MODULE 6

Rate, Speed and Capacity Calculations

Conveyor Solutions Engineering | Professional Training Program
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SECTION 1: INTRODUCTION

The flow diagram from Module 5 tells you where material moves and roughly how much. Module 6 is where you make that picture precise. Rate, speed, and capacity calculations are what connect the customer's throughput requirement to the physical reality of a conveyor system. They answer the questions that every other decision depends on: how fast does this belt need to run, how many packages per hour can this section handle, is the conveyor type selected capable of operating in the range this application requires.

There is a discipline to using these calculations that the formulas themselves do not teach. The formulas produce theoretical results. They assume packages present their ideal surface to the belt, that the belt runs at exactly the commanded speed, that gaps are consistent, and that nothing in the environment introduces variation. In practice, belts slip, packages shift orientation, and real-world conditions introduce variability that theory does not account for. An engineer who reads a calculator output and treats it as a guaranteed field result will consistently be surprised by actual system performance.

There is also a discipline to knowing when to be precise and when a directional answer is enough. In early solutioning, the goal is to confirm that the conveyor types being considered are capable of operating in the ranges the application requires. A plus or minus ten percent interpretation of the outputs is appropriate at that stage. In final engineering, the same calculators are used again with tighter inputs and the outputs are used to set actual specifications. The calculator does not change. The precision of the inputs and the interpretation of the outputs does.

This module teaches you to use the Speed Formulas, Speed Gap and Sorter Speed, Case Feet Per Minute, and Speed of Takeaway Spur calculators in their correct context. It teaches you what each one answers, when each one is the right tool, and how to interpret their outputs with the engineering judgment that theory alone cannot provide.

SECTION 2: LEARNING OBJECTIVES

By the end of this module you will be able to:

1	Explain the difference between theoretical rate and real-world rate and apply appropriate margin to calculator outputs to account for slippage, gap variability, and real-world operating conditions.
2	Use the Speed Formulas calculator to determine required belt speed from throughput requirements and product dimensions, and interpret the output at the correct level of precision for the stage of the project.
3	Use the Speed Gap and Sorter Speed calculator during the flow diagram phase to establish the speeds required across different sections of a system before any AutoCAD work begins, and explain how those speeds drive conveyor selection.
4	Use the Speed of Takeaway Spur calculator to determine the correct spur speed at a divert point and explain why the divert angle creates a speed compensation requirement.
5	Use the Case Feet Per Minute calculator in the context of rate verification and explain what it confirms and at what stage of the project it is applied.
6	Distinguish between early solutioning use of these calculators and final engineering use, and explain how the interpretation of outputs differs between the two stages.

SECTION 3: PREREQUISITES

Required Prior Knowledge

Module 2: Product and Package Analysis. Package dimensions, weights, and the starting gap from the product envelope are direct inputs to every rate and speed calculator in this module. Have your Package Calcs outputs in hand before opening any calculator in Module 6.

Module 5: System Design and Flow Layout. The flow diagram with its volume and rate layer is the primary input to speed calculations. The rates and throughput numbers from the flow diagram are what you are calculating to. If those numbers are not on the diagram, the calculator has no target to work toward.

Module 4: Conveyor Types and Technology Selection. Rate and speed calculations are used in part to confirm that the selected conveyor type can operate within the required speed range. You need to know what you selected before you can verify it is capable.

SECTION 4: THE THREE W'S

The Three W's in this module apply to the calculation discipline itself and to each calculator. Each tool answers a different question and is used at a different point in the design process.

Theoretical Rate vs. Real-World Rate

WHY	Every rate calculator produces a theoretical result based on idealized assumptions. Packages present their optimal surface, belts run at exactly the commanded speed, gaps are perfectly consistent, and no environmental variation exists. Real systems do not operate in those conditions. Belts slip. Packages arrive in varying orientations. Gaps are not perfectly consistent at all times. An engineer who does not account for the difference between theoretical and real-world rate will specify a system that hits its rate target on paper and misses it in the field. Understanding where theory and reality diverge, and building appropriate margin into the interpretation, is the foundational skill this module teaches.
WHEN	Every time a calculator produces a rate or speed output and that output is being used to make a specification decision. In early solutioning, apply a plus or minus ten percent range to outputs and use them to confirm capability. In final engineering, tighten the inputs, reduce the tolerance, and use the outputs to set actual specifications.
WHERE	This principle applies across every rate and speed calculation in the program. It is introduced formally here because Module 6 is where students first work with these tools in depth. It is reinforced in Module 7 when sortation rates are calculated and the consequences of tight gap margins become critical.

