C-r-o-s-s-l-i-n-k International, Inc.

Company Profile

C-r-o-s-s-l-i-n-k International, Inc.

Mission Statement

Our commitment is to minimize **COST without compromising QUALITY** while continuously improving our global operations.

ISO Quality Policy

C-r-o-s-s-l-i-n-k International, Inc. is dedicated to being the leader in providing quality elastomer products which meet or exceed our customer's expectations.

ISO Scope

Design and Manufacture of Engineered Rubber and Rubber to Metal Products for Automotive, Industrial and Specialty Applications.

MARKETS

Heavy Truck

Industrial

Bus/Motor Coach

Automotive

Aerospace

Specialty

MARKETS Automotive

- Meeting future vehicle comfort and safety demands has required ever increasing innovation of materials, processes, and time efficient development technologies for the passenger car and light truck markets.
- C-I engineering continues to develop more effective methods to combat today's increasing temperature, operating, and part performance requirements. We are continuing to exceed in validated replacement materials such as silicone and better bonding materials, while also managing environmentally safe products that comply within our changing industry standards.
- While customer development pressures grow each year, we continue to grow our offering of computer programs and instrumentation tools to help model, simulate, and analyze part performance. We'll never completely abandon the age old bench testing and lab fatigue testing as our primary means of development and part proofing.
- C-I also will work closely with the tire, engine, and powertrain groups to ensure our proposed designs are compatible with the remainder of the ride system. Our system development has helped to improve the overall product, ride comfort and performance.
- Some of our current automotive products consist of non-fluid engine mounts, exhaust isolators, body mounts, and a variety of undercarriage and powertrain bushings and free rubber.

MARKETS ▮ Industrial

- Crosslink is a leading supplier of rubber and rubber to metal for the industrial market. Our concept of a common family of parts has allowed us to offer a range of products capable of serving a multi-purpose application in multiple customer product lines. Using common molds, we match a range of spring rates by using a variation of compounds. This has allowed us to utilize a common design in application with a 70 durometer in the mounting of crane cabs, and a 50 durometer to isolate air compressor cabinets using the same design bushing.
- Though many of our customers in the industrial market are cost conscious, which favors a less stringent application data need, we still offer the full line of engineering resources to them, and will build a custom product if called upon.
- Our current Industrial applications include machine mounting systems, machine leveling mounts, body and cab mounting systems, heavy duty door stops, as well as many types of grommets, bumpers, boots, and seals.

MARKETS ▮ Heavy Truck

- Crosslink offers a wide range of rubber and silicone products for the medium, heavy, and off road truck industry. As a development partner with all of our Heavy Truck OEM's, we provide our customers only the most current materials and processes available in the rubber industry. Our products are guaranteed to be a system solution for increased reliability, safety, and ride comfort.
- C-I engineering is known to be World Class competitive in this industry. Our qualified supplier network allows C-I to process only our core competency materials, products and assemblies. This has allowed C-I to hold a competitive edge as materials and processing in some sectors have increased dramatically.
- C-I currently offers a variety of rubber and silicone products for the Heavy Truck market. Our offering includes high temperature exhaust systems, radiator mounting systems, body mounting systems, engine mounting systems, as well as a large selection of free rubber for undercarriage and chassis.

MARKETS Bus/Motor Coach

- Ride comfort begins to be defined when one effectively separates exterior noise from the interior of a vehicle. Exterior noise, vibration, and harshness will generate driver and passenger discomfort. Ride discomfort can be developed from a range from power system noise(s), frequency conflicts, as well as when poor isolation from the traveled terrain inputs as road harshness.
- Our Bus & Coach products help dampen and isolate transmissible noise from the engine compartment and undercarriage into the driver and passenger cabin areas. Crosslink offers a wide range of materials and product designs that will enhance and improve ride quality.
- C-I products are designed and developed based on a problem, the space available, and operating conditions which drives material selections. Bonding of rubber and silicone to metals offers our customers increased durability, wider range of temperature performance, as well as color coding selection.
- Today, our core Bus and Coach product offerings are isolators for exhaust systems, mounting systems for radiator modules and engine systems, as well as general anti-vibration chassis assemblies.
- All of our designs are application specific, and are not recommended to be transferable from one OEM to the other.

