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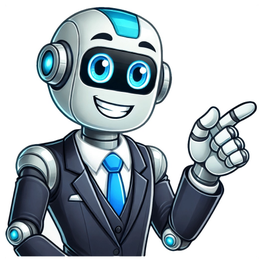

Productivity calculation Most of the industrial engineers calculate worker/line efficiency on the basis of SAM value and actual productivity (per hour productivity of a operator/line). Below are the simple methods to calculate worker/line efficiency and productivity. Worker/line efficiency SAM (Standard allowed minutes) of the garment = 10 Minutes produced by each labor =(40 pieces X 10) = 400 minutes Minutes Available = 10 Hrs x 60 Minutest = 600 Worker/line efficiency = (Minutes Produced / Minutes Available) = (400/600*100)% = 66.66 Productivity per worker Total production in day per line =1600 pieces Total manpower (operator +helpers+ others) = 40 Working time = 600 minutes (10 hours) Productivity for 10 hours is =Total pieces produced/ manpower = (1600/40) Pieces =40 pieces. By signing up, you agree to our Terms of Use and acknowledge the data practices in our Privacy Policy. You may unsubscribe at any time. Prakash Dutt May 4, 2021 April 6, 2019 Prakash is an accomplished apparel professional with extensive experience in apparel manufacturing, sourcing, quality control, sustainability, and CSR.He is a lean management professional (black belt in lean six sigma), innovative and open to experimenting with new technology and changes in the industry. You might be using the formula to calculate standard time, labor productivity, and labor cost per minute. There are many such common performance measures we need to calculate every day for preparing daily reports and measuring performance in various parameters. Many use online calculators to find results. In this article, we will try to understand how the basic performance measures are calculated and the formulas that are used for calculating those measures. In the apparel industry, industrial engineers, production managers, and production planners measure the factory performance daily by following a standard formula for each measure. You might be already using such formulas for calculating your factory performance. For example, industrial engineers prepare OB sheet, measure key performance indicators (KPIs) prepare daily reports on factory performance, and line performance in terms of productivity and efficiency. They also measure line capacity as well as individual operator capacity in the given hours. All these are essential for production management, balancing work, and planning production and manpower. As these are common measures in apparel production, most of the factories use Excel templates to prepare such reports and calculations where the Excel templates are pre-filled with formulas. We just follow the report template. We don't need to calculate every time we make a report. So, many times we are not clear about how to calculate a particular measure. Let's discuss 10 basic production measures and the formula used to calculate those measures. 1. Hourly production target Hourly production target calculation is a part of an OB and daily production report. Hourly production target is calculated for individual operators as well as for a line as needed. In an OB production target is calculated for each operation. The following formula is used to calculate the hourly production target. Hourly production target = (60 / Operation SAM) Note: This target is calculated at 100% efficiency. If you want to plan an hourly production target at a certain percentage (i.e. at 75% efficiency), multiply the above by line efficiency for line target calculation. Multiplying the value by individual operator efficiency to calculate individual operator target and operation-wise target. A few examples are shown for calculating hourly production targets at 100% efficiency in the table below. Table 1: Examples of hourly target calculation Like the hourly production target, the daily production target of a line is calculated. This target is given to line supervisors. Based on the daily production target production planning and the total production time needed to complete an order are calculated. The following formula is used to calculate the daily line target. Daily Line Target = (Shift hours X 60 X No. of operators working in a line X Line efficiency %) /Garment SAM See the example in the following table. Table -2: Daily production target calculation We measure individual operators' performance (efficiency %) for operator grading, skill matrix, and daily employee performance reporting. In case you are distributing performance-based incentives to individual operators, you need to measure individual operator efficiency too. This is the formula to calculate individual operator efficiency. Individual operator Efficiency% = (Total minutes produced*100/Total minutes worked) Total minutes produced = Total units produced X operation SAM See the following examples (Table 3) for calculating individual operator efficiency. In case an operator is doing more than one operation, first calculate the total minutes produced in each operation and sum up the total minutes produced in all operations by an employee. Table 3: Examples of individual operator efficiency calculation Line efficiency is the common measure for measuring line performance and factory