

Producers of Contact Lenses

A large number of firms make contact lenses, but the overall industry is rather highly concentrated and the largest half-dozen manufacturers hold most of the market. For example, soft lenses currently make up 75 percent of total lens production, and the four largest soft lens producers account for over two-thirds of that sector, equivalent to about 55 percent of the total contact lens market (table 8). Gas-permeable lenses represent about 15 percent of the total market, but one type, PMMA-silicone lenses (which outsell the other type, CAB lenses, by four pairs to one), are almost entirely provided by one firm (table 9). Only for hard lenses, which have a small and declining share of the market, are there many sellers, no one or few of which are dominant.

Sales concentration in the predominant soft-lens sector would rank high by most economic stand-

ards. The largest firm, Bausch & Lomb, accounts for at least 40 percent of the market. The four largest (adding American Hydron, Barnes Hind/Hydrocurve, and CooperVision¹) account for about 70 percent; and the seven largest (including UCO Optics, Wesley-Jessen, and American Optical) account for over 80 percent of the market (31). (UCO has since been acquired by CooperVision, doubling the latter's market share to approximately 15 percent and increasing the four- and eight-firm concentration levels somewhat (41).) The data on firm shares in this market segment for 1978 to 1982 are presented in table 8, which shows four- and eight-firm concentration levels to be high in each of the 5 years. However, both, especially four-firm concentration levels,

¹CooperVision was recently sold to Nestle.

Table 8.—Market Shares and Concentration Ratios, Soft Lenses, 1978-82 (est.) (percentages)

Firm	1978	1979	1980	1981	1982 est.
Bausch & Lomb	.61	48	53	48	40+
American Optical	16	19	13	11	4
Barnes-Hind/Hydrocurve	12	14	11	10	13
Wesley-Jessen	6	4	3	2	5
UCO Optics	5	8	7	8	7
Channel/Lombart	—	3	4	3	2
American Hydron	—	3	5	7	8
CooperVision	—	—	2	3	8
Vistakon	1	1	1	2	2
Other	—	—	1	7	9
Total	100	100	100	100	100
Four largest firms total	95	89	84	77	69
Eight largest firms total	100	100	98	91	89

SOURCE: L. Schwarz and D. K. Temple, *Contact Lens Industry-The Shakeout Continues* (New York: Salomon Bros., Inc., 1963).

Table 9.—Market Shares and Concentration Ratios, Gas-Permeable Lenses, 1979-82 (est.) (percentages)

Firm	Trade name	Lens type	1979	1980	1981	1982 (est.)
Syntex	Polycon	PM MA-silicone	30	67	64	80
Barnes-Hind/Hydrocurve	CAB Curve	CAB	—	—	15	6
Danker Laboratories	Meso	CAB	40	20	11	6
Rynco Scientific	RX56	CAB	30	13	9	5
Dow Corning	Silcon	silicone	—	—	1	3
Four largest firms total			100 ^a	100	^a 99	97

^aThree firms accounted for the total market.

SOURCE: L. Schwarz and D. K. Temple, *Contact Lens Industry-The Shakeout Continues* (New York: Salomon Bros., Inc., 1983).

have declined steadily. Although the shares of the leading firms are far from being equalized, competitors capable of eroding the share of the one-time monopolist in soft-lens manufacture, Bausch & Lomb, are well established in the market.

For gas-permeable lenses, there are fewer firms, and the dominance of the leader is greater than in the case of soft lenses. Here, as indicated earlier, the preferred PMMA-silicone lenses have 80 percent of gas-permeable lens sales. One firm, Syntex, accounts for about the entire output of PMMA-silicone lenses. (Several others were marketing this type of lens to a limited extent in 1983, but their products had not yet been approved by the Food and Drug Administration (FDA). They have been marketing their lenses under "Investigational Device Exemptions" issued by FDA and therefore must operate within certain restrictions.) Four firms produce the CAB-type, and one (Dow Corning) markets an all-silicone gas-permeable lens. Thus, the gas-permeable lens' general market is also highly concentrated, with one dominant firm, five others with small shares, and a fringe of several brands under clinical investigation or approved for a specific use only. Market share data for this sector are presented in table 9.

