

SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 8-A

FOR REGISTRATION OF CERTAIN CLASSES OF SECURITIES
PURSUANT TO SECTION 12(b) OR 12(g) OF THE
SECURITIES EXCHANGE ACT OF 1934

APA Optics, Inc.

(Exact name of registrant as specified in its charter)

Minnesota

41-1347235

(State of Incorporation or Organization)

(IRS Employer Identification No.)

2950 NE 84th Lane, Blaine, Minnesota

55434

(Address of Principal Executive Offices)

(Zip Code)

If this Form relates to the registration of a class of securities pursuant to Section 12(b) of the Exchange Act and is effective pursuant to General Instruction A.(c), check the following box. []

If this Form relates to the registration of a class of securities pursuant to Section 12(g) of the Exchange Act and is effective pursuant to General Instruction A.(d), please check the following box. []

Securities Act registration statement file number to which this form relates: N/A.

Securities to be registered pursuant to Section 12(b) of the Act: None

Securities to be registered pursuant to Section 12(g) of the Act:

Series B Preferred Share Purchase Rights

(Title of class)

(Title of class)

ITEM 1. DESCRIPTION OF REGISTRANT'S SECURITIES TO BE REGISTERED.

On October 23, 2000, the Board of Directors of APA Optics, Inc. (the "Company"), declared a dividend of one preferred share purchase right (a "Right") for each outstanding share of Common Stock, par value \$.01 per share (the "Common Shares"), of the Company. The dividend is payable on November 13, 2000 (the "Record Date") to shareholders of record on that date.

Each Right entitles the registered holder to purchase from the Company one one-hundredth of a Series B Junior Participating Preferred Share, par value \$.01 per share (the "Series B Preferred Shares"), of the Company at a price of \$80.00 per one one-hundredth of a Series B Preferred Share (the "Purchase Price"), subject to adjustment. The description and terms of the Rights are set forth in a Share Rights Agreement (the "Rights Agreement"), dated as of October 23, 2000, between the Company and Wells Fargo Bank Minnesota, N.A., as Rights Agent (the "Rights Agent").

Initially, the Rights will attach to all certificates representing Common Shares then outstanding and no separate Right Certificates will be distributed. The Rights will separate from the Common Shares and a Distribution Date for the Rights will occur, subject to certain exceptions, upon the earlier of:

(i) the close of business on the fifteenth day following a public announcement that a person or group of affiliated or associated persons has become an "Acquiring Person" (i.e., has become, subject to certain exceptions, the beneficial owner of 15% or more of the outstanding Common Shares); or

(ii) the close of business on the fifteenth day following the commencement or public announcement of a tender offer or exchange offer the consummation of which would result in a person or group of affiliated or associated persons becoming, subject to certain exceptions, the beneficial owner of 15% or more of the outstanding Common Shares.

Until the Distribution Date,

(i) the Rights will be evidenced by the Common Share certificates and will be transferred with and only with the Common Shares,

(ii) new Common Share certificates issued after the Record Date upon transfer or new issuance of the Common Shares will contain a notation incorporating the Rights Agreement by reference, and

(iii) the surrender for transfer of any Common Share certificate, even without such notation or a copy of this Summary of Rights attached thereto, will also constitute the transfer of the Rights associated with the Common Shares represented by such certificate.

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As promptly as practicable following the Distribution Date, separate certificates evidencing the Rights ("Right Certificates") will be mailed to holders of record of the Common Shares as of the close of business on the Distribution Date and such separate Right Certificates alone will evidence the Rights.

The Rights are not exercisable until the Distribution Date. The Rights will expire on November 13, 2010, unless extended or earlier redeemed or exchanged by the Company as described below.

The Purchase Price payable, and the number of Series B Preferred Shares or other securities or property issuable, upon exercise of the Rights are subject to adjustment from time to time to prevent dilution:

(i) in the event of a stock dividend on, or a subdivision, combination or reclassification of, the Series B Preferred Shares,

(ii) upon the grant to holders of the Series B Preferred Shares of certain rights, options or warrants to subscribe for or purchase Series B Preferred Shares or convertible securities at less than the then current market price of the Series B Preferred Shares, or

(iii) upon the distribution to holders of the Series B Preferred Shares of evidences of indebtedness or assets (excluding regular periodic cash dividends or dividends payable in Series B Preferred Shares) or of subscription rights or warrants (other than those described in clause (ii) hereof).

The number of Series B Preferred Shares issuable upon the exercise of a Right is also subject to adjustment in the event of a dividend on Common Shares payable in Common Shares, or a subdivision, combination or consolidation of the Common Shares.

With certain exceptions, no adjustment in the Purchase Price will be required until cumulative adjustments require an adjustment of at least 1% in the Purchase Price. No fractional Series B Preferred Shares will be issued (other than fractional shares which are integral multiples of one one-hundredth (subject to adjustment) of a Series B Preferred Share, which may, at the election of the Company, be evidenced by depositary receipts) if in lieu thereof a payment in cash is made based on the closing price (pro-rated for the fraction) of the Series B Preferred Shares on the last trading date prior to the date of exercise.

In the event that any person or group of affiliated or associated persons becomes an Acquiring Person, proper provision shall be made so that each holder of a Right, other than Rights that are or were beneficially owned by the Acquiring Person (which will thereafter be void), will thereafter have the right to receive upon exercise thereof at the then current exercise price of the Right that number of Common Shares having a market value of two times the exercise price of the Right, subject to certain possible adjustments. For example, if the exercise price were \$80, each holder of a Right would be entitled to purchase \$160 in market value of Common Shares for \$80.

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In the event that, after the Distribution Date or within 15 days prior thereto, the Company is acquired in certain mergers or other business combination transactions or 50% or more of the assets or earning power of the Company and its subsidiaries (taken as a whole) are sold after the Distribution Date or within 15 days prior thereto in one transaction or a series of related transactions, each holder of a Right (other than Rights which have become void under the terms of the Rights Agreement) will thereafter have the right to receive, upon exercise thereof at the then current exercise price of the Right, that number of common shares of the acquiring company (or, in certain cases, one of its affiliates) having a market value of two times the exercise price of the Right. Thus, if the exercise price were \$80, each holder of a Right would be entitled to purchase \$160 in market value of common shares of the acquiring

company for \$80.

In certain events specified in the Rights Agreement, the Company is permitted to temporarily suspend the exercisability of the Rights.

At any time after a person or group of affiliated or associated persons becomes an Acquiring Person (subject to certain exceptions) and prior to the acquisition by a person or group of affiliated or associated persons of 50% or more of the outstanding Common Shares, the Board of Directors of the Company may exchange all or part of the Rights (other than Rights which have become void under the terms of the Rights Agreement) for Common Shares or equivalent securities at an exchange ratio per Right equal to the result obtained by dividing the exercise price of a Right by the current per share market price of the Common Shares, subject to adjustment.

At any time prior to the close of business on the date of a public announcement that a person or group of affiliated or associated persons has become an Acquiring Person, the Board of Directors of the Company may redeem the Rights in whole, but not in part, at a price of \$.001 per Right, subject to adjustment (the "Redemption Price"), payable in cash. The redemption of the Rights may be made effective at such time, on such basis and with such conditions as the Board of Directors in its sole discretion may establish. The Board of Directors and the Company shall not have any liability to any person as a result of the redemption or exchange of the Rights pursuant to the provisions of the Rights Agreement.

The terms of the Rights may be amended by the Board of Directors of the Company, subject to certain limitations after the Distribution Date, without the consent of the holders of the Rights, including an amendment prior to the date a person or group of affiliated or associated persons becomes an Acquiring Person, to lower the 15% threshold for exercisability of the Rights to not less than the greater of (i) the sum of .001% and the largest percentage of the outstanding Common Shares then known by the Company to be beneficially owned by any person or group of affiliated or associated persons (subject to certain exceptions) or (ii) 10%.

Until a Right is exercised, the holder thereof, as such, will have no rights as a shareholder of the Company, including, without limitation, the right to vote or to receive dividends.

A copy of the Rights Agreement is available free of charge from the Company by contacting the Secretary at APA Optics, Inc., 2950 N.E. 84th Lane, Blaine, Minnesota 55449.

This summary description of the Rights does not purport to be complete and is qualified in its entirety by reference to the Rights Agreement, which is hereby incorporated herein by reference.

ITEM 2. EXHIBITS.

1. Share Rights Agreement dated October 23, 2000 by and between the Company and Wells Fargo Bank Minnesota, N.A., as Rights Agent, which includes as Exhibit B the form of Right Certificate.

SIGNATURE

Pursuant to the requirements of Section 12 of the Securities Exchange Act of 1934, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereto duly authorized.

APA OPTICS, INC.
(Registrant)

By: /s/ Anil K. Jain

Anil K. Jain
Its Chief Executive Officer

Dated: November 2, 2000

SHARE RIGHTS AGREEMENT

APA OPTICS, INC.

AND

WELLS FARGO BANK MINNESOTA, N.A.
RIGHTS AGENT

DATED AS OF OCTOBER 23, 2000

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SHARE RIGHTS AGREEMENT

Agreement, dated as of October 23, 2000, between APA Optics, Inc., a Minnesota corporation (the "Company"), and Wells Fargo Bank Minnesota, N.A. (the "Rights Agent").

The Board of Directors of the Company has authorized and declared a dividend of one preferred share purchase right (individually a "Right" and collectively the "Rights") for each Common Share (as defined in this Agreement) of the Company outstanding at the Close of Business (as defined in this Agreement) on November 13, 2000 (the "Record Date"), each Right initially representing the right to purchase one one-hundredth of a Series B Preferred Share (as defined in this Agreement), upon the terms and subject to the conditions set forth in this Agreement, and has further authorized the issuance of one Right (as such number may hereafter be adjusted pursuant to the provisions of Section 11) with respect to each Common Share that shall become outstanding (i) at any time between the Record Date and the earliest of the Distribution Date, the Redemption Date or the Final Expiration Date (as such terms are defined in this Agreement) or (ii) upon the exercise or conversion, prior to the earlier of the Redemption Date or the Final Expiration Date, of any option or other security exercisable for or convertible into Common Shares, which option or other such security is outstanding on the Distribution Date.

Accordingly, in consideration of the premises and the mutual agreements herein set forth, the parties hereby agree as follows:

Section 1. Certain Definitions. For purposes of this Agreement, the following terms have the meanings indicated:

(a) "Acquiring Person" shall mean any Person (as such term is defined in this Agreement) who or which, together with all Affiliates and Associates (as such terms are defined in this Agreement) of such Person, shall be the Beneficial Owner (as such term is defined in this Agreement) of the Threshold Percentage (as such term is defined in this Agreement) or more of the Common Shares of the Company then outstanding, but shall not include an Exempt Person (as such term is defined in this Agreement). Notwithstanding the foregoing, no Person shall become an "Acquiring Person" as the result of an acquisition of Common Shares by the Company which, by reducing the number of Common Shares outstanding, increases the proportionate number of shares beneficially owned by such Person to at least the Threshold Percentage of the Common Shares of the Company then outstanding; provided, HOWEVER, that if a Person shall, together with all Affiliates or Associates of such Person, become the Beneficial Owner of at least the Threshold Percentage of the Common Shares of the Company then outstanding by reason of share acquisitions by the Company and if such Person or such Person's Affiliates or Associates shall, after such share acquisitions by the Company, become the Beneficial Owner of any additional Common Shares of the Company, and, immediately after becoming the Beneficial Owner of such additional Common Shares, such Person shall, together with all Affiliates and Associates of such Person, be the Beneficial Owner of the Threshold Percentage or more of the Common Shares of the Company then outstanding, then such Person

(unless such Person shall be an Exempt Person) shall be deemed an "Acquiring Person." An entity other than the Company or any Subsidiary of the Company holding Common Shares for or pursuant to the terms of an employee benefit plan of the Company or of any Subsidiary of the Company and in addition being the Beneficial Owner of Common Shares that are not held for or pursuant to the terms of any such plan shall be deemed to constitute an Acquiring Person, notwithstanding anything herein stated, if, but only if, it, together with its Affiliates and Associates, shall be the Beneficial Owner of at least the Threshold Percentage, exclusive of those Common Shares held by it for or pursuant to the terms of any such plan, of the Common Shares then outstanding. Notwithstanding the foregoing, if the Board of Directors of the Company determines in good faith that a Person who would otherwise be an "Acquiring Person," as defined pursuant to the foregoing provisions of this paragraph, has become such inadvertently (including, without limitation, because (A) such Person was unaware that it beneficially owned a percentage of the Common Shares that would otherwise cause such Person to be an "Acquiring Person" or (B) such Person was aware of the extent of its beneficial ownership but had no actual knowledge of the consequences of such beneficial ownership under this Agreement), and without any intention of changing or influencing control of the Company, and such Person divests as promptly as practical a sufficient number of Common Shares so that such Person would no longer be an "Acquiring Person," as defined pursuant to the foregoing provisions of this paragraph, then such Person shall not be deemed to be an "Acquiring Person" for any purposes of this Agreement.

(b) "Affiliate" and "Associate" shall have the respective meanings ascribed to such terms in Rule 12b-2 of the General Rules and Regulations under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), as in effect on the date of this Agreement.

(c) A Person shall be deemed the "Beneficial Owner" of, and shall be deemed to "beneficially own" or have "beneficial ownership" of, any securities:

(i) which such Person or any of such Person's Affiliates or Associates beneficially owns, directly or indirectly, including without limitation securities with respect to which such Person or any of such Person's Affiliates or Associates has "beneficial ownership" pursuant to Rule 13d-3 of the General Rules and Regulations under the Exchange Act;

(ii) which such Person or any of such Person's Affiliates or Associates has, directly or indirectly, (A) the right to acquire (whether such right is exercisable immediately or after the passage of time) pursuant to any agreement, arrangement or understanding, whether or not in writing (other than customary agreements with and between underwriters and selling group members with respect to a bona fide public offering of securities), or upon the exercise of conversion rights, exchange rights, other rights (other than the Rights), warrants or options, or otherwise; PROVIDED, HOWEVER, that a Person shall not be deemed the Beneficial Owner of, or to beneficially own, or to have beneficial ownership of, any securities pursuant to subparagraph (i), (ii) or (iii) of this paragraph (c) solely because such securities are tendered pursuant to a tender or exchange offer made by or on behalf of such Person or any of such Person's Affiliates or Associates until such tendered securities are accepted for purchase or exchange; or (B) the right to vote or dispose of (including without limitation pursuant to any agreement, arrangement or understanding (whether or not in writing)); PROVIDED, however, that a Person shall not be deemed

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the Beneficial Owner of, or to beneficially own, or to have beneficial ownership of, any securities pursuant to subparagraph (i), (ii) or (iii) of this paragraph (c) solely because of the right to vote such securities pursuant to an agreement, arrangement or understanding if the agreement, arrangement or understanding to vote such securities (1) arises solely from a revocable proxy or consent given to such Person or any of such Person's Affiliates or Associates in response to a public proxy or consent solicitation made pursuant to, and in accordance with, the applicable rules and regulations under the Exchange Act and (2) is not also then reportable by such Person on Schedule 13D under the Exchange Act (or any comparable or successor report) as being beneficially owned by such Person; or

(iii) which are beneficially owned, directly or indirectly, by any other Person (or any Affiliate or Associate thereof) with which such Person (or any of such Person's Affiliates or Associates) has any agreement, arrangement or understanding (other than customary agreements with and between underwriters and selling group members with respect to a bona fide public offering of securities) for the purpose of acquiring, holding, voting (except pursuant to a revocable proxy as described in the final proviso to subparagraph (ii) of this paragraph (c)) or disposing of any voting securities of the Company.

