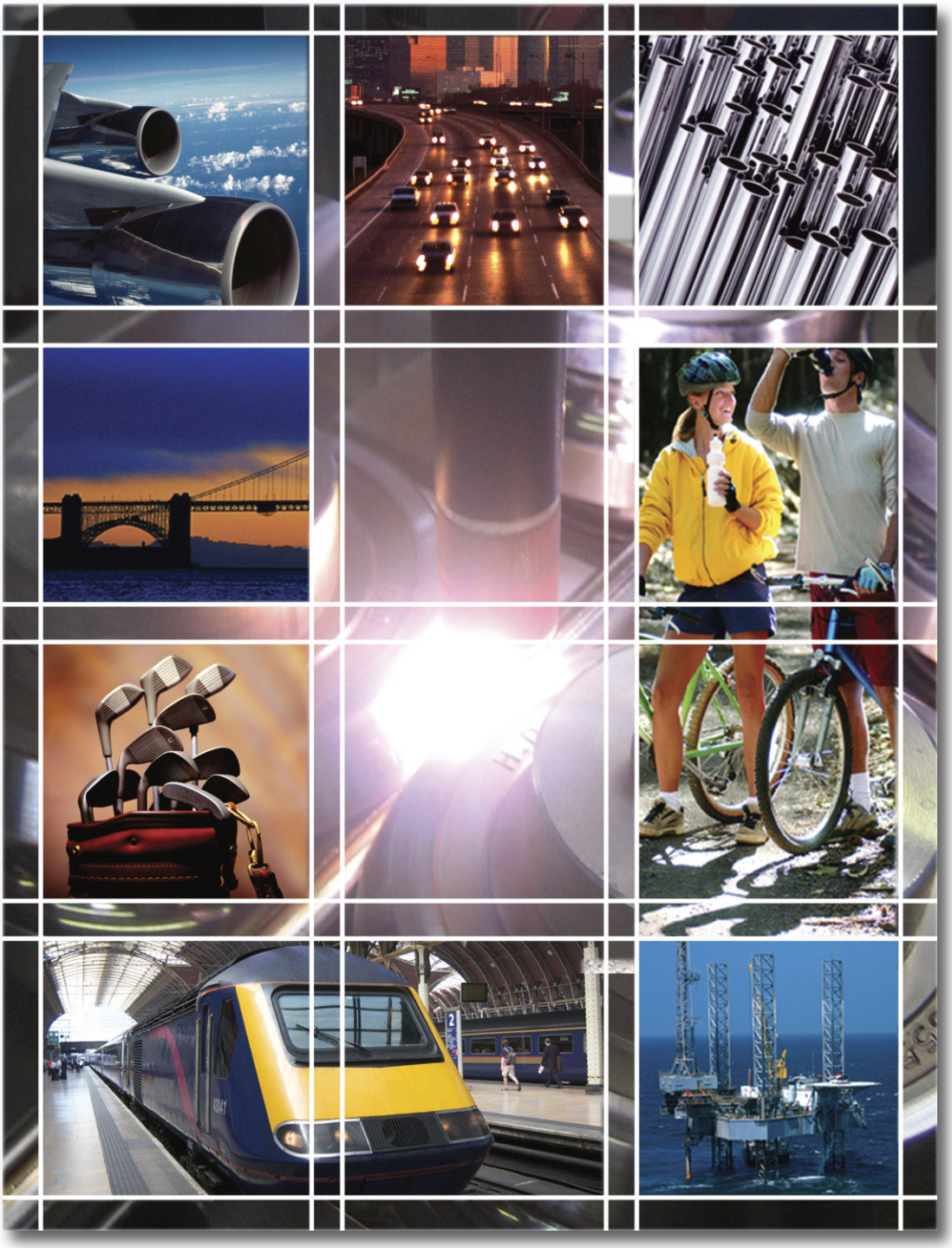
New Material Technology Changes The Status Quo