However, the dominance of Syntex and the almost 100 percent four-firm concentration level, while implying a potentially noncompetitive situation, must be viewed in historical perspective. The soft lens market was dominated for the first several years by the initial entrant, Bausch & Lomb, but subsequent entry, after 4 to 5 years, led to the erosion of Bausch & Lomb's share and a decreasing four-firm concentration ratio. The vigorous competition in this market has been demonstrated by the sizable price declines described in the previous chapter. Therefore, the situation in gas-permeable lenses represents, at least thus far, a replication of the development of soft lenses. If substantial entry occurs, Syntex's large share will be reduced and strong price competition will occur. But even if entry occurs only gradually, firms that may dominate in this sector of the industry must still take into account the substitutability among lens types and thus adopt prices that practitioners and patients will accept relative to those of hard and soft lenses.

For the older, hard PMMA lenses, the case is quite different. This market sector has been characterized as a "cottage industry," where small laboratories prevail. They generally operate within a small geographic area, manufacturing lenses from plastic "buttons" purchased from bulk plastics manufacturers, and providing custom services to prescribing dispensers. There are many such small manufacturers and so-called "optical laboratories" that can compete effectively with larger manufacturers. While the case is not conclusive, there is at present no evidence of economies of large-scale production in lens manufacturing of any type. However, many small manufacturers have gone out of business or suffered sales declines during the past decade because of the shrinkage of the market for hard lenses, and the small firms' inability to meet the requirements for FDA approval of the newer lens types (22). Nonetheless, this segment of the market remains especially price competitive.

In summation then, the three sectors of the contact lens industry display different degrees of competition, yet the differences are explainable in terms of the different stage in the "life cycle" of each. The mature hard lens sector has few, if any, dominant firms, and has been highly price competitive for many years. The soft-lens sector is moving out of its youth phase and now displays increasing entry, an equalizing of market power among a group of large firms, and strong competition in price and innovation. The newest product sector, gas-permeable lenses, thus far has retraced the steps of the soft-lens sector, and the economic forces at work promise to maintain that similarity, conditional on the magnitude of the barriers to entry such as those posed by premarket regulatory requirements.

With regards to the individual firms who comprise the industry, table 10 provides data on 17 major competitors, ranging from Bausch & Lomb, with 1982 worldwide lens sales of \$150 million and profits of \$52 million (including lens solutions), to Rynco and Alcon Optic, each with only \$2 million in sales. Of these 17 firms, only Bausch & Lomb can be called a broad line optical goods producer; the others are primarily contact lens producers, although many have broad contact

Table 10.—Worldwide Sales, Profit, and R&D Data of the 17 Major Firms in the Contact Lens Industry, 1982 (millions of dollars)

Firm (and parent company)	Contact lens sales	Lens solutions sales	Operating profit
Bausch & Lomb	150.0	57.0	52
Barnes-Hind/Hydrocurve (Revlon).	38.0	48.0	8.5
CooperVision (Cooper Laboratories)	36.0	15.0	17.2
Syntex Ophthalmic (Syntex Corp.)	26.7	—	0.7
American Hydron (National Patent Development Corp.)	30.0	—	marginally profitable
UCO Optics (CooperVision)	19.0	—	2.8
Wesley-Jessen (Schering-Plough, Inc.)	15.0	—	marginally profitable
American Optical	13.0	—	loss
American Medical Optics (American Hospital Supply)	2.5	—	—
Ciba Vision Care (Ciba-Geigy)	9.0	—	loss
Vistakon (Johnson & Johnson).	8.0	—	loss
Danker Laboratories	5.0	—	loss
Dow Corning Ophthalmic (Dow Corning Corp.)	5.0	—	loss
Channel-Lombart (Channel Industries)	8.0	—	loss
Rynco Scientific	2.0	—	loss
Alcon Optic (Nestle).	2.0	26.0	NA
Allergan (Smith Kline-Beckman)	—	69.0	NA

NA indicates data not available.