Notwithstanding anything in these definitions of "Beneficial Owner," "beneficially own" or "beneficial ownership" to the contrary, the phrase "then

outstanding," when used with reference to a Person's beneficial ownership of securities of the Company, shall mean the number of such securities then issued and outstanding together with the number of such securities not then actually issued and outstanding which such Person would be deemed to beneficially own under this Agreement.

(d) "Business Day" shall mean any day other than a Saturday, Sunday or a day on which banking institutions in the State of New York or Minnesota are authorized or obligated by law or executive order to close.

(e) "Close of Business" on any given date shall mean 5:00 P.M., Minneapolis, Minnesota time, on such date; PROVIDED, HOWEVER, that if such date is not a Business Day, it shall mean 5:00 P.M., Minneapolis, Minnesota time, on the next succeeding Business Day.

(f) "Common Shares," when used with reference to the Company, shall mean the Common Stock, par value \$.01 per share, of the Company. "Common Shares," when used with reference to any Person other than the Company, shall mean the capital stock (or equity interest) with the greatest voting power of such other Person.

(g) "Distribution Date" shall have the meaning set forth in Section 3.

(h) "Exempt Person" shall mean (i) the Company, (ii) any Subsidiary of the Company, (iii) any employee benefit plan of the Company or of any Subsidiary of the Company, or (iv) any Person holding Common Shares for or pursuant to the terms of any such plan described in clause (iii) of this sentence.

(i) "Final Expiration Date" shall have the meaning set forth in Section 7.

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(j) "Person" shall mean any individual, firm, corporation, partnership or other entity, and shall include any successor (by merger or otherwise) of any such entity.

(k) "Series B Preferred Shares" shall mean Series B Junior Participating Preferred Shares, par value \$.01 per share (as such par value may be changed from time to time), of the Company having the rights and preferences set forth in the Form of Certificate of Designation, Preferences and Rights attached to this Agreement as Exhibit A hereto.

(l) "Redemption Date" shall have the meaning set forth in Section 7.

(m) "Section 11(a)(ii) Event" shall mean an event described in the first sentence of Section 11 (a)(ii).

(n) "Section 13 Event" shall mean any event described in clauses (w), (x), (y) or (z) of Section 13(a).

(o) "Shares Acquisition Date" shall mean the first date of public announcement (which, for purposes of this definition, shall include, without limitation, a report filed pursuant to Section 13(d) of the Exchange Act) by the Company or an Acquiring Person that an Acquiring Person has become such.

(p) "Subsidiary" of any Person shall mean any corporation or other entity of which a majority of the voting power of the voting equity securities or other equity interests entitled to vote in the election of directors (or Persons with comparable responsibilities if the entity has no directors) is beneficially owned, directly or indirectly, by such Person, or otherwise controlled by such Person.

(q) "Threshold Percentage" shall mean 15 percent.

Section 2. Appointment of Rights Agent. The Company hereby appoints the Rights Agent to act as agent for the Company and the holders of the Rights (who, in accordance with Section 3, shall prior to the Distribution Date also be the holders of the Common Shares) in accordance with the terms and conditions of this Agreement, and the Rights Agent hereby accepts such appointment. The Company may from time to time appoint such co-Rights Agents as it may deem necessary or desirable.

Section 3. Issue of Right Certificates.

(a) Until the earlier of (i) the Close of Business on the 15th day after the Shares Acquisition Date or (ii) the Close of Business on the 15th day (or such later date as may be determined by action of the Board of Directors of the Company prior to such time as any Person becomes an Acquiring Person) after the date of the first public announcement (as defined in Rule 14d-2 of the General Rules and Regulations under the Exchange Act) by any Person (other than an Exempt Person) relating to a tender offer or an exchange offer the consummation of which would result in beneficial ownership by a Person (other

than an Exempt Person) of at least the Threshold Percentage of the then outstanding Common Shares (including any such date that is

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after the date of this Agreement and prior to the issuance of the Rights, the earlier of such dates being herein referred to as the "Distribution Date"), (x) the Rights will be evidenced (subject to the provisions of Section 3(b) hereof) by the certificates for Common Shares registered in the names of the holders thereof (which certificates shall also be deemed to be Right Certificates where the context so requires) and not by separate Right Certificates, and (y) the right to receive Right Certificates will be transferable only in connection with the transfer of Common Shares. As soon as practicable after the Distribution Date, the Company will prepare and execute, the Rights Agent will countersign, and the Company will send or cause to be sent (and the Rights Agent will, if requested, send) by first-class, postage-prepaid mail, to each record holder of Common Shares as of the close of business on the Distribution Date, at the address of such holder shown on the records of the Company, one or more Right Certificates, in substantially the form of Exhibit B hereto (the "Right Certificates"), evidencing one Right for each Common Share so held, subject to adjustment pursuant to Section 11(i). In the event that an adjustment in the number of Rights per Common Share has been made pursuant to Section 11(i), at the time Right Certificates are distributed, the Company may, to the extent provided in Section 14(a), make the necessary and appropriate adjustments (as set forth in Section 14(a)) so that Right Certificates are distributed representing only whole numbers of Rights and pay cash in lieu of fractional Rights pursuant to Section 14(a). As of and after the Distribution Date, the Rights will be evidenced solely by such Right Certificates.

(b) On the Record Date, or as soon as practicable thereafter, the Company will send a copy of a Summary of Rights to Purchase Series B Preferred Shares, in substantially the form of Exhibit C hereto (the "Summary of Rights"), by first-class, postage-prepaid mail, to each record holder of Common Shares as of the Close of Business on the Record Date, at the address of such holder shown on the records of the Company. With respect to certificates for Common Shares outstanding as of the Record Date, until the Distribution Date, the Rights will be evidenced by such certificates registered in the names of the holders thereof, and the registered holders of the Common Shares shall also be the registered holders of the associated Rights. Until the Distribution Date (or the earlier of the Redemption Date or the Final Expiration Date), the surrender for transfer of any certificate for Common Shares outstanding on the Record Date, with or without a copy of the Summary of Rights attached thereto, shall also constitute the transfer of the Rights associated with the Common Shares represented thereby.

(c) Certificates for Common Shares which become outstanding after the Record Date and (i) prior to the earliest of the Distribution Date, the Redemption Date or the Final Expiration Date, or (ii) upon the exercise or conversion, prior to the earlier of the Redemption Date or the Final Expiration Date, of any option or other security exercisable for or convertible into Common Shares, which option or other security is outstanding on the Distribution Date, shall have impressed on, printed on, written on or otherwise affixed to them the following legend:

This certificate also evidences and entitles the holder hereof to certain Rights as set forth in a Share Rights Agreement between APA Optics, Inc. and Wells Fargo Bank Minnesota, N.A., dated as of October 23, 2000 (the "Rights Agreement"), the terms of which (including restrictions on the transfer of such Rights) are hereby incorporated herein by reference and a copy of which is on file

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with the Secretary at the principal executive offices of the Company. Under certain circumstances, as set forth in the Rights Agreement, such Rights will be evidenced by separate certificates and will no longer be evidenced by this certificate. The Company will mail to the holder of this certificate a copy of the Rights Agreement without charge after receipt of a written request therefor to its Secretary from such holder. Under certain circumstances, as set forth in the Rights Agreement, Rights that are or were acquired or beneficially owned by an Acquiring Person or any Associate or Affiliate thereof (as such terms are defined in the Rights Agreement) may become null and void.

With respect to certificates containing the foregoing legend, until the earliest of the Distribution Date, the Redemption Date or the Final Expiration Date, the Rights associated with the Common Shares represented by such certificates shall be evidenced by such certificates alone, the registered holders of the Common

Shares shall also be the registered holders of the associated Rights and the surrender for transfer of any such certificate shall also constitute the transfer of the Rights associated with the Common Shares represented thereby. In the event that the Company purchases or acquires any Common Shares after the Record Date but prior to the Distribution Date, any Rights associated with such Common Shares shall be deemed canceled and retired so that the Company shall not be entitled to exercise any Rights associated with the Common Shares which are no longer outstanding.

Section 4. Form of Right Certificates. The Right Certificates (and the forms of election to purchase Series B Preferred Shares and of assignment to be printed on the reverse thereof) shall be in substantially the form of Exhibit B hereto and may have such marks of identification or designation and such legends, summaries or endorsements printed thereon as the Company may deem appropriate and as are not inconsistent with the provisions of this Agreement, or as may be required to comply with any applicable law, rule or regulation (including, without limitation, any rule or regulation of any stock exchange on which the Rights may from time to time be listed) or to conform to usage or to reflect adjustments to the Rights made pursuant to this Agreement. Subject to the provisions of Section 11 and Section 22, the initial Right Certificates, whenever distributed, shall entitle the holders thereof to purchase such number of one one-hundredths of a Series B Preferred Share as shall be set forth therein at the price per one one-hundredth of a Series B Preferred Share set forth therein (the price per one-hundredth of a Series B Preferred Share being herein called the "Purchase Price"), but the amount and type of securities purchasable upon the exercise of each Right and the Purchase Price shall be subject to adjustment as provided in this Agreement.

Section 5. Countersignature and Registration.

(a) The Right Certificates shall be executed on behalf of the Company by any one of its Chief Executive Officer, its President, its Chief Financial Officer or any of its Vice Presidents, either manually or by facsimile signature. The Right Certificates shall be countersigned, either manually or by facsimile signature, by the Rights Agent and shall not be valid for any purpose unless so countersigned. In case any officer of the Company who shall have signed any of the Right Certificates shall cease to be such officer of the Company before

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countersignature by the Rights Agent and issuance and delivery by the Company, such Right Certificates, nevertheless, may be countersigned by the Rights Agent and issued and delivered by the Company with the same force and effect as though the person who signed such Right Certificates had not ceased to be such officer of the Company; and any Right Certificate may be signed on behalf of the Company by any person who, at the actual date of the signing of such Right Certificate, shall be a proper officer of the Company to sign such Right Certificate, although at the date of the execution of this Agreement any such person was not such an officer.

(b) Following the Distribution Date, the Rights Agent will keep or cause to be kept, at its principal office or the office or offices designated as the appropriate place for surrender of Right Certificates upon exercise or transfer, books for registration and transfer of the Right Certificates. Such books shall show the names and addresses of the respective holders of the Right Certificates, the number of Rights evidenced on its face by each of the Right Certificates and the date of each of the Right Certificates.

Section 6. Transfer, Split-Up, Combination and Exchange of Right Certificates; Lost, Stolen, Destroyed or Mutilated Right Certificates.

(a) Subject to the provisions of Section 14 hereof, at any time after the Close of Business on the Distribution Date, and at or prior to the Close of Business on the earlier of the Redemption Date or the Final Expiration Date, any Right Certificate or Right Certificates (other than Right Certificates representing Rights that have become void pursuant to Section 11(a) (ii) hereof or that have been exchanged pursuant to Section 24 hereof) may be transferred, split up, combined or exchanged for another Right Certificate or Right Certificates, entitling the registered holder to purchase a like number of one one-hundredths of a Series B Preferred Share as the Right Certificate or Right Certificates surrendered then entitled such holder (or former holder in the case of a transfer) to purchase. Any registered holder desiring to transfer, split up, combine or exchange any Right Certificate or Right Certificates shall make such request in writing delivered to the Rights Agent and shall surrender the Right Certificate or Right Certificates to be transferred, split up, combined or exchanged at the office or offices of the Rights Agent designated for such purpose. Thereupon the Rights Agent shall, subject to Section 14 hereof, countersign and deliver to the Person entitled thereto a Right Certificate or Right Certificates, as the case may be, as so requested. The Company may require payment by the registered holder of a sum sufficient to cover any tax or governmental charge that may be imposed in connection with any transfer,

split-up, combination or exchange of Right Certificates. Neither the Rights Agent nor the Company shall be obligated to take any action whatsoever with respect to the transfer of any such surrendered Right Certificate until the registered holder shall have duly completed and executed the form of assignment on the reverse side of such Right Certificate and shall have provided such additional evidence of the identity of the Beneficial Owner (or former Beneficial Owner) of such Right Certificate or Affiliates or Associates thereof as the Company shall reasonably request.

(b) Upon receipt by the Company and the Rights Agent of evidence reasonably satisfactory to them of the loss, theft, destruction or mutilation of a Right Certificate, and, in case of loss, theft or destruction, of indemnity or security reasonably satisfactory to them, and, at the Company's request, reimbursement to the Company and the Rights Agent of all reasonable expenses incidental thereto, and upon surrender to the Rights Agent and cancellation of the Right

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Certificate if mutilated, the Company will make and deliver a new Right Certificate of like tenor to the Rights Agent for countersignature and delivery to the registered owner in lieu of the Right Certificate so lost, stolen, destroyed or mutilated.

Section 7. Exercise of Rights, Purchase Price, Expiration Date of Rights.

(a) Subject to Section 11(a)(ii) hereof, the registered holder of any Right Certificate may exercise the Rights evidenced thereby (except as otherwise provided in this Agreement) in whole or in part at any time after the Distribution Date upon surrender of the Right Certificate, with the form of election to purchase on the reverse side thereof duly completed and executed, to the Rights Agent at the office or offices of the Rights Agent designated for such purpose, together with payment of the Purchase Price for each one one-hundredth of a Series B Preferred Share as to which the Rights are exercised, prior to the earliest of (i) the Close of Business on November 13, 2010 (the "Final Expiration Date"), (ii) the time at which the Rights are redeemed as provided in Section 23 (the "Redemption Date"), or (iii) the time at which such Rights are exchanged as provided in Section 24.

(b) The Purchase Price for each one one-hundredth of a Series B Preferred Share purchasable pursuant to the exercise of a Right shall initially be \$80.00, shall be subject to adjustment from time to time as provided in Sections 11 and 13 hereof and shall be payable in lawful money of the United States of America in accordance with paragraph (c) below.

(c) Upon receipt of a Right Certificate representing exercisable Rights, with the form of election to purchase duly completed and executed, accompanied by payment of the Purchase Price for the shares to be purchased and an amount equal to any applicable transfer tax required to be paid by the holder of such Right Certificate in accordance with Section 9 in cash, or by certified check or bank cashier's check or money order payable to the order of the Company, the Rights Agent shall, subject to Section 20(k), thereupon promptly (i) (A) requisition from any transfer agent of the Series B Preferred Shares (or make available, if the Rights Agent is the transfer agent for such shares) certificates for the number of Series B Preferred Shares to be purchased and the Company hereby irrevocably authorizes its transfer agent to comply with all such requests, or (B) if the Company shall have elected to deposit the total number of Series B Preferred Shares issuable upon exercise of the Rights under this Agreement with a depository agent, requisition from the depository agent depository receipts representing such number of one one-hundredths of a Series B Preferred Share as are to be purchased (in which case certificates for the Series B Preferred Shares represented by such receipts shall be deposited by the transfer agent with the depository agent) and the Company hereby directs the depository agent to comply with such request, (ii) when appropriate, requisition from the Company the amount of cash to be paid in lieu of issuance of fractional interests in shares in accordance with Section 14, (iii) after receipt of such certificates or depository receipts, cause the same to be delivered to or upon the order of the registered holder of such Right Certificate, registered in such name or names as may be designated by such holder and (iv) when appropriate, after receipt, deliver such cash for fractional interests in shares to or upon the order of the registered holder of such Right Certificate.

(d) In case the registered holder of any Right Certificate shall exercise less than all the Rights evidenced thereby, a new Right Certificate evidencing Rights equivalent to the Rights

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remaining unexercised shall be issued by the Rights Agent and delivered to the registered holder of such Right Certificate or to such holder's duly authorized

assigns, subject to the provisions of Section 14 hereof.