Speed Gap and Sorter Speed Calculator

WHY	This is the calculator that bridges the flow diagram and conveyor selection. It takes throughput requirements and product dimensions and produces the belt speeds needed to achieve those rates at different points in the system. Used during the flow diagram phase, before AutoCAD work begins, it gives the engineer the speed picture across the whole system. Those speeds, combined with product weights and sizes from the product envelope, are what drive conveyor selection. The engineer who runs this calculator before drawing anything selects conveyors that are capable. The engineer who selects conveyors first and calculates speeds after sometimes discovers the selection cannot deliver the rate.
WHEN	During the flow diagram phase, after Layer 2 volume and rate information has been added to the diagram, before any AutoCAD layout work begins. This is the pre-drawing use that makes it a design driver rather than a verification tool. It can also be run again during final engineering to confirm the selected conveyors and the actual system layout are aligned with the original speed picture.
WHERE	The Speed Gap and Sorter Speed calculator is the primary rate calculation tool for the system as a whole. It anchors the speed picture that every other calculator in this module refines. Use it early and use it before drawing anything.

Speed of Takeaway Spur Calculator

WHY	When product diverts from a sorter onto a takeaway spur, the divert angle creates a geometric relationship between the sorter speed and the spur speed. A spur running at the same speed as the sorter will not accept product cleanly because the package is arriving at an angle, not head-on. The spur must run faster to compensate for that angle and accept the package without jamming or misaligning it. The Speed of Takeaway Spur calculator takes the sorter speed and the divert angle and produces the correct spur speed. Without this calculation, takeaway spurs are guessed at, and the consequences of a wrong guess are jams and product damage at every divert point.
WHEN	Any time a layout includes a divert point where product leaves a sorter onto a spur conveyor at an angle. This applies to shoe sorters, pop-up wheel sorters, and any other divert mechanism where product leaves the main line at an angle rather than straight ahead.
WHERE	The Speed of Takeaway Spur calculator is used during layout development when divert points are being designed. It is first introduced here in Module 6 and used again in Module 7 when sortation systems are covered in depth.

Case Feet Per Minute and Speed Formulas Calculators

WHY	These two calculators work together to translate between the different ways rate is expressed. Case Feet Per Minute converts throughput requirements expressed as cases per hour into the belt speed in feet per minute required to achieve that rate given the package length and gap. Speed Formulas provides the underlying mathematical relationships between speed, gap, package length, and rate. Together they let the engineer verify that a specified belt speed produces the required throughput, or determine what speed is needed to hit a target rate. They are verification and translation tools used throughout the design process.
WHEN	Case Feet Per Minute is used during rate verification when confirming that a selected belt speed achieves the required throughput. Speed Formulas is used whenever the relationship between speed, gap, and rate needs to be worked in either direction: given a rate, what speed is required, or given a speed, what rate is achievable.
WHERE	Both calculators are used throughout the design and final engineering phases. They are the arithmetic foundation that supports every other rate and speed decision in the program.

SECTION 5: CORE CONTENT

5.1 The Gap Between Theory and Reality

Every rate calculator in this module assumes the system operates in ideal conditions. The package presents its flat bottom squarely to the belt. The belt runs at exactly the speed commanded by the drive. The gap between packages is exactly what was specified. None of those conditions are guaranteed in a real installation, and the degree to which they are not guaranteed determines how far actual performance will deviate from calculated performance.

The most significant source of deviation is slippage. Belts slip against packages, especially on inclines, during acceleration zones, and when belt tension has relaxed from its initial specification. Slippage means the belt moves faster than the package. The package does not receive the full speed the belt is running at. The gap that was calculated assumes the package travels at belt speed. When it does not, the gap that actually forms between packages is different from the calculated gap.

The practical response to this is margin. When calculating the minimum required gap, do not design right to the minimum. Build in buffer. A system designed to operate exactly at the minimum gap specification will fail to maintain that gap the moment any real-world variation is introduced. A system designed with margin above the minimum will maintain acceptable gaps even when conditions are not ideal.

FIELD INSIGHT | MICHAEL COLLINS

The formulas do not account for slippage. That is the most important thing to understand about gap calculations. When you run the calculator and it gives you a minimum required gap, that is the minimum in a perfect world. In the real world, you need to add buffer to that number. How much buffer depends on the application, the belt type, the product surface, and the incline conditions. But never design right to the minimum. The gap that forms in practice will be smaller than the gap the formula assumes, and a system that was calculated to just barely meet the minimum gap will not meet it in the field.