SOURCES: L. Schwarz and D K Temple, *Contact Lens Industry-The Shakeout Continues* (New York: Salomon Bros., Inc., 1983), and *Moody's Industrial Manual, 1982*, vols. 1 and 2 (New York: Moody's Investor Service, 1982).

lens product lines or are owned by parent companies that range across the health care and personal products fields or even into heavy industry and broadly based conglomerate activities. In fact, 13 of the 17 largest firms are parts of larger corporate organizations as a result of mergers and acquisitions, and the acquisition of one or more contact lens firms is usually only part of a larger acquisition pattern by the parent company (see app. A).

Small firms historically have been among the industry's most successful innovators, and entry via small-firm acquisition often provides the larger acquirer with a position in the industry more advanced than it could obtain with a "de novo" entry. (For example, Syntex, which had a bifocal soft lens only "in development," recently acquired Salvatori Laboratories, a long-established, smaller firm which had moved very close to obtaining FDA approval for a bifocal soft lens.) This advanced position, combined with the parent company's financial resources, marketing strength, and in one case a captive chain of dispensing optician outlets, provides a strong potential for eventual large-scale commercial success. Thus, on the one hand, the "deep pocket" of the acquirer, to-

gether with the innovational momentum of the acquired firm, provides an effective challenger to the market position of dominant firms, which enhances competition. On the other hand, continuous acquisitions of smaller by larger firms narrow the base of product innovation. A larger number of small, dynamic firms becomes reduced to a smaller number of larger firms, and there is as yet little, if any, evidence to indicate that their combined research productivity will exceed that of the smaller firms.

As a result of both mergers and internal expansion, almost all of the major firms produce several lines of contact lenses (see table 11). The two firms included in table 10 but not in table 11 are Alcon Optic and Allergan, each of whose primary activity is the sales of lens solutions. Most have diversified their product lines to cover all or most of the soft lenses' individual submarkets as well as gas-permeable lenses.

Thus, while the number of major competitors is growing, their full-line strategies are making it more difficult for the small, specialized firm to occupy more than a toehold position. For example, a list of FDA-approved spherical (single-

Table 11.—U.S. Product Lines and List Prices Per Lens for the 15 Major Contact Lens Manufacturers, May 1983 (except as noted)

Daily-wear soft lenses	Extended-wear soft lenses	Toric lenses	Bifocal lenses	Gas-permeable lenses
Bausch & Lomb				
Softlens/\$18.00	03, 04 (cosmetic)/\$20.00 ^a	B & L Toric/\$33.00	PA.1/\$40.00	In FDA process
Ultrathin U3, U4/\$18.00	B & L 70 (cosmetic)/\$20.00 ^a CW79 (aphakic)/\$40.00 ^a			
Barnes-Hind/Hydrocurve (Wilson, Inc.)				
Hydrocurve II (45%) 15.5-16.0 mm/\$28.00 13.5-14.5 mm/\$18.00	Hydrocurve (45%) (aphakic)/\$49.50 Hydrocurve (55%) (aphakic, cosmetic)/\$49.50	Hydrocurve II (45%) Daily Wear Toric/\$52.00 ^b Hydrocurve II (55%) Extended Wear Toric/\$59.50 ^c	In FDA process	GP II/\$32.00 ^b (CAB lens)
CooperVision (controlled by Cooper Laboratories)				
To offer daily wear O.T. (39%) lens via licensing agreement with Ocular Science	Permalens (aphakic, cosmetic) High Plus/\$55.00 Minus (therapeutic)/\$40.00 Plano/\$45.00 Low Plus/\$40.00	In development	In development	In development
Syntex Ophthalmics (Syntex Corp.)				
CSI/\$25.00	—	In development	In development	Polycom/\$33.00 (Silicone/PMMA Lens)
American Hydron (National Patent Development Corp.)				
Hydron/\$20.00	In development	Hydron Custom/\$75.00 ^b Hydron Stock/\$30.00 ^b	—	Hyperperm lens sold in Europe
UCO Optics (CooperVision)				
Aquaflex/\$22.00	—	—	—	^c FDA process with Boston II lens
Wesley-Jessen (Schering-Plough, Inc.)				
Durasoft 2/\$20.00	In FDA process	Original Durasoft TT/\$35.00 Durasoft 2 Toric/\$39.50 Durasoft 3 Custom/\$65.00	Durasoft-Tru Focal/\$59.50 ^a	Airlens sold in Canada; in FDA process U.S.
Durasoft 3/\$29.50	with Durasoft 3	—	—	—
American Optical (M. Cunniffe and R. Wood)				
AOSoft } price set by	Softcon (aphakic)/	—	—	—
AOThin } distributors	price set by distributors	—	—	—
Softcon }		—	—	—
American Medical Optics (American Hospital Supply)				
Sauflon 70/\$35.00	Sauflon 70 (cosmetic)/\$50.00 ^a Sauflon P.W. (aphakic)/\$35.00 ^a Sauflon P.W. (pediatric aphakic)/\$60.00 ^a	—	—	—