(e) Notwithstanding anything in this Agreement to the contrary, neither the Rights Agent nor the Company shall be obligated to undertake any action with respect to a registered holder upon the occurrence of any purported exercise as set forth in this Section unless such registered holder shall have (i) duly completed and executed the form of election to purchase set forth on the reverse side of the Right Certificate surrendered for such exercise and (ii) provided such additional evidence of the identity of the Beneficial Owner (or former Beneficial Owner) of such Right Certificate or Affiliates or Associates thereof as the Company shall reasonably request.

Section 8. Cancellation and Destruction of Right Certificates. All Right Certificates surrendered for the purpose of exercise, transfer, split-up, combination or exchange shall, if surrendered to the Company or to any of its agents, be delivered to the Rights Agent for cancellation or in canceled form, or, if surrendered to the Rights Agent, shall be canceled by it, and no Right Certificates shall be issued in lieu thereof except as expressly permitted by any of the provisions of this Agreement. The Company shall deliver to the Rights Agent for cancellation and retirement, and the Rights Agent shall so cancel and retire, any other Right Certificate purchased or acquired by the Company otherwise than upon the exercise thereof. The Rights Agent shall deliver all canceled Right Certificates to the Company within eighteen months after cancellation of the Certificates. The Company may then destroy the Certificates, after any Securities and Exchange Commission required retention period.

Section 9. Reservation and Availability of Series B Preferred Shares.

(a) The Company covenants and agrees that it will cause to be reserved and kept available out of its authorized and unissued Series B Preferred Shares, the number of Series B Preferred Shares that will be sufficient to permit the exercise in full of all outstanding Rights.

(b) The Company will prepare and file, as soon as practicable following expiration of the Company's right of redemption pursuant to Section 23, a registration statement under the Securities Act of 1933, as amended (the "Act"), with respect to the Rights and the Company's securities purchasable upon exercise of the Rights, on an appropriate form, and use its best efforts to cause such registration statement to (i) become effective as soon as practicable after such filing and (ii) remain effective (with a prospectus at all times meeting the requirements of the Act) until the earlier of (A) the date as of which the Rights are no longer exercisable for such securities or (B) the Final Expiration Date. The Company will also take such action as may be appropriate under, or to ensure compliance with, the securities or "blue sky" laws of the various states in connection with the exercisability of the Rights. The Company may temporarily suspend, for a period of time not to exceed 90 days after the date the registration statement is filed, the exercisability of the Rights in order to permit the registration statement to become effective. Upon any such suspension, the Company shall issue a public announcement stating that the exercisability of the Rights has been temporarily suspended, as well as a public announcement at such time as the suspension is no longer in effect. Notwithstanding any provision of this Agreement to the contrary, the Rights shall not be exercisable in any

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jurisdiction if the requisite qualification in such jurisdiction shall not have been obtained or the exercise thereof is not permitted under applicable law.

(c) The Company covenants and agrees that it will take all such action as may be necessary to ensure that all Series B Preferred Shares delivered upon exercise of Rights shall, at the time of delivery of the certificates for such Series B Preferred Shares (subject to payment of the Purchase Price and any applicable transfer taxes), be duly and validly authorized and issued and fully paid and nonassessable shares.

(d) The Company further covenants and agrees that it will pay when due and payable any and all federal and state transfer taxes and charges that may be payable in respect of the issuance or delivery of the Right Certificates or of any Series B Preferred Shares upon the exercise of Rights. The Company shall not, however, be required to pay any transfer tax that may be payable in respect of any transfer or delivery of Right Certificates to a person other than, or the issuance or delivery of certificates or depositary receipts for the Series B Preferred Shares in a name other than that of, the registered holder of the Right Certificate evidencing Rights surrendered for exercise, or to issue or to deliver any certificates or depositary receipts for Series B Preferred Shares upon the exercise of any Rights, until any such tax shall have been paid (any such tax being payable by the holder of such Right Certificate at the time of surrender) or until it has been established to the Company's satisfaction that no such tax is due.

Section 10. Series B Preferred Shares Record Date. Each person in whose name any certificate for Series B Preferred Shares is issued upon the exercise

of Rights shall for all purposes be deemed to have become the holder of record of the Series B Preferred Shares represented thereby on, and such certificate shall be dated, the date upon which the Right Certificate evidencing such Rights was duly surrendered and payment of the Purchase Price (and any applicable transfer taxes) was made; PROVIDED, HOWEVER, that if the date of such surrender and payment is a date upon which the Series B Preferred Shares transfer books of the Company are closed, such person shall be deemed to have become the record holder of such shares on, and such certificate shall be dated, the next succeeding Business Day on which the Series B Preferred Shares transfer books of the Company are open. Prior to the exercise of the Rights evidenced thereby, the holder of a Right Certificate as such shall not be entitled to any rights of a holder of Series B Preferred Shares for which the Rights shall be exercisable, including without limitation, the right to vote, to receive dividends or other distributions or to exercise any preemptive rights, and shall not be entitled to receive any notice of any proceedings of the Company, except as provided herein.

Section 11. Adjustment of Purchase Price, Number and Kind of Shares or Number of Rights. The Purchase Price, the number and kind of shares covered by each Right and the number of Rights outstanding are subject to adjustment from time to time as provided in this Section 11.

(a) (i) In the event the Company shall at any time after the date of this Agreement (A) declare a dividend on the Series B Preferred Shares payable in Series B Preferred Shares, (B) subdivide the outstanding Series B Preferred Shares, (C) combine the outstanding Series B Preferred Shares into a smaller number of Series B Preferred Shares or (D) issue any

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shares of its capital stock in a reclassification of the Series B Preferred Shares (including any such reclassification in connection with a consolidation, merger or statutory share exchange in which the Company is the continuing, surviving or acquiring corporation), except as otherwise provided in this Section 11(a), the Purchase Price in effect at the time of the record date for such dividend or of the effective date of such subdivision, combination or reclassification, and the number and kind of shares of capital stock issuable on such date pursuant to the exercise of the Rights, shall be proportionately adjusted so that the holder of any Right exercised after such time shall be entitled to receive, upon payment of the Purchase Price then in effect (and any applicable transfer taxes), the aggregate number and kind of shares of capital stock which, if such Right had been exercised immediately prior to such date and at a time when the Series B Preferred Shares transfer books of the Company were open, such holder would have owned upon such exercise and been entitled to receive by virtue of such dividend, subdivision, combination or reclassification. If an event occurs which would require an adjustment under both Section 11(a)(i) and Section 11(a)(ii), the adjustment provided for in this Section 11(a)(i) shall be in addition to, and shall be made prior to, any adjustment required pursuant to Section 11(a)(ii).

(ii) Subject to Section 24 of this Agreement, in the event any Person shall become an Acquiring Person (other than pursuant to any Section 13 Event occurring after the Distribution Date or within 15 days prior thereto), proper provision shall be made so that each holder of a Right, subject to Section 11(a)(iii), shall thereafter have a right to receive, upon exercise thereof by payment of the amount equal to the product of the number of one one-hundredths of a Series B Preferred Share which would otherwise be issuable upon exercise of a Right and the then current Purchase Price in accordance with the terms of this Agreement, in lieu of Series B Preferred Shares, such number of Common Shares of the Company as shall equal the result obtained by (x) multiplying the then current Purchase Price by the number of one one-hundredths of a Series B Preferred Share for which a Right is exercisable immediately prior to the occurrence of the Section 11(a)(ii) Event and (y) dividing that product by 50% of the then current per share market price of the Company's Common Shares (determined pursuant to Section 11(d) hereof) on the date of such occurrence.

From and after the first occurrence of a Section 11(a)(ii) Event or a Section 13 Event, any Rights that are beneficially owned by any Acquiring Person (or any Associate or Affiliate thereof) or were beneficially owned by any Acquiring Person (or any Associate or Affiliate thereof) after the Acquiring Person became an Acquiring Person shall become null and void without any further action and no holder of such Rights shall thereafter have any rights to exercise such Rights or any other rights whatsoever with respect to such Rights, whether under any provision of this Agreement or otherwise. No Right Certificate shall be issued pursuant to Section 3 that represents Rights that would be void pursuant to the preceding sentence; no Right Certificate shall be issued at any time upon the transfer of any Rights to or from an Acquiring Person whose Rights would be void pursuant to the preceding sentence or any Associate or Affiliate of such an Acquiring Person or any nominee of such Acquiring Person, Associate or Affiliate; and any Right Certificate delivered to the Rights Agent for transfer to or from an Acquiring Person or any Associate or Affiliate of such Acquiring Person whose Rights would be void pursuant to the preceding sentence shall be canceled. The Company shall use all reasonable efforts to insure that the provisions of this Section 11(a)(ii) are complied with, but shall have no

liability to any holder of a Right Certificate or other Person as a result of its failure in good faith to make any determinations with respect to an Acquiring Person or its Affiliates or Associates.

(iii) If, on the date of the occurrence of a Section 11(a) (ii) Event (the "Adjustment Date"), the Company does not have sufficient authorized, unissued and unreserved Common Shares available to permit the exercise in full of all Rights that are exercisable on the Adjustment Date for the number of Common Shares per Right provided for in Section 11(a) (ii), then the Exercise Price (as defined below) and the number of Common Shares to be delivered by the Company upon exercise of a Right shall be further adjusted as provided in this subparagraph (iii).

(1) Definitions:

(A) The "Aggregate Market Value" is the product of (i) the number of Available Shares and (ii) the current per share market price of the Common Shares on the Adjustment Date, determined as provided in Section 11(d) hereof.

(B) The "Available Shares" are all unreserved Common Shares which are authorized and unissued immediately prior to the Adjustment Date.

(C) The "Exercise Price" is the amount of the payment that must be made by the holder of a Right in connection with the exercise of one Right immediately prior to the Adjustment Date.

(D) The "Deficiency" is the amount by which (i) two times the Exercise Price exceeds (ii) the quotient obtained by dividing the Aggregate Market Value by the number of Rights remaining outstanding immediately prior to the Adjustment Date (the "Remaining Rights") (which number shall not include the Rights that are beneficially owned by any Acquiring Person (or any Associate or Affiliate thereof) or were beneficially owned by any Acquiring Person (or any Associate or Affiliate thereof) after the Acquiring Person became an Acquiring Person that shall have become void pursuant to Section 11(a) (ii) hereof).

(2) If the Deficiency is less than or equal to the Exercise Price, then

(A) the number of Common Shares to be delivered by the Company upon exercise of a Right shall be adjusted to be equal to the number of Available Shares divided by the number of Remaining Rights; and

(B) the amount of cash required to be delivered by the holder of a Right upon the exercise thereof shall be adjusted (the "New Exercise Price") to equal the Exercise Price minus the Deficiency; PROVIDED, HOWEVER, that in no event will the New Exercise Price be less than the aggregate par value of the Common Shares required to be delivered upon the exercise of one Right pursuant to subparagraph (2) (A) above.

(3) If the Deficiency is greater than the Exercise Price, then

(A) the number of Common Shares to be delivered by the Company upon exercise of a Right shall be adjusted to equal the quotient obtained by dividing the Exercise Price by the current per share market price of the Common Shares on the Adjustment Date;

(B) the New Exercise Price shall equal the aggregate par value of the Common Shares required to be delivered upon the exercise of one Right pursuant to subparagraph (3) (A) above; and

(C) in lieu of issuing Common Shares (in whole or in part upon the exercise of Rights) the Company may issue, upon the exercise of Rights at the New Exercise Price, other equity securities of the Company (including, without limitation, shares, or units or fractions of shares, of preferred stock) which the Board of Directors of the Company has determined to have substantially the same value, voting rights and other rights as Common Shares (such equity securities are herein called "Common Share equivalents"). To the extent that such Common Share equivalents (or fractions thereof) are substituted for Common Shares upon exercise of the Rights following the occurrence of a Section 11(a) (ii) Event, they shall be substituted on a pro-rata basis with respect to all Rights (other than Rights that are beneficially owned by any Acquiring Person (or any Associate or Affiliate thereof) or were beneficially owned by any Acquiring Person (or any Associate or Affiliate thereof) after the Acquiring Person became an Acquiring Person that shall have become void pursuant to Section 11(a) (ii) hereof). Such Common Share equivalents

shall not be included in Available Shares, and all of the Available Shares shall be reserved, as of the Adjustment Date, for issuance, on a pro-rata basis, upon exercise of the Rights and may not be substituted for with Common Share equivalents upon the exercise of any Right except to the extent that the number of Common Shares required to be delivered under subparagraph (3) (A) upon the exercise of such Right exceeds the quotient of the number of Available Shares divided by the number of Remaining Rights.

(4) If, at the time any adjustment is required pursuant to this 11(a)(iii), the Common Shares shall have no par value, then for the purposes of this Section 11(a)(iii), the par value of the Common Shares shall be deemed to be \$.01 per share.

(5) In the event that there shall not be sufficient authorized but unissued and unreserved Common Shares (or Common Share equivalents the issuance of which is permitted under Section 11(a)(iii)(3)(C)) to permit the exercise in full of the Rights in accordance with this subparagraph (iii), the Company shall use its best efforts to cause the authorization of sufficient additional Common Shares or Common Share equivalents to permit such exercise and, if the Board of Directors of the Company shall determine in good faith that it is likely that sufficient additional Common Shares or Common Share equivalents could be authorized to permit such exercise, the Company may suspend the exercisability of the Rights for a period not to exceed 90 days in order to seek any authorization of additional Common Shares or other Common Share equivalents. In the event of any such suspension, the Company shall issue a public announcement stating that the exercisability of the Rights has been temporarily suspended, as well as a public announcement at such time as the suspension is no longer in effect.

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(b) In case the Company shall fix a record date for the issuance of rights, options or warrants to all holders of Series B Preferred Shares entitling them (for a period expiring within 45 calendar days after such record date) to subscribe for or purchase Series B Preferred Shares (or shares having the same rights, privileges and preferences as the Series B Preferred Shares ("equivalent preferred shares")) or securities convertible into Series B Preferred Shares or equivalent preferred shares at a price per Series B Preferred Share or equivalent preferred share (or having a conversion price per share, if a security convertible into Series B Preferred Shares or equivalent preferred shares) less than the current per share market price of the Series B Preferred Shares (as determined pursuant to Section 11(d) hereof) on such record date, the Purchase Price to be in effect after such record date shall be determined by multiplying the Purchase Price in effect immediately prior to such record date by a fraction, the numerator of which shall be the number of Series B Preferred Shares outstanding on such record date, plus the number of Series B Preferred Shares which the aggregate offering price of the total number of Series B Preferred Shares and/or equivalent preferred shares so to be offered (and/or the aggregate initial conversion price of the convertible securities so to be offered) would purchase, at such current per share market price, and the denominator of which shall be the number of Series B Preferred Shares outstanding on such record date, plus the number of additional Series B Preferred Shares and/or equivalent preferred shares to be offered for subscription or purchase (or into which the convertible securities so to be offered are initially convertible). In case such subscription price may be paid in a consideration part or all of which shall be in a form other than cash, the value of such consideration shall be as determined in good faith by the Board of Directors of the Company, whose determination shall be described in a statement filed with the Rights Agent and shall be binding on the Rights Agent and the holders of the Rights. Series B Preferred Shares owned by or held for the account of the Company shall not be deemed outstanding for the purpose of any such computation. Such adjustment shall be made successively whenever such a record date is fixed; and in the event that such rights or warrants are not so issued, the Purchase Price shall again be adjusted to be the Purchase Price which would then be in effect if such record date had not been fixed.

