ARON ALPHA®
INDUSTRIAL KRAZY GLUE™

A Kickstart Guide to Cyanoacrylates

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For secure and effective bonding of material surfaces or objects, adhesives offer ample opportunities. There are hundreds of different adhesives available, and each one has its own unique formulation. This formulation will determine the adhesive's specific properties, including its bond speed, strength, viscosity, and environmental resistance. Cyanoacrylates are instant adhesives that enable the bonding of similar and dissimilar materials such as rubber, plastics, metals, and composites. Their rapid curing time and exceptional bond strength make them a popular adhesive choice for many applications. This eBook will provide you with a great foundational overview of cyanoacrylates, the accelerators and primers that enhance their performance, and proper dispensing tools and techniques to prepare you for your next project involving these versatile adhesives.

Cyanoacrylate Adhesives

Cyanoacrylate is the primary chemical used in the instant adhesives commercially known as super glue or Krazy Glue. Cyanoacrylate glue was first discovered in 1942 in an attempt to find a suitable adhesive for manufacturing clear plastic gun sights for World War II. Although it was initially rejected for being too sticky, it was rediscovered in 1951 after researchers from Eastman Kodak realized its commercial potential. Since then, formulation enhancements and the development of specialty primers and accelerators have evolved cyanoacrylate adhesives to become more robust and versatile than ever.

Characteristics & Properties

The most common cyanoacrylate used today is ethyl-2-cyanoacrylate; other monomers are methyl, ethoxyethyl, and isobutyl cyanoacrylates. The instant curing process of cyanoacrylate glues is initiated by contact pressure and small amounts of water from surface moisture or atmospheric humidity. They bond rapidly at room temperature and do not require any mixing, heating, or addition of curing agents/catalysts.

With cyanoacrylate adhesives, it is important to make sure you choose the appropriate viscosity for your specific application. These adhesives are available in viscosities ranging from water-thin liquids to no-run gels. While the low-viscosity options cure the fastest, they are prone to running and are best suited for applications in which the substrate is fairly level and flat with very little to no gap between the mating surfaces. High-viscosity adhesives take a little longer to cure but are less runny and offer more controllability during application. They tend to be better suited for vertically aligned surfaces or porous materials or gap filling applications.

Advantages & Disadvantages

When considering the suitability of cyanoacrylate adhesives for a given application, it is important to be mindful of both the benefits and limitations associated with their use. Cyanoacrylate systems are easily applied, one-part solutions that cure rapidly at room temperature and leave a virtually invisible bond. They are compatible with a wide range of substrates, from ceramics to elastomers to engineering plastics to metals. Furthermore, they provide exceptional shear and tensile strength, making them suitable for harsh operating conditions.

These advantages make them great for components within the following industries:

- Automotive and transportation
- Industrial assembly
- Building, construction, and furniture
- Electronics and electric devices
- Medical device manufacturing
- Maintenance, repair, and overhaul (MRO)
- Specialty markets such as criminal investigation, cosmetic packaging, and more

It is important to keep in mind that cyanoacrylate adhesives will not be suitable for every application. They exhibit poor peel strength relative to other adhesive technology and are unable to fill large gaps. They also demonstrate a weak resistance to many solvents and have a limited temperature tolerance (however, certain modern formulations have been designed to withstand high heat – we recommend checking in with your adhesive supplier about availability). Consequently, cyanoacrylate adhesives should be avoided when bonding substrates with large size gaps, or in applications involving exposure to certain solvents or operational extremes. It is recommended to fully assess the demands and conditions of an end application and to communicate these to your adhesives supplier.

Precautions

Another factor to be aware of when using cyanoacrylate adhesives is their ability to bond with unwanted surfaces, such as skin. As a precaution, the user should always wear protective plastic or rubber gloves when applying cyanoacrylate adhesives to a surface. For additional information about how to remove unwanted cyanoacrylate glue from various surfaces, please **click here**.

Cyanoacrylate Accelerators

A cyanoacrylate accelerator, also referred to as a setter or activator, is a substance used to speed up the curing time of cyanoacrylate adhesives. After applying the adhesive to the surface of one of the materials, the other surface is coated with the accelerator. The instant these materials come into contact with one another, a strong bond is formed between them. Accelerators also can be used after the parts are mated and assembled by overspraying onto the bond line causing any exposed adhesive to flash cure. The active ingredients of these accelerators are organic compounds known as amines, which enable fast bonds to be formed in low-moisture environments.

Cyanoacrylate accelerators help to minimize issues related to improper or slow curing, which include:

- **Blooming.** When using instant adhesives, an unsightly white haze known as blooming (chlorosis) can sometimes appear. This phenomenon is usually a result of excess glue application, which slows the curing process. Accelerators can eliminate this occurrence by rapidly solidifying the liquid glue before it can react with moisture to form the unattractive white residue.

