



## USING ABRADABLE POWDER COATINGS™



**Line2Line Coatings** is a thick, self-fitting, graphite coating that safely minimizes piston-to-wall clearance and finds the perfect operational fit to stabilize pistons and reduce piston assembly friction and wear. A stable piston improves ring seal and reduces wear modes within the piston-ring-bore assembly. Power cylinders are more efficient and last longer. Engines benefit with a cleaner burn for better tuning, less blow-by, higher crankcase (pan) vacuum, less noise, better oil control, and longer life.



**HOW IT WORKS:** Start with normal or increased metal-to-metal Piston to Wall Clearance (PWC). Order coating to custom thickness, **leaving only 25% of the Recommended PWC (RPWC)**. During a brief break-in period, the pistons expand, causing the Line2Line abrasible powder coating to lap in and find the optimum fit within each bore, under load and at temperature. As the perfect skirt shape is approached, the oil film develops uniform loading across an enlarged contact area, and becomes nearly impenetrable. The wear rate drops (asymptotically) to zero, and the perfect fit is locked in for the life of the engine.



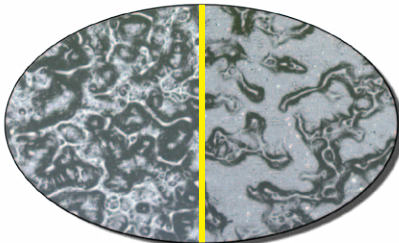
**HOW TO SELECT THICKNESS:** (all coating thicknesses are figured on the diameter, relative to PWC) **Line2Line Coatings 'Standard Thickness' targets 75% of the Recommended PWC (RPWC).**

**NOTE:** Because the pistons are installed with reduced clearance, and the coated pistons need to lap in, the assembled engine will require a short series of gradually increasing engine load cycles to increase piston temperature and size, with pauses (idle or off) between cycles. If you have not used Line2Line on this specific engine configuration before, allow more time for a more gradual break-in. Visit [www.line2linecoatings.com](http://www.line2linecoatings.com) for break-in guideline videos.

### ABRADABLE POWDER COATINGS™



BEFORE



AFTER

BREAK-IN



### COATING THICKNESS CALCULATION WORKSHEET

DIMENSIONS REQUIRED TO START:	EXAMPLE	ACTUAL	ENGINE I.D.
Finished Bore Size (FBS) =	4.1320	<input type="text"/>	<input type="text"/>
Recommended Metal PWC (RPWC) =	0.0060	<input type="text"/>	<input type="text"/>
Uncoated Piston Size (UPS) =	4.1240	<input type="text"/>	<input type="text"/>



#### HOW TO CALCULATE TARGET PISTON SIZE (TPS):

Multiply the **RPWC** by **.25** (25%) then subtract that amount from the **FBS** to get the **TPS**. See example:

**EXAMPLE:** TPS = FBS  4.1320 - (RPWC  0.0060 X 0.25 =  0.0015 ) = TPS  4.1305

**ACTUAL:** TPS = FBS  - (RPWC  X 0.25 =  ) = TPS

#### HOW TO CALCULATE TARGET COATING THICKNESS (TCT):

**EXAMPLE:** TCT = TPS  4.1305 - UPS  4.1240 = TCT  0.0065 \*

**ACTUAL:** TCT = TPS  - UPS  = TCT  \*

\*Round up to go tighter. Round down for looser build.



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**PISTON COATING ORDER FORM**

**DO NOT SEND ring sets, wrist pins, or circlips – REMOVE prior to shipping**

<b>Ship To Address:</b>		<b>Bill To Address (if different):</b>	
Company:		Company:	
Name:		Name:	
Address:		Address:	
City:		City:	
State:	Zip:	State:	Zip: P.O. / Reference #:

