (OSUR), OTONOMY, INC. (OTIC), ON TRACK INNOVATIONS LTD (OTIV), OVASCIENCE, INC. (OVAS), OVID THERAPEUTICS INC. (OVID), OXFORD IMMUNOTEC GLOBAL PLC (OXFD), OXFORD INDUSTRIES INC (OXM), PACIFIC BIOSCIENCES OF CALIFORNIA, INC. (PACB), PLATFORM SPECIALTY PRODUCTS CORP (PAH), PHIBRO ANIMAL HEALTH CORP (PAHC), PALO ALTO NETWORKS INC (PANW), PAR TECHNOLOGY CORP (PAR), PATRICK INDUSTRIES INC (PATK), PAVMED INC. (PAVM), PBF ENERGY INC. (PBF), PRESTIGE CONSUMER HEALTHCARE INC. (PBH), PITNEY BOWES INC (PBI), PUMA BIOTECHNOLOGY, INC. (PBYI), PACCAR INC (PCAR), PACIRA PHARMACEUTICALS, INC. (PCRX), PC TEL INC (PCTI), PRO DEX INC (PDEX), PDL BIOPHARMA, INC. (PDLI), PACIFIC ETHANOL, INC. (PEIX), PENUMBRA INC (PEN), PEPSICO INC (PEP), ARATANA THERAPEUTICS, INC. (PETX), TDH HOLDINGS, INC. (Foreign) (PETZ), PFIZER INC (PFE), PROFIRE ENERGY INC (PFIE), P&F INDUSTRIES INC (PFIN), PFENEX INC. (PFNX), PROCTER & GAMBLE CO (PG), PROGENICS PHARMACEUTICALS INC (PGNX), PGT INNOVATIONS, INC. (PGTI), PARKER HANNIFIN CORP (PH), KONINKLIJKE PHILIPS NV (Foreign) (PHG), IMPINJ INC (PI), POLARIS INDUSTRIES INC (PII), PARK ELECTROCHEMICAL CORP (PKE), PACKAGING CORP OF AMERICA (PKG), PERKINELMER INC (PKI), PARK OHIO HOLDINGS CORP (PKOH), POSCO (Foreign) (PKX), PHOTRONICS INC (PLAB), DOUGLAS DYNAMICS, INC (PLOW), PULSE BIOSCIENCES, INC. (PLSE), PLANTRONICS INC (PLT), PLUG POWER INC (PLUG), PROTALIX BIOTHERAPEUTICS, INC. (PLX), PLX PHARMA INC. (PLXP), PLEXUS CORP (PLXS), PHILIP MORRIS INTERNATIONAL INC. (PM), PENTAIR PLC (PNR), POINTER TELOCATION LTD (Foreign) (PNTR), INSULET CORP (PODD), POLYONE CORP (POL), POLAR POWER, INC. (POLA), POST HOLDINGS, INC. (POST), POWER INTEGRATIONS INC (POWI), POWELL INDUSTRIES INC (POWL), PILGRIMS PRIDE CORP (PPC), PPG INDUSTRIES INC (PPG), PERMA-PIPE INTERNATIONAL HOLDINGS, INC. (PIIH), PIONEER POWER SOLUTIONS, INC. (PPSI), PQ GROUP HOLDINGS INC. (PQG), PRANA BIOTECHNOLOGY LTD (Foreign) (PRAN), PERCEPTRON INC (PRCP), PERRIGO CO PLC (PRGO), PROTO LABS INC (PRLB), PROPHASE LABS, INC. (PRPH), PRECIPIO, INC. (PRPO), PROQR THERAPEUTICS N.V. (Foreign) (PRQR), PROTHENA CORP PLC (PRTA), PARATEK PHARMACEUTICALS, INC. (PRTK), PROTEON THERAPEUTICS INC (PRTO), PEARSON PLC (Foreign) (PSO), PURE STORAGE, INC. (PSTG), PLURISTEM THERAPEUTICS INC (PSTI), PHILLIPS 