



SONOTECH[®] INC

NDT Ultrasonic Couplants

Sound Technology...Sound Results™

www.sonotech-inc.com

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In July of 2008, Sonotech, Inc. was acquired by Magnaflux, a division of Illinois Tool Works (ITW).



Corporate Affiliations:



The Couplant Experts

Sonotech focuses exclusively on industrial and medical ultrasonic couplants, manufacturing the broadest product line in the world, with over 50 industrial NDT couplants and water treatment additives. Sonotech is dedicated to ongoing research and development in couplant performance, corrosion inhibition, operator and environmental safety.

Four decades of product history in performance, metallurgy and operator safety


Sonotech pioneered environmentally benign, operator-safe, high performance couplants with no harsh surfactants, dyes or fragrances. In addition to NDT ultrasonic couplants, Sonotech manufactures diagnostic medical ultrasound couplants, and developed the first unit dose couplant used by 50% of the top ten hospitals to reduce cross-contamination from scanning gel and bottles.

Over 55 product approvals to aerospace, nuclear and military specifications

QUALITY: Sonotech has been assessed and registered as conforming to the requirements of the international standard, **ISO 9001:2000** - Quality Management Systems and to the quality and uniformity standards of ISO 13485 and Federal Regulation 21CFR Part 820.

The Professional's Choice® Tens of thousands of users, millions of inspections worldwide

Sonotech products have been selected with confidence in their material compatibility, physical properties, operator safety, product reproducibility and uniformity for millions of ultrasonic NDT flaw and thickness gaging tests.

 Sonotech features the dolphin prominently in our logo to recognize one of the first uses of sound in location and imaging and to symbolize Sonotech's commitment to minimize our impact on the environment.

- offers environmentally benign ultrasonic couplants
- uses recyclable packaging & materials
- utilizes Puget Sound Energy "Green Power"
- has taken the Watershed Business Pledge
- employees maintain a section of highway



Couplant Selection Tips

ACOUSTIC PROPERTIES

A couplant must have no macro or micro air bubbles that can reflect, scatter, and attenuate sound waves.

Higher acoustic impedance improves transmission and reduces surface noise, particularly on rough or tightly curved metal and concrete surfaces.

- **High Z[®]** has the highest acoustic impedance. (p12)
- **Ultragel II[®]** and **SonoGlide[®]** have increased acoustic impedance (p7 & 9).

CORROSION INHIBITION

A basic premise in ultrasonic testing is that it must be truly nondestructive. A couplant must not cause damage to the part by corrosion.

In critical applications, corrosion potential should be established by specific corrosion testing of the couplant, or by confirming that the couplant has been tested for the required corrosion inhibition characteristics.

Sonotech has developed a ferrous corrosion test and rating system that evaluates both surface and crevice corrosion inhibition of our couplants. Additionally, Sonotech has many products that have been tested by third parties for hydrogen embrittlement, titanium stress corrosion cracking and high temperature corrosion. (p15 & 16)

Sonotech's **Industry Standard Series** has the highest corrosion inhibition ratings for our water-based couplants. (p7 & 8)

HALOGENS AND SULFUR

Most Sonotech couplants contain very low amounts of Halogens and Sulfur (<50ppm). Standard certificates of analysis are available for approval prior to placing an order. Sonotech can arrange specific batch testing if required. Certificates of Analysis are packed with every certified product.

For an explanation of standard testing and certifications, see page 18.

- **SonoGlide UP[®]** offers the lowest halogens and sulfur. (p9)

SURFACE WETTING

The ideal couplant quickly cuts through surface films to provide an unobstructed acoustic interface between the transducer and the test surface.

- **Ultragel[®]II** has the highest wetting capability of the water-based couplants. (p7)
- **Thermasonic[®]** and **Gel 3000[®]** are the best wetting water-free couplants. (p12 & 14)

DRYING TIME

Reapplication is minimized when a couplant stays wet and acoustically conductive longer, thus optimizing efficiency and removal. For water-based couplants, drying time is usually related to temperature range: the higher the upper limit, the longer the drying time.

- **Ultragel[®] II and Echogel XP[®]** have the longest drying time of the water-based couplants. (p7 & 8)
- **SonoGlide[®] UP & FE, Thermasonic[®] and Gel 3000[®]** have the longest drying time of the non-water-based, but water soluble couplants. (p9 & 12)

TEMPERATURE RANGE

For accurate, reproducible results, a couplant must be used within its rated temperature range. Some high temperature couplants have a minimum, as well as a maximum, temperature.