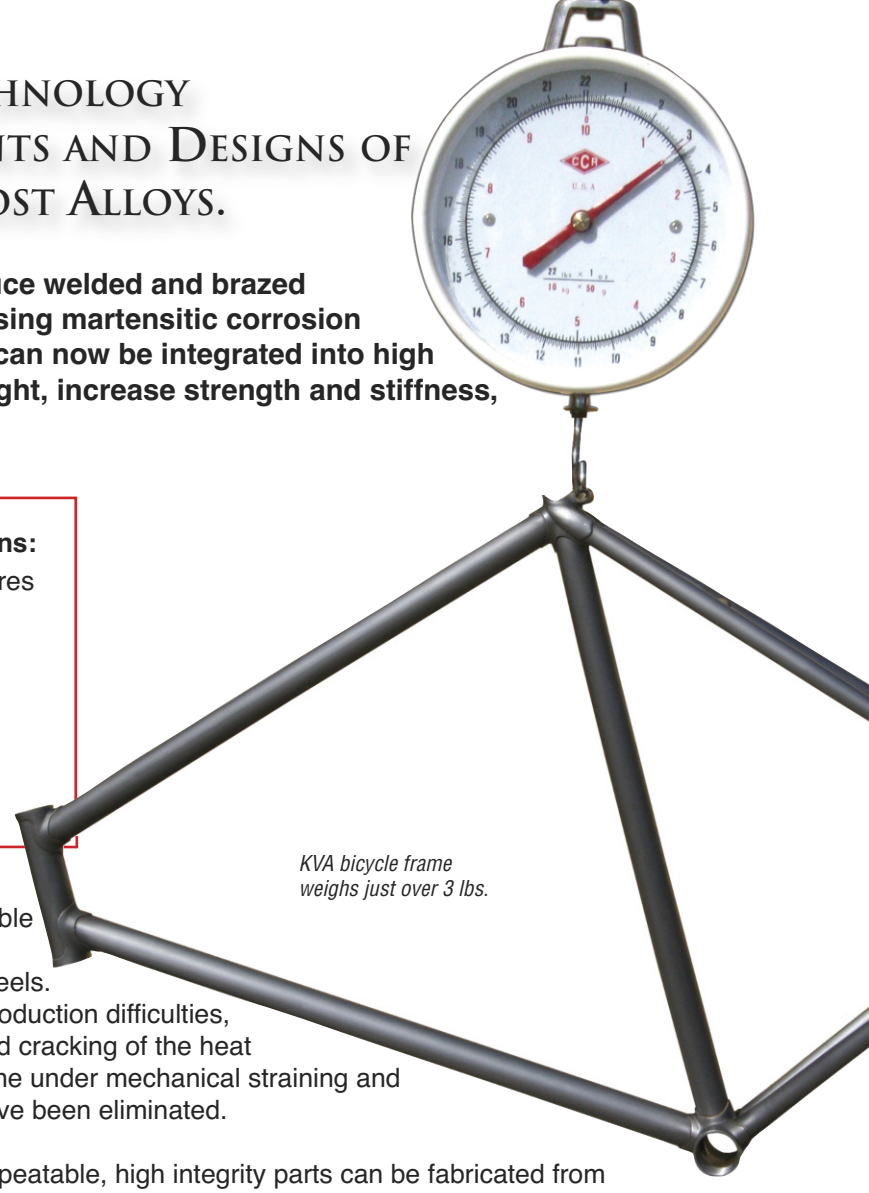
Martensitic Structural Solutions

KVA Patented Processing Technology Enables Structural Components and Designs of Ultra High Strength, Low Cost Alloys.

KVA has developed proprietary methods to produce welded and brazed tubular forms, stamped and shelled structures, using martensitic corrosion resistant steels. High strength structural shapes can now be integrated into high performance structural assemblies to reduce weight, increase strength and stiffness, without significant cost increases.