66 (PSX), PTC THERAPEUTICS, INC. (PTCT), PROTAGONIST THERAPEUTICS, INC (PTGX), PROTEOSTASIS THERAPEUTICS, INC. (PTI), PAIN THERAPEUTICS INC (PTIE), PORTOLA PHARMACEUTICALS INC (PTLA), PALATIN TECHNOLOGIES INC (PTN), PERNIX THERAPEUTICS HOLDINGS, INC. (PTX), PULMATRIX, INC. (PULM), PVH CORP. (PVH), PIXELWORKS, INC (PXLW), QUALSTAR CORP (QBAK), QUALCOMM INC (QCOM), QUIDEL CORP (QDEL), QIAGEN NV (Foreign) (QGEN), QORVO, INC. (QRVO), QUANTUM CORP (QTM), QUANTENNA COMMUNICATIONS INC (QTNA), QUOTIENT LTD (QTNT), QUANTERIX CORP (QTRX), QUAD/GRAPHICS, INC. (QUAD), QUICKLOGIC CORPORATION (QUIK), UNIQUIRE N.V. (QURE), FERRARI N.V. (Foreign) (RACE), FREIGHTCAR AMERICA, INC. (RAIL), ULTRAGENYX PHARMACEUTICAL INC. (RARE), RA PHARMACEUTICALS, INC. (RARX), RAVEN INDUSTRIES INC (RAVN), REGAL BELOIT CORP (RBC), RUBICON TECHNOLOGY, INC. (RBCN), ROCKET PHARMACEUTICALS, INC. (RCKT), ROCKY BRANDS, INC. (RCKY), ARCUS BIOSCIENCES, INC. (RCUS), RADCOM LTD (Foreign) (RDCM), REDHILL BIOPHARMA LTD. (Foreign) (RDHL), RADIUS HEALTH, INC. (RDUS), DR REDDYS LABORATORIES LTD (Foreign) (RDY), REED'S, INC. (REED), RENEWABLE ENERGY GROUP, INC. (REGI), REGENERON PHARMACEUTICALS INC (REGN), RELIV INTERNATIONAL INC (RELV), RELX PLC (Foreign) (RELX), RECRO PHARMA, INC. (REPH), RESONANT INC (RESN), REATA PHARMACEUTICALS INC (RETA), RETO ECO-SOLUTIONS, INC. (Foreign) (RETO), REVLON INC (REV), REV GROUP, INC. (REVG), REX AMERICAN RESOURCES CORP (REX), R F INDUSTRIES LTD (RFIL), RESOLUTE FOREST PRODUCTS INC. (RFP), REPLIGEN CORP (RGEN), REGULUS THERAPEUTICS INC. (RGLS), REGENXBIO INC. (RGNX), STURM RUGER & CO INC (RGR), RICEBRAN TECHNOLOGIES (RIBT), RIGEL PHARMACEUTICALS INC (RIGL), RIOT BLOCKCHAIN, INC. (RIOT), ARCADIA BIOSCIENCES, INC. (RKDA), RALPH LAUREN CORP (RL), RAMBUS INC (RMBS), ROCKY MOUNTAIN CHOCOLATE FACTORY, INC. (RMCF), RESMED INC (RMD), ROCKWELL MEDICAL, INC. (RMTI), REXAHN PHARMACEUTICALS, INC. (RNN), GIBRALTAR INDUSTRIES, INC. (ROCK), ROGERS CORP (ROG), ROCKWELL AUTOMATION INC (ROK), RBC BEARINGS INC (ROLL), ROPER TECHNOLOGIES INC (ROP), CASTLE BRANDS INC (ROX), RPM INTERNATIONAL INC (RPM), RR DONNELLEY & SONS CO (RRD), RESHAPE LIFESCIENCES INC. (RSL), RADISYS CORP (RSYS), RUDOLPH TECHNOLOGIES INC (RTEC), RTI SURGICAL, INC. (RTIX), RAYTHEON CO (RTN), RETROPHIN, INC. (RTRX), RITTER PHARMACEUTICALS INC (RTTR), SUNRUN INC. (RUN), REVOLUTION LIGHTING TECHNOLOGIES, INC. (RVLT), REVANCE THERAPEUTICS, INC. (RVNC), RETRACTABLE TECHNOLOGIES INC (RVP), REWALK ROBOTICS LTD. (Foreign) (RWLK), REYNOLD CORP (RXN), RAYONIER ADVANCED MATERIALS INC. (RYAM), RHYTHM PHARMACEU-