- **Misaligned parts.** When the curing time is prolonged, bonded parts can become jostled or shifted out of alignment during part-handling and assembly. Accelerators reduce the occurrence of improper setting by speeding up the adhesive drying process.

- **Poor adhesion.** Porous substrates such as leather, wood, or sponge rubber often require accelerators to allow the adhesive to adhere properly. This prevents the adhesive from having time to seep into the substrate's pores.

- **Bonding Acidic Surfaces.** Cyanoacrylates bond well on basic chemical surfaces, so if the material has an acidic chemistry, most cyanoacrylates will bond very slowly and an activator can assist with the curing of cyanoacrylates on these surfaces

Accelerators are beneficial for applications that require almost instant curing times, such as fast-paced assembly operations in which bond speed is the limiting factor for moving on to the next procedure. They can also be used to normalize manufacturing processes and promote stronger bonds in environments where temperature and humidity tend to fluctuate significantly throughout the year.

Cyanoacrylate Primers

Primers are surface treatment coatings that are used with cyanoacrylate adhesives to improve adhesion on polyolefins and other low surface energy materials that typically present more challenges in terms of bonding.
These primers are usually specific to the type of material being bonded.
In order to achieve the best cure possible, the primer should be pre-applied to the substrate's surface before using the adhesive. With solvent-based primers, it is important to allow adequate time for the solvent carrier to evaporate or flash off the substrate prior to adhesive application.

Cyanoacrylate Applicators and Dispensers

To optimize adhesive performance, it is critical to make sure the dispensing method provides the control necessary to apply it in the appropriate amount. Some of the most successful and frequently used dispensing methods include:

- **Pick method.** This manual application method involves the use of a metal or plastic pick to quickly spread a thin coating of adhesive across a larger surface area.

- **Pinch tubes.** Pinch tubes are designed for the manual application of continuous beads or fixed volumes of low-viscosity adhesive to the substrate.

- **Pneumatic dispensers.** These time/pressure dispensers consist of a plunger and syringe. A compressor uses pulses of air to tap the top of the plunger in a rhythmic fashion, regularly pushing adhesive out through its open end. This method is ideal for automated or semi-automated bonding operations.

- **Diaphragm valves.** Diaphragm valves are best suited for bonding operations requiring the controlled dispensing of adhesives in dots or beads. Like pneumatic dispensers, diaphragm valves are great for automated application systems.

For further details on how to dispense cyanoacrylates, please **click here**.

Cyanoacrylate Solutions by Aron Alpha

Cyanoacrylates are unique one-part adhesives that cure almost instantly in the presence of surface moisture to form high-strength bonds. Choosing the appropriate cyanoacrylate adhesive formulation, supportive products, and dispensing method will help to ensure success in your application.

For over 50 years, Toagosei America, Inc. has been manufacturing and marketing the successful **Aron Alpha** brand of cyanoacrylate adhesive products for a diverse range of manufacturing and general assembly applications in **the following industries**:

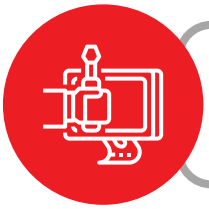
Automotive and transportation

Building and construction

Furniture

Electronics

Medical



Maintenance, Repair, and Operations (MRO)

Specialty markets

Aron Alpha's product portfolio includes a diverse selection of **cyanoacrylate adhesives**, each of which is specially formulated for specific operational environments and substrate surfaces. We also manufacture a variety of cyanoacrylate **accelerators**, **primers**, and **applicators** to further optimize our adhesive products for specific uses. In addition to our standard adhesive product line, we offer extensive support services, including custom adhesive formulations, lab services and testing, on-site engineering assistance and consultation, and prototype testing.

Have any questions about cyanoacrylates or the information in this guide? **Reach out to us** today, and we will be happy to offer our guidance. You can also check out our informative blog post on **how cyanoacrylate adhesives work**, or browse our insightful **eBook** and **blog** libraries.

ARON ALPHA® INDUSTRIAL KRAZY GLUE™

About Us

Since 1963, Toagosei Inc. has been marketing the Aron Alpha brand of cyanoacrylate technology in Japan and in North and South America and their best known Instant Krazy Glue brand, to the North American consumer market.

As a turnkey adhesives provider who manufactures, packages and distributes our own products, product quality and consistency of performance are the keys to our customers' success. In addition to our standard line of products, special formulations are available, as well as a variety of packaging options.

Our research and technical facilities are located at our West Jefferson, Ohio plant whose quality management system is registered to ISO 9001. Call us today at 800-338-5192 to discuss all of your instant adhesive requirements.

Contact Us | Resource Library

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