





# Hardman

- **Hardman Rubber Co. Founded in 1879**
  - Rubber cements, molded rubber sundries, DPR
  - Developed epoxy brush adhesives in 1950's
  - Developed electrical encapsulants in 1960's
- **60,000 Square Feet Manufacturing Center in Belleville, NJ**
- **4,000+ Square Feet R&D Center in Belleville, NJ**
- **80 Years Combined Experience Formulating Epoxy and Urethane Adhesives**



**ROYAL**  
ADHESIVES & SEALANTS



# Structural Adhesives

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- **EPOWELD<sup>®</sup> Two-Part Epoxy Adhesives**
- **MONOPOXY<sup>®</sup> One-Part Epoxy Adhesives**
- **KALEX<sup>®</sup> Two-Part Urethane Adhesives**
  
- **Custom Formulations**
  - R&D has ability to develop customized formulations in a timely manner through TSR system
  
- **Variety of Packaging and Applications Solutions**



# Competitor Comparisons

Two-Component Epoxy	Product Range	Base Material	Viscosity	Work Life (Minutes)	Peel @ 75F (PLI)	Lap Shear @ 75F (PSI)	Hardness (Shore D)	Packaging
	Loctite Hysol Brand	Epoxy	Low Medium High Paste	5-120	5-50	1000-6000	75-90	50ML, 200ML, 400ML Dual Cartridge
	Huntsman Araldite 2000 Brand	Epoxy	Low Medium High Paste	1-75	30-60	1700-3000	75-90	50ML, 200ML, Dual Cartridge
	3M Scotch-Weld Brand	Epoxy	Low Medium High Paste	4-120	2-60 (PIW)	1400-4900	35-90	50ML, 200ML, 400ML Dual Cartridge
	Hardman Brand	Epoxy	Low Medium High Paste	3-198	1-70	675-4500	40-95	Double Bubble  250ML Universal Cartridge

Two-Component Urethane	Product Range	Base Material	Viscosity	Work Life (Minutes)	Peel @ 75F (PLI)	Lap Shear @ 75F (PSI)	Hardness (Shore D)	Packaging
	Loctite Hysol Brand	Urethane	Low Medium	4-10	5-30	800-3000	45-68	50ML, 200ML, 400ML Dual Cartridge
	Huntsman Araldite 2000 Brand	Urethane	Low Medium	3-15	5-40	300-3000	40-80	50ML, 200ML Dual Cartridge
	3M Scotch-Weld Brand	Urethane	Low Medium	3-60	15-25 (PIW)	1250-2000	40-80	50ML, 200ML, 400ML Dual Cartridge
	Hardman Brand	Urethane	Low Medium	5-85	5-70	675-4000	40-85	Double Bubble  250ML Universal Cartridge



# Multi-Component Kits

## DOUBLE/BUBBLE® Packets



DOUBLE/BUBBLE packets are convenient, one-shot use, high-performance adhesives that allows for quick, one-the-spot repairs anywhere, anytime. Each adhesive component is pre-measured in a single foil packet for ease of use.

## Universal Cartridges



Universal cartridges are innovative, two-component systems that fit into a variety of mechanical, pneumatic, and electric 1/10th gallon caulking guns. Each adhesive component is separated with one adhesive component in the front of the cartridge and the other in the back.

## Side-by-Side Cartridges



Side-by-side cartridges are ideal for small volume applications where mix ratios and viscosities can vary widely. Each adhesive component is isolated "side-by-side" to prevent cross-contamination and accidental cure until the adhesive applied.

\* Adhesives also available in bulk 5-gallon pails, 55 gallon drums





# DOUBLE/BUBBLE Packets

- High Performance Adhesives
- Single-Use Packet
- Quick and Convenient
- Wide Variety of Applications
- Private Label Almost Any Adhesive



