

Conveyor Speed & Cars Per Hour

“Cars per hour” is a relative term that has many different definitions and calculations throughout the car wash industry. This article explains how Hanna computes cars per hour and how it compares to the way many competitors and car wash management programs calculate the volume of a car wash.

Conveyor speed is usually measured in feet per minute, cars per minute or cars per hour. The first two options need little explanation. However, the third requires a formula and some basic rules.

Determining Car Per Hour

Determining cars per hour requires additional information about the conveyor. Namely, you must know the roller spacing of the conveyor and understand the assumption being made about the length of vehicles.

A vehicle can only be loaded on the conveyor when there is a roller available to push the vehicle. For example, if the average vehicle is 17 feet long and we need 3 feet between vehicles, we need approximately 20 feet per vehicle.

Inefficient Roller Spacing. Using the above example, if we have a conveyor with 14 feet roller spacing, we can send a car through the car wash every 28 feet of conveyor. Therefore for every 17-foot vehicle, we are using 28 feet of conveyor — not a very efficient use of our conveyor. To produce 60 cars per hour, our conveyor must travel at 28 feet per minute (or 28 feet per car). This equals a total of 1680 feet per hour for your conveyor to wash 60 cars per hour.

Efficient Roller Spacing. Now assume the conveyor has 7'-4" roller spacing. The average vehicle requires 20 feet. With 7'-4" roller spacing we can load a vehicle every 22 feet (or every third roller at 7'-4" -- $3 \times 7'-4" = 22$ feet). To produce 60 cars per hour, the conveyor must move at a rate of 22 feet per minute for a total of 1320 feet per hour. **This is a reduction of over 21 percent of conveyor speed.**

Correctly Calculating Cars Per Hour

Hanna uses conveyor roller spacing and conveyor speed to calculate cars per hour for car washes. Hanna provides two different roller spacings, which in the long run, provide basically the same results. Those spacings are 3'-6" and 7'-4", which result in 22 feet of conveyor required per vehicle. Thus to simply calculate cars per hour (CPH), just do the following:

1. Time the conveyor to determine how long it takes to move 22 feet. For 7'-4" spacing, it is the distance of 3 rollers. For 3'-6" roller spacing, it is the distance between 6 rollers.
2. Make the following calculation:

$$3600 / (\text{Time In Seconds}) = \text{Maximum Cars Per Hour}$$

$$\text{For example: } 3600 / 60 = 60 \text{ Cars Per Hour}$$

The result is the maximum number of cars that the conveyor can transport in one hour.

In reality, the maximum may not be attained. Each time you miss one roller and cars are not loaded "bumper to bumper," you have reduced the maximum conveyor throughput by 1/3 of a car. Once you have missed three rollers, your maximum car per hour rate has been decreased by one vehicle.

Running Your Car Wash More Efficiently

It is vital that every roller is used efficiently to insure the maximum throughput at your given conveyor speed. If you are missing rollers and you have 7'-4" or more between your cars, the solution is not to increase your conveyor speed — but rather to review your loading procedures. The goal should be to process the maximum number of cars at the slowest conveyor speed without causing timely delays at the entrance of the car wash.

Beware of Car Wash Management Programs That Provide Inaccurate CPH!

Did you know that many car wash management programs often provide inaccurate car per hour calculations? These programs often calculate an average vehicle length and then calculate the cars per hour from that dimension. This leads to invalid information with regards to conveyor speed. You cannot load more cars on a conveyor than there are rollers available. If the average car length is 17 feet, it still requires room before and after the car for the brushes to operate properly. In reality, you can only load one car per 22 feet.

Correct Car Per Hour Times

The following chart shows the times required for conveyors that have 22 feet roller spacing per car.

CPH	Seconds
30	120.0
40	90.0
50	72.0
60	60.0
70	51.4
80	45.0
90	40.0
100	36.0
110	32.7
120	30.0
140	25.7
150	24.0
160	22.5
180	20.0