(c) In case the Company shall fix a record date for the making of a distribution to all holders of the Series B Preferred Shares (including any such distribution made in connection with a consolidation or merger in which the Company is the continuing or surviving corporation or in a statutory share exchange) of evidences of indebtedness or cash or non-cash assets (other than a regular quarterly cash dividend or a dividend payable in Series B Preferred Shares) or subscription rights or warrants (excluding those referred to in Section 11(b) hereof), the Purchase Price to be in effect after such record date shall be determined by multiplying the Purchase Price in effect immediately prior to such record date by a fraction, the numerator of which shall be the then current per share market price of the Series B Preferred Shares (as determined pursuant to Section 11(d) hereof) on such record date, less the fair market value (as determined in good faith by the Board of Directors of the Company, whose determination shall be described in a statement filed with the Rights Agent and shall be binding on the Rights Agent and the holders of the Rights) of the portion of the evidences of indebtedness or cash or non-cash assets so to be distributed on, or of such subscription rights or warrants

applicable to, one Series B Preferred Share, and the denominator of which shall be such then current per share market price of the Series B Preferred Shares; PROVIDED, HOWEVER, that in no event shall the consideration to be paid upon the exercise of one Right be less than the aggregate par value of the shares of capital stock

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of the Company to be issued upon exercise of one Right. Such adjustments shall be made successively whenever such a record date is fixed; and in the event that such distribution is not so made, the Purchase Price shall again be adjusted to be the Purchase Price that would then be in effect if such record date had not been fixed.

(d) (i) For the purpose of any computation hereunder, the "current per share market price" of any security (a "Security" for the purpose of this Section 11(d)(i)) on any date shall be deemed to be the average of the daily closing prices per share of such Security for the 30 consecutive Trading Days (as such term is hereinafter defined) immediately prior to such date; PROVIDED, HOWEVER, that in the event that the current per share market price of the Security is determined during a period following the announcement by the issuer of such Security of (A) a dividend or distribution on such Security payable in such Security or securities convertible into such Security (other than the Rights) or (B) any subdivision, combination or reclassification of such Security, and prior to the expiration of 30 Trading Days after the ex-dividend date for such dividend or distribution, or the record date for such subdivision, combination or reclassification, then, and in each such case, the current per share market price shall be appropriately adjusted to reflect the current market price per share equivalent of such Security. The closing price for each day shall be the last sale price, regular way, or, in case no such sale takes place on such day, the average of the closing bid and asked prices, regular way, in either case as reported in the principal consolidated transaction reporting system with respect to securities listed or admitted to trading on the New York Stock Exchange or, if the Security is not listed or admitted to trading on the New York Stock Exchange, as reported in the principal consolidated transaction reporting system with respect to securities listed on the principal national securities exchange on which the Security is listed or admitted to trading or, if the Security is not listed or admitted to trading on any national securities exchange, the last quoted price or, if not so quoted, the average of the high bid and low asked prices in the over-the-counter market, as reported on the Nasdaq National Market or the Nasdaq SmallCap Market or such other system then in use, or, if on any such day the Security is not so quoted or reported, the average of the closing bid and asked prices as furnished by a professional market maker making a market in the Security selected by the Board of Directors of the Company. Except as provided in Section 11(d)(ii) with respect to Series B Preferred Shares, if on any such day the Security is not publicly held or no professional market maker is making a market in the Security, the fair value of such Security on such day as determined in good faith by the Board of Directors of the Company (whose determination shall be described in a statement filed with the Rights Agent and shall be binding on the Rights Agent and the holders of the Rights) shall be used in lieu of the closing price for such day. The term "Trading Day" shall mean a day on which the principal national securities exchange on which the Security is listed or admitted to trading is open for the transaction of business or, if the Security is not listed or admitted to trading on any national securities exchange, a Business Day.

(ii) If the Series B Preferred Shares are not publicly held or traded in a manner described in Section 11(d)(i) hereof, then, notwithstanding anything to the contrary provided in Section 11(d)(i) hereof, the "current per share market price" of the Series B Preferred Shares shall be conclusively deemed to be the current per share market price of the Common Shares as determined pursuant to Section 11(d)(i) (appropriately adjusted to reflect any stock split, stock dividend or similar transaction occurring after the date of this Agreement) multiplied by one hundred. If neither the Common Shares nor the Series B Preferred Shares are publicly held or so

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traded, the "current per share market price" of the Series B Preferred Shares shall mean the fair value per share as determined in good faith by the Board of Directors of the Company, whose determination shall be described in a statement filed with the Rights Agent and shall be binding on the Rights Agent and the holders of the Rights.

(e) Except as provided in the third sentence of this Section 11(e), no adjustment in the Purchase Price shall be required unless such adjustment would require an increase or decrease of at least 1% in the Purchase Price; PROVIDED, HOWEVER, that any adjustments which by reason of this Section 11(e) are not required to be made shall be carried forward and taken into account in any subsequent adjustment. All calculations under this Section 11 shall be made to the nearest cent or to the nearest one one-millionth of a Series B Preferred

Share or one ten-thousandth of any other share or security, as the case may be. Notwithstanding the first sentence of this Section 11(e), any adjustment required by this Section 11, but for the first sentence of this Section 11(e), shall be made no later than the earlier of (i) three years from the date of the transaction that requires such adjustment or (ii) the Final Expiration Date.

(f) If as a result of an adjustment made pursuant to Section 11(a) or Section 13(a), the holder of any Right thereafter exercised shall become entitled to receive any shares of capital stock other than Series B Preferred Shares, thereafter the number of such other shares so receivable upon exercise of any Right shall be subject to adjustment from time to time in a manner and on terms as nearly equivalent as practicable to the provisions with respect to the Series B Preferred Shares contained in Section 11(a) through (c), inclusive, and the provisions of Sections 7, 9, 10, 13 and 14 with respect to the Series B Preferred Shares shall apply on like terms to any such other shares.

(g) All Rights originally issued by the Company subsequent to any adjustment made to the Purchase Price under this Agreement shall evidence the right to purchase, at the adjusted Purchase Price, the number of one one-hundredths of a Series B Preferred Share (or other securities) purchasable from time to time under this Agreement upon exercise of the Rights, all subject to further adjustment as provided in this Agreement.

(h) Unless the Company shall have exercised its election as provided in Section 11(i), upon each adjustment of the Purchase Price as a result of the calculations made in Section 11(b) and (c), each Right outstanding immediately prior to the making of such adjustment shall thereafter evidence the right to purchase, at the adjusted Purchase Price, that number of one one-hundredths of a Series B Preferred Share (calculated to the nearest one one-millionth of a Series B Preferred Share) obtained by (i) multiplying (x) the number of one one-hundredths of a share covered by a Right immediately prior to this adjustment by (y) the Purchase Price in effect immediately prior to such adjustment of the Purchase Price and (ii) dividing the product so obtained by the Purchase Price in effect immediately after such adjustment of the Purchase Price.

(i) The Company may elect on or after the date of any adjustment of the Purchase Price to adjust the number of Rights, in substitution for any adjustment in the number of one one-hundredths of a Series B Preferred Share purchasable upon the exercise of a Right. Each of the Rights outstanding after such adjustment of the number of Rights shall be exercisable for the number of one one-hundredths of a Series B Preferred Share for which a Right was exercisable

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immediately prior to such adjustment. Each Right held of record prior to such adjustment of the number of Rights shall become that number of Rights (calculated to the nearest one ten-thousandth) obtained by dividing the Purchase Price in effect immediately prior to adjustment of the Purchase Price by the Purchase Price in effect immediately after adjustment of the Purchase Price. The Company shall make a public announcement of its election to adjust the number of Rights, indicating the record date for the adjustment, and, if known at the time, the amount of the adjustment to be made. This record date may be the date on which the Purchase Price is adjusted or any day thereafter, but, if the Right Certificates have been issued on or after the Distribution Date, shall be at least 10 days later than the date of the public announcement. If Right Certificates have been issued on or after the Distribution Date, upon each adjustment of the number of Rights pursuant to this Section 11(i) the Company shall, as promptly as practicable, cause to be distributed to holders of record of Right Certificates on such record date Right Certificates evidencing, subject to Section 14 hereof, the additional Rights to which such holders shall be entitled as a result of such adjustment, or, at the option of the Company, shall cause to be distributed to such holders of record in substitution and replacement for the Right Certificates held by such holders prior to the date of adjustment, and upon surrender thereof, if required by the Company, new Right Certificates evidencing all the Rights to which such holders shall be entitled after such adjustment. Right Certificates so to be distributed shall be issued, executed and countersigned in the manner provided for in this Agreement, shall bear the adjusted Purchase Price, and shall be registered in the names of the holders of record of Right Certificates on the record date specified in the public announcement.

(j) Irrespective of any adjustment or change in the Purchase Price or the number of one one-hundredths of a Series B Preferred Share issuable upon the exercise of the Rights, the Right Certificates theretofore issued may continue to express the Purchase Price and the number of one one-hundredths of a Series B Preferred Share which were expressed at the time of the issuance of such Right Certificates under this Agreement.

(k) In any case in which this Section 11 shall require that an adjustment in the Purchase Price be made effective as of a record date for a specified event, the Company may elect to defer until the occurrence of such

event the issuing to the holder of any Right exercised after such record date of the Series B Preferred Shares and other capital stock or securities of the Company, if any, issuable upon such exercise over and above the Series B Preferred Shares and other capital stock or securities of the Company, if any, issuable upon such exercise on the basis of the Purchase Price in effect prior to such adjustment; PROVIDED, HOWEVER, that the Company shall deliver to such holder a due bill or other appropriate instrument evidencing such holder's right to receive such additional shares upon the occurrence of the event requiring such adjustment.

(1) Anything in this Section 11 to the contrary notwithstanding, the Company shall be entitled to make such reductions in the Purchase Price, in addition to those adjustments expressly required by this Section 11, as and to the extent that the Board of Directors of the Company shall determine to be advisable in order that any (i) consolidation or subdivision of the Series B Preferred Shares, (ii) issuance wholly for cash of any of the Series B Preferred Shares at less than the current per share market price, (iii) issuance wholly for cash of Series B Preferred Shares or securities which by their terms are convertible into or exchangeable for Series B Preferred

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Shares, (iv) dividends on Series B Preferred Shares payable in Series B Preferred Shares or (v) issuance of rights, options or warrants referred to in Section 11(b) hereof, hereafter made by the Company to holders of its Series B Preferred Shares shall not be taxable to such shareholders.

(m) Anything in this Agreement or the Rights to the contrary notwithstanding, in the event that at any time after the date of this Agreement and prior to the Distribution Date, the Company shall (i) declare or pay any dividend on the Common Shares payable in Common Shares or (ii) effect a subdivision, combination or consolidation of the Common Shares (by reclassification or otherwise) into a greater or lesser number of Common Shares, then in any such case (x) the number of one one-hundredths of a Series B Preferred Share purchasable after such event upon proper exercise of each Right shall be determined by multiplying the number of one one-hundredths of a Series B Preferred Share so purchasable immediately prior to such event by a fraction, the numerator of which is the number of Common Shares outstanding immediately before such event and the denominator of which is the number of Common Shares outstanding immediately after such event and (y) each Common Share outstanding immediately after such event shall have issued with respect to it that number of Rights which each Common Share outstanding immediately prior to such event had issued with respect to it. The adjustments provided for in this Section 11(m) shall be made successively whenever such a dividend is declared or paid or such a subdivision, combination or consolidation is effected. If an event occurs which would require an adjustment under Section 11(a)(ii) and this Section 11(m), the adjustments provided for in this Section 11(m) shall be in addition and prior to any adjustment required pursuant to Section 11(a)(ii).

(n) If any adjustment in the Purchase Price pursuant to paragraph (b) or (c) of this Section 11 would not be permitted by law, under the Company's Articles of Incorporation or under the Certificate of Designation, Preferences and Rights establishing the Series B Preferred Shares, no such issuance of securities or distribution of evidences of indebtedness or other assets or subscription rights or warrants, as the case may be, that would require such an adjustment but for the limitations established by law, the Company's Articles of Incorporation or such Certificate of Designation, Preferences and Rights shall be made by the Company.

Section 12. Certificate of Adjusted Purchase Price or Number of Shares. Whenever an adjustment is made as provided in Sections 11 and 13, the Company shall (a) promptly prepare a certificate setting forth such adjustment and a brief statement of the facts accounting for such adjustment, (b) promptly file with the Rights Agent and with each transfer agent for the Common Shares or the Series B Preferred Shares a copy of such certificate and (c) if such adjustment is made after the Distribution Date, mail a brief summary thereof to each holder of record of a Right Certificate in accordance with Section 26. The Rights Agent shall be fully protected in relying on such certificate and on any adjustment therein contained.

Section 13. Consolidation, Merger, Statutory Share Exchange or Sale or Transfer of Assets or Earning Power.

(a) In the event, after the Distribution Date or within 15 days prior thereto, directly or indirectly,

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(w) the Company shall consolidate with, or merge with and into, any other Person, and the Company shall not be the continuing or surviving corporation of such consolidation or merger,

(x) any Person shall consolidate with the Company, or merge with and into the Company and the Company shall be the continuing or surviving corporation of such consolidation or merger and, in connection with such consolidation or merger, all or part of the outstanding Common Shares of the Company held by existing shareholders of the Company shall be changed into or exchanged for stock or other securities of any other Person (or the Company) or money or any other property (except as a result of the exercise of statutory dissenters' rights),

(y) the Company shall effect a statutory share exchange with outstanding Common Shares of the Company being exchanged for stock or other securities of any other Person, money or other property, or

(z) the Company shall sell or otherwise transfer (or one or more of its Subsidiaries shall sell or otherwise transfer), in one transaction or a series of related transactions, assets or earning power aggregating 50% or more of the assets or earning power of the Company and its Subsidiaries (taken as a whole) to any other Person or Persons (other than the Company or one or more of its wholly owned Subsidiaries),

then, and in each such case, proper provision shall be made so that (i) each holder of a Right (except as otherwise provided herein) shall thereafter have the right to receive, upon the exercise thereof by payment of the amount equal to the product of the number of one one-hundredths of a Series B Preferred Share which would otherwise be issuable upon exercise of a Right and the then current Purchase Price in accordance with the terms of this Agreement and in lieu of Series B Preferred Shares, such number of validly authorized and issued, fully paid, nonassessable and freely tradeable Common Shares of the Principal Party (as hereinafter defined), not subject to any liens, encumbrances, rights of first refusal or adverse claims, as shall be equal to the result obtained by (x) multiplying the then current Purchase Price by the number of one one-hundredths of a Series B Preferred Share for which a Right is, immediately prior to the occurrence of the Section 13 Event, exercisable and (y) dividing that product by 50% of the then current per share market price of the Common Shares of such Principal Party (determined pursuant to Section 11(d) hereof) on the date of consummation of such Section 13 Event; (ii) such Principal Party shall thereafter be liable for, and shall assume, by virtue of such merger, consolidation, statutory share exchange, sale or transfer, all the obligations and duties of the Company pursuant to this Agreement; (iii) the term "Company" shall thereafter be deemed to refer to such Principal Party; and (iv) such Principal Party shall take such steps (including, but not limited to, the reservation of a sufficient number of its Common Shares to permit the exercise of all outstanding Rights) in connection with the consummation of any such transaction as may be necessary to assure that the provisions hereof shall thereafter be applicable, as nearly as reasonably may be, in relation to its Common Shares thereafter deliverable upon the exercise of the Rights.