MARKETS Aerospace

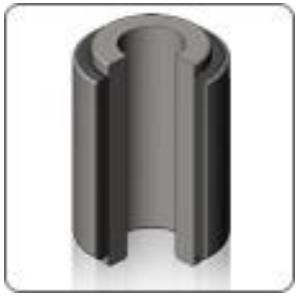
- The Aerospace Industry is one of the most advanced markets in the world. It is also very diverse, with the majority of applications being safety rated and/or critical in nature to the function of the sub-assembly or product.
- The Aerospace Industry produces commercial aircraft, military aircraft, aircraft engines, space vehicles, guided missiles, propulsion units, to name a few. Most of the Aerospace Industry is comprised in supporting Commercial or Government programs.
- Rubber and rubber to metal products are widely used in the Aerospace Industry. Rubber material with the ability to withstand extreme temperatures makes rubber ideal for use in aerospace applications. Specialty synthetic rubber can withstand aerospace types of fluids, engine lubricants, oils, hydraulic fluids, jet fuels, oxidizers and rocket propellants.
- Seals and isolators utilizing materials such as Viton and Hypalon are regularly used in commercial and military applications. Some typical rubber applications would be: isolators for auxiliary power units, o-rings used in connectors, pumps and oil reservoirs, bleed air valves, firewall seals, T-seals, radial lip seals used in pumps, and various dampers and bumpers.
- We accomplish a differentiated approach to these parts by offering a variety of specialty and commercial materials, or a use of standard materials with specialty coatings to enhance the performance of the common material in the areas of abrasion or temperature and/or fatigue.

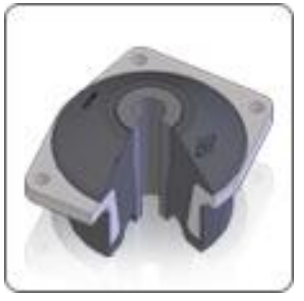
MARKETS ▪ Specialty

- Crosslink is a leading supplier of custom designed products for the agricultural, marine, rail, golf cart, sport vehicle, and utility vehicle business.
- We offer engineering services that specifically handle a wide range of land, air, and sea product development demands from our specialty market customers. Though our specialty customers are unique in product design and operating criterion, all of our specialty OEM's have one common denominator - the goal to eliminate noise, vibration, and harshness from their chassis no matter how it operates.
- C-I engineering provides computer simulation for each application which measures an application's vibration and noise optimization levels. Our current specialty products support a variety of undercarriage isolation components, rubber bonded bushings, rubber engine covers, and isolation seats. Other parts consist of counter acting dampers and basic grommets.

PRODUCT MIX





PRODUCT MIX

Anti-Vibration:

- Mounts
- Dampers
- 2-Pc. Bushings
- Bonded Journals
- Engine Mounts
- Strut Mounts
- Center-Bonded Mounts

NVH Applications:

- Suspension Bushings

High-Temp Applications:

- Muffler Hangers
- Exhaust Mounts
- Specialty Silicone

Small Parts:

- Grommets
- Specialty
- Bumpers
- O-Rings
- Seals
- Snubbing Washers

PRODUCTS ▮ Anti-Vibration

Mounts

Dampers

2-Pc. Bushing

Bonded Journals

PRODUCTS ▮ Anti-Vibration

Engine Mounts

PRODUCTS ▪ Anti-Vibration

Strut Mounts

Center-Bonded Mounts

PRODUCTS ▪ High-Temp Applications

Muffler Hangers

Exhaust Mounts

Specialty Silicone

PRODUCTS ▪ NVH Applications

Suspension Bushings

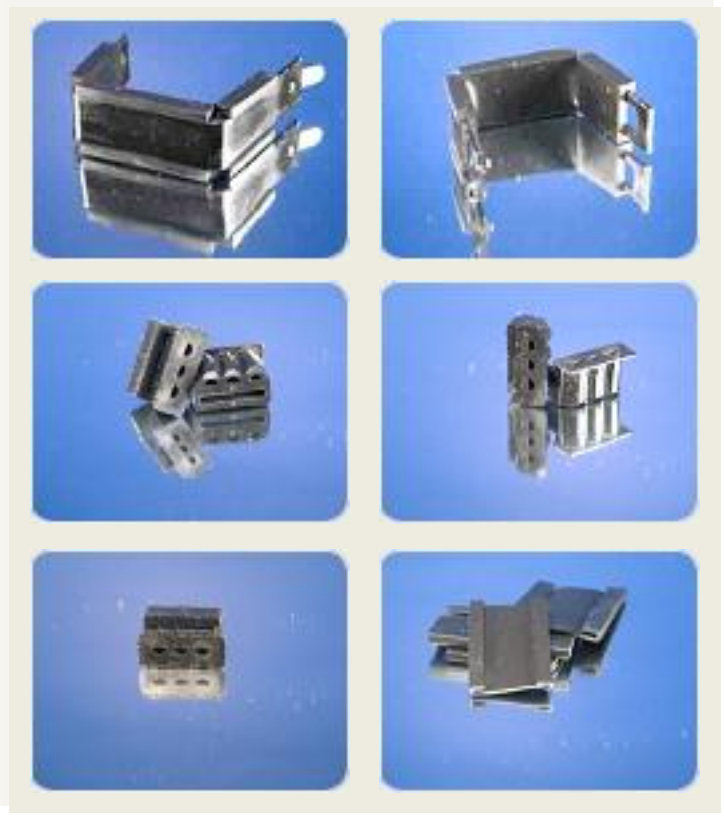
PRODUCTS ▪ Small Parts

Grommets

Specialty Applications

PRODUCTS ▪ Small Parts

Specialty Applications



Bumpers

Grommets

PRODUCTS ▪ Small Parts

O-Rings, Seals

PRODUCTS ▪ Small Parts

O-Rings