TICALS, INC. (RYTM), SANDERSON FARMS INC (SAFM), SAGE THERAPEUTICS, INC. (SAGE), BOSTON BEER CO INC (SAM), SANMINA CORP (SANM), ECHOSTAR CORP (SATS), STRONGBRIDGE BIOPHARMA PLC (SBBP), STELLAR BIOTECHNOLOGIES, INC. (SBOT), SPRING BANK PHARMACEUTICALS, INC. (SBPH), SCHOLASTIC CORP (SCHL), SOCKET MOBILE, INC. (SCKT), STEPAN CO (SCL), SUPERCONDUCTOR TECHNOLOGIES INC (SCON), SCPHARMACEUTICALS INC. (SCPH), STEELCASE INC (SCS), STARRETT L S CO (SCX), SCYNEXIS INC (SCYX), STANDARD DIVERSIFIED INC. (SDI), SUPERIOR DRILLING PRODUCTS, INC. (SDPI), SEACHANGE INTERNATIONAL INC (SEAC), SOLAREEDGE TECHNOLOGIES INC (SEDG), SEALED AIR CORP (SEE), SHARING ECONOMY INTERNATIONAL INC. (SEII), SELECTA BIOSCIENCES INC (SELB), SENECA FOODS CORP (SENEA), SENSEONICS HOLDINGS, INC. (SENS), SYNTHESIS ENERGY SYSTEMS INC (SES), SESEN BIO, INC. (SESN), SUPERIOR GROUP OF COMPANIES, INC. (SGC), SEATTLE GENETICS INC (SGEN), SMART GLOBAL HOLDINGS, INC. (SGH), SIGMA LABS, INC. (SGLB), SIGMATRON INTERNATIONAL INC (SGMA), SANGAMO THERAPEUTICS, INC (SGMO), SGOCO GROUP, LTD. (Foreign) (SGOC), SYNERGY PHARMACEUTICALS, INC. (SGYP), SINOPEC SHANGHAI PETROCHEMICAL CO LTD (Foreign) (SHI), SHILOH INDUSTRIES INC (SHLO), STEVEN MADDEN, LTD. (SHOO), SHIRE PLC (SHPG), NATIONAL STEEL CO (Foreign) (SID), SIENRA, INC. (SIEN), SIFCO INDUSTRIES INC (SIF), SIGA TECHNOLOGIES INC (SIGA), SILICOM LTD. (Foreign) (SILC), GROUP SIMEC SA DE CV (Foreign) (SIM), SILICON MOTION TECHNOLOGY CORP (Foreign) (SIMO), J M SMUCKER CO (SJM), SKECHERS USA INC (SKX), SKYLINE CHAMPION CORP (SKY), SILICON LABORATORIES INC (SLAB), SOLID BIOSCIENCES INC. (SLDB), SOL-GEL TECHNOLOGIES LTD. (Foreign) (SLGL), SILGAN HOLDINGS INC (SLGN), SOLENO THERAPEUTICS INC (SLNO), SELLAS LIFE SCIENCES GROUP, INC. (SLS), SCOTTS MIRACLE-GRO CO (SMG), SEMICONDUCTOR MANUFACTURING INTERNATIONAL CORP (Foreign) (SMI), SCHMITT INDUSTRIES INC (SMIT), SUMMIT THERAPEUTICS PLC (Foreign) (SMMT), STANDARD MOTOR PRODUCTS INC (SMP), SIMPLY GOOD FOODS