OPTIMA® BATTERIES
THE ULTIMATE POWER SOURCE™

# THE ULTIMATE POWER SOURCE™

## OPTIMA Heavy Duty Application Guide

SPIRALCELL® TECHNOLOGY

Heavy machineries in the engineering field are always the best platform for OPTIMA batteries. More and more heavy machinery manufacturers are utilizing and trusting OPTIMA Batteries as the "Ultimate Power Source." Throughout the years, OPTIMA Batteries has exceeded and outperformed performance standards in the U.S. and European heavy industry markets.

OPTIMA Batteries can easily handle the abuse of applications that draws high current loads and high vibration environments. It has a low self-discharge rate that leads to a longer shelf life when not in use. Whether you are an equipment manufacturer, distributor or direct end user of Heavy Machineries, we believe that you will enjoy the Full Power brought by OPTIMA Batteries.

Johnson Controls

Founded in 1885, Johnson Controls is a global leader in automotive systems and facility management and control. Total sales revenue in 2007 reached $34 billion and Johnson Controls was racked top 200 in the Global Fortune 500 that year, with its global battery market share reached 37%.

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OPTIMA batteries are the premier position product of Johnson Controls Power Solution Group, which also represent the highest technology level of the current battery market globally. Its patented Spiralcell Technology brings perfect performance in almost all extreme environments.

## OPTIMA Batteries has the following application advantages in the engineering machinery field:

- OPTIMA Batteries adopt a particular polar plate formula which can endure the internal corrosion during the long term battery cycling process. OPTIMA Batteries' shelf life is more than 2 times as long as traditional ones. Furthermore OPTIMA Batteries can recharge quickly which helps you deal with downtime problems and improve work efficiency of your equipments.

- OPTIMA Batteries' Spiracell®technology gives it superior high-current discharge, and extreme temperature performance. OPTIMA Batteries can handle huge Diesel Engines even in extreme temperature conditions. Due to the advanced design concept and manufacturing processes of OPTIMA Batteries, they are absolutely the "Ultimate Power Source" for engineering projects under sub-zero temperatures or in high heat environments.

Damage from vibration is a leading cause of battery failure. OPTIMA batteries have over **15 times more vibration resistance** than traditional batteries due to patented Spiralcell Technology®.

- With OPTIMA Batteries' fully sealed and maintenance-free design, OPTIMA Batteries provides up to 15X more resistance to shock and vibration than traditional batteries. Likewise, it can be mounted to 180º with no acid spillage!

- OPTIMA Batteries' polar plates are compressed tightly. This makes it easily handle harsh work environments that causes heavy vibration that can render traditional batteries to malfunction prematurely.

- OPTIMA Batteries utilize high purity materials making the batteries dischargeslower and enable a longer shelf life than any other traditional battery. With OPTIMA Batteries, starting your equipments has never been so easy! You can easily install this in heavy machineries and construction vehicles, without worrying of the batteries loosing charge after it is unused for a long period of time. Traditional batteries, made out of lead alloys that sit unused for extended periods of time tend to lose charge very fast. OPTIMA Batteries provide convenience and safety to engineering machineries even if it is installed on engineering equipments that are sent for transportation.

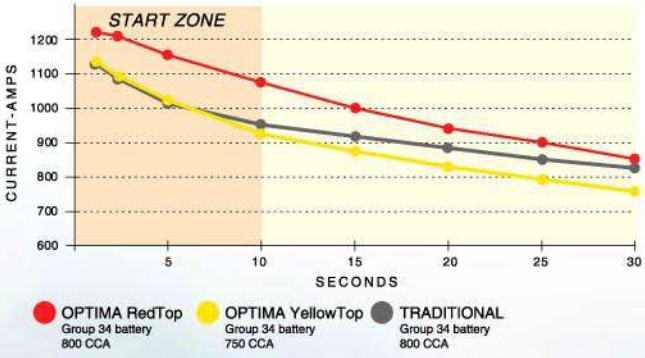

Damage from heat is the leading cause of battery failure. Even in high heat environments, OPTIMA batteries can outlast traditional batteries by **up to 2 times.**

Traditional batteries will spill acid after a rotation of 45º, OPTIMA batteries can be **rotated up to 180º** with no acid spill. That's because they're sealed and maintenance free.

Johnson Controls is currently the world largest supplier of lead acid batteries and has a worldwide sales network for OPTIMA Batteries. So wherever you are in the world, we can provide you with our professional service.

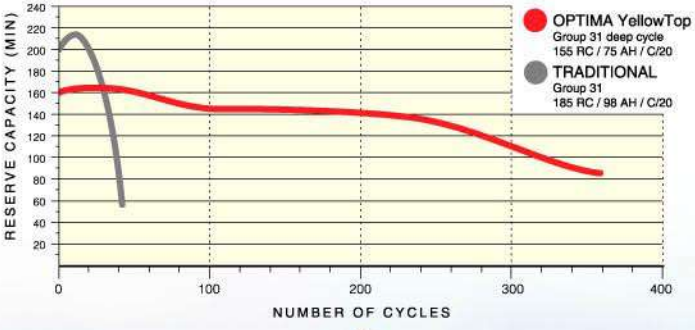
## More Starting Power

OPTIMA batteries deliver a higher level of power to the starter in the critical first 10 seconds of the vehicle starting cycle.




## Repetitive Reserve Capacity

OPTIMA batteries have the ability to withstand significantly more discharge /recharge cycles and still deliver a high percentage of the original full capacity.