Sonotech manufactures a broad range of high and low temperature couplants.

- **SonoGlide[®]** has the broadest temperature range of the ambient temperature couplants. -60° to 250°F (-51° to 121°C) (p9)
- **Pyrogel[®]** offers the broadest range of the high temperature couplants. -50° to 800°F (-45° to 427°C) (p14)
- **Sono 1200+[®]** offers the highest temperature range. 700° to 1200°+ F (371° to 650°C) (p14)

FLUORESCENT TRACER

Gel 3000[®] contains a UV fluorescent tracer for monitoring couplant removal and transducer contact coverage. Visual and UV dyes can be added to other couplants upon request.

UNIFORMITY

Sonotech's advanced manufacturing process and equipment were developed to meet the requirements of medical product quality and uniformity standards ISO 13485 and Federal Regulation 21CFR Part 820 ensuring that all couplant is homogeneous throughout the entire batch.






Ambient Temperature Couplants		Water-based couplants feature high surface wetting, high ferrous corrosion inhibition factors and each has less than 50 ppm halogens and sulfur thus meeting nuclear power specifications for halogens, sulfur and low melting point metals (p16).			
Gel Couplant		Key Benefits	Viscosity	Temperature Range	Ferrous Corrosion Inhibition Rating*
	<p>Ultrage II®</p> <p>Page 7</p>	<ul style="list-style-type: none"> • Most specified and approved ultrasonic couplant • Increased acoustic impedance for reduced surface noise • Extended temperature range • Slow drying with good transducer lubrication • Good wetting characteristics on oily or dirty surfaces • Holds on vertical and overhead surfaces • Many specification approvals, highest corrosion inhibition of the Industry Standard series • Contains glycerine to extend drying time • Remove with water 	<p>80,000 cps Brookfield Helipath Spindle E @ 1.5 rpm</p>	<p>-10° to 210°F -23° to 99°C</p>	<p>90</p>
A Complete Range Of Low Through Very High Viscosity Fluids and Gels	<p>Sonotrace®</p> <p>Page 8</p>	<ul style="list-style-type: none"> • Good price to performance ratio • Does not contain glycerine • Slow drying • Good wetting ability and ferrous corrosion resistance • Highest viscosity holds on overhead and vertical surfaces • Easiest of the Industry Standard Couplants to remove with water 	<p>Grade 20 37,500 cps Brookfield Helipath Spindle E@1.5rpm</p> <p>Grade 30 65,000 cps Brookfield Helipath Spindle E@1.5rpm</p> <p>Grade 40 125,000 cps Brookfield Helipath Spindle E@1.5rpm</p>	<p>25° to 175°F -4° to 79°C</p>	<p>80</p>
	<p>Echogel®</p> <p>Page 8</p>	<ul style="list-style-type: none"> • Remains stable on corrosion or salt cake • Does not contain glycerine • Good wetting characteristics on oily or dirty surfaces • Highest viscosity holds on overhead and vertical surfaces • Remove with water 	<p>Grade 10 3,000 cps Brookfield LV #4 @60rpm</p> <p>Grade 14 25,000 cps Brookfield LV #4 @6rpm</p> <p>Grade 20 75,000 cps Brookfield LV #4 @6rpm</p> <p>Grade 30 160,000 cps Brookfield LV #5 @60rpm (semisolid)</p>	<p>27° to 140°F -3° to 60°C</p>	<p>65</p>
	<p>Echogel® XP</p> <p>Page 8</p>	<ul style="list-style-type: none"> • Slow drying for large coverage and reinspection • Remains stable on corrosion or salt cake • Does not contain glycerine • Broad operating temperature range • Good wetting characteristics on oily or dirty surfaces • Highest viscosity holds on overhead and vertical surfaces • Remove with water 	<p>Grade 14 25,000 cps Brookfield LV #4 @6rpm</p> <p>Grade 20 75,000 cps Brookfield LV #4 @6rpm</p>	<p>5° to 190°F -15° to 87°C</p>	<p>80</p>

* Please refer to Sonotech Ferrous Corrosion Inhibition Chart for complete details (p15 & 16)