Fold



Cut



Squeeze Out



Mix Thoroughly and Apply

*Quick* • *Convenient* • *Ready-to-Use*



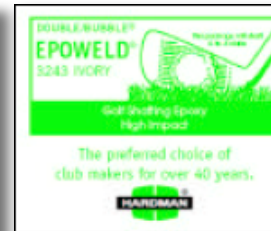


# Specialty DOUBLE/BUBBLE Packets

- **Golf DOUBLE/BUBBLE**

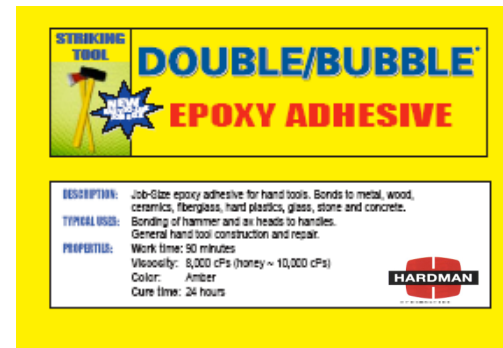
- Shafting of golf clubs

- EPOWELD 3243 Ivory
- EPOWELD 3243 Black
- EPOWELD 16822 Black



- **Striking DOUBLE/BUBBLE**

- Hammers and axes
- 28 gram (1 oz.) packet





# DOUBLE/BUBBLE Selector Guide

## SELECTOR GUIDE



Package Color & Reorder Number	EPOXIES								URETHANES			SILICONE
	RED 04001	RED 04008 (NON-SAG)	YELLOW 04002	PURPLE 04003 ①	GREEN 04004	BLUE 04005	BLACK 04006	ORANGE 04007	GREEN/BEIGE D-50 04022	BLUE/BEIGE D-85 04023	PURPLE/BEIGE A-85 04024	BROWN 04030 ②
WORK TIME (MINUTES)	3	3	25	25	60	120	45	180	5	5	5	10
MAX. SERVICE TEMP. (°F)	180	180	300	225	180	200	125	250	175	200	150	450
WATER RESISTANCE *	F	F	E	E	E	G	G	G	G	VG	F	E

SUBSTRATES		EPOXIES								URETHANES			SILICONE
		RED 04001	RED 04008 (NON-SAG)	YELLOW 04002	PURPLE 04003 ①	GREEN 04004	BLUE 04005	BLACK 04006	ORANGE 04007	GREEN/BEIGE D-50 04022	BLUE/BEIGE D-85 04023	PURPLE/BEIGE A-85 04024	BROWN 04030 ②
METAL	CARBON STEEL	●	●	○	○	○	○	○	○	○	○	○	
	STAINLESS STEEL	●	●	●	●	●	●	●	○	○	○	○	
	ALUMINUM	●	●	●	●	●	●	●	○	○	○	○	
	COPPER/BRASS	○	○	○	○	○	○	○	○	○	○	○	
	TIN	○	○	○	○	○	○	○	○	○	○	○	
ZINC	○	○	○	○	○	○	○	○	○	○	○		
PLASTIC	ACETATE	○	○	○	○	○	○	○	○	○	○	○	
	ACRYLIC	○	○	○	○	○	○	○	○	○	○	○	
	EPOXY	●	●	○	○	○	○	○	○	○	○	○	
	PHENOLIC	○	○	○	○	○	○	○	○	○	○	○	
	POLYCARBONATE	○	○	○	○	○	○	○	○	○	○	○	
	POLYESTER	○	○	○	○	○	○	○	○	○	○	○	
	PVC	○	○	○	○	○	○	○	○	○	○	○	
	POLYSTYRENE	○	○	○	○	○	○	○	○	○	○	○	
	URETHANE	○	○	○	○	○	○	○	○	○	○	○	
	ABS	○	○	○	○	○	○	○	○	○	○	○	
	FIBERGLASS	○	○	○	○	○	○	○	○	○	○	○	
NYLON	○	○	○	○	○	○	○	○	○	○	○		
OTHER	RUBBER	○	○	○	○	○	○	○	○	○	○	○	
	STONE	●	●	●	●	●	●	●	○	○	○	○	
	WOOD	●	●	●	●	●	●	●	○	○	○	○	
	GLASS	●	●	●	●	●	●	●	○	○	○	○	
	CHINA	●	●	●	●	●	●	●	○	○	○	○	
LEATHER	●	●	●	●	●	●	●	○	○	○	○		

**KEY**  
 ● First Choice  
 ○ Second Choice

**\* WATER RESISTANCE CODES**  
 Excellent E  
 Very Good VG  
 Good G  
 Fair F

① Cures on wet surfaces.

② Silicone is an adhesive as well as an excellent moisture resistant sealant.

**NOTE:**  
 When joining different substrates, select the adhesive recommended for both substrates (e.g., for bonding carbon steel to nylon, the orange epoxy package is the product of choice).

**SURFACE PREPARATION:**  
 Surface must be clean and dry before application. Remove all chemicals, dirt, wax and oil.

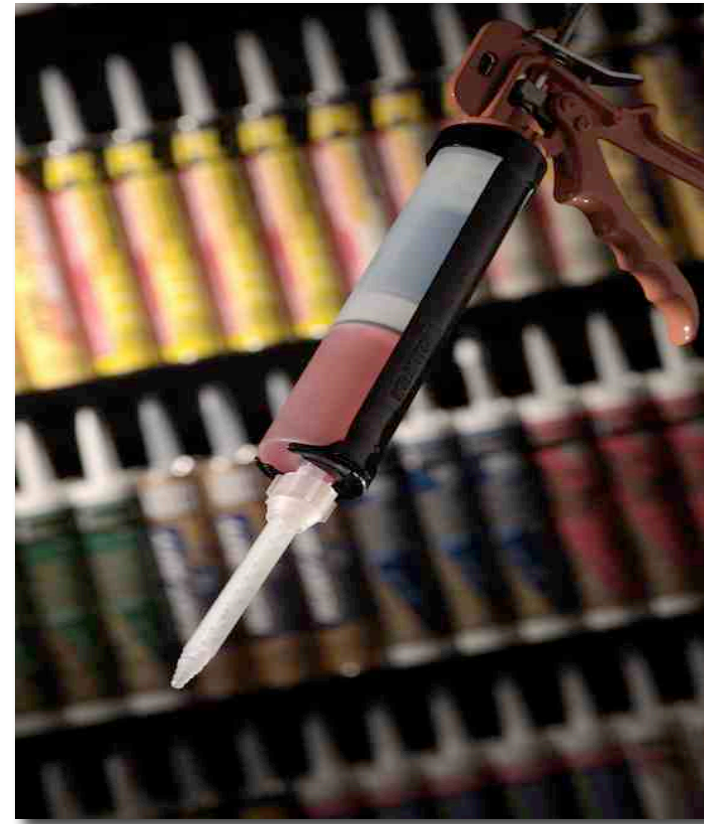
➔ Available in a variety of value-added packaging