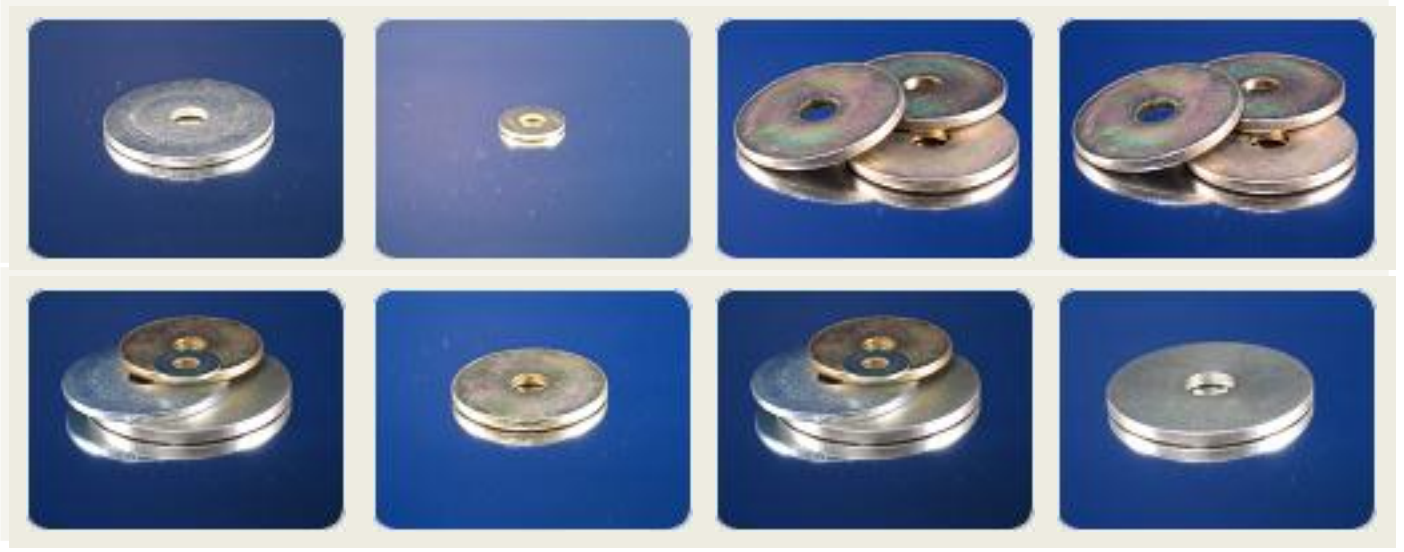
Grommets, Seals





PRODUCTS ▪ Hardware – Custom Washers

Snubbing Washers



PRODUCTS ▮ Hardware – Custom Washers

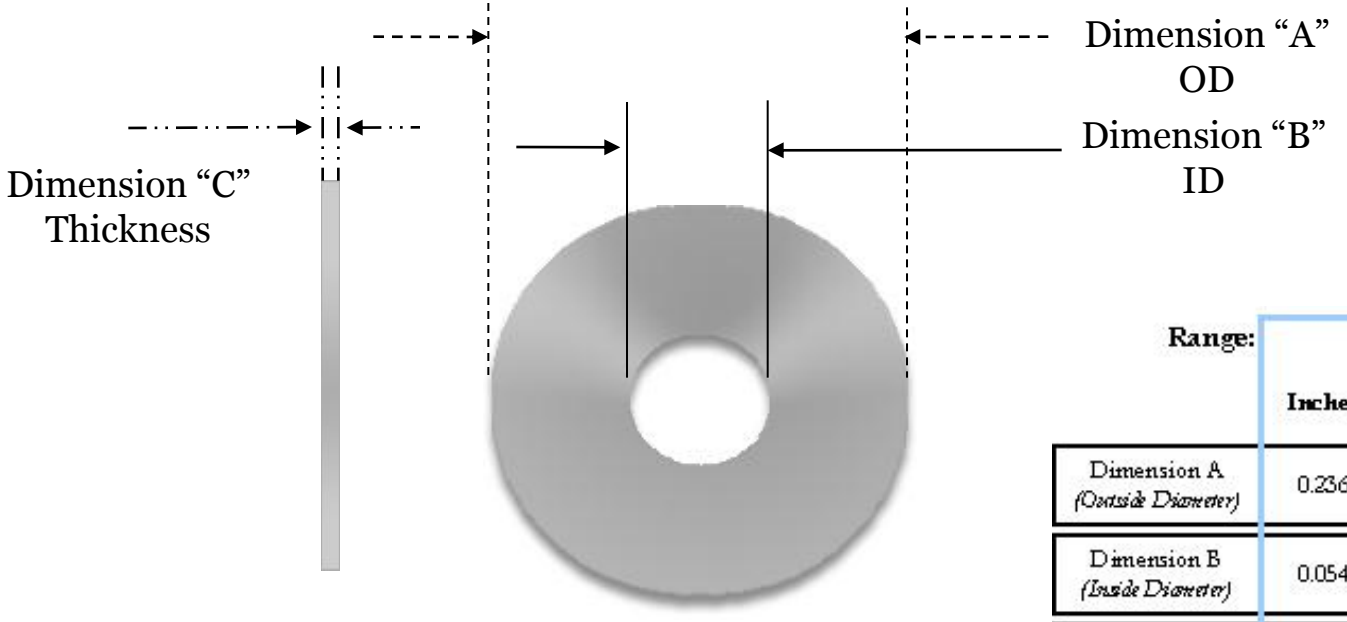
Snubbing Washers

Materials:

- Brass
- Copper
- Bronze
- Steel
- Aluminum
- Stainless Steel

Plating:

- YZD
- Zinc
- Chrome
- E-Coat
- Others



Range:	Low		High	
	Inches	Metric mm	Inches	Metric mm
Dimension A *(Outside Diameter)*	0.236	6.000	7.750	196.850
Dimension B *(Inside Diameter)*	0.054	2.390	5.000	127.000
Dimension C *(Thickness)*	0.005	0.127	0.750	19.050

ENGINEERING

- Design Engineering
- Materials Engineering
- Product Engineering
- Test Equipment