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(b) "Principal Party" shall mean:

(i) in the case of any transaction described in clauses (w), (x) or (y) of the first sentence of Section 13(a), the Person (including, without limitation, the Company as successor thereto or as the surviving corporation) that is the issuer of any securities into which Common Shares of the Company are converted in such merger, consolidation or exchange, or if no securities are so issued, the Person that is the other party to such merger, consolidation or exchange; and

(ii) in the case of any transaction described in clause (z) of the first sentence of Section 13(a), the Person that is the party receiving the greatest portion of the assets or earning power transferred pursuant to such transaction or transactions;

PROVIDED, HOWEVER, that in any such case, (1) if the Common Shares of such Person are not at such time or have not been continuously over the preceding 12-month period registered under Section 12 of the Exchange Act, and such Person is a direct or indirect Subsidiary of another Person the Common Shares of which are and have been so registered, "Principal Party" shall refer to such other Person, and (2) in case such Person is a Subsidiary, directly or indirectly, of more than one Person, the Common Shares of two or more of which are and have been so registered, "Principal Party" shall refer to whichever of such Persons is the issuer of the Common Shares having the greatest aggregate market value.

(c) The Company shall not consummate any Section 13 Event unless the Principal Party shall have a sufficient number of authorized, unreserved Common Shares which have not been issued or are held in treasury to permit the exercise in full of the Rights in accordance with this Section 13 and unless prior thereto the Company and such Principal Party shall have executed and delivered to the Rights Agent a supplemental agreement providing for the terms set forth in paragraphs (a) and (b) of this Section 13 and further providing that, as soon as practicable after the date of any Section 13 Event, the Principal Party will:

(i) prepare and file a registration statement under the Act, with respect to the Rights and the securities purchasable upon exercise of the Rights, on an appropriate form, and use its best efforts to cause such registration statement to (A) become effective as soon as practicable after such filing and (B) remain effective (with a prospectus at all times meeting the requirements of the Act) until the earlier of (1) the date as of which the Rights are no longer exercisable for such securities or (2) the Final Expiration Date;

(ii) take such action as may be appropriate under, or to ensure compliance with, the securities or "blue sky" laws of the various states in connection with the exercisability of the Rights; and

(iii) deliver to holders of the Rights historical financial statements for the Principal Party and each of its Affiliates which comply in all respects with the requirements for registration on Form 10 under the Exchange Act.

(d) The Company shall not enter into any transaction of the kind referred to in this Section 13 if at the time of such transaction there are any rights, warrants, instruments or

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securities outstanding or any agreements or arrangements which, as a result of the consummation of such transaction, would eliminate or substantially diminish the benefits intended to be afforded by the Rights.

The provisions of this Section 13 shall similarly apply to successive mergers, consolidations, statutory share exchanges or sales or other transfers.

Section 14. Fractional Rights and Fractional Shares.

(a) The Company shall not be required to issue fractions of Rights or to distribute Right Certificates which evidence fractional Rights. In lieu of such fractional Rights, there may be paid to the registered holders of the Right Certificates with regard to which such fractional Rights would otherwise be issuable an amount in cash equal to the same fraction of the current market value of a whole Right. For the purposes of this Section 14(a), the current market value of a whole Right shall be the closing price of the Rights for the Trading Day immediately prior to the date on which such fractional Rights would have been otherwise issuable. The closing price for any day shall be the last sale price, regular way, or, in case no such sale takes place on such day, the average of the closing bid and asked prices, regular way, in either case as reported in the principal consolidated transaction reporting system with respect to securities listed or admitted to trading on the New York Stock Exchange or, if the Rights are not listed or admitted to trading on the New York Stock Exchange, as reported in the principal consolidated transaction reporting system with respect to securities listed on the principal national securities exchange on which the Rights are listed or admitted to trading or, if the Rights are not listed or admitted to trading on any national securities exchange, the last quoted price or, if not so quoted, the average of the high bid and low asked prices in the over-the-counter market, as reported on the Nasdaq National Market or the Nasdaq SmallCap Market or such other system then in use or, if on any such date the Rights are not so quoted or reported, the average of the closing bid and asked prices as furnished by a professional market maker making a market in the Rights selected by the Board of Directors of the Company. If on any such date no such market maker is making a market in the Rights, the fair value of the Rights on such date as determined in good faith by the Board of Directors of the Company shall be used in lieu of the closing price for such day.

(b) The Company shall not be required to issue fractions of Series B Preferred Shares (other than fractions that are integral multiples of one one-hundredth of a Series B Preferred Share, or, if a Right shall then be exercisable for a fraction other than one one-hundredth of a Series B Preferred Share, integral multiples of that fraction) upon exercise of the Rights or to distribute certificates which evidence fractions of Series B Preferred Shares (other than fractions that are integral multiples of one one-hundredth of a Series B Preferred Share or, if a Right shall then be exercisable for a fraction other than one one-hundredth of a Series B Preferred Share, integral multiples of that fraction). Fractions of Series B Preferred Shares in integral multiples of one one-hundredth of a Series B Preferred Share or, if a Right shall then be exercisable for a fraction other than one one-hundredth of a Series B Preferred Share, integral multiples of that fraction may, at the election of the Company, be evidenced by depositary receipts pursuant to an appropriate agreement between the Company and a depositary selected by it, PROVIDED, that such agreement shall provide that the holders of such depositary receipts shall have all the rights, privileges and preferences to which they are entitled as beneficial owners of the Series B Preferred Shares represented by such depositary receipts. In lieu of fractional Series B Preferred

Shares that are not integral multiples of one one-hundredth of a Series B Preferred Share, or, if a Right shall then be exercisable for a fraction other than one one-hundredth of a Series B Preferred Share, integral multiples of that fraction, the Company may pay to the registered holders of Right Certificates at the time such Rights are exercised as herein provided an amount in cash equal to the same fraction of the current market value of one Series B Preferred Share. For purposes of this Section 14(b), the current market value of a Series B Preferred Share shall be the closing price of a Series B Preferred Share (as determined pursuant to Section 11(d)(ii)) for the Trading Day immediately prior to the date of such exercise.

(c) The holder of a Right by the acceptance of the Rights expressly waives such holder's right to receive any fractional Rights or any fractional shares (except as provided above) upon exercise of a Right.

Section 15. Rights of Action. All rights of action in respect of this Agreement, excepting the rights of action given to the Rights Agent under Section 18, are vested in the respective registered holders of the Right Certificates (and, prior to the Distribution Date, the registered holders of the Common Shares); and any registered holder of any Right Certificate (or, prior to the Distribution Date, of any Common Share), without the consent of the Rights Agent or of the holder of any other Right Certificate (or, prior to the Distribution Date, of any other Common Share), may, in such holder's own behalf and for such holder's own benefit, enforce, and may institute and maintain any suit, action or proceeding against the Company to enforce, or otherwise act in respect of, such holder's right to exercise the Rights evidenced by such Right Certificate (or, prior to the Distribution Date, the associated Common Share certificate) in the manner provided in such Right Certificate and in this Agreement. Without limiting the foregoing or any remedies available to the holders of Rights, it is specifically acknowledged that the holders of Rights would not have an adequate remedy at law for any breach of this Agreement and will be entitled to specific performance of the obligations under, and injunctive relief against actual or threatened violations of the obligations of any Person subject to, this Agreement.

Section 16. Agreement of Right Holders. Every holder of a Right, by accepting the same, consents and agrees with the Company and the Rights Agent and with every other holder of a Right that:

(a) prior to the Distribution Date, the Rights will be transferable only in connection with the transfer of the Common Shares;

(b) after the Distribution Date, the Right Certificates are transferable only on the registry books of the Rights Agent if surrendered at the office or offices of the Rights Agent designated for such purposes, duly endorsed or accompanied by a proper instrument of transfer;

(c) the Company and the Rights Agent may deem and treat the person in whose name the Right Certificate (or, prior to the Distribution Date, the associated Common Share certificate) is registered as the absolute owner thereof and of the Rights evidenced thereby (notwithstanding any notations of ownership or writing on the Right Certificate or the associated Common Share certificate made by anyone other than the Company or the Rights Agent) for all purposes

whatsoever, and neither the Company nor the Rights Agent shall be affected by any notice to the contrary;

(d) the Company may issue Rights after the Record Date as provided in this Agreement; and

(e) notwithstanding anything in this Agreement or the Rights to the contrary, the Company, the Rights Agent and the Board of Directors of the Company shall not have any liability to any holder of a Right or other Person as a result of the inability of the Company or the Rights Agent to perform any of its obligations under this Agreement by reason of any preliminary or permanent injunction or other order, decree or ruling issued by a court of competent jurisdiction or by a governmental, regulatory or administrative agency or commission, or any statute, rule, regulation or executive order promulgated or enacted by any governmental authority prohibiting or otherwise restraining performance of such obligation.

Section 17. Right Certificate Holder Not Deemed a Shareholder. No holder, as such, of any Right Certificate shall be entitled to vote, receive dividends or be deemed for any purpose the holder of the Series B Preferred Shares or any other securities of the Company which may at any time be issuable on the exercise of the Rights represented thereby, nor shall anything contained in this Agreement or in any Right Certificate be construed to confer upon the holder of any Right Certificate, as such, any of the rights of a shareholder of

the Company or any right to vote for the election of directors or upon any matter submitted to shareholders at any meeting thereof, or to give or withhold consent to any corporate action, or to receive notice of meetings or other actions affecting shareholders (except as provided in Section 25), or to receive dividends or subscription rights, or otherwise, until the Right or Rights evidenced by such Right Certificate shall have been exercised in accordance with the provisions of this Agreement.

Section 18. Concerning the Rights Agent.

(a) The Company agrees to pay to the Rights Agent reasonable compensation for all services rendered by it under this Agreement and, from time to time, on demand of the Rights Agent, its reasonable expenses and counsel fees and other disbursements incurred in the administration and execution of this Agreement and the exercise and performance of its duties under this Agreement. The Company also agrees to indemnify the Rights Agent for, and to hold it harmless against, any loss, liability or expense (including the costs and expenses of defending against any claim of liability), incurred without negligence, bad faith or willful misconduct on the part of the Rights Agent, for anything done or omitted by the Rights Agent in connection with the acceptance and administration of this Agreement.

(b) The Rights Agent shall be protected and shall incur no liability for, or in respect of any action taken, suffered or omitted by it in connection with, its administration of this Agreement in reliance upon any Right Certificate or certificate for the Series B Preferred Shares or Common Shares or for other securities of the Company, instrument of assignment or transfer, power of attorney, endorsement, affidavit, letter, notice, direction, consent, certificate, statement, or other paper or document believed by it to be genuine and to be signed, executed and, where necessary, verified or acknowledged, by the proper person or persons, or otherwise upon the advice of its counsel as set forth in Section 20 hereof.

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Section 19. Merger or Consolidation or Change of Name of Rights Agent.

(a) Any corporation into which the Rights Agent or any successor Rights Agent may be merged or with which it may be consolidated, or any corporation resulting from any merger or consolidation to which the Rights Agent or any successor Rights Agent shall be a party, or any corporation succeeding to the corporate trust or stock transfer business of the Rights Agent or any successor Rights Agent, shall be the successor to the Rights Agent under this Agreement without the execution or filing of any paper or any further act on the part of any of the parties to this Agreement; PROVIDED, HOWEVER, that such corporation would be eligible for appointment as a successor Rights Agent under the provisions of Section 21 hereof. If at the time such successor Rights Agent shall succeed to the agency created by this Agreement any of the Right Certificates shall have been countersigned but not delivered, any such successor Rights Agent may adopt the countersignature of the predecessor Rights Agent and deliver such Right Certificates so countersigned; and in case at that time any of the Right Certificates shall not have been countersigned, any successor Rights Agent may countersign such Right Certificates either in the name of the predecessor Rights Agent or in the name of the successor Rights Agent; and in all such cases such Right Certificates shall have the full force provided in the Right Certificates and in this Agreement.

(b) In case at any time the name of the Rights Agent shall be changed and at such time any of the Right Certificates shall have been countersigned but not delivered, the Rights Agent may adopt the countersignature under its prior name and deliver Right Certificates so countersigned; and in case at that time any of the Right Certificates shall not have been countersigned, the Rights Agent may countersign such Right Certificates either in its prior name or in its changed name; and in all such cases such Right Certificates shall have the full force provided in the Right Certificates and in this Agreement.

Section 20. Duties of Rights Agent. The Rights Agent undertakes the duties and obligations imposed by this Agreement upon the following terms and conditions, by all of which the Company and the holders of Right Certificates (or, prior to the Distribution Date, the Common Share certificates), by their acceptance of the Rights, shall be bound:

(a) The Rights Agent may consult with legal counsel (who may be legal counsel for the Company), and the opinion of such counsel shall be full and complete authorization and protection to the Rights Agent as to any action taken or omitted by it in good faith and in accordance with such opinion.

(b) Whenever in the performance of its duties under this Agreement the Rights Agent shall deem it necessary or desirable that any fact or matter (including, without limitation, the identity of any Acquiring Person and the determination of the "current per share market price") be proved or established by the Company prior to taking or suffering any action under this Agreement, such fact or matter (unless other evidence in respect thereof be herein

specifically prescribed) may be deemed to be conclusively proved and established by a certificate signed by any one of the Chief Executive Officer, the President, the Chief Financial Officer, any Vice President or the Secretary of the Company and delivered to the Rights Agent; and such

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certificate shall be full authorization to the Rights Agent for any action taken or suffered in good faith by it under the provisions of this Agreement in reliance upon such certificate.

(c) The Rights Agent shall be liable hereunder to the Company and any other Person only for its own negligence, bad faith or willful misconduct.

(d) The Rights Agent shall not be liable for or by reason of any of the statements of fact or recitals contained in this Agreement or in the Right Certificates (except its countersignature thereof) or be required to verify the same, but all such statements and recitals are and shall be deemed to have been made by the Company only.

(e) The Rights Agent shall not be under any responsibility in respect of the validity of this Agreement or the execution and delivery of this Agreement (except the due execution by the Rights Agent) or in respect of the validity or execution of any Right Certificate (except its countersignature thereof); nor shall it be responsible for any breach by the Company of any covenant or condition contained in this Agreement or in any Right Certificate; nor shall it be responsible for any change in the exercisability of the Rights (including the Rights becoming void pursuant to Section 11(a)(ii) hereof) or any adjustment in the terms of the Rights (including the manner, method or amount thereof) provided for in Section 3, 11, 13, 23 or 24, or the ascertaining of the existence of facts that would require any such change or adjustment (except with respect to the exercise of Rights evidenced by Right Certificates after actual notice that such change or adjustment is required); nor shall it by any act under this Agreement be deemed to make any representation or warranty as to the authorization or reservation of any Series B Preferred Shares or Common Shares to be issued pursuant to this Agreement or any Right Certificate or as to whether any Series B Preferred Shares or Common Shares will, when issued, be validly authorized and issued, fully paid and nonassessable.

(f) The Company agrees that it will perform, execute, acknowledge and deliver or cause to be performed, executed, acknowledged and delivered all such further and other acts, instruments and assurances as may reasonably be required by the Rights Agent for the carrying out or performing by the Rights Agent of the provisions of this Agreement.

(g) The Rights Agent is hereby authorized and directed to accept instructions with respect to the performance of its duties under this Agreement from any one of the Chief Executive Officer, the President, the Chief Financial Officer, any Vice President or the Secretary of the Company, and to apply to such officers for advice or instructions in connection with its duties, and it shall not be liable for any action taken or suffered to be taken by it in good faith in accordance with instructions of any such officer or for delay in acting while waiting for those instructions.

