



## GATES FEATURES GUIDE

V-BELTS: ENGINEERED FOR PERFORMANCE

While two V-belts may look similar to the casual observer, the engineering and design processes used to create them can vary greatly, leading to vast differences in performance and belt life. With nearly 100 years of experience, Gates V-belt systems are constructed to outperform and outlast competitive products.

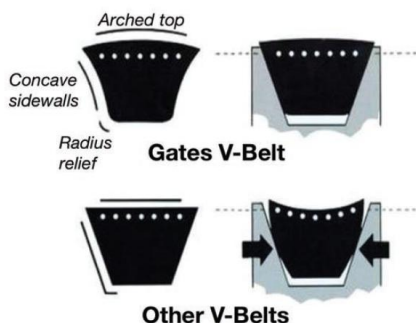
This guide will walk you through the advanced features of Gates V-belts, offering tips and product information that illustrate how “not all belts are created equal”.

### > The Shape of Power

#### V-belt Curves

When V-belts are under tension and running in a pulley they change shape. To optimise power transmission, many Gates V-belts are designed with the exclusive Gates Curves feature. Gates Curves consist of three key components: concave sidewalls, radius relief corners and an arched top.

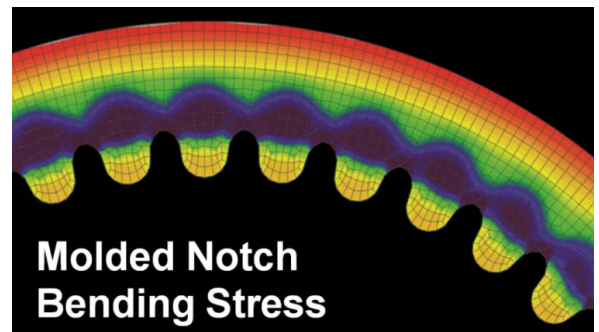
**Concave sidewalls** assure even contact with the pulley, evenly distributing wear for increased belt life. **Radius relief** reduces corner wear and works in conjunction with the concave sidewalls for uniform tensile loading. The **arched top** provides strength, preventing the “dishing” effect that is found in other belts not engineered for shape change. Because of this, the tensile members work together to carry the load evenly reducing internal stress. The superior Gates Curves work to evenly distribute wear and offer uniform cord support creating more efficient drives and increased service life.



#### Notched V-Belts

Gates designs notches in belts to reduce the bending stress as the belt wraps around small diameter pulleys, thereby reducing the heat generated by rapid flexing which is one of the causes of premature belt failure. Since most drive systems have high load requirements, belts need more undercord material for tensile cord support. Available in all existing profiles, Gates notched V-belts are constructed to offer support for even load distribution and a longer life. A relatively large, deep notch provides excellent flexibility for bending around pulleys by implementing the notch near the cord line.

While tensile cord support and flexibility are important, proper notch shape and spacing also affect the distribution of stress when the belt bends and can prevent undercord cracking and extend belt life. It is simple to design exclusively for flexibility or cord support, but Gates engineers have devised a belt that addresses both, to perform under a wide range of conditions.



### > Not Just Rubber

#### EPDM

While it is important for V-belts to have high-performing physical attributes, it is essential that they are made out of material that can withstand high temperatures and resist wear. Gates molded notch V-belts are now exclusively constructed with EPDM, a high-performance synthetic rubber compound. Belts made with EPDM offer a 70% broader temperature range compared to other belts and resist hardening to avoid cracking. They meet the Rubber Manufacturers' Association (RMA) standards for oil and heat resistance as well as static conductivity.



#### Expanded Belt Temperature Range

#### Match Free Belts

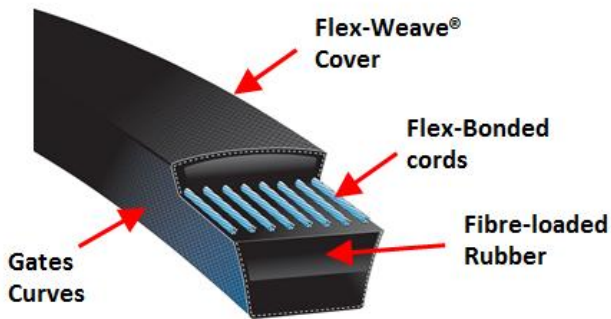
To prevent users from going through the cumbersome task of matching their V-belts, Gates has applied proven statistical process control (SPC) methods to material and assembly processes, creating the V80® and UNISET series of belts, which are built to tight tolerances in each size category.