performance. The performance of a production line varies depending on operators' skills, product design, line balancing, presence of lost time, style run time, and many other factors. Better efficiency means higher output and reduced production costs. So we aim to improve line efficiency as much as possible. Line efficiency is calculated using the following formula. Line Efficiency% = (Total minutes produced *100) / (Total hours worked * 60) Where, Total minutes produced by the line = Line output X Garment SAM Total hours worked by the line = Number of operators X Shift hours Table 4: Examples of line efficiency calculationNote: Include helpers and workers doing manual operations in the manpower, in case SAM of the manual operations are included in garment SAM. The above formula is used majorly for line efficiency calculation. This is known as output-based line efficiency. Line efficiency can be also measured differently. Instead of line output data, individual operators' produced minutes and hours worked are calculated first, and later their produced minutes and hours worked are summed up to the calculated line's produced minutes and total hours worked.To many factories, this is not easy to calculate individual operators' output, their total produced minutes, and the actual hours they worked in a day. Following the second method is only practical if a factory is using a real-time production tracking system. 5. Machine Productivity Machine productivity is measured to know the average production per machine per day or in the defined time frame. A line with 48 machines producing 480 shirts and another line with 36 machines producing 400 shirts (same design). How do you figure out which line doing better? This can be answered simply by measuring machine productivity. Productivity is the ratio of output and input. The machine productivity of a production line is calculated using the following formula. Machine Productivity= Line output / No. of machine used Machine productivity is measured as production per machine per shift day. See the following example (Table 5). Table 5: Example of machine productivity calculationFloor productivity is also measured as labor productivity. Instead of machine input in this case line output is divided by labor input to calculate labor productivity. See the following example of labor productivity calculation in Table 6. Normally, number of manpower utilized in a production will be greater than equal to the machines used in the line. In such cases, labor productivity will be less than machine productivity. In modular lines, line-wise assigned operators can be less than the machine count. Labour Productivity = (Line Output Quantity / No. of total manpower (operators +helpers))Table 6: Labor productivity calculation Standard time is the time allowed to an operator to carry out the specified task under specified conditions and defined level of performance. This is a standard definition for standard time. Some additional time is added to the basic time to arrive standard time of a task. In practice, none can work throughout the day without taking a rest. Operators need time for relaxation from fatigue. Various allowances are relaxation allowance, contingency allowance (like machine breakdown), and bundle allowance (for the PBS system). Standard Time = (Observed time X observed rating) + Allowances Allowances include Relaxation allowance, contingency allowance The basic constituents of standard time are shown in the following chart. This chart shows how standard time is made up of observed time and basic time of a job. Chart-1: This chart shows how standard time is made up. Source: Introduction to work study by ILO Related post: Standard Minute Value (SMV): Definition, Calculation and Use Machines and equipment are primary resources of garment manufacturing units. These resources must be utilized as much as possible to improve factory performance. But due to work unavailability or less work, some machines (like specialized machines) are partially utilized by the factory. In such cases, the same machine is shared for multiple lines. Machine utilization is calculated using the below formula. Machine utilization% = (Actual machine running time X 100) / Time available If you are running one of your special machines for only 4 hours in 8 hours a day, utilization of that particular machine would be 50%. 9. Labor cost per unit Labor cost is part of garment FOB. For every order, we have a target labor cost. We need to track the actual labor cost and control it. So we measure it after a style is loaded. Here is the formula to calculate labor cost per garment. Labor cost pet unit = (Total cost incurred in labor wages / No. of garments produced) in a day Production capacity is measured in available minutes as well as in the number of pieces. First, we will see how available minutes in a line are calculated. Then we will calculate capacity in the number of garment units per day. Line capacity per day= {(No. of machine x daily work hours x 60)*(1 – absenteeism %)} x Efficiency % (capacity in minutes) Production capacity (in pieces) = (Available minutes / Garment SAM) Table 7: Example of production capacity calculation Related post: How to Calculate Production Capacity of a Factory? Like other garment manufacturing units, you may be also measuring key production measures to keep track of production performance and control the production. Whatever measures and formulas you are using must be standardized and approved by the authorized person internally. Also, everyone in an organization should be aware of how the particular measures are calculated. 