In early solutioning, use plus or minus ten percent as your working tolerance on calculator outputs. You are trying to confirm that the conveyor types you are considering are capable of operating in the ranges the application requires. You are not setting final specifications yet. In final engineering, you tighten the inputs, refine the assumptions, and use the outputs to set actual specs. The calculator does not change. Your precision and your interpretation do.

5.2 Two Stages of Calculation: Solutioning and Final Engineering

The same calculators are used at two different stages of a project, and the way they are used at each stage is different. Confusing the two stages produces either over-engineered early solutioning that slows down the design process or under-refined final engineering that misses real performance requirements.

In early solutioning, the goal is to get a feel for whether the chosen conveyor types are capable of operating in the ranges the application requires. The inputs are approximate: average package dimensions, estimated throughput, rough gap assumptions. The outputs are interpreted with a plus or minus ten percent tolerance. The question being answered is: is this conveyor family in the right operating range for this application, or does the selection need to change before the design goes further? A conveyor that cannot get close to the required speed within its published rating is eliminated at this stage. One that is comfortably within range is confirmed and the design proceeds.

In final engineering, the same calculators are run again with tighter inputs. Package dimensions come from the confirmed product envelope. Throughput requirements come from the finalized flow diagram with its volume layer. Gap requirements account for slippage margin and the specific belt and product surface combination. The outputs are used to set actual belt speed specifications, confirm motor sizing, and verify that the installed system will hit its rate targets under real operating conditions.

SOLUTIONING VS. FINAL ENGINEERING: HOW CALCULATOR USE CHANGES

Factor	Early Solutioning	Final Engineering
Input precision	Approximate: average package, estimated throughput	Confirmed: product envelope, finalized flow diagram rates
Output interpretation	Plus or minus 10 percent tolerance	Tight: used to set actual specifications
Primary question	Is this conveyor type capable in this range?	Does this specific configuration hit this specific rate?
Gap assumption	Conservative estimate with buffer	Calculated with slippage margin for specific belt and product
Action on output	Confirm or change conveyor selection	Set belt speed, confirm motor, verify rate target

5.3 Speed Gap and Sorter Speed Calculator: The Pre-Drawing Rate Tool

The Speed Gap and Sorter Speed calculator is the primary rate calculation tool for establishing the speed picture across a system before any AutoCAD work begins. It takes the throughput requirement at each stage of the flow, the average package dimensions, and the required gap, and produces the belt speeds needed to achieve those rates.

The critical insight about this calculator is when to use it. Most engineers reach for it during layout development, after conveyors have been selected and speeds need to be verified. The more powerful use is during the flow diagram phase, after Layer 2 volume and rate has been added to the diagram but before AutoCAD is opened. At that stage, the calculator tells you what speeds you need to hit your rates in different areas of the system. Those speeds, combined with the product weight and size from the product envelope, are what drive conveyor selection. You are choosing the conveyor to fit the speed requirement, not discovering after the fact that the chosen conveyor cannot meet it. If you do it this way, you reduce your available conveyor types, and the selection process becomes much simpler.

FIELD INSIGHT | MICHAEL COLLINS

I often fill out the Speed Gap and Sorter Speed calculator during the diagram phase because it gives me the speeds I need to hit my desired rates in different areas of the system. Those speeds, combined with product weights and sizes, let me choose the conveyor before I draw anything. If I need 200 FPM in a section to hit the rate with the product mix I have, and the conveyor I was considering has a maximum speed of 150 FPM at that product weight, I know before I draw a single line that I need a different conveyor. That is a much cheaper discovery than finding it out after the layout is done.

How to Use the Speed Gap and Sorter Speed Calculator During the Flow Diagram Phase

Pull the throughput requirement for each section from the Layer 2 volume and rate notes on the flow diagram.

Use the package length and the required minimum gap from the product envelope as inputs.

Run the calculator for each major section of the system: induction feed, sorter speed, accumulation release rate, takeaway lane rates.

Record the required belt speed for each section on the flow diagram alongside the rate notes.

Compare each required speed against the published maximum speed for the conveyor type being considered at the relevant product weight.

Any section where the required speed approaches or exceeds the conveyor's published maximum is a selection that needs review before the layout proceeds.