(h) The Rights Agent and any shareholder, director, officer or employee of the Rights Agent may buy, sell or deal in any of the Rights or other securities of the Company or become pecuniarily interested in any transaction in which the Company or its Subsidiaries may be interested, or contract with or lend money to the Company or its Subsidiaries or otherwise act as fully and freely as though it were not Rights Agent under this Agreement. Nothing in this

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Agreement shall preclude the Rights Agent from acting in any other capacity for the Company or its Subsidiaries or for any other legal entity.

(i) The Rights Agent may execute and exercise any of the rights or powers hereby vested in it or perform any duty under this Agreement either itself or by or through its attorneys or agents, and the Rights Agent shall not be answerable or accountable for any act, default, neglect or misconduct of any such attorneys or agents or for any loss to the Company resulting from any such act, default, neglect or misconduct, provided reasonable care was exercised in the selection and continued employment thereof.

(j) No provision of this Agreement shall require the Rights Agent to expend or risk its own funds or otherwise incur any financial liability in the performance of any of its duties under this Agreement or in the exercise of its rights or powers if there shall be reasonable grounds for believing that repayment of such funds or adequate indemnification against such risk or liability is not reasonably assured to it.

(k) If, with respect to any Right Certificate surrendered to the Rights Agent for exercise or transfer, the form of assignment or form of election to purchase, as the case may be, has either not been duly completed and executed or indicates an affirmative response to enumerated clause 1 and/or 2 on the reverse side of the applicable Right Certificate, the Rights Agent shall not take any further action with respect to such requested exercise or transfer without first consulting with the Company.

Section 21. Change of Rights Agent. The Rights Agent or any successor Rights Agent may resign and be discharged from its duties under this Agreement upon 30 days' notice in writing mailed to the Company and to each transfer agent of the Common Shares and Series B Preferred Shares by registered or certified mail, and, if such notice is mailed after the Distribution Date, to the holders of the Right Certificates by first-class mail. The Company may remove the Rights Agent or any successor Rights Agent upon 30 days' notice in writing mailed to the Rights Agent or successor Rights Agent, as the case may be, and to each transfer agent of the Common Shares and Series B Preferred Shares by registered or certified mail, and, if such notice is mailed after the Distribution Date, to the holders of the Right Certificates by first-class mail. If the Rights Agent shall resign or be removed or shall otherwise become incapable of acting, the Company shall appoint a successor to the Rights Agent. If the Company shall fail to make such appointment within a period of 30 days after giving notice of such removal or after it has been notified in writing of such resignation or incapacity by the resigning or incapacitated Rights Agent or by the holder of a Right Certificate (who shall, with such notice, submit such holder's Right Certificate for inspection by the Company), then the registered holder of any Right Certificate may apply to any court of competent jurisdiction for the appointment of a new Rights Agent. Any successor Rights Agent, whether appointed by the Company or by such a court, shall be (a) a corporation organized and doing business under the laws of the United States or of the State of Minnesota or New York (or of any other state of the United States so long as such corporation is authorized to do business as a banking institution in the State of Minnesota or New York), in good standing, having an office in the State of Minnesota or New York which is authorized under such laws to exercise corporate trust or stock transfer powers and is subject to supervision or examination by federal or state authority and which has at the time of its

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appointment as Rights Agent a combined capital and surplus of at least \$50 million or (b) an affiliate of a corporation described in clause (a) of this sentence. After appointment, the successor Rights Agent shall be vested with the same powers, rights, duties and responsibilities as if it had been originally named as Rights Agent without further act or deed; but the predecessor Rights Agent shall deliver and transfer to the successor Rights Agent any property at the time held by it under this Agreement and execute and deliver any further assurance, conveyance, act or deed necessary for the purpose. Not later than the effective date of any such appointment the Company shall file notice thereof in writing with the predecessor Rights Agent and each transfer agent of the Common Shares and Series B Preferred Shares, and, if such notice is filed after the Distribution Date, mail a notice thereof in writing to the registered holders of the Right Certificates. Failure to give any notice provided for in this Section, however, or any defect therein, shall not affect the legality or validity of the resignation or removal of the Rights Agent or the appointment of the successor Rights Agent, as the case may be.

Section 22. Issuance of New Right Certificates. Notwithstanding any of the provisions of this Agreement or of the Rights to the contrary, the Company may, at its option, issue new Right Certificates evidencing Rights in such form as may be approved by its Board of Directors to reflect any adjustment or change in the Purchase Price and the number or kind or class of shares or other securities or property purchasable under the Right Certificates made in accordance with the provisions of this Agreement.

Section 23. Redemption.

(a) Subject to the provisions of Section 27, the Board of Directors of the Company may, at its option, at any time prior to the earlier of (x) the Close of Business on the Shares Acquisition Date or (y) the Close of Business on the Final Expiration Date, redeem all but not less than all of the then outstanding Rights at a redemption price of \$.001 per Right, appropriately adjusted to reflect any stock split, stock dividend or similar transaction occurring after the date of this Agreement (such redemption price being hereinafter referred to as the "Redemption Price"). The Redemption Price shall be payable in cash by the Company. The redemption of the Rights by the Board of Directors of the Company may be made effective at such time and on such basis and with such conditions as the Board of Directors of the Company in its sole discretion may establish. Except for the obligation to pay the Redemption Price, the Board of Directors and the Company shall not have any liability to any Person as a result of the redemption of Rights pursuant to the terms of this Section 23.

(b) Immediately upon the action of the Board of Directors of the

Company ordering the redemption of the Rights pursuant to paragraph (a) of this Section 23, and without any further action and without any notice, the right to exercise the Rights will terminate and the only right thereafter of the holders of Rights shall be to receive the Redemption Price for each Right so held. Promptly after the action of the Board of Directors of the Company ordering the redemption of the Rights, the Company shall give notice of such redemption to the Rights Agent and the holders of the then outstanding Rights by mailing such notice to all such holders at their last addresses as they appear upon the registry books of the Rights Agent or, prior to the Distribution Date, on the registry books of the transfer agent for the Common Shares; PROVIDED, HOWEVER, that the failure to give, or any defect in, any such notice shall not affect the validity of such redemption. Any notice which is mailed in the manner provided in this paragraph shall be

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deemed given whether or not the holder receives the notice. The notice of redemption will state the method by which the payment of the Redemption Price will be made. Neither the Company nor any of its Affiliates or Associates may redeem, acquire or purchase for value any Rights at any time in any manner except as specifically set forth in this Section or in Section 24 or in connection with the purchase of Common Shares prior to the Distribution Date.

Section 24. Exchange.

(a) The Board of Directors of the Company may, at its option, at any time after the date the Rights first become exercisable for Common Shares pursuant to Section 11(a)(ii), exchange all or part of the then outstanding and exercisable Rights (which shall not include Rights that have become void pursuant to the provisions of Section 11(a)(ii) hereof) for Common Shares, with each Right to be exchanged for such number of Common Shares as shall equal the result obtained by dividing (x) the Exercise Price (as defined in Section 11(a)(iii)) by (y) the current per share market price of the Common Shares (determined pursuant to Section 11(d)) on the date the Rights first become exercisable for Common Shares pursuant to Section 11(a)(ii) (such number of shares being hereinafter referred to as the "Exchange Ratio"). The Exchange Ratio shall be appropriately adjusted to reflect any stock split, stock dividend or similar transaction affecting the Common Shares that occurs after the date the Rights first become exercisable for Common Shares pursuant to Section 11(a)(ii). Notwithstanding the foregoing, the Board of Directors of the Company shall not be empowered to effect such exchange at any time after any Person (other than an Exempt Person), together with all Affiliates and Associates of such Person, becomes the Beneficial Owner of 50% or more of the Common Shares then outstanding.

(b) Immediately upon the action of the Board of Directors of the Company ordering the exchange of any Rights pursuant to paragraph (a) of this Section 24 and without any further action and without any notice, the right to exercise such Rights shall terminate and the only right thereafter of a holder of such Rights shall be to receive that number of Common Shares equal to the number of such Rights held by such holder multiplied by the Exchange Ratio. The Company shall promptly give public notice of any such exchange; PROVIDED, HOWEVER, that the failure to give, or any defect in, such notice shall not affect the validity of such exchange. The Company shall promptly mail a notice of any such exchange to all of the holders of such Rights at their last addresses as they appear upon the registry books of the Rights Agent. Any notice which is mailed in the manner herein provided shall be deemed given, whether or not the holder receives the notice. The notice of exchange will state the method by which the exchange of the Common Shares for Rights will be effected and, in the event of any partial exchange, the number of Rights which will be exchanged. Any partial exchange shall be effected pro rata based on the number of Rights (other than Rights which have become void pursuant to the provisions of Section 11(a)(ii) hereof) held by each holder of Rights.

(c) In the event that there shall not be sufficient Common Shares authorized, unissued and unreserved to permit the exchange of Rights as contemplated in accordance with this Section 24, the Company, at its option, may substitute Series B Preferred Shares (or equivalent preferred shares, as such term is defined in Section 11(b), or Common Share equivalents, as such term is defined in Section 11(a)(iii)(3)(C) hereof), for Common Shares exchangeable for Rights, at the initial rate of one one-hundredth of a Series B Preferred Share (or equivalent preferred share) or

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one Common Share equivalent for each Common Share, as appropriately adjusted to reflect stock splits, stock dividends or similar transactions affecting the Common Shares that occur after the date of this Agreement.

(d) In the event that there shall not be sufficient Common Shares, Series B Preferred Shares, equivalent preferred shares or Common Share

equivalents, authorized, unissued and unreserved to permit the exchange of Rights as contemplated in accordance with this Section 24, the Company shall take all such action as may be necessary to authorize additional Common Shares or Series B Preferred Shares, equivalent preferred shares or Common Share equivalents for issuance upon exchange of the Rights.

(e) The Company shall not be required to issue fractions of Common Shares or to distribute certificates which evidence fractional Common Shares. In lieu of such fractional Common Shares, the Company may pay to the registered holders of the Right Certificates with regard to which such fractional Common Shares would otherwise be issuable an amount in cash equal to the same fraction of the current market value of a whole Common Share. For the purposes of this paragraph (e), the current market value of a whole Common Share shall be the closing price of a Common Share (as determined pursuant to the second sentence of 11(d)(i) hereof) for the Trading Day immediately prior to the date of exchange pursuant to this Section. The Board of Directors and the Company shall not have any liability to any Person as a result of the exchange of Rights pursuant to the terms of this Section.

Section 25. Notice of Certain Events.

(a) In case the Company shall propose, at any time after the Distribution Date, (i) to pay any dividend payable in stock of any class to the holders of its Series B Preferred Shares or to make any other distribution to the holders of its Series B Preferred Shares (other than a regular quarterly cash dividend), or (ii) to offer to the holders of its Series B Preferred Shares rights or warrants to subscribe for or to purchase any additional Series B Preferred Shares or shares of stock of any class or any other securities, rights or options, or (iii) to effect any reclassification of its Series B Preferred Shares (other than a reclassification involving only the subdivision of outstanding Series B Preferred Shares), or (iv) to effect any consolidation or merger into or with any other Person, or to effect any sale or other transfer (or to permit one or more of its Subsidiaries to effect any sale or other transfer), in one transaction or a series of related transactions, of 50% or more of the assets or earning power of the Company and its Subsidiaries (taken as a whole) to any other Person or Persons (other than the Company and/or any of its wholly owned Subsidiaries), or (v) to effect any statutory share exchange with outstanding Common Shares of the Company being exchanged for stock or other securities of any other corporation or money or other property, or (vi) to effect the liquidation, dissolution or winding-up of the Company, or (vii) to declare or pay any dividend on the Common Shares payable in Common Shares or to effect a subdivision, combination or consolidation of the Common Shares (by reclassification or otherwise), then, in each such case, the Company shall give to each holder of a Right Certificate, to the extent feasible and in accordance with Section 26, a notice of such proposed action, which shall specify the record date for the purposes of such stock dividend or distribution of rights or warrants, or the date on which such reclassification, consolidation, merger, sale, transfer, exchange, liquidation, dissolution, or winding-up is to take place and the date of participation therein by the holders of the Common Shares and/or Series B Preferred

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Shares, if any such date is to be fixed, and such notice shall be so given in the case of any action covered by clause (i) or (ii) above at least 10 days prior to the record date for determining holders of the Series B Preferred Shares for purposes of such action, and in the case of any such other action, at least 10 days prior to the date of the taking of such proposed action or the date of participation therein by the holders of the Common Shares and/or Series B Preferred Shares, whichever shall be the earlier.

(b) In case any Section 11(a)(ii) Event shall occur, then, in any such case, the Company shall as soon as practicable thereafter give to each holder of a Right Certificate, in accordance with Section 26 hereof, a notice of the occurrence of such event, which shall specify the event and the consequences of the event to holders of Rights under Section 11(a)(ii).

Section 26. Notices. Notices or demands authorized by this Agreement to be given or made by the Rights Agent or by the holder of any Right Certificate to or on the Company shall be sufficiently given or made if sent by first-class mail, postage-prepaid, addressed (until another address is filed in writing with the Rights Agent) as follows:

APA Optics, Inc.
2950 N.E. 84th Lane
Blaine, Minnesota 55449
Attention: Secretary

Subject to the provisions of Section 21, any notice or demand authorized by this Agreement to be given or made by the Company or by the holder of any Right Certificate to or on the Rights Agent shall be sufficiently given or made if sent by first-class mail, postage-prepaid, addressed (until another address is filed in writing with the Company) as follows:

Wells Fargo Bank Minnesota, N.A.
161 North Concord Exchange
South St. Paul, MN 55075
Attention: Stock Transfer Manager

Notices or demands authorized by this Agreement to be given or made by the Company or the Rights Agent to the holder of any Right Certificate shall be sufficiently given or made if sent by first-class mail, postage-prepaid, addressed to such holder at the address of such holder as shown on the registry books maintained by the Rights Agent.

Section 27. Supplements and Amendments. The Company may and the Rights Agent shall, if so directed by the Company, from time to time supplement or amend this Agreement without the approval of any holders of Common Shares or Right Certificates in order (i) to extend the Final Expiration Date, (ii) to cure any ambiguity, or to correct or supplement any provision contained in this Agreement which may be defective or inconsistent with any other provisions in this Agreement, (iii) prior to the Distribution Date, to otherwise change or supplement any provision in this Agreement in any manner which the Company may deem necessary or desirable, or (iv) following the Distribution Date, to otherwise change or supplement any provision in this Agreement in any manner which the Company may deem

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necessary or desirable and which shall not adversely affect the interests of the holders of Right Certificates (other than Right Certificates evidencing Rights that shall have become null and void pursuant to Section 11(a) (ii)). Without limiting the foregoing, the Company may at any time prior to such time as any Person becomes an Acquiring Person amend this Agreement to lower the Threshold Percentage set forth in Sections 1(q) and 3(a) hereof to not less than the greater of (i) the sum of .001% and the largest percentage of the outstanding Common Shares then known by the Company to be beneficially owned by any Person (other than an Exempt Person) or (ii) 10%.

Section 28. Successors. All the covenants and provisions of this Agreement by or for the benefit of the Company or the Rights Agent shall bind and inure to the benefit of their respective successors and assigns hereunder.

Section 29. Benefits of this Agreement.

(a) Nothing in this Agreement shall be construed to give to any Person other than the Company, the Rights Agent and the registered holders of the Right Certificates (and, prior to the Distribution Date, the registered holders of Common Shares) any legal or equitable right, remedy or claim under this Agreement. This Agreement shall be for the sole and exclusive benefit of the Company, the Rights Agent and the registered holders of the Right Certificates (and, prior to the Distribution Date, the registered holders of Common Shares).