85%(13)85% found this document useful (13 votes)28K viewsThe document provides formulas used in garment production for calculating important metrics like capacity, cycle time, team target, capacity achievable, balance, standard time, daily output,... SaveSave Some IE Formula Use in Garments Production For Later85%85% found this document useful, undefined85%(13)85% found this document useful (13 votes)28K viewsThe document provides formulas used in garment production for calculating important metrics like capacity, cycle time, team target, capacity achievable, balance, standard time, daily output,... © Textile Calculator Ltd, . Disclaimer: All calculators in the Textile Calculator have been reviewed by the relevant textile industry experts. Garments Efficiency (%) = (Produced Minutes ÷ Available Minutes) × 100The calculation involves two main components:Produced Minutes = Total pieces produced × Standard minute value (SMV)Available Minutes = Number of operators × Total working hours × 60This formula helps factory managers assess their production processes and identify inefficiencies.In textile manufacturing, efficiency is critical. One essential tool for evaluating productivity is the garments efficiency calculator. This tool enables manufacturers to measure how effectively their resources, such as operators and time, are utilized during production. With precise calculations, the garments efficiency calculator helps identify areas for improvement and optimize overall operations.lets manufacturers.A garments efficiency calculator is a tool used in textile production to determine how efficiently a factory utilizes its time and labor to produce garments. The formula measures the ratio of productive time (produced minutes) to the total available time (available minutes) expressed as a percentage.Efficient garment production is essential to ensure high-quality output, meet deadlines, and maintain profitability. Poor efficiency leads to wasted resources, missed production targets, and increased costs. Factories can pinpoint bottlenecks, optimize workflows, and improve overall productivity by calculating efficiency.To calculate efficiency, follow these steps:Produced Minutes: Multiply the number of garments produced by their respective SMV.Available Minutes: Multiply the number of operators by total working hours and convert the hours into minutes.Divide the produced minutes by the available minutes, then multiply by 100 to get the efficiency percentage.Total Garments Produced: 500 piecesSMV: 2.5 minutesOperators: 10Working Hours: 8Produced Minutes = 500 × 2.5 = 1250Available Minutes = 10 × 8 × 60 = 4800Efficiency (%) = (1250 ÷ 4800) × 100 = 26.04%This indicates that only 26.04% of available time was utilized in productive work.The calculator helps managers allocate resources more effectively, ensuring no time or labor is wasted.By identifying inefficiencies, factories can optimize workflows to boost output and meet production targets.Better efficiency reduces idle time and unnecessary labor costs, improving overall profitability.With accurate efficiency data, factory managers can make informed decisions about staffing, equipment, and production schedules.Investing in skill development for workers ensures higher productivity and fewer errors during garment production.2. Maintain Equipment RegularlyWell-maintained machinery operates efficiently, reducing downtime and minimizing disruptions.Arrange workstations to minimize unnecessary movement and improve workflow efficiency.Regularly track efficiency metrics and compare them with industry benchmarks to stay competitive.This tool is essential for:Production Managers: To track and optimize efficiency.Industrial Engineers: For workflow analysis and improvement.Factory Owners: To ensure cost-effective operations and higher profits.A good efficiency percentage varies by industry standards but typically ranges between 50% and 70%. Top-performing factories may achieve over 80%.Focus on worker training, regular equipment maintenance, workflow optimization, and performance monitoring to increase efficiency.Yes, several software tools and apps are available to automate efficiency calculations and generate detailed reports.A garments efficiency calculator is a vital tool for optimizing textile manufacturing operations. It provides actionable insights into how resources are utilized, helping factories achieve higher productivity and profitability. By implementing the efficiency formula and adopting best practices, manufacturers can ensure smooth operations and maintain a competitive edge in the garment industry. The comparison of what is produced or performed with what can be achieved with the same consumption of resources (money, time, labor, etc.) So, Efficiency Calculation Formula=(QC Pass×SMV) ÷ (Manpower×Working Hours×60)×100Measuring efficiency in the garment manufacturing industry is pivotal for optimizing production processes and boosting profitability. This calculation highlights areas for improvement and aids in setting realistic production targets.What is Efficiency?Efficiency in the garment industry is key to success. This sector thrives on the ability to produce quality clothing quickly and at low costs. Efficiency measures how well resources convert into products. 