

18th Technical Training Series

December 3-6, 2018 | Hyatt Regency Monterey



Waste Tire Counting



USEFUL TOOLS
AND
COMMONLY
ENCOUNTERED
SITUATIONS

Session Outline

Importance

General Information

References and Tools

Basic Methods for Counting Tires

- Direct count

- Volumetric estimation

Common Situations and Basic Formulas

Review, Discuss and Practice

Importance

Developing an accurate, defensible waste tire count is the core activity performed during an inspection

Waste tire count is the key metric that determines applicability of California waste tire laws & regulations.

Nothing conducted during an inspection is more important than this.

Known Tire Counting Issues

Law does not distinguish between different sizes of whole tires

- 1 golf cart tire = 1 semi-truck tire = 1 passenger tire = 1 OTR

Tire piles often contain different types of tires

- Inspector discretion as to conversion factor used

WTMS converts weight and volume CTL data into Passenger Tire Equivalents (PTE)

- Based on conversion factor of 20# per waste tire and 10 tires per CY

Waste Tire Math Reference Guide

(4 page document)

Waste Tire Math Reference

Prepared by CalRecycle Waste Evaluation and Enforcement Branch

Volumetric Calculations

Note—When counting whole tires, each tire counts as one tire regardless of size or mass.

Passenger Tire Equivalent (PTE)

PTE is only to be used for volumetric calculations of Altered Waste Tires. Never calculate or incorporate PTE in any whole tire count. 20 lbs = 1 PTE (See 14 CCR 17225.770)

Calculating Area

Area of Polygons

A polygon is a two dimensional (plane) shape with straight sides.

Area of a rectangle = base × height
Area of a rectangle = length × width



Area of a triangle = 1/2 base × height



Area of a parallelogram = base × height



Area of a trapezoid = 1/2 (base1+base2) × height



Area of Ellipse and Circle

An oval or ovoid is any curve that looks like an egg or an ellipse. It is not a precise term and there are many curves that get called "oval."

An ellipse is a regular oval shape, traced by a point moving in a plane so that the sum of its distances from two other points (the foci) is constant. π , sometimes written pi, is a mathematical constant whose value is the ratio of any circle's circumference to its diameter. π is approximately equal to 3.1416.

Area of a circle = πr^2



Area of an ellipse = $\pi \times r_1 \times r_2$

NOTE: Radius is diameter divided by 2.

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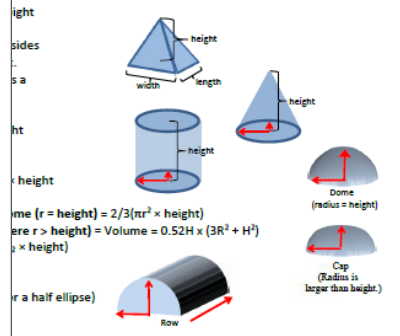
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Count Averages, and Questionable Counts

This would apply to volumetric estimates, count averages, and not unquestionably count every tire, but where volumetric pile of a count average would be finding 19 stacks that appear to each tire, but instead calculated 19 × 8 = 152, then list the total as 121. Do not count that you can unquestionably count, and another portion that you the portion you cannot unquestionably count.

Other Formulas to Use When Converting to CY

Sidewalls = 20 tires/cy
Treads = 20 tires/cy
Primary Shreds = 20 tires/cy
Shreds 2 inches or smaller = 40 tires/cy

Crumb Rubber

Waste tire material less than or equal to 1/4 inch in size (6mm) is not regulated by CalRecycle. (See 14 CCR 17225.720 and 14 CCR 18450 (a) (38))

Passenger and Light Truck Tires

Less than 15 Years

10 to 15 Feet	More than 15 Feet
12 Tires/Cubic Yard	14 Tires/Cubic Yard
14 Tires/Cubic Yard	16 Tires/Cubic Yard
16 Tires/Cubic Yard	18 Tires/Cubic Yard

More than 15 Years

10 to 15 Feet	More than 15 Feet
14 Tires/Cubic Yard	16 Tires/Cubic Yard
16 Tires/Cubic Yard	18 Tires/Cubic Yard
18 Tires/Cubic Yard	20 Tires/Cubic Yard

Semi-Truck Tires

Less than 15 Years

10 to 15 Feet	More than 15 Feet
2.75 Tires/Cubic Yard	3.0 Tires/Cubic Yard
4.4 Tires/Cubic Yard	4.6 Tires/Cubic Yard
4.3 Tires/Cubic Yard	4.5 Tires/Cubic Yard