**Date:** \_\_\_\_\_ **Phone:** \_\_\_\_\_ **Email:** \_\_\_\_\_

2 Stroke  4 Stroke # of cylinders: \_\_\_\_\_  Nitrous  Supercharged  Turbo  Diesel

**Block:**  Water cooled  Hard Blok  Billet **Engine use:**  Street  Race  Other \_\_\_\_\_

**THIS SECTION MUST BE FILLED OUT COMPLETELY**

Complete "Coating Thickness Calculation Worksheet" first

**Finish Bore Size (FBS):** \_\_\_\_\_ **Engine HP:** \_\_\_\_\_ **Displacement:** \_\_\_\_\_

**Desired Coating Thickness (On Diameter):** \_\_\_\_\_ (thousandths of an Inch)

Skirt coat only  Crown coat only  Skirt and crown coat

APC™ Skirts – please check box and write in the number of pistons

1-3 Pistons: \$40 per piston X \_\_\_\_\_  4-7 Pistons: \$38 per piston X \_\_\_\_\_  8+ Pistons: \$35 per piston X \_\_\_\_\_

**Additional Charges:**

- + Coating over .006" diametric thickness: add \$2 per .001" per piston
- + Pistons over 5" diameter: add \$10 per piston
- + Bore measurement \$5 per cylinder X \_\_\_\_\_
- + **Special masking/coating instructions that are not part of standard coating process – quote required**
- + **Degreasing fee for dirty or oily pistons: \$30**
- + **Ring/pin/clip removal if left in: \$30\***
- \* L2L is not responsible for broken or missing rings/pins/clips

**Crowns:**  ThermBar thermal barrier coating on crowns: \$35 per piston

**We coat turbos, oil pumps, compressors, superchargers, snowmobile carb slides and more. Email for info**

**Coating Services Turn-Around Time (in business days)**

Standard (15 days +/-)  8 days +30% of total  6 - 7 days +50% of total  1 - 5 days +100% of total

**Return Shipping Service (Parts are shipped via UPS ground with no declared value unless otherwise specified)**

UPS Ground Service  UPS 3 Day Select  UPS 2<sup>nd</sup> Day Air  UPS Next Day Air

**Payment Options:**  Business or personal check. Parts will ship when check clears our account.  Money order

Visa/MasterCard/American Express /PayPal – **a 3% convenience fee will be added to your total**

Account Number: \_\_\_\_\_ Expiration Date: \_\_\_\_\_ Security Code: \_\_\_\_\_

Signature \_\_\_\_\_ Credit Card Billing Zip Code: \_\_\_\_\_

Credit cards are not billed until the coating work is complete and the parts are ready to ship. **We do not ship COD**