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Firms seek ways to boost output while maintaining quality. This section explores effective strategies to enhance efficiency.Continuous Improvement PracticesContinuous improvement drives productivity. It involves regular analysis and adjustments. Implementing lean manufacturing techniques can streamline processes. This minimizes waste and optimizes resource use. Key practices include:Kaizen: Small, ongoing positive changes create significant improvements.5S Methodology: Sort, Set in order, Shine, Standardize, and Sustain to keep workspaces efficient and organized.Value Stream Mapping: Identifies process inefficiencies, enabling targeted improvements.Employee Training And IncentivesSkilled workers are productive workers. Effective training programs ensure employees are proficient and updated with the latest industry standards. Incentive schemes motivate staff to exceed targets. Consider these points:On-the-job trainingTechnical WorkshopsIncentives like bonuses, recognition, and career development opportunities encourage high performance. They can be structured as:Performance bonuses for meeting or exceeding goals.Employee of the month for exceptional work.Training opportunities for personal growth.ConclusionEfficiency in the garment industry is crucial for profitability and sustainability. Manufacturers can optimize production and reduce waste by mastering the art of efficiency calculation. Adopt this knowledge to stay competitive and meet the ever-evolving market demands. Let's embrace these strategies for a thriving future in garment manufacturing.Read More: How To Calculate SMV in Garments Industry: Easy WayTakt Time Formula: How to Calculate Takt Time in Easy WayFrequently Asked QuestionsGarment efficiency is calculated using the formula: (QC Pass × SMV) ÷ (Manpower × Working Hours × 60) × 100. The actual output is determined by the number of units produced and compared to a standard or expected production within a specific time frame.Factors affecting efficiency include worker skill levels, machine performance, workflow management, and the quality of raw materials. Streamlining operations and training can significantly improve efficiency.Measuring efficiency in garment manufacturing helps identify areas for improvement, ensures optimal resource use, and maintains competitiveness by reducing costs and increasing productivity.Yes, technology such as automated machines and skilled manpower, along with good techniques, can greatly boost efficiency by speeding up production processes. Line efficiency is a known term in the readymade garments sector. Line efficiency plays an important role to produce target garments production. Normally it's done by industrial engineers. As its importance in garments manufacturing, today I will present here the estimation method of line efficiency for garment production.Line Efficiency of a Garment ProductionCalculation Method for Line Efficiency of a Garment Production:An industrial engineer has to confirm the following items before starting the calculation method for line efficiency of garment production:Production output from the line (Pcs),The standard allowed minutes (SAM) for garments,Total number of operators in the line,Total working hours.Now, by applying all the above items in the below formula, an industrial engineer can easily estimate the line's efficiency of garment production.Line's Efficiency (%), Now, one example is enough to remove all the confusion from the above discussion.Example:In Zara Fashion Ltd. a garment production line produced 300pcs Sweet shirt garments in 45 Standard allowed minutes (SAM) by using 40 operators, where working hours was 8.Now, estimate the line's efficiency for the mentioned garment production.Solution:Here, Production output from the line- 300pcs The standard allowed minutes (SAM) for Sweet shirt garments – 45 Total number of operators in the line – 40 Total working hours – 8hrsNow, by using the following formula, the industrial engineer can estimate easily the line's efficiency of the mentioned garment production.Line's Efficiency (%), = 70.3%So, the line's efficiency of the mentioned sweet shirt garments production stands at 70.3%More questions related to this article:What do you mean by line's efficiency in the apparel sector?What is the line's efficiency in the clothing industry?Which method normally followed to calculate a line's efficiency in a garment manufacturing factory?Show a method for calculating the line's efficiency of apparel production.Written By-Mayedul Islam Merchandiser at Fashion Xpress Buying House. Badda, Dhaka, Bangladesh. Email: mayedul.islam66@gmail.comMayedul Islam is a Founder and Editor of Garments Merchandising. He is an Expert in Garments