CO (SMPL), SEMTECH CORP (SMTC), SMTC CORP (SMTX), SNAP-ON INC (SNA), SLEEP NUMBER CORP (SNBR), SYNDAX PHARMACEUTICALS INC (SNDX), SONY CORP (Foreign) (SNE), SENESTECH, INC. (SNES), SOLIGENIX, INC. (SNGX), SUN HYDRAULICS CORP (SNHY), SMITH & NEPHEW PLC (Foreign) (SNN), SIENNA BIOPHARMACEUTICALS, INC. (SNNA), SONOMA PHARMACEUTICALS, INC. (SNOA), CHINA PETROLEUM & CHEMICAL CORP (Foreign) (SNP), SUNESIS PHARMACEUTICALS INC (SNS), SANOFI (Foreign) (SNY), SODASTREAM INTERNATIONAL LTD. (Foreign) (SODA), SONIC FOUNDRY INC (SOFO), SOLARIS OILFIELD INFRASTRUCTURE, INC. (SOI), RENESOLA LTD (Foreign) (SOL), SONOCO PRODUCTS CO (SON), SORL AUTO PARTS INC (SORL), SPARTON CORP (SPA), SPARTAN MOTORS INC (SPAR), SPECTRUM BRANDS HOLDINGS, INC. (SPB), SUPERCOM LTD (Foreign) (SPCB), SOPHRIS BIO INC. (SPHS), SPI ENERGY CO., LTD. (Foreign) (SPI), STEEL PARTNERS HOLDINGS L.P. (SPLP), SEASPINE HOLDINGS CORP (SPNE), SPECTRUM PHARMACEUTICALS INC (SPPI), SPIRIT AEROSYSTEMS HOLDINGS, INC. (SPR), SPERO THERAPEUTICS, INC. (SPRO), SUNPOWER CORP (SPWR), SPX CORP (SPXC), SEQUENTIAL BRANDS GROUP, INC. (SQBG), SEQUANS COMMUNICATIONS (Foreign) (SQNS), SURMODICS INC (SRDX), STONERIDGE INC (SRI), SAREPTA THERAPEUTICS, INC. (SRPT), SIERRA ONCOLOGY, INC. (SRRA), SCHOLAR ROCK HOLDING CORP (SRRK), SENSUS HEALTHCARE, INC. (SRTS), SIMPSON MANUFACTURING CO INC (SSD), STRATA SKIN SCIENCES, INC. (SSKN), STRATASYS LTD. (Foreign) (SSYS), SENSATA TECHNOLOGIES HOLDING PLC (ST), STAAR SURGICAL CO (STAA), STERIS PLC (STE), STEEL DYNAMICS INC (STLD), STMICROELECTRONICS NV (Foreign) (STM), STEMLINE THERAPEUTICS INC (STML), STRATTEC SECURITY CORP (STRT), SEAGATE TECHNOLOGY PLC (STX), CONSTELLATION BRANDS, INC. (STZ), SUNCOR ENERGY INC (Foreign) (SU), SUMMER INFANT, INC. (SUMR), SUNWORKS, INC. (SUNW), SUPERIOR INDUSTRIES INTERNATIONAL INC (SUP), SUPERNUS PHARMACEUTICALS INC (SUPN), SURFACE ONCOLOGY, INC. (SURF), SINOVAC BIOTECH LTD (Foreign) (SVA), SAVARA INC (SVRA), SERVOTRONICS INC (SVT), SIERRA WIRELESS INC (Foreign) (SWIR), STANLEY BLACK & DECKER, INC. (SWK), SKYWORKS SOLUTIONS, INC. (SWKS), SCHWEITZER MAUDUIT INTERNATIONAL INC (SWM), SUNCOKE ENERGY, INC. (SXC), SUNCOKE ENERGY PARTNERS, L.P. (SXCP), STANDEX INTERNATIONAL CORP (SXI), SENSIENT TECHNOLOGIES CORP (SXT), SYNLOGIC, INC. (SYBX), STRYKER