Ambient Temperature Couplants		All Sonotech Environmentally Benign Couplants are fragrance free, contain no dyes, thus reducing skin irritation potential, and will not stain clothing. All couplants in this category contain an environmentally benign ferrous corrosion inhibition system for steel and have less than 50 ppm halogens and sulfur meeting nuclear power specifications for halogens, sulfur and low melting point metals.			
Gel Couplants in Two Viscosities		Key Benefits	Viscosity	Temperature Range	Ferrous Corrosion Inhibition Rating*
	SoundSafe® <i>Page 10</i>	<ul style="list-style-type: none"> • Highest performance in environmentally benign category • Reduced surface noise from increased acoustic impedance • Good surface wetting capability • Slow drying with excellent transducer lubrication • Gel viscosity holds on most overhead and vertical surfaces • Compatible with most composites and metals, except magnesium • Corrosion inhibiting system for ferrous based materials • Remove with water 	80,000 cps (Brookfield Helipath Spindle E @ 1.5 rpm)	0° to 200°F -18° to 93°C	75
	SoundSafe® HV <i>Page 10</i>	<ul style="list-style-type: none"> • Highest viscosity water-soluble couplant • Reduced surface noise from increased acoustic impedance • Good surface wetting capability • Slow drying with excellent transducer lubrication • Compatible with most composites and metals, except magnesium • Remove with water 	200,000 cps Brookfield Helipath Spindle E @ 1.5 rpm	0° to 200°F -18° to 93°C	75
Low Through Very High Viscosity Fluids and Gels	SonoGlide® UP For all non-ferrous metals except Magnesium <i>Page 9</i>	<ul style="list-style-type: none"> • For all non-ferrous metals (except magnesium), plastics and most composites • Non-toxic, water soluble, non-staining • Broad temperature range • Extended drying time • Self leveling provides fast, easy spreading over large areas • Remove with water 	Grade 10 2,500 cps Brookfield LV #2 @6 rpm Grade 20 25,000 cps Brookfield LV #4 @12 rpm Grade 40 80,000 cps Brookfield LV #4 @1.5 rpm)	-60° to 250°F -51° to 121°C	N/A
	SonoGlide® FE For ferrous metals <i>Page 9</i>	<ul style="list-style-type: none"> • For ferrous metals • Extended drying time • Broad temperature range • Water soluble with excellent transducer lubrication and acoustic properties • Compatible with plastics - will not harden on transducers or instruments • Self leveling provides fast, easy spreading over large areas • Remove with water 	Grade 7 1,000 cps Brookfield LV #4 @ 6 rpm Grade 10 2,500 cps Brookfield LV #2 @ 6 rpm Grade 20 25,000 cps Brookfield LV #4 @ 12 rpm Grade 40 80,000 cps Brookfield LV #4 @ 1.5 rpm	-60° to 250°F -51° to 121°C	75
	Soundclear® Economical <i>Page 10</i>	<ul style="list-style-type: none"> • Good price to performance ratio • Increased acoustic impedance • Good surface wetting capability • Slow drying with excellent transducer lubrication • Self leveling provides fast, easy spreading over large areas • Remove with water 	Grade 40 105,000 cps Brookfield Helipath Spindle E @ 1.5 rpm Grade 60 170,000 cps Brookfield Helipath Spindle E @ 1.5 rpm	20° to 200°F -7° to 93°C	45
Powder Couplants	UT-X® Powder Economical - Mix On Site <i>Page 11</i>	<ul style="list-style-type: none"> • Most economical couplant - mix on site • Self de-airing 2 packet system • Lump-free, uniform mixing • Salt stable • Reduced storage space 	Variable by altering water amount.	32° to 120°F 0° to 49°C in tap water can be winterized to 20°F / -29°C	10
	UT-X® FE Powder Economical - Mix On Site <i>Page 11</i>	<ul style="list-style-type: none"> • Mild corrosion inhibition for cast iron and steel • Self de-airing 2 packet system • Lump-free, uniform mixing • Salt stable • Reduced storage space 	Variable by altering water amount.	32° to 120°F 0° to 49°C in tap water can be winterized to 20°F / -29°C	40

* Please refer to Sonotech Ferrous Corrosion Inhibition Chart for complete details (p15 & 16)