5.4 Speed of Takeaway Spur Calculator: Compensating for Divert Angle

When a sorter diverts product onto a takeaway spur, the package leaves the main sorter line at an angle. It does not arrive at the spur head-on. The leading edge of the package contacts the spur while the trailing edge is still on the sorter. The angle of that transition creates a geometric relationship between the sorter speed and the spur speed that must be accounted for.

If the spur runs at the same speed as the sorter, it will not accept the package cleanly. The package is arriving at an angle and the spur needs to run fast enough to pull the package off the sorter before the trailing edge is left behind. A spur running too slowly relative to the sorter speed will cause the package to hang up at the divert point, either jamming or misaligning on the spur in a way that creates problems downstream.

The Speed of Takeaway Spur calculator takes the sorter speed and the divert angle as inputs and produces the minimum spur speed required to accept the package cleanly at that angle. The output is not the sorter speed. It is always higher than the sorter speed. How much higher depends on the divert angle. Steeper divert angles require proportionally higher spur speeds.

KEY PRINCIPLE: SPUR SPEED IS ALWAYS HIGHER THAN SORTER SPEED

The physics of a divert angle means the spur must run faster than the sorter to accept product cleanly. A spur at the same speed as the sorter will not work. A spur slower than the sorter will create jams at every divert event.

> The Speed of Takeaway Spur calculator quantifies exactly how much faster the spur must run for a given sorter speed and divert angle. Run it for every divert point in the layout. Do not assume a round number speed for the spur and hope it is fast enough.
>
> This calculation also drives conveyor selection for the spur. The spur conveyor must be capable of running at the calculated speed with the heaviest product in the mix. Check the spur speed output against the selected conveyor's published maximum speed before finalizing the layout.

5.5 Case Feet Per Minute and Speed Formulas: Rate Verification Tools

Case Feet Per Minute and Speed Formulas are the arithmetic foundation of rate and speed calculations. They translate between the different ways throughput can be expressed and verify that specified belt speeds produce required rates.

Case Feet Per Minute works from the throughput requirement. Given a target rate in cases per hour, a package length, and a gap between packages, it produces the belt speed in feet per minute needed to achieve that rate. This is the forward calculation: given what we need, what speed do we need to run.

Speed Formulas works in both directions. Given a belt speed and a package configuration, it produces the achievable rate. Given a required rate, it produces the required speed. It is the reference tool for checking that the relationship between speed, gap, and rate is consistent across the design.

Both of these calculators are used throughout the design and final engineering phases. They are not specialized tools for specific situations. They are the basic arithmetic of rate and speed that underpins every other calculation in the module. An engineer who is comfortable working in both directions with these tools, from rate to speed and from speed to rate, has the foundational calculation fluency that every subsequent module builds on.

5.6 Gap Calculations and Slippage Margin

The gap between packages on a conveyor is not just a spacing preference. It is a functional requirement driven by the downstream equipment. A scan tunnel needs a minimum gap to read each package independently. A sorter induction needs a minimum gap to divert product reliably. A print and apply system needs a minimum gap to complete the label application cycle before the next package arrives. Each of these downstream requirements sets a minimum gap that the conveyor system must maintain.

The calculation of what belt speed produces what gap is straightforward in theory. In practice, slippage means the actual gap that forms is different from the calculated gap. The belt moves at the commanded speed. The package reacts to speed changes slower due to slippage between the belt surface and the package bottom. The gap between packages is therefore different than the calculation predicts. How the package is balanced makes a difference too

The design response is to calculate a gap that is larger than the minimum required, not to the minimum itself. How much larger depends on the application. For systems where the gap is critical, such as upstream of a print and apply station or a high-speed scan tunnel, the margin should be meaningful. For systems where some gap variation is acceptable, a smaller margin is appropriate. The point is that the margin must be a deliberate decision, not an accident of rounding.

Gap Calculation Principles

Never design to the minimum required gap. Always add margin above the minimum to account for slippage and real-world gap variability.

The tighter the gap requirement from the downstream equipment, the more margin the gap calculation needs.

In early solutioning, use a conservative gap estimate with generous margin. In final engineering, calculate the gap requirement specifically for the belt type, product surface, and operating speed of that section.

Document the gap margin as an explicit design assumption. When the system is commissioned and gap performance is evaluated, the margin built into the original calculation is the reference point for whether the system is performing as designed.