Merchandising. Writing is his passion. He loves to write articles about Apparel, Textile and Garment Washing specially on Merchandising. Mail him at mayedul.islam66@gmail.com The efficiency formula is used for measuring batch production efficiency and workers' production efficiency. The efficiency is the work output from an operation, divided by work input from the same operation, and expressed as a percentage. The general formula for calculating efficiency is: (Work output /work input) X 100 If you consider work input and output in 'minute', the efficiency formula would be like this - the ratio of total standard minutes produced and total minutes spent on the work. I am working in the apparel manufacturing sector. In a garment manufacturing factory, we calculate line efficiency every day to check and measure their line performance. We use the following formula for calculating efficiency. Efficiency Formula Efficiency % = (Total minutes produced X 100)/(Total hours worked X 60) In the above formula, 60 is multiplied to convert hours into minutes and 100 is multiplied to express in percentage. In the second formula, instead of calculating minutes, we are considering produced garments as output and production targets for the given hours as an input. The production target is calculated from the garment SAM. The below formula is used for calculating the production target. Production target per hour (@100 Efficiency) = (60/Operation SAM) Also Read: How to calculate hourly production target? In the garment manufacturing sector, production efficiency data is calculated in many forms. Like, Individual employee efficiency for the day, individual efficiency per hour, line efficiency, and factory efficiency. In all cases, the efficiency calculation formula remains the same. The total minutes produced and total minutes worked need to be calculated based on where the formula is used. Calculate individual operator efficiency Let's find the efficiency of a stitching machine operator. The machine operator is worked 8 hours and he has produced 400 garments in the given job. The standard time of the job was 30 seconds. Note that to calculate produced minutes you need to know the standard minute of the job (operation). He has produced minutes (400 X 30)/60 = 200 minutes. He has worked 480 minutes. So, his efficiency is (200/480)*100 = 41.67 % The line efficiency calculation method is explained in an earlier post. Read How to calculate line efficiency? Source: www.accountingtools.com, www.softschools.com Author: Calculator Academy Team Last Updated: August 2, 2023 How do I use this calculator? The basic portion of this calculator allows you to calculate any of the variables shown directly above. Calculator Operations: Enter the line output, garment SAM, and manpower to calculate the garment industry efficiency. Enter the line output, garment SAM, and shift hours to calculate the manpower. Enter the line output, manpower, and shift hours to calculate the garment SAM. Enter the line output, garment SAM, and manpower to calculate the shift hours. Enter the line output, manpower, and shift hours to calculate the garment industry efficiency. The advanced version of this calculator adds additional parameters such as total shift hours and overtime hours to calculate a more accurate efficiency. Use the calculate button when all known values have been entered and use the reset button when you want to clear the values from the calculator. Enter the line output, Garment SAM, manpower, and shift hours into the calculator to determine the garment line efficiency. The following equation is used to calculate the Garment Industry Efficiency. LE () = (O * GSAM) / (M*H*60) * 100 Where LE is the line efficiency in the garment industry (%) O is the output of the line (# of pieces) GSAM is the standard minutes of a garment (machine SAM and manual SAM) M is the total manpower (#people) H is the shift hours (hours) Definition: In the garment industry, efficiency is most often used to describe line efficiency in a factory. This line efficiency measures how many garments the line produces relative to its theoretical maximum output. Example Problem: The following example outlines the steps and information needed to calculate Garment Industry Efficiency. First, determine the line output. In this example, the line output is 50 pieces. Next, determine the Garment Sam. For this problem, the Garment SAM is 20 minutes. Next, determine the manpower. For this example, 5 people are working on the line. Next, determine the shift hours. Each worker is expected to work 8 hour shifts. Finally, calculate the garment line efficiency using the formula above: LE (%) = (O * GSAM) / (M*H*60) * 100 LE (%) = (50 * 20) / (5*8*60) * 100 LE (%) = 41.667 % Are you struggling to measure your garment production efficiency? Do you want to optimize your factory's performance and meet production targets effortlessly? You're in the right place! Introducing the Garment Production Efficiency Calculator – a simple, powerful tool designed to help you track and improve your production processes.What is Garment Production Efficiency?Garment production efficiency measures how effectively your factory converts labor and time into finished