(b) The Board of Directors of the Company shall have the exclusive power and total and complete authority to administer this Agreement and to exercise all rights and powers specifically granted to the Board of Directors or the Company or necessary or advisable in the administration of this Agreement, including without limitation the right and power to interpret this Agreement and to make conclusively all determinations deemed necessary or advisable for the administration of this Agreement. All such acts, calculations, interpretations and determinations (including, for purposes of clause (y) below, all omissions with respect to the foregoing) that are done or made by the Board of Directors in good faith shall (x) be final, conclusive and binding on the Company, the Rights Agent and the holders of the Rights and all other parties and (y) not subject the Board of Directors to any liability to the holders of the Rights or any other party.

Section 30. Severability. If any term, provision, covenant or restriction of this Agreement is held by a court of competent jurisdiction or other authority to be invalid, void or unenforceable, the remainder of the terms, provisions, covenants and restrictions of this Agreement shall remain in full force and effect and shall in no way be affected, impaired or invalidated.

Section 31. Governing Law. This Agreement and each Right Certificate issued hereunder shall be deemed to be a contract made under the laws of the State of Minnesota and for all purposes shall be governed by and construed in accordance with the laws of the State of Minnesota applicable to contracts to be made and performed entirely within such state.

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Section 32. Counterparts. This Agreement may be executed in any number of counterparts and each of such counterparts shall for all purposes be deemed to be an original, and all such counterparts shall together constitute but one

and the same instrument.

Section 33. Descriptive Headings. Descriptive headings of the several Sections of this Agreement are inserted for convenience only and shall not control or affect the meaning or construction of any of the provisions of this Agreement.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be duly executed as of the day and year first above written.

APA OPTICS, INC.

By: /s/ Anil K. Jain

Its: Chief Executive Officer

WELLS FARGO BANK MINNESOTA, N.A.

By: /s/ Corbin B. Connell

Its: Assistant Vice President

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EXHIBIT A

CERTIFICATE OF DESIGNATION, PREFERENCES AND RIGHTS OF SERIES B
JUNIOR PARTICIPATING PREFERRED SHARES OF
APA OPTICS, INC.

I, Kenneth A. Olsen, the Secretary of APA Optics, Inc., a corporation organized and existing under the Business Corporation Act of the State of Minnesota, in accordance with the provisions of Section 302A.401 thereof, DO HEREBY CERTIFY:

That pursuant to the authority conferred upon the Board of Directors by the Restated Articles of Incorporation of the corporation, as amended (the "Articles of Incorporation"), the Board of Directors on October 23, 2000, adopted the following resolution creating a series of preferred stock, par value \$.01 per share, designated as Series B Junior Participating Preferred Shares:

RESOLVED, that pursuant to the authority granted to and vested in the Board of Directors of the corporation in accordance with the provisions of its Restated Articles of Incorporation, as amended, a series of preferred stock of this corporation be, and it hereby is, created from the undesignated shares of the corporation, and that the designation and amount thereof and the relative rights and preferences of the shares of such series, are as follows:

1. Designation and Amount. The shares of such series shall be designated as "Series B Junior Participating Preferred Shares" (the "Series B Preferred Shares"), the par value of the shares constituting such series shall be \$.01 per share and the number of shares constituting such series shall be Five Hundred Thousand (500,000). The number of shares constituting such series may, unless prohibited by the Articles of Incorporation or by applicable law of the State of Minnesota, be increased or decreased by resolution of the Board of Directors; PROVIDED, that no decrease shall reduce the number of Series B Preferred Shares to a number less than the number of shares then outstanding plus the number of shares issuable upon the exercise of outstanding options, rights or warrants or upon the conversion of any outstanding securities issued by the corporation convertible into Series B Preferred Shares.

2. Dividends and Distributions.

(i) The holders of Series B Preferred Shares, in preference to the holders of Common Stock, par value \$.01 per share, of the Company (the "Common Shares") and of any other junior stock, shall be entitled to receive, when, as and if declared by the Board of Directors out of funds legally available for the purpose, quarterly dividends payable in cash on the last day of March, June, September, and December in each year (each such date being referred to herein as a "Quarterly Dividend Payment Date"), commencing on the first Quarterly Dividend Payment Date after the first issuance of a Series B Preferred Share, or fraction thereof, in an amount per share (rounded to the nearest cent) equal to the greater of (a) \$1.00 or (b) subject to the provision for adjustment hereinafter set forth, one hundred (100) times the aggregate per share amount of all cash dividends, and one hundred (100) times the aggregate per share amount (payable in kind) of all non-cash dividends or other distributions, other than a dividend payable in Common Shares or a subdivision of the outstanding Common Shares (by reclassification or otherwise),

declared on the Common Shares since the immediately preceding Quarterly Dividend Payment Date or, with respect to the first Quarterly Dividend Payment Date, since the first issuance of any Series B Preferred Share, or fraction thereof. In the event the corporation shall at any time after November 13, 2000, declare or pay any dividend on Common Shares payable in Common Shares, or effect a subdivision or combination or consolidation of the outstanding Common Shares (by reclassification or otherwise) into a greater or lesser number of Common Shares, then in each such case the amount to which holders of Series B Preferred Shares were entitled immediately prior to such event under clause (b) of the preceding sentence shall be adjusted by multiplying such amount by a fraction, the numerator of which is the number of Common Shares outstanding immediately after such event and the denominator of which is the number of Common Shares that were outstanding immediately prior to such event.

(ii) The corporation shall declare a dividend or distribution on the Series B Preferred Shares as provided in subparagraph (i) of this paragraph 2 simultaneously with its declaration of a dividend or distribution on the Common Shares (other than a dividend payable in Common Shares or a subdivision of the outstanding Common Shares); PROVIDED that, in the event no dividend or distribution shall have been declared on the Common Shares during the period between any Quarterly Dividend Payment Date and the next subsequent Quarterly Dividend Payment Date, a dividend of \$1.00 per share on the Series B Preferred Shares shall nevertheless be payable, out of funds legally available for such purpose, on such subsequent Quarterly Dividend Payment Date.

(iii) Dividends shall begin to accrue and be cumulative on outstanding Series B Preferred Shares from their date of issue. Accrued but unpaid dividends shall not bear interest. Dividends paid on the Series B Preferred Shares in an amount less than the total amount of such dividends at the time accrued and payable on such shares shall be allocated pro rata on a share-by-share basis among all such shares outstanding at that time. The Board of Directors may fix a record date for the determination of holders of Series B Preferred Shares entitled to receive payment of a dividend or distribution declared thereon, which record date shall be not more than sixty (60) days prior to the date fixed for the payment thereof.

3. Voting Rights. The holders of Series B Preferred Shares shall have the following voting rights:

(i) Subject to the provision for adjustment hereinafter set forth, each Series B Preferred Share shall entitle the holder thereof to one hundred (100) votes on all matters submitted to a vote of the shareholders of the corporation. In the event the corporation shall at any time after November 13, 2000, declare or pay any dividend on Common Shares payable in Common Shares, or effect a subdivision or combination or consolidation of the outstanding Common Shares (by reclassification or otherwise) into a greater or lesser number of Common Shares, then in each such case the number of votes per share to which holders of Series B Preferred Shares were entitled immediately prior to such event shall be adjusted by multiplying such number by a fraction, the numerator of which is the number of Common Shares outstanding immediately after such event and the denominator of which is the number of Common Shares that were outstanding immediately prior to such event.

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(ii) Except as otherwise provided herein, in any other Certificate of Designation, Preferences and Rights creating a series of Preferred Stock or by law, the holders of Series B Preferred Shares and the holders of Common Shares and any other capital shares of the corporation having general voting rights shall vote together as one class on all matters submitted to a vote of the shareholders of the corporation.

(iii) Except as otherwise provided herein or by law, the holders of Series B Preferred Shares shall have no special voting rights and their consent shall not be required (except to the extent they are entitled to vote with holders of Common Shares and any other capital stock of the corporation having general voting rights as set forth herein) for taking any corporate action.

4. Certain Restrictions.

(i) Whenever quarterly dividends or other dividends or distributions payable on the Series B Preferred Shares as provided in paragraph 2 hereof are in arrears, thereafter and until all accrued and unpaid dividends and distributions, whether or not declared, on Series B Preferred Shares outstanding shall have been paid in full, the corporation shall not:

(a) declare or pay dividends, or make any other distributions on any shares of stock ranking junior (either as to dividends or upon liquidation,

dissolution or winding-up) to the Series B Preferred Shares;

(b) declare or pay dividends, or make any other distributions, on any shares of stock ranking on a parity (either as to dividends or upon liquidation, dissolution or winding-up) with the Series B Preferred Shares, except dividends paid ratably on the Series B Preferred Shares and all such parity stock on which dividends are payable or in arrears in proportion to the total amounts to which the holders of all such shares are then entitled;

(c) redeem or purchase or otherwise acquire for consideration shares of any stock ranking junior (either as to dividends or upon liquidation, dissolution or winding-up) to the Series B Preferred Shares, PROVIDED that the corporation may at any time redeem, purchase or otherwise acquire shares of any such junior stock in exchange for shares of stock of the corporation ranking junior (both as to dividends and upon liquidation, dissolution or winding-up) to the Series B Preferred Shares; or

(d) redeem or purchase or otherwise acquire for consideration any Series B Preferred Shares, or any shares of stock ranking on a parity with the Series B Preferred Shares, except in accordance with a purchase offer made in writing or by publication (as determined by the Board of Directors) to all holders of such shares upon such terms as the Board of Directors, after consideration of the respective annual dividend rates and other relative rights and preferences of the respective series and classes, shall determine in good faith will result in fair and equitable treatment among the respective series or classes.

(ii) The corporation shall not permit any subsidiary of the corporation to purchase or otherwise acquire for consideration any shares of stock of the corporation unless the

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corporation could, under subparagraph (i) of this paragraph 4, purchase or otherwise acquire such shares at such time and in such manner.

5. Reacquired Shares. Any Series B Preferred Shares purchased or otherwise acquired by the corporation in any manner whatsoever shall constitute authorized but unissued shares and may be reissued as part of a new series of shares by resolution or resolutions of the Board of Directors, subject to the conditions and restrictions on issuance set forth herein, in the Articles of Incorporation, or in any other Certificate of Designation, Preferences and Rights creating a series of capital stock or as otherwise required by law.

6. Liquidation, Dissolution or Winding-Up. Upon any liquidation, dissolution or winding-up of the corporation, no distributions shall be made (a) to the holders of shares of stock ranking junior (either as to dividends or upon liquidation, dissolution or winding-up) to the Series B Preferred Shares unless, prior thereto, the holders of Series B Preferred Shares shall have received the greater of (i) \$100 per share, plus an amount equal to accrued and unpaid dividends and distributions thereon, whether or not declared, to the date of such payment, or (ii) an aggregate amount per share, subject to the provision for adjustment hereinafter set forth, equal to one hundred (100) times the aggregate amount to be distributed per share to holders of Common Shares, or (b) to the holders of shares of stock, ranking on a parity (either as to dividends or upon liquidation, dissolution or winding-up) with the Series B Preferred Shares, except distributions made ratably on the Series B Preferred Shares and all other such parity stock in proportion to the total amounts to which the holders of all such shares are entitled upon such liquidation, dissolution or winding-up. In the event the corporation shall at any time after November 13, 2000, declare or pay any dividend on the Common Shares payable in Common Shares, or effect a subdivision or combination or consolidation of the outstanding Common Shares (by reclassification or otherwise) into a greater or lesser number of Common Shares, then in each such case the aggregate amount to which holders of Series B Preferred Shares were entitled immediately prior to such event under clause (a)(ii) of the preceding sentence shall be adjusted by multiplying such amount by a fraction the numerator of which is the number of Common Shares outstanding immediately after such event and the denominator of which is the number of Common Shares that were outstanding immediately prior to such event.

7. Consolidation, Merger, Exchange, etc. In case the corporation shall enter into any consolidation, merger, combination, statutory share exchange or other transaction in which the Common Shares are exchanged for or changed into other stock or securities, money and/or any other property, then in any such case the Series B Preferred Shares shall at the same time be similarly exchanged or changed into an amount per share (subject to the provision for adjustment hereinafter set forth) equal to one hundred (100) times the aggregate amount of stock, securities, money and/or any other property (payable in kind), as the case may be, into which or for which each Common Share is changed or exchanged. In the event the corporation shall at any time after November 13, 2000, declare or pay any dividend on Common Shares payable in Common Shares, or effect a subdivision or combination or consolidation of the outstanding Common Shares (by reclassification or otherwise) into a greater or lesser number of Common Shares,

then in each such case the amount set forth in the preceding sentence with respect to the exchange or change of Series B Preferred Shares shall be adjusted by multiplying such amount by a fraction, the numerator of which is the number of Common Shares outstanding immediately after such

event and the denominator of which is the number of Common Shares that were outstanding immediately prior to such event.

8. No Redemption. The Series B Preferred Shares shall not be redeemable.

9. Rank. The Series B Preferred Shares shall rank junior in terms of dividend and liquidation, dissolution and winding-up rights to all series of the corporation's Preferred Stock hereafter issued that specifically provide that they shall rank senior to the Series B Preferred Shares.

10. Fractional Shares. Series B Preferred Shares may be issued in fractions of a share which shall entitle the holder, in proportion to such holder's fractional shares, to receive dividends, participate in distributions and to have the benefit of all other rights of holders of Series B Preferred Shares.

IN WITNESS WHEREOF, I have executed this Certificate of Designation, Preferences and Rights this ___ day of November, 2000.

Kenneth A. Olsen, Secretary

EXHIBIT B

[FORM OF RIGHT CERTIFICATE]

Certificate No. R- _____ Rights

NOT EXERCISABLE AFTER _____, 2010 OR SUCH EARLIER DATE AS THE BOARD OF DIRECTORS ORDERS REDEMPTION OR EXCHANGE OF THE RIGHTS. THE RIGHTS ARE SUBJECT TO REDEMPTION, AT THE OPTION OF THE COMPANY, AT \$.001 PER RIGHT (SUBJECT TO ADJUSTMENT) AND TO EXCHANGE ON THE TERMS SET FORTH IN THE RIGHTS AGREEMENT. UNDER CERTAIN CIRCUMSTANCES SET FORTH IN THE SHARE RIGHTS AGREEMENT, RIGHTS THAT ARE OR WERE ACQUIRED OR BENEFICIALLY OWNED BY AN ACQUIRING PERSON OR AN AFFILIATE OR ASSOCIATE OF AN ACQUIRING PERSON (AS SUCH TERMS ARE DEFINED IN THE SHARE RIGHTS AGREEMENT) MAY BECOME NULL AND VOID.

Right Certificate
APA OPTICS, INC.

This certifies that, _____, or registered assigns, is the registered owner of the number of Rights set forth above, each of which entitles the owner thereof, subject to the terms, provisions and conditions of the Share Rights Agreement dated as of October 23, 2000 (the "Rights Agreement") between APA Optics, Inc., a Minnesota corporation (the "Company"), and Wells Fargo Bank Minnesota, N.A. (the "Rights Agent"), to purchase from the Company at any time after the Distribution Date (as such term is defined in the Rights Agreement) and prior to 5:00 P.M. (Minneapolis, Minnesota time) on November 13, 2010 at the office or offices of the Rights Agent designated for such purpose, or of its successor as Rights Agent, one one-hundredth of a fully paid, nonassessable Series B Junior Participating Preferred Share, par value \$.01 per share (the "Series B Preferred Shares"), of the Company, at a purchase price of \$80.00 per one one-hundredth of a Series B Preferred Share (the "Purchase Price"), upon presentation and surrender of this Right Certificate with the Form of Election to Purchase duly completed and executed. The number of Rights evidenced by this Right Certificate (and the number of one one-hundredths of a Series B Preferred Share which may be purchased upon exercise thereof) set forth above, and the Purchase Price set forth above, are, except for adjustments required pursuant to the Rights Agreement, the number and Purchase Price as of November 13, 2000, based on the Series B Preferred Shares as constituted at such date.