Benefits:
- Reduced weight
- Increased strength
- Increased toughness
- Increased durability
- Enhanced formability
- Improved fatigue performance
- Enhanced corrosion resistance

Suitable applications:
- Automotive structures
- Aviation structures
- Oil production
- Train cars
- Bridges
- Bicycle frames
- Sports equipment



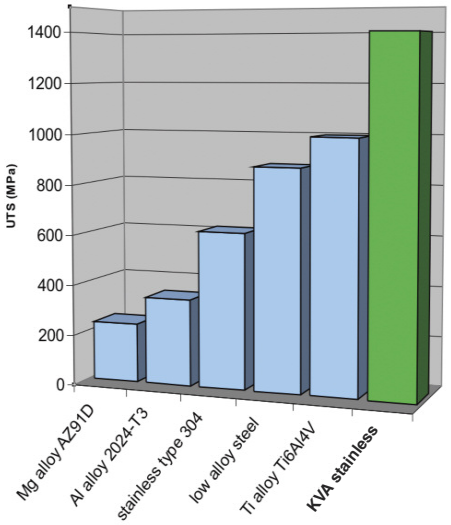
KVA bicycle frame weighs just over 3 lbs.

Excellent mechanical properties, including specific strength and stiffness, toughness and fatigue performance, in addition to corrosion resistance, can be achieved using martensitic stainless steels in place of other materials. Tensile strengths in excess of 200 ksi (1400 MPa) are capable from simple low cost air hardening quench processes.

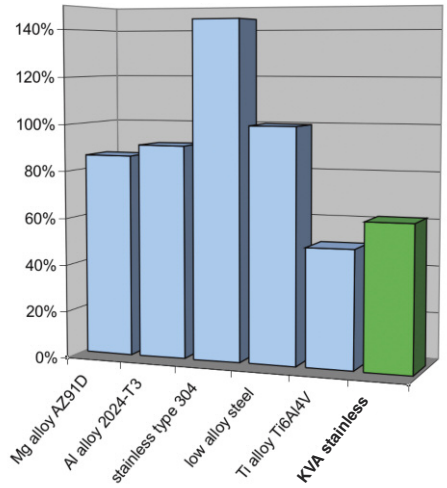
KVA's technology has overcome the conventional limitations of high speed welding air hardenable martensitic stainless steels. Previous production difficulties, such as cold cracking of the heat affected zone under mechanical straining and forming, have been eliminated.

Reliable, repeatable, high integrity parts can be fabricated from commonly available, inexpensive straight chromium alloy grades.

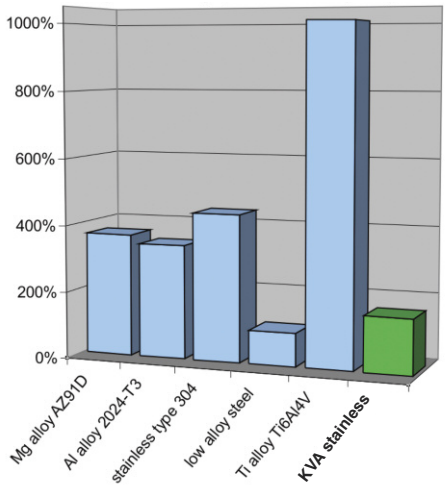
Comparison of Ultimate Tensile Strengths



Component Weight
strength-based design (relative to low alloy steel)



Component Cost
strength-based design (relative to low alloy steel)



As the above charts indicate, the superior mechanical properties of KVA martensitic processed stainless allows for significant weight savings and/or stronger components.

These charts also indicate, when a part is redesigned to take advantage of a high performance engineering material, namely to reduce weight while maintaining current strength levels, **a part redesigned with KVA stainless steel can achieve a significant weight reduction and cost much less than other 'lightweight' metals.**

Reduce Weight, Increase Strength and Stiffness, Without Significant Cost Increases.