ENGINEERING · Test Equipment

Materials -Tensile Tester

Rheometer

Ozone Chamber

Oil Swell Tester

Oven Aging

Mooney Viscosity

ENGINEERING ▪ Part Test Equipment

Horizontal Test Machine

MTS - Dynamic Sweep

Vertical Tensile Tester

MTS - Dynamic
Environment Chamber

Static Spring Rate Tester

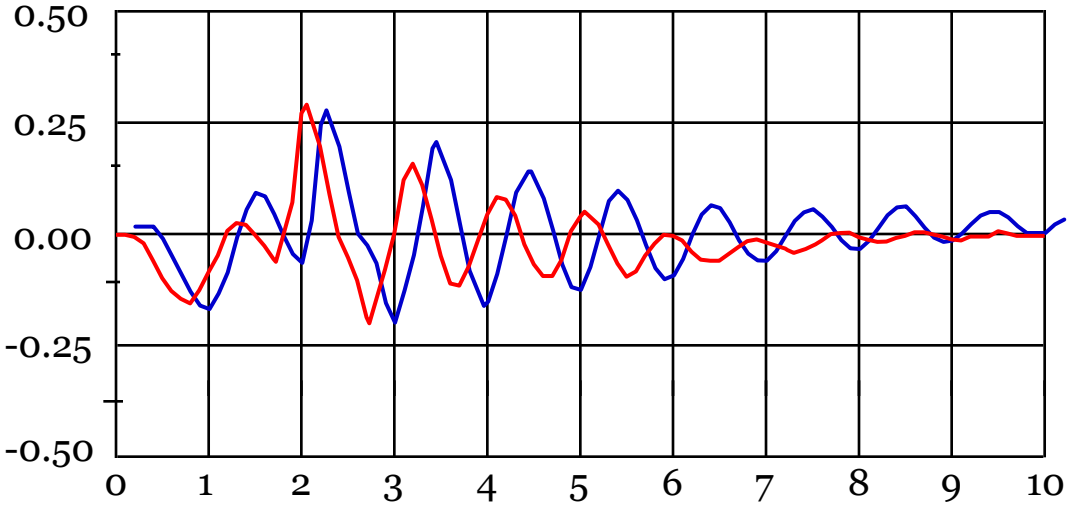
ENGINEERING

Physical Testing

- Static & Dynamic Spring Rate Curves
- Adhesion Testing
- Ozone Testing
- Bench Durability

Material Testing

- Specific Gravity Testing
- Durometer/Hardness
- Oil Swell
- Low Temp Testing
- Tensile & Elongation



ENGINEERING Materials

		Physical Properties				
Polymer Type	ASTM D2000	Hardness Range	Tensile Strength	Elongation MAX	Compression Set	Ozone
Chloroprene (Neoprene)	BC, BE	*30-95	4000	800	Good	Good
Epichlorohrdrin	CH	*40-95	250	350	Fair-Good	Excellent
Chlorosulfonated Polyethylene (Hypalon)	CE	40-95	4000	500	Fair-Good	Excellent
Nitrile (Buna-N)	BF, BG, BK, CH	40-95	4000	800	Good	Fair-Good
Fluorocarbon Elastomer (Viton®, Technoflon®, Fluorel®)	HK	*40-95	3000	500	Excellent	Excellent
Fluorocarbon Elastomer (Kel-F®)	HK	50-85	3500	500	Good	Excellent
Silicone	FC, FE, GE	15-90	1500	800	Good-Excellent	Excellent
Fluorosilicone	FK	40-85	1300	350	Good	Excellent
EPDM-EPR	BA, CA, DA	*30-95	3000	800	Good	Excellent
Polyacrylate	DF, DH	*25-85	2500	400	Good	Excellent
Butyl	AA	*20-80	3000	800	Good	Good-Excellent
Halo Butyl	BA, CA	30-90	3000	800	Good	Good-Excellent
Polyurethane	BG	40-95	5000	700	Poor	Good-Excellent
SBR (GRS)	AA, BA	40-80	3500	600	Good	Poor-Fair
Natural Rubber	AA	30-90	4500	700	Good-Excellent	Poor-Fair
Ethylene Acrylic (Vamac®)	EF	40-90	2500	700	Good-Excellent	Excellent
Ethylene Propylene Fluorocarbon (AFLAS®, Fluorel II®)	HK	60-95	3200	400	Good	Excellent
Kalrez	HK	55-65	1800	250	Good	Excellent
Chlorinated Polyethylenne CPE (Tyrin®)	CE	40-90	2700	600	Good	Excellent
Hydroginated Nitrile (HNBR)	CH	30-100	4000	400	Good	Excellent
Carboxylated Nitrile	BF, BG, BK, CH	55-95	4000	800	Good	Fair-Good
Fluorocarbon Elastomer (Low Temperature)	HK	50-95	2500	500	Excellent	Excellent