More than 15 Years

10 to 15 Feet	More than 15 Feet
3.5 Tires/Cubic Yard	4.0 Tires/Cubic Yard
4.6 Tires/Cubic Yard	4.8 Tires/Cubic Yard
4.5 Tires/Cubic Yard	4.7 Tires/Cubic Yard



Loose

Laced

Loose
Barrel Stacked

$$\text{Volume} = \text{length} \times \text{width} \times \text{height} = \text{feet}^3$$

$$\text{Volume} = 0.5 \times \text{Base} \times \text{height} \times \text{length} = \text{feet}^3$$

Note: The height is the vertical distance perpendicular to the base, not the length of another side of the triangle.

$$\text{Volume} = 0.5 \times \left(\frac{\text{Base1} + \text{Base2}}{2} \right) \times \text{height} \times \text{length} = \text{feet}^3$$

(DO THIS FIRST) Before doing any multiplication you must first add base1 and base2 together.

$$\text{Volume} = 0.5 \times \text{Base} \times \text{height1} \times \text{height2} \div 3 = \text{feet}^3$$

Note: The height1 is the horizontal distance perpendicular to the base, not the length of another side of the triangular base. Height 2 is the vertical distance perpendicular to the plane of the base triangle.

$$\text{Volume} = \text{length} \times \text{width} \times \text{height} \div 3 = \text{feet}^3$$

$$\text{Volume} = 3.14 \times \frac{R1 \times R2}{2} \times \text{height} \div 3 = \text{feet}^3$$

Note: For an elliptical base R1 should be measured along the widest diameter and R2 should be measured along the narrowest diameter. For a circle R1 and R2 will be the same.

$$\text{Volume} = 0.52H \times (3R^2 + H^2)$$

Note: This equation works for any dome shaped pile with a roughly circular base, and any height. See next dome equation for a simplified version but note the additional restrictions.

$$\text{Volume} = 2.1 \times \frac{R \times R}{2} \times \text{height} = \text{feet}^3$$

Note: This equation is only accurate for domes that are approximately half of a complete sphere (elliptical or circular).

$$\text{Volume} = 3.14 \times \frac{R1 \times R2}{2} \times \text{height} = \text{feet}^3$$

Note: For an elliptical base R1 should be measured along the widest diameter and R2 should be measured along the narrowest diameter. For a circle R1 and R2 will be the same.

Waste Tire Math Reference Guide Continued

PTE = Passenger Tire Equivalent

- Addresses quantifying altered waste tires, term is not to be used for whole tires
- 20lbs = 1 PTE
- Found in 14 CCR Section 17225.770

Wa

Volumetric Calcul

Note—When counting whole

Passenger Tire Equivalent

PTE is only to be used
whole tire count.

Calculat

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Area of Ellipse and Circle

An oval or ovoid is any curve that looks like an oval. It is a curve that looks like an oval.

An ellipse is a regular oval shape, traced by a point moving in a plane so that the sum of its distances from two other points (the foci) is constant. It, sometimes written pi, is a mathematical constant whose value is the ratio of any circle's circumference to its diameter. π is approximately equal to 3.1416.

Area of a circle = πr^2

Area of an ellipse = $\pi \times r_1 \times r_2$



NOTE: Radius is diameter divided by 2.

Waste Tire Math Reference Guide Continued

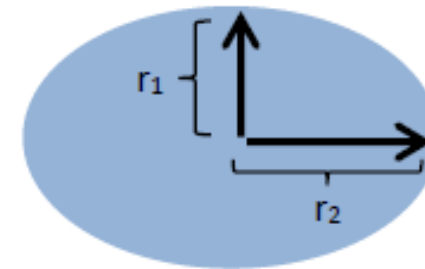
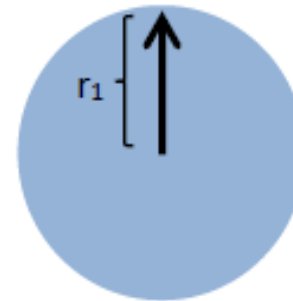
Area of a rectangle = $L \times W$

Area of a triangle = $\frac{1}{2} B \times H$

Area of a **circle** = πr^2

Area of an **ellipse** = $\pi \times r_1 \times r_2$

NOTE: Radius is diameter divided by 2.