Each V80 and UNISET belt is manufactured with a finite length tolerance so that any belt will match and perform with any other V80 or UNISET belt of the same size and type. Made with high-modulus polyester tensile cords, Gates V80 and UNISET belts exhibit extremely low stretch, saving maintenance time and money.

# V-BELTS: ENGINEERED FOR PERFORMANCE

## Transverse Rigidity

Every V-belt must have a high level of rigidity across its width so that load is equally transferred by all of the tensile cords. It is equally important that there is a high level of flexibility along the length of the belt to reduce heat build-up and bending stresses. Gates belts are constructed with Fibre-loaded rubber (parallel alignment of fibres in the rubber compound) that allows for this duality. This is especially key in wide variable speed belts due to the lateral force extended by the spring-loaded pulleys found on a typical variable speed drive. The transverse rigidity on Gates V-belts is engineered to allow for better load life capacity and maximum efficiency from the belt.



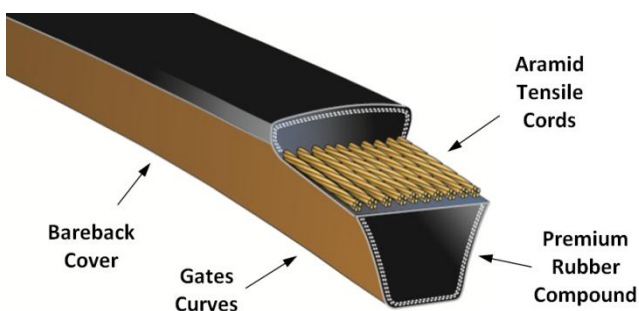
## > Strength Meets Flexibility

### Flex-Bonded Cords

A strong chemical bond is used between the tensile cord and the belt's rubber body, allowing all of the belt materials to function as one unit. The Flex-Bonded cords result in less stretch. The cords cannot creep inside the belt, often the case with low quality belts.

### Aramid Cords

Many belts are made with standard polyester cords, but Gates offers V-belts made with Kevlar® or aramid tensile cords. Aramid cords offer a higher tensile strength and can handle a heavier shock load than traditional polyester tensile cords. The fibres reinforce the belt resulting in less stretch and less need for re-tensioning, saving both valuable production time and money.



## PowerBand® Belts

PowerBand® belts were developed by Gates for drives subjected to pulsating loads, shock loads or extreme vibrations where single belts can flip over. A high-strength tie band permanently joins two or more belts to provide lateral rigidity and allow all of the strands to work together as one unit. This keeps the belts running in a straight line in the pulley grooves and eliminates jumped, flipped, tangled or separated belts.

## > Judge a Belt by its Cover

### Flex-Weave® Cover

Belt covers should shield the belt core from destructive forces such as oil, dirt and heat. Gates patented Flex-Weave® cover takes that protection to the next level. Made out of a flexible fabric, treated to maintain a strong chemical bond to the belt core, the Flex-Weave® cover can withstand the stress of constant bending over an extended period of time, offering longer cover life and greater protection of the belt. Other belts are typically made with bias-cut fabric which has a mechanical bond to the belt core that isn't as flexible, making them more likely to split. Gates Flex-Weave® cover is engineered to keep belts running longer for less downtime.

### Bare Back Clutching Cover

Many V-belt covers are made with a fabric wrap impregnated with rubber, but Gates Bare Back cover consists of raw cotton nylon blend fabric on the outside and rubber that adheres and sticks on the inside. Ideal for clutching drives, Gates Bare Back cover allows belts to spin freely until engaged, resulting in less heat build-up and less wear.

## Gates Predator® V-belts



Gates specifically designed Predator® V-belts for harsh environments and demanding applications where other V-belts may fail. They are extremely robust, have the highest power density of any V-belt and stretch one half as much as

standard construction belts making them an ideal choice for use on heavy-duty applications such as wood, saw mill equipment and rock crushers.