Specialty Couplants	Each Specialty Couplant offers unique properties for unusual or difficult inspections.			
	Key Benefits	Viscosity	Temperature Range	Ferrous Corrosion Inhibition Rating*
<p>High Z</p> <p><i>Page 12</i></p>	<ul style="list-style-type: none"> • Highest acoustic transmission to reduce surface noise and improve coupling performance on rough and curved surfaces • Close acoustic match to lucite wedges used for angle beam inspection • Environmentally benign formula • Remove with water 	<p>Low 40,000 cps Brookfield LV #5 @1.5 rpm</p> <p>High 500,000 cps Brookfield LV #5 @1.5 rpm</p>	<p>0° to 200°F -18° to 93°C</p>	<p>70</p>
<p>Shear Gel</p> <p><i>Page 12</i></p>	<ul style="list-style-type: none"> • Extremely thick viscosity to couple normal incidence (zero degree) shear waves • Remove with water 	<p>40,000 cps Brookfield LV #5 @1.5 rpm</p>	<p>40° to 90°F 4° to 32°C</p>	<p>85</p>
<p>Gel 3000®</p> <p><i>Page 12</i></p>	<ul style="list-style-type: none"> • Ultraviolet fluorescent tracer • Excellent corrosion inhibition and compatible with magnesium • Water-free, water-soluble • Excellent wetting properties • Does not contain glycerine • Highest viscosity holds on overhead and vertical surfaces • Broad temperature range, slow evaporation rate • Remove with water 	<p>Grade 8 20,000 cps Brookfield LV #5 @1.5 rpm</p> <p>Grade 25 140,000 cps Brookfield LV #5 @1.5 rpm</p> <p>Grade 60 600,000 cps Brookfield LV #5 @1.5 rpm</p>	<p>0° to 325°F -18° to 163°C</p>	<p>85</p>
<p>Thermasonic®</p> <p><i>Page 12</i></p>	<ul style="list-style-type: none"> • Broad temperature range • Slow evaporation rate • Water-free, water-soluble • Environmentally benign • Does not contain glycerine • Highest viscosity holds on overhead and vertical surfaces • Excellent corrosion inhibition • Excellent wetting properties • <200 ppm Halogens and <150ppm Sulfur • Remove with water 	<p>Grade 8 20,000 cps Brookfield LV #5 @1.5 rpm</p> <p>Grade 25 140,000 cps Brookfield LV #5 @1.5 rpm</p> <p>Grade 60 600,000 cps Brookfield LV #5 @1.5 rpm</p>	<p>0° to 325°F -18° to 163°C Auto Ignition 720° F / 38° C</p>	<p>85</p>
<p>UT-X® Powder</p> <p>Economical - Mix On Site</p> <p><i>Page 11</i></p>	<ul style="list-style-type: none"> • Most economical - mix on site • Self de-airing 2 packet system • Lump free, uniform mixing • Salt stable • Reduced storage space • No dyes or fragrance, will not stain clothing 	<p>Variable by altering water amount.</p>	<p>32° to 120°F 0° to 49°C in tap water can be winterized to 20°F / -29°C</p>	<p>10</p>
<p>UT-X® FE Powder</p> <p>Economical - Mix On Site</p> <p><i>Page 11</i></p>	<ul style="list-style-type: none"> • Mild corrosion inhibition for cast iron and steel • Self de-airing 2 packet system • Lump free, uniform mixing • Salt stable • Reduced storage space • No dyes or fragrance, will not stain clothing 	<p>Variable by altering water amount.</p>	<p>32° to 120°F 0° to 49°C in tap water can be winterized to 20°F / -29°C</p>	<p>40</p>

* Please refer to Sonotech Ferrous Corrosion Inhibition Chart for complete details (p15 & 16)