**PARTS WILL SHIP WHEN PAYMENT IN FULL IS RECEIVED**

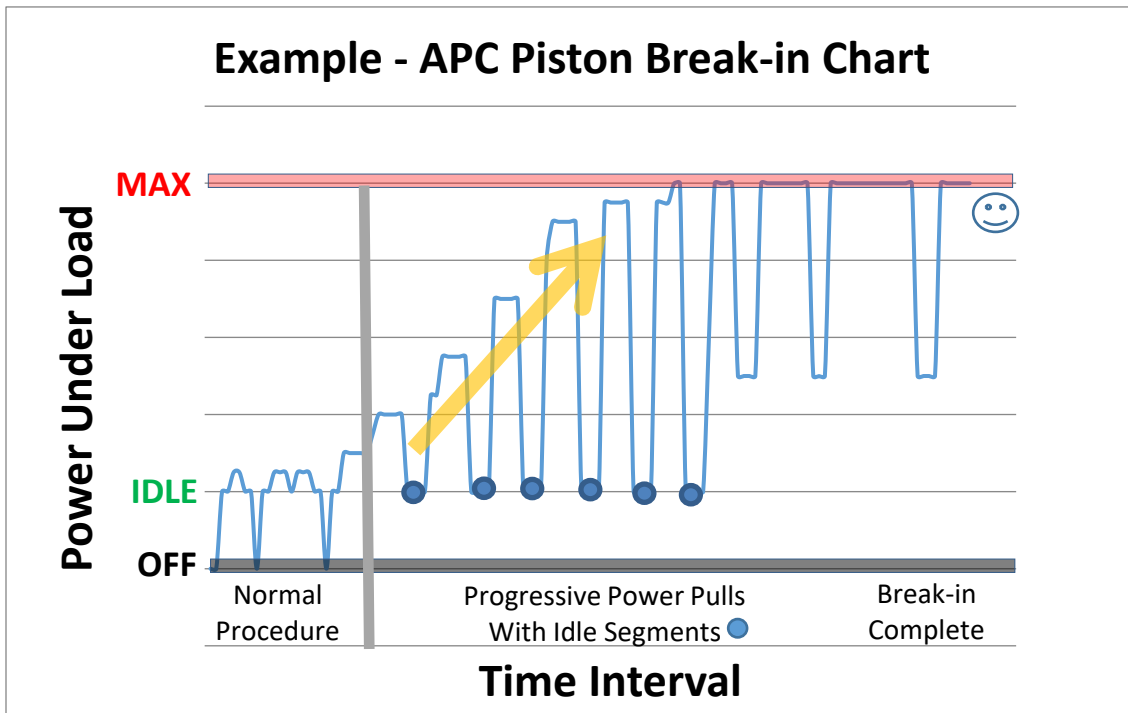
**Shipping terms and conditions:** Return shipping is by UPS. Customer is responsible for all shipping costs, which shall be added to the invoice and is based on package size, weight and destination. Return shipping cost cannot be calculated until the order is complete, packaged and ready to ship. **Expedited shipping and/or insurance coverage must be specifically requested by Customer prior to shipping;** all additional shipping charges shall be added to the invoice price.

**Please note:** Customer parts are returned in the same packaging materials that they are received in. Line2Line Coatings shall not be liable for any part and/or coating damage that occurs from shipping in customer supplied packaging that does not adequately protect individual parts or prevent them from coming in contact with each other while in transit.



## Abradable Powder Coating™ Piston Coating Ordering & Installation Instructions

Specify Your Desired Coating Thickness
<p><b>1.</b> Do not alter metal to metal clearances to accommodate APC™. L2L needs your Finished Bore Size(s) (FBS), the Manufacturer’s Recommended Piston to Wall Clearance (RPWC), and the Target Coating Thickness (TCT) as calculated on the “How To Order” form.</p> <p><i>*Note: We measure one piston for “all same thickness” service or each piston for “individual sizing” option.</i></p>
<p><b>2.</b> On the Line2Line website “Order” page, print the Thickness Calculation Worksheet and Order Form that corresponds to your home state. Complete both forms and include them in the box with the pistons.</p>
When They Return, Fit Your Pistons Perfectly
<p><b>3. 25% of Manufacturer’s Recommended Clearance</b> –For a Line2Line order- with no rings and no oil, a properly fitted piston will move through its ENTIRE stroke with <i>fingertip</i> pressure. If piston fitment is too tight based on measurements or feel, lightly scrub with a green scotch brite pad to gently remove the coating in tight spots like the gage point, or as indicated by the witness marks. <b><i>Be sure to carefully follow break-in instructions upon startup.</i></b></p>
<p><b>4.</b> Clean the pistons prior to installation. Oil the skirts and bores at assembly.</p>
<p><b>5.</b> Refer to <b><i>Example - APC Piston Break-in Chart</i></b>. After normal break-in, give the engine time to fit pistons at each power level, idle briefly, progressively raise power levels until happy at full power. <b><u>Please note that dyno sweeps may not provide enough time for complete break-in. It’s better to hold progressive power levels for approximately 5 seconds and let off for a minute before increasing to the next power level. The idea is to pinch the coating for a short time and then let the oil get back in. Each power cycle laps each piston closer to its perfect geometry!</u></b></p>



Disclaimer: Due to the nature of coating applications, L2L coatings are sold with no express warranty or implied warranty of merchantability or fitness for any particular purpose. Final decisions regarding the suitability, installation or use of L2L coatings for any application are solely the responsibility of the Customer. Line2Line, Inc. shall not, under any circumstances, be liable for any special, incidental or consequential damages related to the use of coated components.