products. It's a key metric for any garment manufacturer aiming to reduce waste, save costs, and meet deadlines. But calculating efficiency manually can be time-consuming and error-prone. That's where our calculator comes in!Why Use the Garment Production Efficiency Calculator?Save Time: No more manual calculations. Get instant results with just a few clicks.Accurate Results: Ensure precision in measuring efficiency, production targets, and line performance.User-Friendly: Designed for everyone – from factory managers to production supervisors.Free Tool: No downloads or subscriptions required. Use it anytime, anywhere.How Does the Calculator Work?The calculator uses industry-standard formulas to provide accurate results. Here's what you need to input:Number of Garments Produced: Enter the total garments your team produced.Standard Time per Garment (SAM): Input the time (in seconds) it takes to produce one garment.Total Hours Worked: Add the total hours your team worked during the shift.Target Production (Optional): Set your production target to compare actual performance.Number of Operators (Optional): Enter the number of operators to calculate line efficiency.Once you input the data, the calculator will instantly show:Total Minutes ProducedEfficiency PercentageProduction Target per HourComparison with Target ProductionLine Efficiency (if applicable)Example CalculationLet's say your team produced 400 garments with a SAM of 30 seconds and worked for 8 hours. Here's what the calculator will show:Total Minutes Produced: 200 minutesEfficiency Percentage: 41.67%Production Target per Hour: 2 garmentsComparison with Target Production: 88.89% (if the target was 450 garments)Line Efficiency: 4.17% (if 10 operators were working)Tips to Improve Garment Production EfficiencyTrain Your Team: Skilled workers perform tasks faster and with fewer errors.Optimize Workflow: Arrange workstations to minimize movement and delays.Use Technology: Invest in tools like this calculator to track and analyze performance.Set Realistic Targets: Use SAM and efficiency data to set achievable goals.Monitor Regularly: Track efficiency daily to identify and fix issues quickly.Final ThoughtsEfficiency is the backbone of successful garment production. With the Garment Production Efficiency Calculator, you can easily measure, analyze, and improve your factory's performance. Start using it today and see the difference it makes in your production process! 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In this article, we discuss How to Calculate Operator Efficiency in the Garments Industry. Operator efficiency in the garment industry is a measure of how productive an operator is compared to the standard time allowed for a particular task. A higher efficiency indicates the operator is producing garments close to the ideal rate. Formula: To calculate the operator efficiency following formula should be followed by any industrial engineer. Operator efficiency (%) = Total minute produced by an operator/ Total minute attended X 100 Where,Total minute produced=Total piece made X SAM of the operation (Cutting or Sewing) &Total minutes attended=Total hours worked in the machine X 60 To collect the data following step should be done using in operator efficiency formula. 1st step:On a definite operation firstly we have to know the SAM of that operation. By counting the time using a stopwatch we can collect this data. 2nd step:Secondly, we have to know how many piece he or she made on that SAM. Counting the total piece of garments after SAM of any operation we can get it. 3rd step:Then we also have to mark that how many hours he or she worked on that machine. From the shift hours, we can assume this time. Usually, 8 hours is in a shift. Then from the above all data finally we can find the operator efficiency by using the operator efficiency calculation formula at work. We have to also consider that an operator doesn't spend all the time in a machine. In that case, we have to minus the time that he or she spends on doing other things like lunch, going to the toilet, etc. Example:An operator was doing an operation of SAM for .50 minutes. In 8 hours shift day, he produces 400 pieces. So according to the efficiency calculating formula, we can put this info below like this formula. Efficiency at work= (400 X .50)/(8X60) * 100=200/480 *100=0.4167*100=41.67 % For exercise:1. An operator was doing an operation of SAM for 0.40 minutes. In 8 hours shift day, he produces 350 pieces. Find out the operator's efficiency at work. Answer: 29.17% 2. An operator needs 0.45 minutes to sew a garment. He spent 8 hours on that machine and produced a total of 380 pieces of garments. So what will be the operator's efficiency at work? You can calculate and let us know in the comment box. The main objective of the IE department in the garments industry is to increase operator efficiency. A comprehensive strategy incorporating technology, process improvement, training, and a positive work atmosphere is needed to increase operator efficiency. The productivity and quality of clothing manufacturers can be significantly increased by consistently improving these factors. How to Calculate Operator Efficiency in Garments Industry?