Extreme Temperature Couplants	Sonotech UT couplants do not contain perfluorocarbons, thus "polymer fume fever" is not an operator hazard.			
	Key Benefits	Viscosity	Temperature Range	Ferrous Corrosion Inhibition Rating*
Thermasonic®	<ul style="list-style-type: none"> • Excellent wetting and slow evaporation rate to 325°F • Water-free, water-soluble • Environmentally benign • Excellent corrosion inhibition • Lubricious; will not run or drip • Remove with water 	<p>Grade 8 20,000 cps Brookfield LV #5 @1.5 rpm</p> <p>Grade 25 140,000 cps Brookfield LV #5 @1.5 rpm</p> <p>Grade 60 600,000 cps Brookfield LV #5 @1.5 rpm</p>	<p>0° to 325°F -18° to 163°C Auto Ignition 720° F / 38°2 C</p>	85
Sono 600	<ul style="list-style-type: none"> • Very slow drying allowing long term coupling to 600°F • Excellent corrosion inhibition and metals compatibility • Economical alternative to silicone based couplants • Non-toxic for food processing equipment • Fluid or gel 	<p>Fluid 2,500 cps Brookfield LV #3 @ 30 rpm</p> <p>Gel 500,000 cps Brookfield LV #5 @1.5 rpm</p>	<p>Thickness gaging: 0° to 600°F -18° to 315°C Flaw inspection: 50° to 500°F 10° to 260°C Auto Ignition 720° F / 38°2 C</p>	100
Sonotemp®	<ul style="list-style-type: none"> • High acoustic impedance • Very high viscosity paste • Resists long-term drying at moderately high temperatures • Excellent for flow metering and acoustic emission • Contains no polymers 	<p>>4,000,000 cps Brookfield LV #5 @ 0.3 rpm</p>	<p>Thickness gaging: 0° to 700°F -18° to 371°C Flaw inspection: 30° to 600°F -1° to 315°C Auto Ignition 1065°F / 574°C</p>	90
Pyrogel®	<ul style="list-style-type: none"> • Broadest operating temperature range (-50 to 800°F) • Resists drying, good choice for long term flow metering • Contains no polymers • Available in a range of viscosities from fluid to gel 	<p>Grade 7 620 cps Brookfield LV #2 @30 rpm</p> <p>Grade 25 150,000 cps Brookfield LV #5 @1.5 rpm</p> <p>Grade 60 550,000 cps Brookfield LV #5 @1.5 rpm</p> <p>Grade 100 4,000,000 cps Brookfield LV #5 @.3 rpm</p>	<p>Thickness gaging: -50° to 800°F -45° to 315°C Flaw inspection: 0° to 600°F -18.6° to 315°C Auto Ignition (GR25) 960°F / 515°C</p>	100
Sono 900	<ul style="list-style-type: none"> • Gritty, high viscosity paste stays in place • Adheres well to transducers at high temperatures 		<p>Thickness gaging: 600° to 900°F 315° to 482°C Flaw inspection: 600° to 650°F 315° to 343°C Auto Ignition 990°F / 532°C</p>	95
Sono 950	<ul style="list-style-type: none"> • Useful to 950°F • Extended time window for longer inspections • Less smoke than Sono 900 • Medium viscosity paste 		<p>Thickness gaging: 600° to 950°F 315° to 510°C Flaw inspection: 600° to 725°F 315° to 385°C Auto Ignition 1040°F / 560°C</p>	95
Sono 1100	<ul style="list-style-type: none"> • Useful to 1100°F • Extended high temperature time window for longer inspections • Medium viscosity paste 		<p>Thickness gaging: 700° to 1100°F 371° to 593°C Flaw inspection: 700° to 900°F 371° to 482°C Auto Ignition 1060°F / 626°C</p>	100
Sono 1200 +	<ul style="list-style-type: none"> • Highest temperature UT couplant commercially available (700 to well over 1200°F) • Extended high temperature time window for longer inspections • Medium viscosity paste 		<p>Thickness gaging: 700° to 1200+°F 371° to 649°C Flaw inspection: 700° to 1000°F 371° to 482°C Auto Ignition °F / °C</p>	100

Industry Standard Series

The Industry Standard Series of water-based couplants features high surface wetting capabilities to optimize transmission on dirty or oily surfaces. Ferrous corrosion inhibition factors for each are the highest in their performance class. The Industry Standard Series meets nuclear specifications for Halogens, Sulfur and low melting point metals and many aircraft and military specifications. The following products have established the standard by which other UT couplants are judged.

ULTRAGEL® II NSN 6850-01-157-4348

The Performance Standard

A gel couplant for use in ultrasonic inspections where corrosion inhibition is an important criterion and Halogens, Sulfur and low melting point metals must be kept to a minimum.

Since 1976, Ultragel II has been the NDT industry's most specified and used ultrasonic couplant because of its outstanding acoustic performance, chemical characteristics and corrosion inhibition. Ultragel II is ideal for flaw detection, thickness gaging, flow metering and acoustic emission testing from -10° to 210°F.

Ultragel II contains a ferrous corrosion inhibitor with a relative effectiveness rating of 90 (p15 & 16), meets a range of ASTM, military and industry specifications partially summarized below, and is compatible with most metals except magnesium. See Gel 3000 for Mg compatible couplant. (p12)



Tested and Approved:

ASTM: F519 Hydrogen Embrittlement Testing on high strength steel, F945 Stress Corrosion Cracking Testing on Titanium alloys

Boeing Specifications: BAC 5968 (adhesive bonds), 5980 (composites), 5439-PSD622 (welds, tubing and wrought material)

Pratt & Whitney: PWA 36604, MCL E-205 Type II (ASTM F945), PWA 36700/36604 Hot corrosion testing on high temperature alloys AMS 5544 (Waspalloy), 5536 (Hastelloy X), 6359 (Ferrous based alloys) 4037 (Aluminum), 5608 (Haynes 188), 5508 (Greek Ascoloy), 4375 (Magnesium), PWA 286 & 275 (Gas turbine blade coatings), 1484 PWA turbine blade alloy

*Visit our website
for shelf life information*

www.sonotech-inc.com

Ultrasonic Couplant Storage

Couplant should be stored in the original container above freezing and out of direct sunlight. Once opened, the container must be closed when not in use. Never put unused couplant back into the original container. If pumps or valves are used on bulk couplant, wash thoroughly between drums to avoid contamination of new product.