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Volumetric Calculat

Note—When counting whole tire

Passenger Tire Equivalent (PTE)

PTE is only to be used for volumetric whole tire count. 20 lbs = 1

Calculating Area

Area of Polygons

A polygon is a shape with three or more sides.

Area of a square = s^2

Area of a rectangle = $L \times W$

Area of a triangle = $\frac{1}{2} B \times H$

Area of a parallelogram = $B \times H$

Area of a trapezoid = $\frac{1}{2} (B_1 + B_2) \times H$

Area of a circle = πr^2

Area of an ellipse = $\pi \times r_1 \times r_2$

Area of a trapezoid = $\frac{1}{2} (B_1 + B_2) \times H$

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An ellipse is a regular oval shape, traced by a point moving in a plane so that the sum of its distances from two other points (the foci) is constant. π , sometimes written pi, is a mathematical constant whose value is the ratio of any circle's circumference to its diameter. π is approximately equal to 3.1416.

Area of a circle = πr^2

Area of an ellipse = $\pi \times r_1 \times r_2$



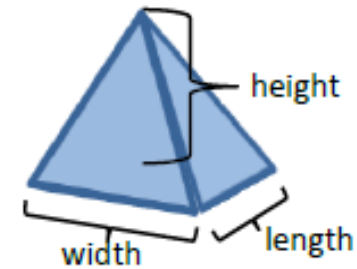
NOTE: Radius is diameter divided by 2.

Waste Tire Math Reference Guide Continued

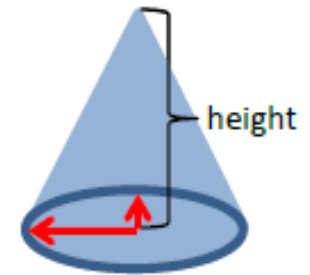
Volumes of cubes and cuboids = $l \times w \times h$

Volume of a pyramid = $1/3(\text{area of base}) \times \text{height}$

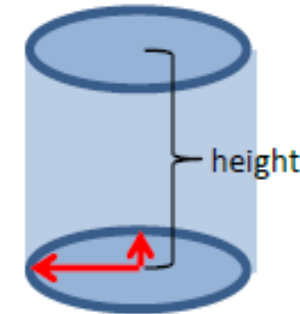
A pyramid has a base and triangular sides which rise to meet at the same point. The base may be any polygon such as a square, rectangle, triangle, etc.



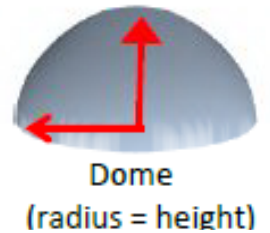
Volume of a cone = $1/3(\text{area of base}) \times \text{height}$



Volume of a circular cylinder = $\pi r^2 \times \text{height}$



Volume of an elliptical cylinder = $\pi \times r_1 \times r_2 \times \text{height}$



Calculating

Volumes of cube

Volume of a pyra

A pyramid which rises to a point. The base may be any polygon such as a square, rectangle, triangle, etc.

Volume of a cone

Volume of a circular cylinder

Volume of an elliptical cylinder

Volume of a dome

Volume of a sphere

Volume of a torus

Volume of a frustum

Volume of a paraboloid

Volume of a hyperboloid

Volume of a spheroid

Volume of a prolate spheroid

Volume of an oblate spheroid

Volume of a paraboloid of revolution

Volume of a hyperboloid of one sheet

Volume of a hyperboloid of two sheets

Volume of a paraboloid of two sheets

Volume of a hyperboloid of two sheets

Volume of a paraboloid of two sheets

Volume of a hyperboloid of two sheets

Volume of a paraboloid of two sheets

Volume of a hyperboloid of two sheets

Volume of a paraboloid of two sheets

Add

Deduct

Reduce any direct count estimation which may be eight tires.

Note—You might not be able to count all tires in such a pile.

Converting Cubic Feet to Tires

Volume in cubic feet

Volume in cubic feet

Volume in cubic feet

Volume in cubic feet

Volume in cubic feet

Volume in cubic feet

Volume in cubic feet

Volume in cubic feet

Volume in cubic feet

Volume in cubic feet

Waste Tire Math Reference Guide Continued

Other notable formulas:

Shreds, treads & sidewalls = 20 tires/cy

Shreds <2 inches = 40 tires/cy

Calculating Volume

Volumes of cubes and cuboids

Volume of a pyramid = $1/3 \times \text{area of base} \times \text{height}$

A pyramid has a base which rises to meet at a point. The base may be any square, rectangle, triangle, etc.