One of the key benefits of KVA technology for automotive applications has proven to be the ease of forming complex stamping geometries. The material can be readily formed in its softer, annealed state, with low force, low cost tooling. Once the desired geometry is created, parts and entire assemblies can be heat treated to uniform microstuctures and hardness/strength levels tailored to the individual application.

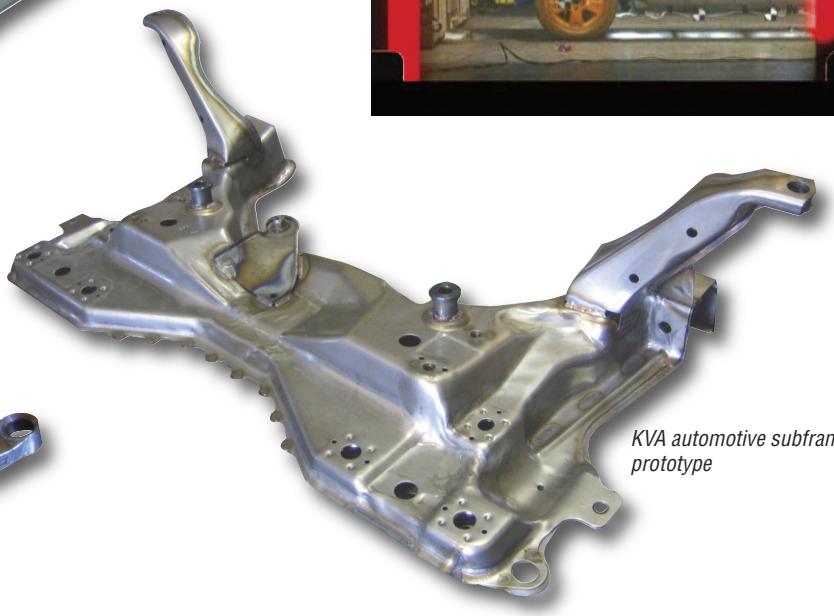
Automotive specific applications include:

- Removable chassis components (bumper beams, frame cross members, suspension control arms, subframes, etc.)
- Safety/intrusion management components (side impact beams, roof bows, roof rails, B-pillars, etc.)
- Vehicle seat frames and supports
- Vehicle accessories (tow hooks, racks, running boards, etc.)
- Entire chassis frame rails

KVA high strength automotive bumper beam prototype

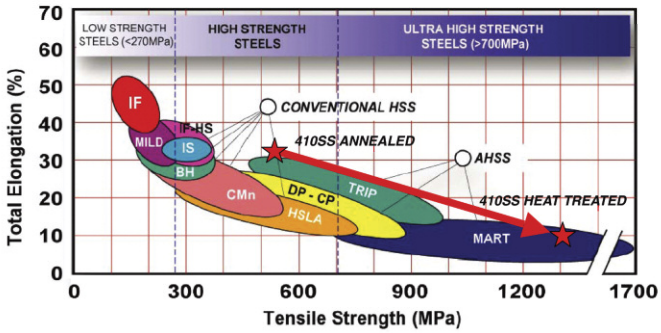
Crash test with KVA high strength bumper