ENGINEERING · Materials

Polymer Type	ASTM D2000	Service Temperatures		
		High Temp. MAX 1,000	Low Temp Dynamic	Low Temp Static
Chloroprene (Neoprene)	BC, BE	225°F	-40°F	-65°F
Epichlorohrdrin	CH	275°F	-50°F	-75°F
Chlorosulfonated Polyethylene (Hypalon)	CE	250°F	-40°F	-60°F
Nitrile (Buna-N)	BF, BG, BK, CH	275°F	-65°F	-65°F
Fluorocarbon Elastomer (Viton®, Technoflon®, Fluorel®)	HK	400°F	-5°F	-40°F
Fluorocarbon Elastomer (Kel-F®)	HK	425°F	-4°F	-40°F
Silicone	FC, FE, GE	450°F	-100°F	-180°F
Fluorosilicone	FK	450°F	-70°F	-100°F
EPDM-EPR	BA, CA, DA	300°F	-60°F	-80°F
Polyacrylate	DF, DH	350°F	-20°F	-40°F
Butyl	AA	212°F	-70°F	-90°F
Halo Butyl	BA, CA	250°F	-70°F	-90°F
Polyurethane	BG	250°F	-50°F	-70°F
SBR (GRS)	AA, BA	158°F	-55°F	-85°F
Natural Rubber	AA	158°F	-55°F	-85°F
Ethylene Acrylic (Vamac®)	EF	350°F	-40°F	-60°F
Ethylene Propylene Fluorocarbon (AFLAS®, Fluorel II®)	HK	400°F	-20°F	-50°F
Kalrez	HK	400°F	0°F	-20°F
Chlorinated Polyethylenne CPE (Tyrin®)	CE	300°F	-50°F	-70°F
Hydroginated Nitrile (HNBR)	CH	325°F	-30°F	-50°F
Carboxylated Nitrile	BF, BG, BK, CH	275°F	-40°F	-60°F
Fluorocarbon Elastomer (Low Temperature)	HK	400°F	-35°F	-40°F

ENGINEERING Materials

Polymer Type	ASTM D2000	Fluid Resistance						
		Gasoline (Aromatics)	Gasohol-M (Methanol)	Gasohol-E (Ethanol)	Lube & Amp Grease	Water	Acids	Oxygenated Solvents
Chloroprene (Neoprene)	BC, BE	Poor	Poor	Poor	Fair-Good	Good	Good-Excellent	Poor-Fair
Epichlorohrdrin	CH	Good-Excellent	Fair-Good	Fair-Good	Excellent	Fair	Fair-Good	Poor-Fair
Chlorosulfonated Polyethylene (Hypalon)	CE	Poor-Fair	Poor	Poor	Fair-Good	Good	Excellent	Good
Nitrile (Buna-N)	BF, BG, BK, CH	Good-Excellent	Fair-Good	Good	Excellent	Good-Excellent	Fair-Good	Poor
Fluorocarbon Elastomer (Viton®, Technoflon®, Fluorel®)	HK	Excellent	Good-Excellent	Excellent	Excellent	Good-Excellent	Good	Poor
Fluorocarbon Elastomer (Kel-F®)	HK	Good-Excellent	Good	Good	Excellent	Excellent	Excellent	Poor
Silicone	FC, FE, GE	Poor	Poor	Poor	Fair	Excellent	Fair-Good	Fair-Good
Fluorosilicone	FK	Good-Excellent	Good	Good-Excellent	Excellent	Excellent	Good-Excellent	Poor
EPDM-EPR	BA, CA, DA	Poor	Poor	Poor	Poor-Fair	Excellent	Excellent	Good-Excellent
Polyacrylate	DF, DH	Poor-Fair	Poor	Poor	Good-Excellent	Poor-Fair	Poor-Fair	Poor
Butyl	AA	Poor	Poor	Poor	Poor	Good-Excellent	Excellent	Good-Excellent
Halo Butyl	BA, CA	Poor	Poor	Poor	Poor	Good-Excellent	Excellent	Good-Excellent
Polyurethane	BG	Fair-Good	Fair-Good	Good	Good	Fair	Poor-Fair	Poor
SBR (GRS)	AA, BA	Poor	Poor	Poor	Poor	Excellent	Fair-Good	Good
Natural Rubber	AA	Poor	Poor	Poor	Poor	Excellent	Fair-Good	Good
Ethylene Acrylic (Vamac®)	EF	Poor-Fair	Poor	Poor	Good	Good-Excellent	Fair	Poor
Ethylene Propylene Fluorocarbon (AFLAS®, Fluorel II®)	HK	Fair	Fair	Fair	Excellent	Excellent	Excellent	Fair
Kalrez	HK	Excellent	Excellent	Excellent	Excellent	Good-Excellent	Excellent	Excellent
Chlorinated Polyethylenne CPE (Tyrin®)	CE	Poor	Poor	Poor	Good	Good	Poor	Poor
Hydroginated Nitrile (HNBR)	CH	Good-Excellent	Fair-Good	Good	Excellent	Good-Excellent	Fair-Good	Poor
Carboxylated Nitrile	BF, BG, BK, CH	Good-Excellent	Fair-Good	Good	Excellent	Good-Excellent	Fair-Good	Poor
Fluorocarbon Elastomer (Low Temperature)	HK	Excellent	Good-Excellent	Excellent	Excellent	Good-Excellent	Good	Poor

FORM #ADS-001

C-r-o-s-s-l-i-n-k International, Inc.
Engineered Products Group

Application Data Sheet

TO BE FILLED OUT BY C-R-O-S-S-L-I-N-K INTERNATIONAL, INC.