CORP (SYK), SYNTHETIC BIOLOGICS, INC. (SYN), SYNALLOY CORP (SYNL), SYPRIS SOLUTIONS INC (SYPR), SYROS PHARMACEUTICALS, INC. (SYRS), TRANSACT TECHNOLOGIES INC (TACT), TANTECH HOLDINGS LTD (Foreign) (TANH), MOLSON COORS BREWING CO (TAP), TARO PHARMACEUTICAL INDUSTRIES LTD (Foreign) (TARO), TAT TECHNOLOGIES LTD (Foreign) (TATT), TAYLOR DEVICES INC (TAYD), THERAVANCE BIOPHARMA, INC. (TBPH), TECHNICAL COMMUNICATIONS CORP (TCCO), TACTILE SYSTEMS TECHNOLOGY INC (TCMD), TRACON PHARMACEUTICALS, INC. (TCON), TERADATA CORP (TDC), TRANSDIGM GROUP INC (TDG), TELEDYNE TECHNOLOGIES INC (TDY), BIO-TECHNE CORP (TECH), TENNECO INC (TEN), TERADYNE, INC (TER), TEVA PHARMACEUTICAL INDUSTRIES LTD (TEVA), TEREX CORP (TEX), TELEFLEX INC (TFX), TREDEGAR CORP (TG), TECOGEN INC. (TGEN), TRIUMPH GROUP INC (TGI), TECNOGLASS INC. (TGLS), TG THERAPEUTICS, INC. (TGTX), THOR INDUSTRIES INC (THO), THERMON GROUP HOLDINGS, INC. (THR), GENTHERM INC (THRM), TREEHOUSE FOODS, INC. (THS), TRUETT-HURST, INC. (THST), TEL INSTRUMENT ELECTRONICS CORP (TIK), INTERFACE INC (TILE), ORCHIDS PAPER PRODUCTS CO (TIS), TOP IMAGE SYSTEMS LTD (Foreign) (TISA), TIMKEN CO (TKR), TANDY LEATHER FACTORY INC (TLF), TELIGENT, INC. (TLGT), TOYOTA MOTOR CORP (Foreign) (TM), THERMO FISHER SCIENTIFIC INC. (TMO), TIMKENSTEEL CORP (TMST), TELENAV, INC. (TNAV), TENNANT CO (TNC), TANDEM DIABETES CARE INC (TNDM), TONIX PHARMACEUTICALS HOLDING CORP. (TNXP), TOCAGEN INC (TOCA), RESTORBIO, INC. (TORC), TOWER INTERNATIONAL, INC. (TOWR), TURNING POINT BRANDS, INC. (TPB), TPI COMPOSITES, INC (TPIC), TAPESTRY, INC. (TPR), TEMPUR SEALY INTERNATIONAL, INC. (TPX), TOOTSIE ROLL INDUSTRIES INC (TR), TRECORA RESOURCES (TREC), TREX CO INC (TREX), THOMSON REUTERS CORP (Foreign) (TRI), TRINITY BIOTECH PLC (Foreign) (TRIB), TRILLIUM THERAPEUTICS INC. (Foreign) (TRIL), TRIMBLE INC. (TRMB), TRINITY



INDUSTRIES INC (TRN), TRANSCAT INC (TRNS), TROVAGENE, INC. (TROV), TRONOX LTD (TROX), THERAPIX BIOSCIENCES LTD. (Foreign) (TRPX), TRIMAS CORP (TRS), TRIO-TECH INTERNATIONAL (TRT), TREVENA INC (TRVN), TRANSENERX INC. (TRXC), TRINSEO S.A. (TSE), TOWER SEMICONDUCTOR LTD (Foreign) (TSEM), TESLA, INC. (TSLA), TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD (Foreign) (TSM), TYSON FOODS INC (TSN), TESARO, INC. (TSRO), THESTREET, INC. (TST), TORO