Industry Standard Series

SONOTRACE®

For use in ultrasonic inspection where a glycerine-free couplant is required.



Sonotrace is a moderately priced, ambient temperature (25° to 175°F), water-based, glycerine-free couplant for flaw detection and thickness gaging where Halogens, Sulfur and low melting point metals must be kept to a minimum. Available in three viscosities from low viscosity fluid to very high viscosity gel.

Sonotrace contains a ferrous corrosion inhibitor with a relative effectiveness rating of 80 (p15 & 16) and is compatible with most composites and metals.

Tested and Approved:

Boeing Specifications: BAC 5968 (adhesive bonds) and BAC 5980 (composites).

ECHOGEL®

A glycerine-free couplant for use in inspection where salt cake or metal corrosion salts are present.

An industry standard since 1974, Echogel is an economically priced, glycerine-free couplant for flaw inspection in volume use at ambient temperatures from 27° to 140°F. Echogel resists viscosity breakdown on salt-caked boiler and corroded surfaces.

Echogel contains a ferrous corrosion inhibitor with a relative effectiveness rating of 65 (p15 & 16) and is compatible with most composites and metals.

Tested and Approved:

ASTM F519 Hydrogen Embrittlement Testing on high strength steel

Boeing Specifications: BAC 5439-PSD622

NAVSHIPS MIL-STD 767, 2041

ECHOGEL® XP

Extended Performance

Slow drying, glycerine-free couplant recommended for extended temperature range (5° to 190°F), or where slow drying is desired in flaw inspection on salt-caked boiler surfaces, corroded pipe or structural steel.

Echogel XP is an economically priced, glycerine-free couplant with a longer drying time designed for volume flaw detection over extended temperature ranges. Echogel XP resists viscosity breakdown on salt-caked boiler surfaces and corroded metals. Echogel XP contains a ferrous corrosion inhibitor with a relative effectiveness rating of 80 (p15 & 16) and is compatible with most composites and metals.



Tested and Approved: ASTM F519-05 Hydrogen Embrittlement Testing on high strength steel.

Environmentally Benign Couplant Series



Environmental Awareness

Sonotech developed environmentally benign couplants to minimize the impact of NDT on the environment. These environmentally benign couplants contain biodegradable materials safe for leave-on applications. Sonotech's environmentally benign couplants have low skin irritation potential, contain no dye or fragrance and will not stain clothing.

The Environmentally Benign Couplant Series meets nuclear power specifications for Halogens, Sulfur and low melting point metals. These couplants contain an environmentally benign ferrous corrosion inhibition system for steel. When ferrous corrosion is the most important criterion, Ultragel II and Sonotrace provide superior corrosion inhibition.

SONOGLIDE® UP (Ultra Pure)

Compatible with titanium, aluminum, copper, stainless steel, plastics, many magnesium alloys, and many composites.

Select when Halogens and Sulfur must be at a minimum, broad material compatibility, slow drying, water wash removability and a broad temperature range (-60° to 250°F) are desired.

Tested and Approved:

Pratt & Whitney: PWA 36604, MCL E-205 Type II, ASTM F945 Stress Corrosion Cracking testing on Titanium Alloys, PWA 36700/36604 Hot corrosion testing on high temperature alloys AMS 5544 (Waspalloy), 5536 (Hastelloy X), 6359 (Ferrous based alloys), 4037 (Aluminum), 5608 (Haynes 188), 5508 (Greek Ascology), 4375 (Magnesium), and PWA 286 & 275 (Gas turbine blade coatings), and 1484 PWA turbine blade alloy

SONOGLIDE® FE

For use with cast iron, steel and its alloys.

SonoGlide FE is a special grade of SonoGlide developed for **ferrous metals** where short-term corrosion is a concern. SonoGlide FE performs over a wide temperature range (-60° to 250°F) and is slow drying. SonoGlide FE remains stable on corroded or salt covered surfaces.

Corrosion Inhibition: There is low short-term corrosion potential with SonoGlide FE on cast iron, steel, and its alloys. SonoGlide contains a ferrous corrosion inhibitor with a relative effectiveness rating of 75 (p15 & 16).