# SPIRALCELL TECHNOLOGY®

**99.99% Pure Lead**
Spiralcell design allows for lead to be used in its purest from

**Solid Cast Cell Connections**
for increased durability and maximum plate height

**Spiralcell Technology**
for superior vibration resistance and extended life

**Tightly Compressed Cells**
for added vibration resistance

**Absorbent Glass-Mat Separators**
holds electrolyte like a sponge to eliminate acid spilling


## YELLOWTOP SPECIFICATIONS

| Model Number | Voltage | Cold Cranking Amps @ -18C (BCI) | Cold Cranking Amps @ -18C (EN) | Cranking Amps @ 0C | Reserve Capacity | Capacity (C/20 Rate) | Internal Resistance (ohms) | Dimensions(CM) | | | Weight (Kg) | Post Type | BCI Group |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Length | Width | Height | | | |
| D34/78 | 12V | 750 | 765 | 870 | 120 | 55 | .0028 | 25.4 | 17.5 | 19.8 | 19.7 | Dual SAE/ST | 34/78 |
| D75/25 | 12V | 620 | 600 | 810 | 100 | 48 | .0030 | 23.7 | 17.3 | 19.4 | 17.1 | Dual SAE/ST | 75/25 |
| D34 | 12V | 750 | 765 | 870 | 120 | 55 | .0028 | 25.4 | 17.5 | 19.8 | 19.5 | SAE | 34 |
| D35 | 12V | 620 | 660 | 810 | 100 | 48 | .0030 | 23.7 | 17.3 | 19.4 | 16.5 | SAE | 35 |
| D51 | 12V | 450 | 460 | 575 | 66 | 38 | .0046 | 23.7 | 12.9 | 22.7 | 11.8 | SAE | 51 |
| D51R | 12V | 450 | 460 | 575 | 66 | 38 | .0046 | 23.7 | 12.9 | 22.7 | 11.8 | SAE | 51R |
| D31T | 12V | 900 | 975 | 1125 | 155 | 75 | .0025 | 32.5 | 16.5 | 23.8 | 27.1 | 3/8 Stud | 31T |
| D31A | 12V | 900 | 975 | 1125 | 155 | 75 | .0025 | 32.5 | 16.5 | 23.8 | 27.1 | SAE | 31A |

## BLUETOP SPECIFICATIONS

| Model Number | Voltage | Cold Cranking Amps @ -18C (BCI) | Cold Cranking Amps @ -18C (EN) | Cranking Amps @ 0C | Reserve Capacity | Capacity (C/20 Rate) | Internal Resistance (ohms) | Dimensions(CM) | | | Weight (Kg) | Post Type | BCI Group |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Length | Width | Height | | | |
| New D27M | 12V | 800 | 845 | 1000 | 140 | 66 | .0025 | 30.9 | 17.3 | 22.2 | 24.4 | Dual SAE & 5/16 Stud | 27 |
| 34M * * * | 12V | 800 | 815 | 1000 | 100 | 50 | .0030 | 25.4 | 17.5 | 19.8 | 17.4 | Dual SAE & 5/16 Stud | 34 |
| D34M * * * | 12V | 750 | 765 | 870 | 120 | 55 | .0028 | 25.4 | 17.5 | 19.8 | 19.7 | Dual SAE & 5/16 Stud | 34 |
| D31M * * | 12V | 900 | 975 | 1125 | 155 | 75 | .0025 | 32.5 | 16.5 | 23.8 | 27.1 | Dual SAE & 5/16 Stud | 31 |
| Trollfury Kit* | 12V | 1500 | — | 1740 | 240 | 110 | — | 59.1 | 21.6 | 21.6 | 40.8 | 5/16 Stud | N/A |
| Trollfury Kit* | 24V | 750 | — | 870 | 120 | 55 | — | 59.1 | 21.6 | 21.6 | 40.8 | 5/16 Stud | N/A |

*Batteries sold separately **D31M model fits group size 27 marine boxes and trays ***34M and D34M models fit group size 24 marine boxes and trays

## REDTOP SPECIFICATIONS

| Model Number | Voltage | Cold Cranking Amps @ -18C (BCI) | Cold Cranking Amps @ -18C (EN) | Cranking Amps @ 0C | Reserve Capacity | Capacity (C/20 Rate) | Internal Resistance (ohms) | Dimensions(CM) | | | Weight (Kg) | Post Type | BCI Group |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Length | Width | Height | | | |
| 34/78 | 12V | 800 | 815 | 1000 | 100 | 50 | .0030 | 25.4 | 17.5 | 19.8 | 17.6 | Dual SAE/ST | 34/78 |
| 75/25 | 12V | 720 | 730 | 910 | 90 | 44 | .0030 | 23.7 | 17.3 | 19.4 | 15 | Dual SAE/ST | 75/25 |
| 25 | 12V | 720 | 730 | 910 | 90 | 44 | .0030 | 23.7 | 17.3 | 19.4 | 14.4 | SAE | 25 |
| 34 | 12V | 800 | 815 | 1000 | 100 | 50 | .0030 | 25.4 | 17.5 | 19.8 | 17.2 | SAE | 34 |
| 34R | 12V | 800 | 815 | 1000 | 100 | 50 | .0030 | 25.4 | 17.5 | 19.8 | 17.2 | SAE | 34R |
| 35 | 12V | 720 | 730 | 910 | 90 | 44 | .0030 | 23.7 | 17.3 | 19.4 | 14.4 | SAE | 35 |
| 6V | 6V | 800 | 815 | 1000 | 100 | 50 | .0019 | 25.4 | 9.0 | 20.6 | 8.4 | SAE | N/A |

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Sude
global solutions for industrial supply.