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Build it or Buy it: The Advantages of a Pre-engineered Sub-assembly Product Over a Component System

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When constructing a linear guide system, the first choice is selecting what type of product to use: a pre-engineered sub-assembly (such as the Uni-Guide) or a component system (such as Profile Rail Technology [PRT]). Both have clear advantages and disadvantages; a component system allows the designer to tailor-fit the system to the application; however a pre-engineered sub-assembly product can save thousands on pre-installation costs: time to design, selection, research and planning. In most cases, the application itself is typically the determining factor on which system to select. The speed, load, travel length, precision and environment of the application all play an integral part when selecting a linear system. Cost is another important factor to consider. As the number of individual system components increases, labor installation and alignment costs increase as well.

Sub-Assembly System

Component Assembled System

In general industrial applications, requiring a linear guide to move a moderate load (650N/150 lbs) a distance of 1 meter at a moderate speed of 0.5 m/s, a pre-engineered sub-assembly is the customers' best balance of performance, reliability and cost. A simple, easy-to-install, two-piece linear guide system has the advantage of ease of use. Designing a specifically tailored component system may seem like the best option; however the cost of design, materials, installation and alignment are too

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large to ignore. Take a look at a full bill of materials list for a component system versus a pre-engineered sub assembly.

Pre-Engineered Sub-Assembly		
Description	Quantity	Cost
Fasteners	10	$2.50
D075 Uni-Guide	1	$237.24
		Total Cost: $239.74

Component System		
Description	Quantity	Cost
Fasteners	20	$5.00
15mm Profile Rails	2	$99.75
15mm Carriages	4	$226.80
1 Carriage Plate	1	$10.00
		Total Cost: 341.55

The above costs reflect purchasing the materials needed. They do not factor in installation and alignment labor; which is a long and complex process to ensure maximum rigidity, precision and parallelism. If the two rails are not installed and aligned properly, the assembled carriage will bind or stall during travel—leading to low performance, premature life and low satisfaction for the customer. The simple two-piece rail and carriage design of the Uni-Guide allows the user to bypass most of these installation steps, saving the end-user on total installed cost. Listed below are the recommended installation steps for each linear guide system:

Installation Steps	
Pre-engineered Sub-Assembly	**Component Assembled System**
1. Drill/tap holes along rail to machine to surface. **2. Mount system to application.**	**1. Drill/Tap machine holes along profile rail for installation.** **2. Align rail with reference surface to begin alignment process.** **3. Loosely secure profile rail to machining surface.** **4. Tighten fasteners while continuously checking straightness and alignment.** **5. Repeat processes 1-4 for second profile rail, but also check for parallelism.** **6. Install (4) carriages. 2 per rail.** **7. Align carriages to corresponding mate (check for parallelism).** **8. Install carriage plate onto carriages, check alignment.** **9. Fasten carriage plate to carriages.**

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To summarize, for this type of short distance/moderate load and speed application, a pre-engineered sub-assembly is the best choice for the end-user on both cost and performance; however, linear motion is a broad topic with a wide array of varying applications. Therefore, different linear motion tools must be used at different times. To determine which is the solution for the customer, all of the following criteria MUST be considered: load, speed, acceleration, travel length, precision, accuracy and environmental factors.

For more information on PBC Linear's Uni-Guide product, please contact an application engineer 1.800.729.9085, email to marketing@pbclinear.com, or visit us at our Uni-Guide dedicated website: UniGuide.pbclinear.com for free downloadable materials and other application examples.

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