Environmentally Benign Couplant Series

Ambient Temperature Couplants

SOUNDSAFE® & SOUNDSAFE® HV (High Viscosity)

The Environmental Standard NSN 6850-01-157-4348

A high performance couplant for use in overhead, vertical and horizontal applications where environmental concerns are a primary consideration.

Soundsafe offers the highest performance of the environmentally benign family of couplants. Soundsafe has a high humectant level to slow drying, increase acoustic impedance and provide transducer lubrication, and has a temperature range of 0° to 200°F.



Soundsafe Tested and Approved:

Pratt & Whitney: PWA 36604, MCL E-205 Type II or ASTM F945 Stress Corrosion Cracking Testing on titanium alloys, PWA 36700/36604 Hot corrosion testing on high temperature alloys AMS 5544 (Waspalloy), 5536 (Hastelloy X), 6359 (Ferrous based alloys) 4037 (Aluminum), 5608 (Haynes 188), 5508 (Greek Ascoloy), 4375 (Magnesium), PWA 286 & 275 (Gas turbine blade coatings) and 1484 PWA turbine blade alloy

Both Soundsafe and Soundsafe HV contain a ferrous corrosion inhibitor with a relative effectiveness rating of 75 (p15 & 16) and are compatible with most composites and metals except magnesium.

SOUNDCLEAR®

A good price to performance ratio couplant for flaw detection and thickness gaging where environmental concerns are a primary consideration. Fills depressions in rough surfaces.

Soundclear contains humectants to slow drying, increase acoustic impedance and provide an operating temperature range of 20° to 200°F.

Soundclear contains a corrosion inhibitor for steel with a relative effectiveness rating of 45 (p15 & 16) and is compatible with aluminum, titanium, and plastics. Not recommended for magnesium.



Environmentally Benign Couplant Concentrates



Environmentally Benign Couplant Concentrates are cost effective powders that are to be mixed with water at the inspection site. The compact and lightweight packets are easy to transport or store against unanticipated shortages.

UT-X and UT-X FE Powders are supplied in a two packet system to provide homogenous distribution of antimicrobial agents and corrosion inhibitors and to minimize air during mixing.



UT-X® POWDER

The most economical couplant, mix on site.

UT-X Powder is a couplant concentrate useful for flaw detection and thickness gaging. UT-X Powder resists viscosity breakdown from salts and has a ferrous corrosion inhibition rating of 10. (p15 & 16) For increased ferrous corrosion inhibition, select UT-X FE.

UT-X® FE POWDER

An economical, mix on site couplant for use where ferrous corrosion inhibition is required.

UT-X FE Powder is a couplant concentrate useful for flaw detection and thickness gaging. UT-X FE Powder incorporates a ferrous corrosion inhibitor, a preservative, and a viscosity building polymer. UT-X FE has a ferrous corrosion inhibition rating of 40. (p15 & 16)

UT-X Powders Storage & Shelf Life

UT-X and UT-X FE Powder couplants should be stored in the original zip-top bags out of sunlight. Once opened and prepared, store mixed couplant in a closed container.

The shelf life for unopened packets of UT-X Powder couplants is three (3) years from the date of manufacture. A prepared container of UT-X Powder has an approximate shelf life of one (1) month.

Cost Effective

- Costs significantly less than standard couplants
- Minimizes shipping charges
- Reduced storage requirements
- No drum disposal expense

Easy to use

- Pre-measured 1-gallon and 5-gallon packets
- Extremely compact storage: A drum's volume can fit in a drawer or briefcase
- Viscosity can be varied for exact job requirements simply by adjusting the amount of water
- Mixes quickly, uniformly and without lumps

Specialty Couplants



HIGH Z

A very high acoustic impedance couplant which optimizes acoustic transmission and reduces surface noise on curved, rough, pitted or heavily corroded surfaces.

Provides the highest acoustic impedance of all Sonotech couplants, reducing surface noise and improving coupling performance on rough and curved surfaces. Many times, High Z will facilitate flaw inspection or thickness gaging when no other couplant will function. Available in two viscosities.



SHEAR GEL®

For use in true shear wave applications.

Provides coupling for shear wave generated by **normal incidence** (zero degree) shear wave transducers.



GEL 3000®

A water-soluble couplant with a fluorescent tracer to assure complete application and/or removal in flaw detection and thickness gaging over a broad temperature range.