DATE | RFQ NO. / APPLICATION NO.

CUSTOMER NAME | CUSTOMER ADDRESS

CUSTOMER ENGINEERING CONTACT PHONE: | CUSTOMER CONTACT (OTHER) PHONE

EQUIPMENT USED ON - PART FUNCTION | NO. OF PC / UNIT | ESTIMATED ANNUAL USAGE

APPLICATIONS DETAILED EXPLANATION

Attach additional sheet as needed for detailed description including pictures or other information, etc.

☐ Bonded ☐ Non-bonded ☐ Mechanical Bond ☐ Free Rubber ☐ High Temp ☐ Other

ENVIRONMENTAL SPECIFICATIONS

OPERATING TEMPERATURES LOW HIGH | OZONE | GREASE (TYPE)

HUMIDITY | DUST OR GRIT | OTHER CONTANIMENTS | OILS OR LUBRICANTS (TYPE/S)

WATER (SALT SPRAY) | APPLICATION PAINTED AFTER ASSEMBLY? ☐ NO ☐ YES TEMP: DURATION:

APPLICATION LOADING

RADIAL LOAD NORMAL OPERATING MAX UNITS | AXIAL LOAD NORMAL OPERATING MAX UNITS

CONICAL ANGLE NORMAL OPERATING MAX UNITS | TORSIONAL WHINED UP NORMAL OPERATING MAX UNITS

SAMPLE PARTS ADDITIONAL INFORMATION

SAMPLE PART AVAILABLE? | FAILURE SPECIMEN AVAILABLE?

SIGNATURE:

FORM	APPROVED	DATE	CHG NO.	NUMBER
APPLICATION DATA SHEET	GLB	JULY, 2004	00	ADS-001

ENGINEERING ▪ Design Engineering

Design Software

Unigraphics

SolidWorks

Catia

C-r-o-s-s-l-i-n-k International, Inc.

C.A.E
Design Capability

FEA Software

Hyperform

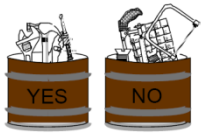
ANSYS

Dyna3D

QUALITY ▪ Quality Systems

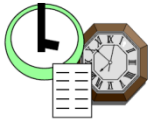
The 6 S's

Sort
Eliminate what is not needed



Straighten
Organize what remains

Shine
Clean work area



Standardize
Schedule cleaning and maintaining

Sustain
Make 6S a way of life

Safety
The result of 6S is
"**NO ACCIDENT**"

Lean Principles

Flow	Waste
1. TAKT time	1. Overproduction
2. Finish goods strategy	2. Inventory (excessive)
3. Continuous Flow	3. Waiting
4. Pull System	4. Over-processing
5. Schedule at 1 point	5. Defects
6. Pitch	6. Motion/Conveyance
7. Interval	7. Transportation

DEKRA

CERTIFICATE

Certificate Number: 111015.00

The Quality System of:

CROSSLINK International, Inc.
6140 Kit Road
Pipersville, PA 18947
United States

Including its implementation, meets the requirements of the standard:

ISO 9001:2008

Scope:
Design and Manufacture of Engineered Rubber and Rubber to Metal Products for Automotive, Industrial and Specialty Applications.

This Certificate is valid until: May 12, 2014
This Certificate is valid as of: May 12, 2011

H. Pierre Sallé
President
DEKRA Certification, Inc

The method of operation for quality certification is defined in the DEKRA General Terms And Conditions For Quality And Environmental Management Systems Certifications. Integral publication of this certificate is allowed.

DEKRA Certification, Inc.
4377 County Line Road
Chalfont, PA 18914
Ph: (215)997-4519
Fax: (215)997-3809

Accredited By:
ANAB

CONTACT

- MAIL: P.O. Box 420
  Doylestown, PA 18901
- LOCATION: 6140 Kit Road
  Pipersville, PA 18947
- PHONE: 215.766.9650
- FAX: 215.766.9606
- WEB SITE: WWW.C-I-INC.COM