SECTION 6: TIPS AND TRICKS

TIPS AND TRICKS | MICHAEL COLLINS

Run the Speed Gap and Sorter Speed calculator during the flow diagram phase, not after the layout is drawn. The speeds it produces are what drive conveyor selection. If you wait until after the layout is done to run it, you may find the conveyor you drew cannot achieve the required speed. Discovering that before you draw anything is always better.

When the calculator gives you a minimum required gap, add margin before you use that number in any design decision. The formulas do not account for slippage. The gap that forms in practice will be smaller than the calculated gap. Design above the minimum, not to it.

In early solutioning, you are answering one question: are the conveyor types I am considering capable of operating in the ranges this application requires? Use plus or minus ten percent as your working tolerance and move on. You are not setting specifications yet.

In final engineering, tighten every input before running the calculator again. Use the confirmed product envelope, the finalized throughput numbers, and slippage-adjusted gap assumptions. The outputs at that stage become actual specifications.

Run the Speed of Takeaway Spur calculator for every divert point in the layout. Do not assume the spur speed. The divert angle creates a speed requirement that is not intuitive, and a spur running at the wrong speed will jam at that divert point with every package.

One thing you may find is that the type of conveyor feeding a divert cannot be the same type used for the takeaway because of the increased speed. If you see this situation, ask yourself whether the margin of error on the inbound conveyor is too tight.

After running any rate calculator, ask: does this speed fall within the published operating range of the selected conveyor at the heaviest product weight in the mix? If the answer is no, the conveyor selection needs to change before the layout proceeds.

Pro Tip: add conveyor models to your flow chart at this stage.

SECTION 7: NOTES AND INSIGHTS

NOTES AND INSIGHTS

Rate and speed calculations are where the product envelope from Module 2 pays off most directly. Every calculator in this module takes package dimensions and gap as inputs. Engineers who have precise, confirmed product data produce reliable rate calculations. Engineers who are working from generic customer-supplied ranges produce calculations with wide uncertainty bands. The quality of the Module 2 work determines the quality of the Module 6 outputs.

The VFD calculator is a final engineering tool. Variable frequency drives are used to adjust belt speed electronically, and the VFD calculator is used during final engineering to specify drive parameters precisely. It is not a solutioning tool. In early solutioning, whether a VFD is needed and what range it must cover is a qualitative decision based on the speed range the application requires. The specific drive parameters are set in final engineering.

The Slave Speed Calculations tool covers speed relationships between mechanically linked conveyor sections. This is a specialized application that applies in specific drive configurations. It is not a primary solutioning tool. When it is needed, the application will make it obvious.

The connection between rate calculations and system layout is direct. The speeds produced by the calculators determine whether the selected conveyor can meet the rate. Those speeds also feed the controls design in Module 9, where belt speed setpoints become PLC parameters. The numbers set here travel forward through every module.

SECTION 8: EXPERT CALLOUT

EXPERT CALLOUT

Placeholder for expert insight on the gap between calculated rate and actual field performance. Reviewer to share a specific example where a system was designed to a theoretical rate that the installed system did not achieve, what the root cause was, and what the calculation approach should have been to catch the problem during design.

[Reviewer Name, Title, Company]

SECTION 9: PITFALLS

! Designing gap calculations to the minimum required gap without adding slippage margin. The formula produces the theoretical minimum. Real-world belt slippage means the actual gap that forms is smaller. A system designed right to the minimum will fail to maintain that gap in the field. Always add margin above the minimum.

! Using final engineering precision in early solutioning. Running calculators with tight inputs and treating the outputs as specifications before the product envelope and throughput requirements

	are confirmed produces false precision. In early solutioning, the goal is directional confirmation, not specification setting.
!	Waiting until after the layout is drawn to run the Speed Gap and Sorter Speed calculator. By the time the layout exists, conveyor selections have been made. Discovering that a selected conveyor cannot achieve the required speed at that stage requires redesign. Run the speed picture during the flow diagram phase and select conveyors to fit the speed requirement.
!	Assuming the takeaway spur speed without running the Speed of Takeaway Spur calculator. The divert angle creates a speed requirement that is not intuitive and cannot be reliably estimated. Run the calculator for every divert point. A spur at the wrong speed will jam consistently.
!	Confusing a rate calculation that works with a design that works. A rate that is achievable in theory at a given belt speed does not mean the system will sustain that rate under real operating conditions with real products. The calculation confirms capability. Engineering judgment, slippage margin, and real-world validation confirm performance.