Volume of a cone = $1/3 \times \text{area of base} \times \text{height}$

Volume of a circular cylinder = $\text{area of base} \times \text{height}$

Volume of an elliptical cylinder = $\text{area of base} \times \text{height}$

Volume of hemispherical, conical, or cylindrical caps

Volume of a cap (A circular base)

Volume of an elliptical dome

Volume of a row = area of face \times length

(Face could be any polygon)

Additional Notes

Deduct 20%—

Reduce any estimate of direct counts by 20% if estimation was used.

Estimation will be eight tires high.

Note—You might not be able to count. In such cases, use the estimate.

Use the estimate.

Converting Cubic Feet

Volume in cubic feet/27 = volume in cubic yards

Typical Conversions for Counting

1 whole tire = 2 sidewalls and 1 tread

1 tread = 2 sidewalls*

4 sidewalls = 1 Tire*

2 treads = 1 Tire*

*Regardless of size

1 bale = 60 to 80 tires (Ask the operator)

Waste Tire Math Reference Guide Continued

Whole Passenger and Light Truck Tires

Stored Less than 15 Years

Pile Height	Less than 10 Feet	10 to 15 Feet	More than 15 Feet
Loose Stacked	10 Tires/Cubic Yard	12 Tires/Cubic Yard	14 Tires/Cubic Yard
Barrel Stacked	12 Tires/Cubic Yard	14 Tires/Cubic Yard	16 Tires/Cubic Yard
Laced	14 Tires/Cubic Yard	16 Tires/Cubic Yard	18 Tires/Cubic Yard

Stored More than 15 Years

Pile Height	Less than 10 Feet	10 to 15 Feet	More than 15 Feet
Loose Stacked	12 Tires/Cubic Yard	14 Tires/Cubic Yard	16 Tires/Cubic Yard
Barrel Stacked	14 Tires/Cubic Yard	16 Tires/Cubic Yard	18 Tires/Cubic Yard
Laced	16 Tires/Cubic Yard	18 Tires/Cubic Yard	20 Tires/Cubic Yard

Whole Semi-Truck Tires

Stored Less than 15 Years

Pile Height	Less than 10 Feet	10 to 15 Feet	More than 15 Feet
Loose Stacked	2.5 Tires/Cubic Yard	2.75 Tires/Cubic Yard	3.0 Tires/Cubic Yard
Barrel Stacked	4.2 Tires/Cubic Yard	4.4 Tires/Cubic Yard	4.6 Tires/Cubic Yard
Laced	4.1 Tires/Cubic Yard	4.3 Tires/Cubic Yard	4.5 Tires/Cubic Yard

Stored More than 15 Years

Pile Height	Less than 10 Feet	10 to 15 Feet	More than 15 Feet
Loose Stacked	3.0 Tires/Cubic Yard	3.5 Tires/Cubic Yard	4.0 Tires/Cubic Yard
Barrel Stacked	4.4 Tires/Cubic Yard	4.6 Tires/Cubic Yard	4.8 Tires/Cubic Yard
Laced	4.3 Tires/Cubic Yard	4.5 Tires/Cubic Yard	4.7 Tires/Cubic Yard

Tires per Cubic

Pile Height	Less than 10 Feet
Loose Stacked	10 Tires/Cubic Yard
Barrel Stacked	12 Tires/Cubic Yard
Laced	14 Tires/Cubic Yard

Stored More than 15 Years

Pile Height	Less than 10 Feet
Loose Stacked	12 Tires/Cubic Yard
Barrel Stacked	14 Tires/Cubic Yard
Laced	16 Tires/Cubic Yard

Whole Passenger and Light Truck Tires	
Stored Less than 15 Years	
Pile Height	Less than 10 Feet
Loose Stacked	2.5 Tires/Cubic Yard
Barrel Stacked	4.2 Tires/Cubic Yard
Laced	4.1 Tires/Cubic Yard

Stored More than 15 Years

Pile Height	Less than 10 Feet
Loose Stacked	3.0 Tires/Cubic Yard
Barrel Stacked	4.4 Tires/Cubic Yard
Laced	4.3 Tires/Cubic Yard



Barrel stacked tires

Waste Tire Counting Tools

Measuring device

- Range finder
- Long tape measure or measuring wheel



Calculator

- Smart phone
- #2 pencil



Waste Tire Counting Methods

Direct count

Volumetric estimation



Volumetric Estimation

As easy as 1,2,3...