As provided in the Rights Agreement, the Purchase Price and the number of one one-hundredths of a Series B Preferred Share which may be purchased upon the exercise of the Rights evidenced by this Right Certificate are subject to modification and adjustment upon the happening of certain events.

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This Right Certificate is subject to all of the terms, provisions and conditions of the Rights Agreement, which terms, provisions and conditions are hereby incorporated herein by reference and made a part hereof and which contains a full description of the Rights, limitations of rights, obligations, duties and immunities hereunder of the Rights Agent, the Company and the holders of the Right Certificates (which limitations of rights include the voiding of the Rights under certain circumstances specified in the Rights Agreement). Copies of the Rights Agreement are on file with the Secretary at the principal executive office of the Company and will be mailed without charge by the Company or the Rights Agent to the holder of this certificate promptly following receipt by the Company or the Rights Agent of a written request therefor.

Upon the occurrence of a Section 11(a)(ii) Event (as such term is defined in the Rights Agreement), any Rights evidenced by this Right Certificate that are beneficially owned by an Acquiring Person or an Associate or Affiliate of such Acquiring Person (as such terms are defined in the Rights Agreement) or were beneficially owned by any Acquiring Person or an Associate or Affiliate of such Acquiring Person after the Acquiring Person becomes an Acquiring Person shall be null and void from and after the occurrence of such Section 11(a)(ii) Event, and any holder of such Rights shall thereafter have no right to exercise such Rights under any provision of the Rights Agreement.

This Right Certificate, with or without other Right Certificates, upon surrender at the office or offices of the Rights Agent designated for such purpose, may be exchanged for another Right Certificate or Right Certificates of like tenor and date evidencing Rights entitling the holder to purchase a like aggregate number of one one-hundredths of a Series B Preferred Share as the Rights evidenced by the Right Certificate or Right Certificates surrendered then entitled such holder to purchase. If this Right Certificate shall be exercised in part, the holder shall be entitled to receive upon surrender hereof another Right Certificate or Right Certificates for the number of Rights not exercised.

Subject to the provisions of the Rights Agreement, the Rights evidenced by this Right Certificate (i) may, but are not required to, be redeemed by the Company at a redemption price of \$.001 per Right, subject to adjustment as provided in the Rights Agreement, payable in cash and (ii) may, but are not required to, be exchanged by the Company in whole or in part for Common Shares or other shares of capital stock of the Company. The Board of Directors of the Company and the Company shall not have any liability to any person as a result of the redemption or exchange of the Rights pursuant to the provisions of the Rights Agreement.

No fractional Series B Preferred Shares will be issued upon the exercise of any Right or Rights evidenced hereby (other than fractional shares which are integral multiples of one one-hundredth of a Series B Preferred Share or, if a Right shall then be exercisable for a fraction other than one one-hundredth of a Series B Preferred Share, integral multiples of that fraction, which may, at the election of the Company, be evidenced by depository receipts), if in lieu thereof a cash payment is made, as provided in the Rights Agreement.

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No holder of this Right Certificate, as such, shall be entitled to vote or receive dividends or be deemed for any purpose the holder of the Series B Preferred Shares or of any other securities of the Company which may at any time be issuable on the exercise hereof, nor shall anything contained in the Rights Agreement or herein be construed to confer upon the holder hereof, as such, any of the rights of a shareholder of the Company or any right to vote for the election of directors or upon any matter submitted to shareholders at any meeting thereof, or to give or withhold consent to any corporate action, or to receive notice of meetings or other actions affecting shareholders (except as provided in the Rights Agreement), or to receive dividends or subscription rights, or otherwise, until the Right or Rights evidenced by this Right Certificate shall have been exercised as provided in the Rights Agreement.

This Right Certificate shall not be valid or obligatory for any purpose until it shall have been countersigned by the Rights Agent.

WITNESS the manual or facsimile signature of the proper officer of the Company.

Dated:

APA OPTICS, INC.

By: _____
Its: _____

Countersigned:

WELLS FARGO BANK MINNESOTA, N.A.

By: _____
Authorized Manual or
Facsimile Signature

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[Form of Reverse Side of Right Certificate]

FORM OF ASSIGNMENT

(To be executed by the registered holder if such
holder desires to transfer the Right Certificate.)

FOR VALUE RECEIVED _____ hereby sells, assigns and transfers unto

(Please print name and address of transferee)

this Right Certificate, together with all right, title and interest therein, and
does hereby irrevocably constitute and appoint _____ Attorney,
to transfer the within Right Certificate on the books of the within-named
Company, with full power of substitution.

Dated: _____

Signature

Signature Medallion Guaranteed:

Signatures must be medallion guaranteed by a member firm of a
registered national securities exchange, a member of the National Association of
Securities Dealers, Inc., or a commercial bank or trust company having an office
or correspondent in the United States or by an eligible guarantor institution
(bank, stockbroker, savings and loan association or credit union with membership
in an approved signature guarantee medallion program), pursuant to Rule 17Ad-15
promulgated under the Securities Exchange Act of 1934, as amended.

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CERTIFICATE

The undersigned hereby certifies (after due inquiry and to the best of
its knowledge) by checking the appropriate boxes that:

(1) the Rights evidenced by this Right Certificate

[] are
or
[] are not

beneficially owned by an Acquiring Person or an Affiliate or Associate of an
Acquiring Person (as such terms are defined in the Rights Agreement); and

(2) the undersigned

[] did
or
[] did not

acquire the Rights evidenced by this Right Certificate from any Person who, at any time that such Person beneficially owned such Rights, is or was an Acquiring Person or an Affiliate or Associate of an Acquiring Person.

Signature

NOTICE

The signature on the foregoing Assignment and Certificate must correspond to the name as written upon the face of this Right Certificate in every particular, without alteration or enlargement or any change whatsoever.

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FORM OF ELECTION TO EXERCISE

(To be executed if holder desires to exercise Rights represented by the Right Certificate.)

TO: APA OPTICS, INC.

The undersigned hereby irrevocably elects to exercise _____ Rights represented by this Right Certificate to purchase the Series B Preferred Shares issuable upon the exercise of such Rights (or such other securities of the Company or of any other person which may be issuable upon exercise of the Rights) and requests that certificates for such shares be issued in the name of:

Please insert social security or other identifying number _____

(Please print name and address)

If such number of Rights shall not be all the Rights evidenced by this Right Certificate, a new Right Certificate for the balance remaining of such Rights shall be registered in the name of and delivered to:

Please insert social security or other identifying number _____

(Please print name and address)

Dated: _____

Signature

Signature Medallion Guaranteed:

Signatures must be medallion guaranteed by a member firm of a registered national securities exchange, a member of the National Association of Securities Dealers, Inc., or a commercial bank or trust company having an office or correspondent in the United States or by an eligible guarantor institution (bank, stockbroker, savings and loan association or credit union with membership in an approved signature guarantee medallion program), pursuant to Rule 17Ad-15 promulgated under the Securities Exchange Act of 1934, as amended.

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CERTIFICATE

The undersigned hereby certifies (after due inquiry and to the best of

its knowledge) by checking the appropriate boxes that:

(1) the Rights evidenced by this Right Certificate

- are
- or
- are not

beneficially owned by an Acquiring Person or an Affiliate or Associate of an Acquiring Person (as such terms are defined in the Rights Agreement); and

(2) the undersigned

- did
- or
- did not

acquire the Rights evidenced by this Right Certificate from any Person who, at any time that such Person beneficially owned such Rights, is or was an Acquiring Person or an Affiliate or Associate of an Acquiring Person.

Signature

NOTICE

The signature on the foregoing Election to Exercise and Certificate must correspond to the name as written upon the face of this Right Certificate in every particular, without alteration or enlargement or any change whatsoever.

EXHIBIT C

SUMMARY OF RIGHTS TO PURCHASE
SERIES B PREFERRED SHARES
OF
APA OPTICS, INC.

On October 23, 2000, the Board of Directors of APA Optics, Inc. (the "Company"), declared a dividend of one preferred share purchase right (a "Right") for each outstanding share of Common Stock, par value \$.01 per share (the "Common Shares"), of the Company. The dividend is payable on November 13, 2000 (the "Record Date") to shareholders of record on that date.

Each Right entitles the registered holder to purchase from the Company one one-hundredth of a Series B Junior Participating Preferred Share, par value \$.01 per share (the "Series B Preferred Shares"), of the Company at a price of \$80.00 per one one-hundredth of a Series B Preferred Share (the "Purchase Price"), subject to adjustment. The description and terms of the Rights are set forth in a Share Rights Agreement (the "Rights Agreement"), dated as of October 23, 2000, between the Company and Wells Fargo Bank Minnesota, N.A., as Rights Agent (the "Rights Agent").

Initially, the Rights will attach to all certificates representing Common Shares then outstanding and no separate Right Certificates will be distributed. The Rights will separate from the Common Shares and a Distribution Date for the Rights will occur, subject to certain exceptions, upon the earlier of:

- (i) the close of business on the fifteenth day following a public announcement that a person or group of affiliated or associated persons has become an "Acquiring Person" (i.e., has become, subject to certain exceptions, the beneficial owner of 15% or more of the outstanding Common Shares); or
- (ii) the close of business on the fifteenth day following the commencement or public announcement of a tender offer or exchange offer the consummation of which would result in a person or group of affiliated or associated persons becoming, subject to certain exceptions, the beneficial owner of 15% or more of the outstanding Common Shares.

Until the Distribution Date,

(i) the Rights will be evidenced by the Common Share certificates and will be transferred with and only with the Common Shares,

(ii) new Common Share certificates issued after the Record Date upon transfer or new issuance of the Common Shares will contain a notation incorporating the Rights Agreement by reference, and

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(iii) the surrender for transfer of any Common Share certificate, even without such notation or a copy of this Summary of Rights attached thereto, will also constitute the transfer of the Rights associated with the Common Shares represented by such certificate.

As promptly as practicable following the Distribution Date, separate certificates evidencing the Rights ("Right Certificates") will be mailed to holders of record of the Common Shares as of the close of business on the Distribution Date and such separate Right Certificates alone will evidence the Rights.

The Rights are not exercisable until the Distribution Date. The Rights will expire on November 13, 2010, unless extended or earlier redeemed or exchanged by the Company as described below.

The Purchase Price payable, and the number of Series B Preferred Shares or other securities or property issuable, upon exercise of the Rights are subject to adjustment from time to time to prevent dilution:

(i) in the event of a stock dividend on, or a subdivision, combination or reclassification of, the Series B Preferred Shares,

(ii) upon the grant to holders of the Series B Preferred Shares of certain rights, options or warrants to subscribe for or purchase Series B Preferred Shares or convertible securities at less than the then current market price of the Series B Preferred Shares, or

(iii) upon the distribution to holders of the Series B Preferred Shares of evidences of indebtedness or assets (excluding regular periodic cash dividends or dividends payable in Series B Preferred Shares) or of subscription rights or warrants (other than those described in clause (ii) hereof).

The number of Series B Preferred Shares issuable upon the exercise of a Right is also subject to adjustment in the event of a dividend on Common Shares payable in Common Shares, or a subdivision, combination or consolidation of the Common Shares.

With certain exceptions, no adjustment in the Purchase Price will be required until cumulative adjustments require an adjustment of at least 1% in the Purchase Price. No fractional Series B Preferred Shares will be issued (other than fractional shares which are integral multiples of one one-hundredth (subject to adjustment) of a Series B Preferred Share, which may, at the election of the Company, be evidenced by depositary receipts) if in lieu thereof a payment in cash is made based on the closing price (pro-rated for the fraction) of the Series B Preferred Shares on the last trading date prior to the date of exercise.

In the event that any person or group of affiliated or associated persons becomes an Acquiring Person, proper provision shall be made so that each holder of a Right, other than Rights that are or were beneficially owned by the Acquiring Person (which will thereafter be void), will thereafter have the right to receive upon exercise thereof at the then current exercise price of the Right that number of Common Shares having a market value of two times the

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exercise price of the Right, subject to certain possible adjustments. For example, if the exercise price were \$80, each holder of a Right would be entitled to purchase \$160 in market value of Common Shares for \$80.

In the event that, after the Distribution Date or within 15 days prior thereto, the Company is acquired in certain mergers or other business combination transactions or 50% or more of the assets or earning power of the Company and its subsidiaries (taken as a whole) are sold after the Distribution Date or within 15 days prior thereto in one transaction or a series of related transactions, each holder of a Right (other than Rights which have become void under the terms of the Rights Agreement) will thereafter have the right to receive, upon exercise thereof at the then current exercise price of the Right, that number of common shares of the acquiring company (or, in certain cases, one of its affiliates) having a market value of two times the exercise price of the Right. Thus, if the exercise price were \$80, each holder of a Right would be entitled to purchase \$160 in market value of common shares of the acquiring company for \$80.

In certain events specified in the Rights Agreement, the Company is permitted to temporarily suspend the exercisability of the Rights.

At any time after a person or group of affiliated or associated persons becomes an Acquiring Person (subject to certain exceptions) and prior to the acquisition by a person or group of affiliated or associated persons of 50% or more of the outstanding Common Shares, the Board of Directors of the Company may exchange all or part of the Rights (other than Rights which have become void under the terms of the Rights Agreement) for Common Shares or equivalent securities at an exchange ratio per Right equal to the result obtained by dividing the exercise price of a Right by the current per share market price of the Common Shares, subject to adjustment.

At any time prior to the close of business on the date of a public announcement that a person or group of affiliated or associated persons has become an Acquiring Person, the Board of Directors of the Company may redeem the Rights in whole, but not in part, at a price of \$.001 per Right, subject to adjustment (the "Redemption Price"), payable in cash. The redemption of the Rights may be made effective at such time, on such basis and with such conditions as the Board of Directors in its sole discretion may establish. The Board of Directors and the Company shall not have any liability to any person as a result of the redemption or exchange of the Rights pursuant to the provisions of the Rights Agreement.

The terms of the Rights may be amended by the Board of Directors of the Company, subject to certain limitations after the Distribution Date, without the consent of the holders of the Rights, including an amendment prior to the date a person or group of affiliated or associated persons becomes an Acquiring Person, to lower the 15% threshold for exercisability of the Rights to not less than the greater of (i) the sum of .001% and the largest percentage of the outstanding Common Shares then known by the Company to be beneficially owned by any person or group of affiliated or associated persons (subject to certain exceptions) or (ii) 10%.

Until a Right is exercised, the holder thereof, as such, will have no rights as a shareholder of the Company, including, without limitation, the right to vote or to receive dividends.

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A copy of the Rights Agreement has been filed with the Securities and Exchange Commission as an Exhibit to a Registration Statement on Form 8-A dated November 8, 2000.

A copy of the Rights Agreement is available free of charge from the Company by contacting the Secretary at APA Optics, Inc., 2950 N.E. 84th Lane, Blaine, Minnesota 55449. This summary description of the Rights does not purport to be complete and is qualified in its entirety by reference to the Rights Agreement, which is hereby incorporated herein by reference.

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