CO (TTC), TATA MOTORS LTD (Foreign) (TTM), TTM TECHNOLOGIES INC (TTMI), TITAN PHARMACEUTICALS INC (TTNP), T2 BIOSYSTEMS, INC. (TTOO), TETRAPHASE PHARMACEUTICALS INC (TPPH), TUPPERWARE BRANDS CORP (TUP), TITAN INTERNATIONAL INC (TWI), TWIN DISC INC (TWIN), HOSTESS BRANDS, INC. (TWNK), THERAPEUTICSMD, INC. (TXMD), TEXAS INSTRUMENTS INC (TXN), TEXTRON INC (TXT), TYME TECHNOLOGIES, INC. (TYME), UNDER ARMOUR, INC. (UAA), UNITED STATES ANTIMONY CORP (UAMY), CVR PARTNERS, LP (UAN), AGEAGLE AERIAL SYSTEMS INC. (UAVS), UBIQUITI NETWORKS, INC. (UBNT), UNITY BIOTECHNOLOGY, INC. (UBX), ULTRA CLEAN HOLDINGS, INC. (UCTT), UNIVERSAL ELECTRONICS INC (UEIC), UNIQUE FABRICATING, INC. (UFAB), UNIFI INC (UFI), UNIVERSAL FOREST PRODUCTS INC (UFPI), UFP TECHNOLOGIES INC (UFPT), DOMTAR CORP (UFS), UNITED GUARDIAN INC (UG), UNILEVER PLC (Foreign) (UL), ULTRALIFE CORP (ULBI), UNITED MICROELECTRONICS CORP (Foreign) (UMC), UNUM THERAPEUTICS INC. (UMRX), UNILEVER N V (Foreign) (UN), UQM TECHNOLOGIES INC (UQM), UROGEN PHARMA LTD. (Foreign) (URGN), UNIVERSAL STAINLESS & ALLOY PRODUCTS INC (USAP), USA TECHNOLOGIES INC (USAT), US CONCRETE INC (USCR), USG CORP (USG), USANA HEALTH SCIENCES INC (USNA), UNITED THERAPEUTICS CORP (UTHR), UTAH MEDICAL PRODUCTS INC (UTMD), UTSTARCOM HOLDINGS CORP. (Foreign) (UTSI), UNITED TECHNOLOGIES CORP (UTX), VARIAN MEDICAL SYSTEMS INC (VAR), VBI VACCINES INC (VBIV), VASCULAR BIOGENICS LTD. (Foreign) (VBLT), VISTEON CORP (VC), VERICEL CORP (VCEL), VOCERA COMMUNICATIONS, INC. (VCRA), VEECO INSTRUMENTS INC (VECO), VEDANTA LTD (Foreign) (VEDL), VERU INC. (VERU), V F CORP (VFC), VECTOR GROUP LTD (VGR), VALHI INC (VHI), VIAVI SOLUTIONS INC. (VIAV), VICAL INC (VICL), VICOR CORP (VICR), VIRCO MFG CORPORATION (VIRC), VIVEVE MEDICAL, INC. (VIVE), MERIDIAN BIOSCIENCE INC (VIVO), VOXELJET AG (Foreign) (VJET), VIKING THERAPEUTICS, INC. (VKTX), VALERO ENERGY CORP (VLO), VALERITAS HOLDINGS INC. (VLRX), VALMONT INDUSTRIES INC (VMI), VANDA PHARMACEUTICALS INC. (VNDA), VOLITIONRX LTD (VNRX), VENATOR MATERIALS PLC (VNTR), VISHAY PRECISION GROUP, INC. (VPG), VERA BRADLEY, INC. (VRA), VIEWRAY, INC. (VRAY), VAREX IMAGING CORP (VREX), VERMILLION, INC. (VRML), VERONA PHARMA PLC (Foreign) (VRNA), VERSO CORP (VRS), VERTEX PHARMACEUTICALS INC (VRTX), VIASAT INC (VSAT), VISHAY INTERTECHNOLOGY INC (VSH), VIVINT SOLAR, INC. (VSLR), VERSUM MATERIALS, INC. (VSM), VERASTEM, INC. (VSTM), VISTA OUTDOOR INC. (VSTO), VISTAGEN THERAPEUTICS, INC. (VTGN), VITAL THERAPIES INC (VTL), VERTEX ENERGY INC. (VTNR), VTV THERAPEUTICS INC. (VTVT), VUZIX CORP (VUZI), VIVUS INC (VVUS), VALVOLINE INC (VVV), VAXART, INC. (VXRT), VOYAGER THERAPEUTICS, INC. (VYGR), WESTINGHOUSE AIR BRAKE TECHNOLOGIES CORP (WAB), WATERS CORP (WAT), ENERGOUS CORP (WATT), WABCO HOLDINGS INC. (WBC), WELBILT, INC. (WBT), WESTERN DIGITAL CORP (WDC), WD 40 CO (WDFC), WEATHERFORD INTERNATIONAL PLC (WFT), WINNEBAGO INDUSTRIES INC (WGO), CACTUS, INC. (WHD), WHIRLPOOL CORP (WHR), ENCORE WIRE CORP (WIRE), WORKHORSE GROUP INC. (WKHS), WESTLAKE CHEMICAL CORP (WLK), WESTLAKE CHEMICAL PARTNERS LP (WLKP), WRIGHT MEDICAL GROUP N.V. (WMGI), ADVANCED DRAINAGE SYSTEMS, INC. (WMS), WABASH NATIONAL CORP (WNC), WORTHINGTON INDUSTRIES INC (WOR), WESTPORT FUEL SYSTEMS INC. (Foreign) (WPRT), WRKCO INC. (WRK), WEST PHARMACEUTICAL SERVICES INC (WST), WESTELL TECHNOLOGIES INC (WSTL), WATTS WATER TECHNOLOGIES INC (WTS), WIRELESS TELECOM GROUP INC (WTT), WAVE LIFE SCIENCES LTD. (WVE), WILLAMETTE VALLEY VINEYARDS INC (WVVI), WOODWARD, INC. (WWD), WOLVERINE WORLD WIDE INC (WWW), UNITED STATES STEEL CORP (X), XENETIC BIOSCIENCES, INC. (XBIO), XBIOTECH INC. (XBIT), XENON PHARMACEUTICALS INC. (XENE), INTERSECT ENT, INC. (XENT), XG TECHNOLOGY, INC. (XGTI), XILINX INC (XLNX), ACCELERON PHARMA INC (XLRN), XENCOR INC (XNCR), EXXON MOBIL CORP (XOM), XOMA CORP (XOMA), EXONE CO (XONE), XPERI CORP (XPER), DENTSPLY SIRONA INC. (XRAY), XTL BIOPHARMACEUTICALS LTD (Foreign) (XTLB), XTANT MEDICAL HOLDINGS, INC. (XTNT), 22ND CENTURY GROUP, INC. (XXII), XYLEM INC. (XYL), YULONG ECO-MATERIALS LTD (Foreign) (YECO), YPF SOCIEDAD ANONIMA (Foreign) (YPF), YIELD10 BIOSCIENCE, INC. (YTEN), ZIMMER BIOMET HOLDINGS, INC. (ZBH), ZEBRA TECHNOLOGIES CORP (ZBRA), ZEALAND PHARMA A (Foreign) (ZEAL), ZAFGEN, INC. (ZFGN), ZOGENIX, INC. (ZGNX), ZIOPHARM ONCOLOGY INC (ZIOP), ZK INTERNATIONAL GROUP CO., LTD. (Foreign) (ZKIN), ZAI LAB LTD (Foreign) (ZLAB), ZOMEDICA PHARMACEUTICALS CORP. (ZOM), ZOSANO PHARMA CORP (ZSAN), ZOETIS INC. (ZTS), ZYMEWORKS INC. (ZYME), ZYNERBA PHARMACEUTICALS, INC. (ZYNE)