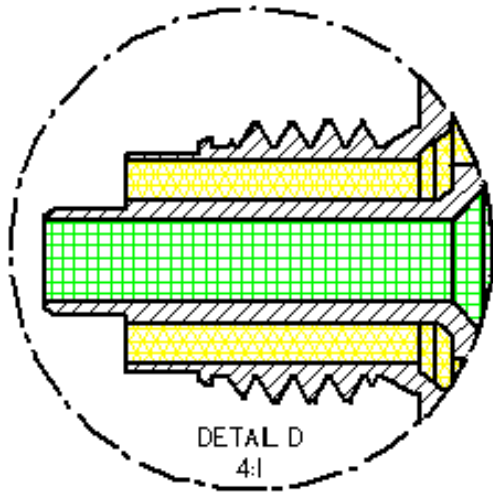
# Universal Cartridge Systems

- **Features**
  - 1/10 gallon, 250 ml
  - 1:1, 2:1, and 10:1 systems
  - Applied via traditional or powered caulk gun
- **Functional Benefits**
  - Superior ratio control
  - Reduced waste and mess
  - Re-closable and reusable
- **Competitive Benefits**
  - Fit in tools that your potential customers already own
  - Ease of application
  - Remove a significant barrier to entry to new markets
  - More user-friendly or cost-effective than currently available solutions

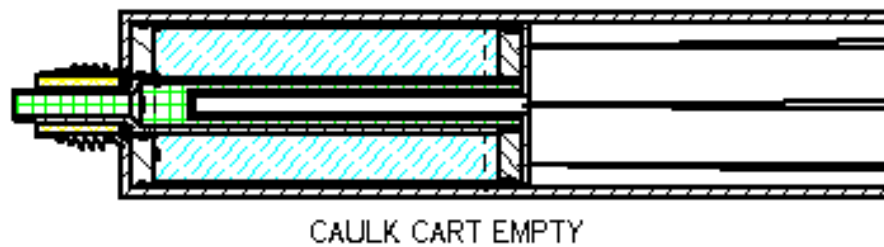
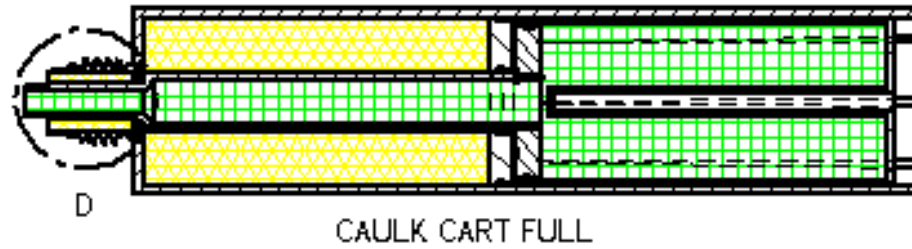




# A Look Inside the Universal Cartridge



TAH - U.S. Patent No. 5,310,091



1:1 ratio



# Universal Cartridges: Caulking Gun Options

- **Manual**

- Several levels of quality and mechanical advantage
- Cost: \$2 - \$20



- **Pneumatic**

- Air source required
- Cost: \$75 - \$120



- **Cordless Electric**

- Special Features: Speed control and shot size
- Cost: \$100 - \$200





# Side-by-Side Cartridge Systems

- **On-demand Mixing and Dispensing of Two-component Reactive Materials**
- **Accurate, Efficient Metering and Mixing**
- **Variety of Volume Mix Ratios**
  - 1:1 to 25:1
- **Variety of Sizes**
  - 4 ml to 1500 ml
- **Wide Range of Viscosities**
- **Improved Shelf-life for Highly Reactive or Moisture-sensitive Materials**
- **Minimizes Waste**
- **Easy to Use**
- **Uniform Material Application**



\* Photo courtesy of APS

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# Hardman Structural Adhesives

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- **Full Range of Epoxy and Urethane Adhesives**
- **Full Range of Packaging and Applications Options**
- **Custom Formulation Capability**
  - Application specific
- **Private Label Programs**



# Additional Markets Served

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- **Assembly Systems**

- Automotive adhesives, sealants, encapsulants, potting compounds
- Filter adhesives and casting compounds
- Brush adhesives

- **Electrical/Electronic Systems**

- Potting compounds
- Encapsulants
- Adhesives