KVA control arm prototype for off road vehicle



KVA automotive subframe prototype

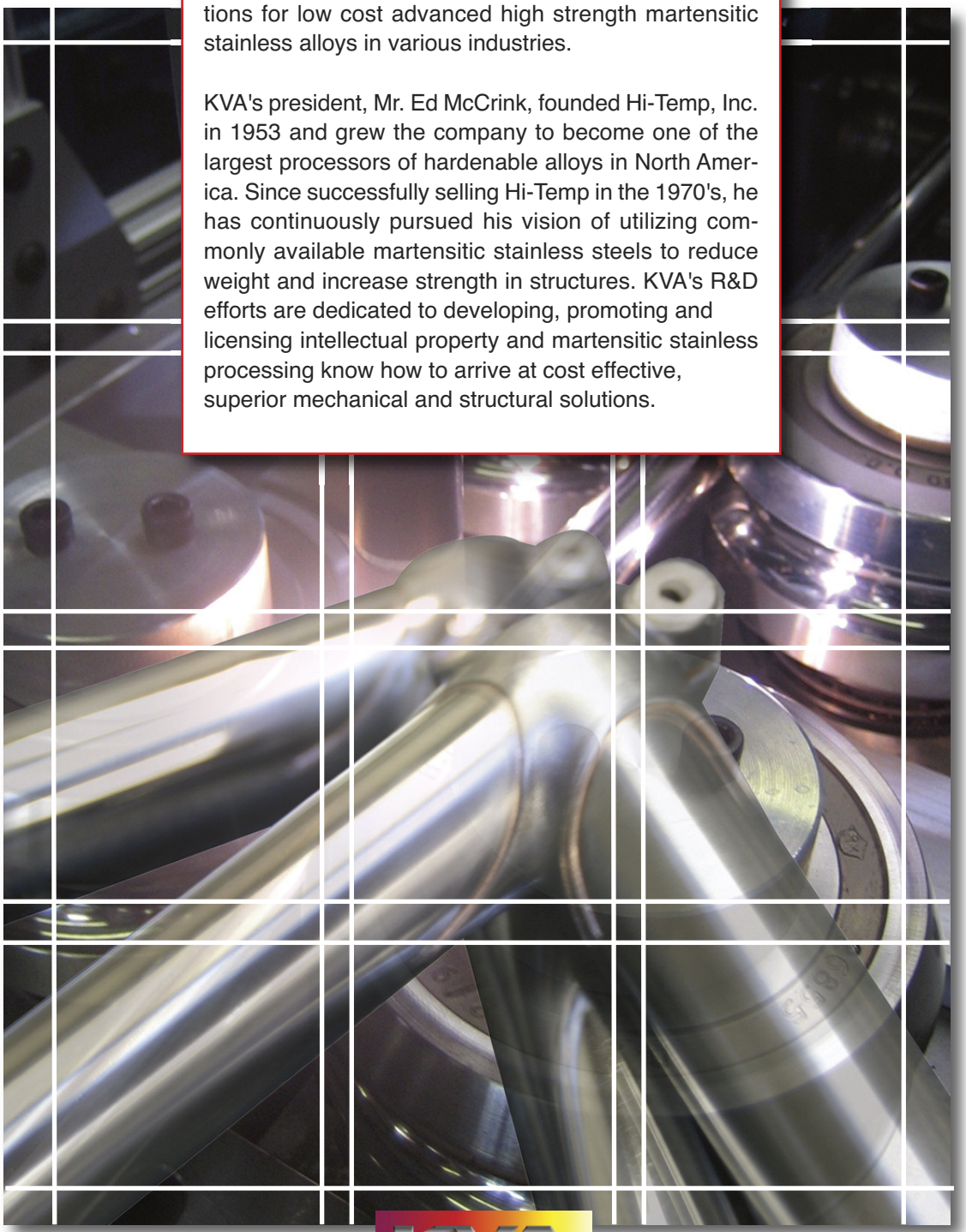
KVA high strength tow hook



History - about us

Located in southern California, KVA is focused on developing and promoting proprietary structural applications for low cost advanced high strength martensitic stainless alloys in various industries.

KVA's president, Mr. Ed McCrink, founded Hi-Temp, Inc. in 1953 and grew the company to become one of the largest processors of hardenable alloys in North America. Since successfully selling Hi-Temp in the 1970's, he has continuously pursued his vision of utilizing commonly available martensitic stainless steels to reduce weight and increase strength in structures. KVA's R&D efforts are dedicated to developing, promoting and licensing intellectual property and martensitic stainless processing know how to arrive at cost effective, superior mechanical and structural solutions.



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