1. Calculate the volume
2. Convert volume to waste tires
3. Apply deduction

Volumetric Estimation

Step 1: Calculate the volume

- Identify which geometric shape(s) matches pile shape
- Take measurements
- Plug measurements into formula & calculate volume
- Convert volume into cubic yards

Volumetric Estimation

Step 2: Convert volume to waste tires

- Identify conversion factor that matches pile characteristics
 - tire type, pile height, length of storage, pile configuration
 - Take account for mixed tire types (inspector discretion)
- Multiply volume (cu.yd) by conversion factor
 - Result is the subtotal

Volumetric Estimation

Step 3: Apply deduction

- Deduct 20% to yield a conservative estimate
 - Multiply subtotal by 0.8
- Result is the tire count
- Record calculation and tire count on inspection report

Common Situations and Associated Formulas...



Method:

Direct count



Methods Used:

Direct count &
Rectangular volume

$$L \times W \times H = \text{Vol in ft}^3$$

$$\text{Vol}(\text{ft}^3) / 27 (\text{ft}^3 / \text{Yd}^3) = \text{Yds}^3$$

Loose passenger whole:

$$\text{Yds}^3 \times 10 \text{ tires} / \text{Yd}^3 = \text{Subtotal}$$

$$\text{Subtotal} \times 0.8 = \text{Total}$$



Methods Used:

Direct count &/or
Count averages &/or
Rectangular volume

$$L \times W \times H = \text{Vol in ft}^3$$

$$\text{Vol}(\text{ft}^3) / 27 (\text{ft}^3 / \text{Yd}^3) = \text{Yds}^3$$

Barrel Stacked, truck:

$$\text{Yds}^3 \times 4.2 \text{ tires} / \text{Yd}^3 = \text{Subtotal}$$

$$\text{Subtotal} \times .8 = \text{Total}$$



Methods Used:

Known weight or
rectangular volume

Weight/20 = PTE or
 $L \times H \times W = \text{Vol in ft}^3$

$\text{Vol}(\text{ft}^3)/27 (\text{ft}^3/\text{yd}^3) = \text{Yds}^3$

Laced passenger tires:

$\text{Yds}^3 \times 14 \text{ tires}/\text{yd}^3 = \text{Subtotal}$

$\text{Subtotal} \times 0.8 = \text{Total}$



Methods Used:

Known weight, or
Cylindrical volume

Weight/20 = PTE or
 $\pi r^2 \times H = \text{Vol in ft}^3$

$\text{Vol}(\text{ft}^3)/27 (\text{ft}^3/\text{yd}^3) = \text{Yds}^3$

Altered waste tires:

$\text{Yds}^3 \times 20 \text{ tires}/\text{yd}^3 = \text{Subtotal}$

$\text{Subtotal} \times 0.8 = \text{Total}$



Method Used:

Pyramid volume
(rectangular base)

$$\frac{1}{3} (L \times W) \times H = \text{Vol in ft}^3$$

$$\text{Vol}(\text{ft}^3) / 27 (\text{ft}^3 / \text{yd}^3) = \text{Yds}^3$$

Treads:

$$\text{Yds}^3 \times 20 \text{ tires} / \text{yd}^3 = \text{Subtotal}$$

$$\text{Subtotal} \times 0.8 = \text{Total}$$

Review



Methods Covered:

Direct count

Known weight

Rectangular volume

Cylindrical volume

Pyramidal volume

Pile types:

Loose

Barrel

Laced

Altered

Review Continued...

Use your resources:

- 4 page Waste Tire Math Reference sheet

www.calrecycle.ca.gov/tires/enforcement/inspections/TireMath.pdf

- Waste Tire Conversion Table—found on Waste Tire Math Reference sheet & on CalRecycle's website

www.calrecycle.ca.gov/tires/enforcement/inspections/NumberTires.htm

Volumetric estimation:

- It's all about the volume in cubic yards!!
- May require using multiple shapes/formulas for complex pile shapes

Review Continued...

Document, document, document...