SECTION 10: FOREST THROUGH THE TREES

How Rate, Speed and Capacity Calculations Connect to Everything That Follows

Module 6 is where the flow diagram becomes a set of engineering specifications. The throughput requirements and volume notes from Module 5 become belt speed targets. The product envelope from Module 2 becomes the dimensional inputs to gap calculations. The conveyor selections from Module 4 get tested against the speed ranges the application requires. Module 6 is the module where abstract requirements become concrete numbers.

Those numbers travel forward through every module that follows. Module 7 uses sorter speeds and gap requirements from this module as the starting point for sortation system design. The takeaway spur speed calculation introduces in this module is developed further in Module 7 when sortation takeaway lanes are designed in full. Module 9 uses the belt speed specifications from this module as the PLC setpoints in the controls architecture.

The two-stage discipline, solutioning versus final engineering, is not limited to rate calculations. It applies to every calculation in the program. In early solutioning, confirm capability with appropriate tolerance. In final engineering, tighten inputs and set specifications. That discipline, practiced consistently, is what produces designs that are right at the concept stage and refined at the specification stage rather than revised at the commissioning stage.

SECTION 11: KEY TAKEAWAYS

KEY TAKEAWAYS | MODULE 6

Calculators produce theoretical results. Real-world conditions, especially belt slippage, mean actual gap performance is smaller than calculated gap. Never design to the minimum required gap. Add margin above it.

In early solutioning, use plus or minus ten percent as the working tolerance on calculator outputs. The goal is to confirm whether selected conveyor types are capable of operating in the required ranges, not to set final specifications.

In final engineering, tighten every input and use calculator outputs to set actual belt speed specifications, confirm motor sizing, and verify rate targets. The calculator is the same. The precision and interpretation change.

Run the Speed Gap and Sorter Speed calculator during the flow diagram phase, before AutoCAD work begins. The speeds it produces drive conveyor selection. Discovering a speed mismatch before drawing anything is always cheaper than discovering it after.

The Speed of Takeaway Spur calculator is required at every divert point. The divert angle always creates a speed requirement that is higher than the sorter speed. Do not assume the spur speed. Calculate it.

Case Feet Per Minute and Speed Formulas are the arithmetic foundation of rate calculations. Fluency with both, working in both directions between rate and speed, is a baseline skill for everything that follows in this program.

SECTION 12: MODULE ASSESSMENT

Knowledge Check

Q1

Explain why gap calculations based on formula outputs alone are not sufficient for real-world system design. What physical phenomenon is not accounted for in the formula and what is the correct design response to it?

Q2

Describe the difference between how you use rate calculators in early solutioning versus final engineering. What changes between the two stages and what stays the same?

Q3

A sorter runs at 180 FPM. A takeaway spur at a 30-degree divert angle is being designed. Why can the spur not run at 180 FPM and what calculator do you use to determine the correct spur speed?

Calculator Exercise

Q1

You are in the early solutioning phase for a system that must process 1,800 cases per hour. The average package is 14 inches long. The minimum required gap for the downstream scan tunnel is 4 inches. Using the Speed Formulas calculator, determine the required belt speed. Apply appropriate slippage margin to the gap input and state your adjusted gap assumption. Then apply the plus or minus ten percent solutioning tolerance to the belt speed output and state the speed range you are confirming the conveyor must operate within. Finally, check that speed range against the published maximum speed for a standard 190-E24 conveyor at 15 lb average package weight and state whether the conveyor type is confirmed or requires review.

Scenario Question

Q1

You are in the flow diagram phase designing a system with a shoe sorter running at 150 FPM and four takeaway spurs, each at a 30-degree divert angle. You are also specifying the accumulation conveyor feeding the sorter induction, which must deliver 2,200 cases per hour. The average package is 12 inches long and the induction requires a minimum 6-inch gap. Walk through the complete calculation sequence: determine the required induction feed speed with slippage margin applied, determine the required spur speed, and identify for both results whether you are in solutioning or final engineering mode and what that means for how you interpret and act on the outputs.

END OF MODULE 6

Next: Module 7 | Sortation and Specialty Systems

Before continuing, complete the calculator exercise using the actual Speed Formulas and Case Feet Per Minute calculators. Do not estimate the outputs. Run the calculators and record the actual numbers.

Keep the speed outputs from this module alongside your flow diagram. Module 7 builds the sortation system design on top of the speed picture established here.

The slippage margin discipline and the solutioning versus final engineering distinction introduced in this module apply to every calculation in every module that follows. Practice both deliberately.