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Daily-wear soft lenses	Extended-wear soft lenses	Toric lenses	Bifocal lenses	Gas-permeable lenses
Ciba Vision Care (Ciba-Geigy Corp.)				
Cibasoft/\$16.00	In FDA process with	Tori soft/\$43 .00	Bi-soft/\$45.00	—
Cibathin/\$23.00	Cibathin			
Softint/\$20.00				
Vistakon (Johnson & Johnson)				
Hydro-Marc/\$20.00	In FDA process	Hydro-Marc Toric/\$45.00	—	—
Hydro-Marc Ultra Thin/\$20.00	with Vistamarc			
VistaMarc (58%)/\$35.00				
Original Durasoft/\$20.00				
Danker Laboratories				
—	Sila Rx (aphakic)/\$35.00 (pediatric aphakic)/\$80.00	—	Front surface bifocal/\$45.00 (Gas-permeable lens)	Dura-Sil Standard/19.00 Dura-Sil Super Thin/\$20.00 Meso/\$22.50
Dow Corning Ophthalmic (Dow Corning Corp.)				
Gelflex/\$15.00	Silsoft (aphakic, cosmetic)/\$50.00	Silcon Custom/\$31.00	VFL-11 (Silicone)/\$53.00	Silcon Stock/\$20.00
Gelflex M-T/\$15.00	Silsoft Super Plus (aphakic)/\$70.00			
Silsoft/39.50 ^b	Silsight (therapeutic)/\$39.50			Silcon Custom/\$27.50
Channel/Lombard (Channel Industries)				
Amsof/\$15.90	—	—	—	—
Amsof Thin/\$15.90				
Rynco Scientific				
CeluSoft/\$20.50	—	—	—	RX-56/\$27.50 Celuflex/\$30.00

^bPrice given by manufacturer Aug. 10, 1983.

^cPrice per case.

NOTE: Since volume discounts vary by manufacturers, actual prices may differ significantly from list prices. Figures given in parentheses are the water contents on hydrogel lenses.

SOURCES: L. Schwarz and D. K. Temple, *Contact Lens Industry-The Shakeout Continues* (New York: Salomon Bros., Inc., 1983); and P. Sposato, "New Ideas in Marketing," *Contact Lens Forum* 8(5):29-45, May 1983; and U.S. Department of Health and Human Services, Food and Drug Administration, National Center for Devices and Radiological Health, Division of Ophthalmic, Ear, Nose, Throat and Dental Devices, "Contact Lens Premarket Approval Application Approvals as of July 25, 1983," Silver Spring, MD, 1983.

vision correction) soft lenses (see app. A) includes those of 17 firms not included in table 11, but their combined market share is not more than 1 or 2 percent. None of the firms outside of the 15 in table 11 had an FDA approval at the end of 1983 for the sale of extended-wear, cosmetic-use soft lenses, and only two firms not on the list had an approved bifocal soft lens (31,48).

Last in this survey of the activities and relative sizes of the various lens manufacturing firms is

a brief profile of each, emphasizing its method of entry into the industry and the acquisitions and licensing arrangements that have contributed to its growth. This material is presented in appendix B. These descriptions show that acquisitions, joint ventures, and licensing agreements have played important roles in firm growth and relative market shares in the contact lens industry. The public policy aspects of these growth mechanisms are discussed in chapter 7.

Contact Lens Prescribers and Dispensers