- Include pile measurements & all calculations in your inspection report
- Take pictures to back up your calculations

Use your lifelines:

- For difficult or out of the ordinary scenarios, take measurements and pictures & sort it out back at the office
- Discuss with your colleagues and/or your CalRecycle Inspector Liaison

...and remember, you can do this!



Questions and Practice...

Practice:

Data:

- *Lancaster, Ca.
- *Rectangular pile
- *Assume whole passenger tires
- *Pile not older than 1 year
- *100+ degrees F

Length = 75 ft

Width = 46 ft

Height = 5 ft

Remember, follow the units!



1. Calculate the volume...

Shape: rectangle

Formula: $L \times W \times H$

$$\text{Vol} = 75' \times 46' \times 5' = 17,250 \text{ cu.ft}$$

Convert to Cubic Yards...

Formula: $\text{cu.ft} / 27 = \text{cu.yd}$

$$17,250 \text{ cu.ft} / 27 = 638.39 \text{ cu.yd}$$



2. Convert volume to waste tires...

Tire type(s): whole passenger

Conversion factor: loose stacked, under 10'
= 10 tires / cu.yd

Formula:

Vol x conv. factor = Sub-total

638.39 cu.yd x 10 tires/cu.yd = 6,383.9



3. Apply deduction ...

Formula: Sub-total x 0.8 = Total

6,383.9 tires x 0.8 = 5,107 tires



Practice:

Data:

- *Whole passenger tires
- *Laced configuration
- *53ft enclosed trailer
- *Weight ticket, 13.73 Tons
- *6ft of space from end of trailer to laced tires

Width = 8ft

Height = 9ft

Follow your units!



Known Weight Method:

$$13.73T \times 2000 \text{ lbs/T} = 27,460 \text{ lbs}$$

$$27,460 \text{ lbs} / 20 \text{ lbs/tire} = 1,373 \text{ tires OR...}$$

1. Calculate the volume...

Shape: rectangle

Formula: $L \times W \times H$

$$\text{Vol} = 47' \times 8' \times 9' = 3,384 \text{ cu.ft}$$

Convert to cubic yards...

Formula: $\text{cu.ft} / 27 = \text{cu.yd}$

$$3,384 \text{ cu.ft} / 27 = 125.33 \text{ cu.yd}$$



2. Convert volume to waste tires...

Tire type(s): whole passenger

Conversion factor: laced, under 10' = 14 tires / cu.yd

Formula:

Vol x conv. factor = Sub-total

125.33 cu.yd x 14 tires/cu.yd = 1,754.62 tires



3. Apply deduction...

Formula: Sub-total x 0.8 = Total

1,754.62 tires x 0.8 = 1,403 tires



Practice:

Data:

*Truck sidewalls

*47 bales total

Bale measurements:

Length = 5.5ft

Diameter = 3ft

Pile measurements:

Length = 27.5ft

Width = 12ft

Height = 10.5ft

Follow your units!



1. Calculate the volume...

Shape/Type: Individual bale volume estimation

Formula: πr^2 (or $\pi \times r \times r$) $\times H$

$$\text{Vol} = \pi \times (1.5' \times 1.5') \times 5.5' = 38.88 \text{ cu.ft}$$

Convert to cubic yards...

Formula: $\text{cu.ft} / 27 = \text{cu.yd}$

$$38.88 \text{ cu.ft} / 27 = 1.44 \text{ cu.yd}$$



2. Convert volume to waste tires...

Tire type: sidewalls

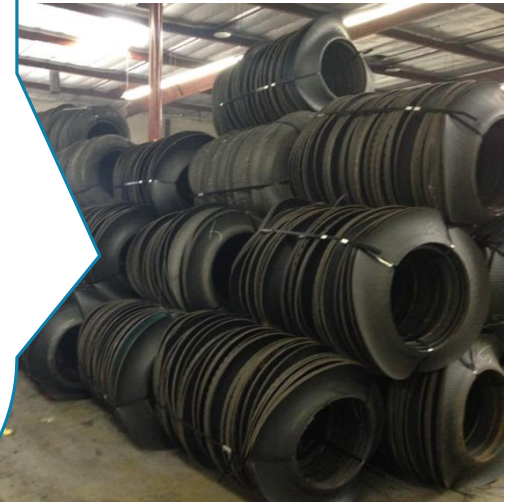
Conversion factor: 20 tires/cu.yd

Formula:

Vol x conv. factor = Sub-total

$1.44 \text{ cu.yd} \times 20 \text{ (tires/cu.yd)} = 28.8 \text{ tires/bale}$

$28.8 \text{ tires} \times 47 \text{ bales} = 1,353.6 \text{ tires}$



3. Apply deduction...

Formula: Sub-total x 0.8 = Total

1,353.6 tires x 0.8 = 1,082 tires



1. Or, calculate the volume...

Shape: triangle row

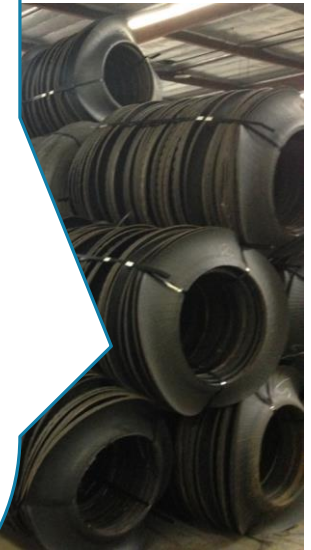
Formula: $\frac{1}{2} \times (B \times H) \times W$

$$\text{Vol} = \frac{1}{2} \times (12' \times 10.5') \times 27.5' = 1,732.5 \text{ cu.ft}$$

Convert to cubic yards...

Formula: $\text{cu.ft} / 27 = \text{cu.yd}$

$$1,732.5 \text{ cu.ft} / 27 = 64.17 \text{ cu.yd}$$



2. Convert volume to waste tires...

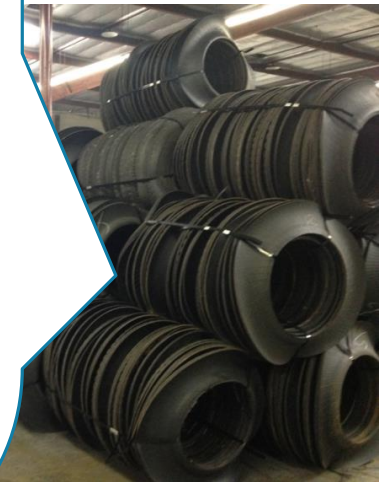
Tire type(s): sidewalls

Conversion factor: 20 tires/cu.yd

Formula:

Vol. x conv. factor = Sub-total

$64.17\text{cu.yd} \times 20 \text{ (tires/cu.yd)} = 1,283.4 \text{ tires}$



3. Apply deduction...

Formula: Sub-total x 0.8 = Total

1,283.4 tires x 0.8 = 1,026 tires



Practice:

Data:

*weight given, 550 lbs

*47 bales total

*25 truck sidewalls per
bale



Known weight method:

Formula: known weight / 20 (lbs/tire)

$550 \text{ lbs} / 20 \text{ (lbs/tire)} = 27.5 \text{ tires}$

$27.5 \text{ (tires/bale)} \times 47 \text{ bales} = 1,292.5 \text{ tires}$

Apply deduction...

$1,292.5 \text{ tires} \times 0.8 = 1,034 \text{ tires}$



Truck sidewall conversions...

Rate: 1 truck sidewall = 1 PTE

*Found online on CalRecycle's website

25 truck sidewalls per bale = 25 PTE

25 PTE x 47 bales = 1,175 PTE

Apply deduction...

1,175 x 0.8 = 940 PTE



Practice:

Data:

Length: 22ft

Width: 16ft

Height: 8ft



1. Calculate the volume...

Shape: pyramid (rectangular base)

Formula: $\frac{1}{3} \times (L \times W) \times H$

$$\text{Vol} = \frac{1}{3} \times (22' \times 16') \times 8' = 938.67 \text{ cu.ft}$$

Convert to cubic yards...

Formula: $\text{cu.ft} / 27 = \text{cu.yd}$

$$938.67 \text{ cu.ft} / 27 = 34.77 \text{ cu.yd}$$



2. Convert volume to waste tires...

Tire type: treads

Conversion factor: 20 tires/cu.yd

Formula:

Vol x conv. factor = Sub-total

$34.77 \text{ cu.yd} \times 20 \text{ (tires/cu.yd)} = 695.4 \text{ tires}$



3. Apply deduction...

Formula: Sub-total x 0.8 = Total

695.4 tires x 0.8 = 556 tires



Thank you

Questions:

Jacob.soza@calrecycle.ca.gov