Developed to test the space shuttle, Gel 3000 contains a fluorescent tracer that enables the inspector to monitor transducer overlap and ensure complete coverage and removal by illumination with ultraviolet light. Gel 3000 is water and humectant-free, enables testing verification and is available in a range of viscosities.

Gel 3000 has excellent corrosion inhibiting characteristics on most metals including magnesium, and has a ferrous corrosion inhibition rating of 95.
(p15 & 16)



THERMASONIC®

For use where rapid wetting, slow drying, broad temperature range and easy water removal are required.

Thermasonic is a water and humectant-free formula for flaw detection and thickness gaging where water solubility is required. Thermasonic, like Gel 3000, has excellent corrosion inhibiting characteristics on most metals.



Extended and Extreme Temperature Couplants



Selection Tip

To achieve the most consistent results, select the couplant having the broadest temperature range overlap with the expected test temperature. For example, at 600°F (315°C) Pyrogel® will give the most consistent results, even though several other products will work at this temperature.

What to Expect

Smoke: All liquids and greases decompose above a certain temperature. Smoke does not mean that the couplant is not working, but does indicate that effective coupling time is limited.

Evaporation: At high temperatures couplants dry relatively quickly; the temperature range for flaw detection is narrower because of this evaporation. More couplant may be required near the upper temperature limit to compensate for drying.

Clean up: Wipe still hot transducers on a dry rag folded into several layers to protect skin. Clean room temperature oily residues with common solvents such as acetone, if required. (Do not use solvents on hot pipes!)

Flash Point vs. Auto-Ignition

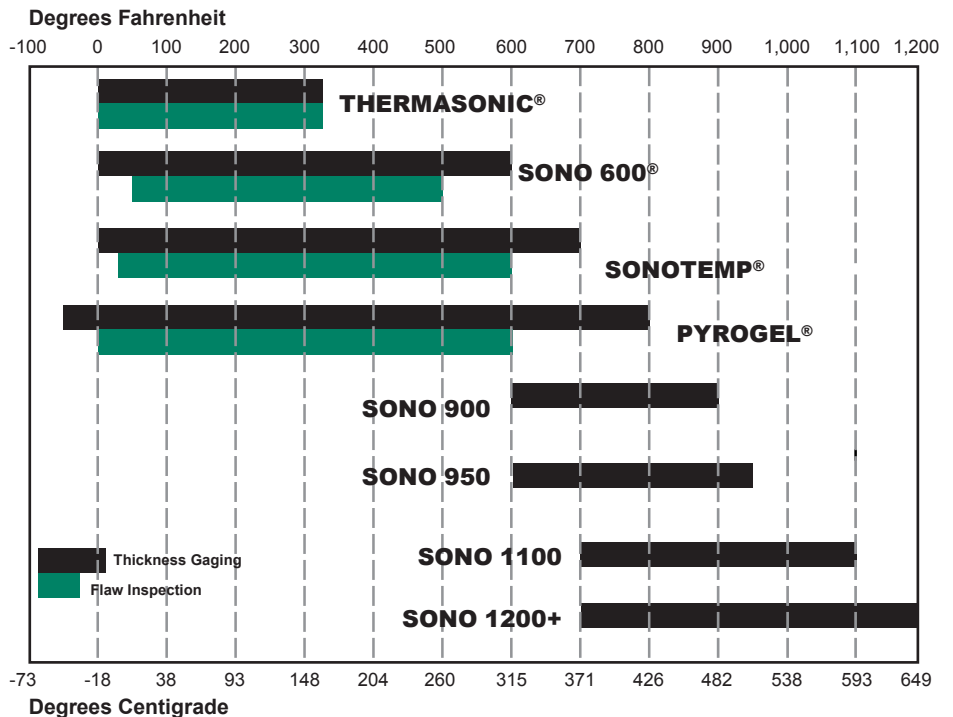
Auto-Ignition is the temperature at which a substance ignites without other sources of energy. This is usually the temperature of interest in UT inspections, as inspections are seldom done in the presence of spark or flame.

The **Flash Point** of a product is the lowest temperature at which vapors arising from the product will ignite momentarily when exposed to a flame.

Selection and Use Tips

- Pyrogel and Sono 600 are available in low viscosities to enable pumping of couplant to remote transducers in crawlers.

- When testing on vertical surfaces, a thicker grade of couplant is more likely to stay in place. A thinner grade generally gives better performance on flat surfaces.



Extended and Extreme Temperature Couplants

Sonotech manufactures a wide variety of couplants with proven performance in flaw detection, thickness gaging, flow metering, and acoustic emission testing at extreme temperatures.



THERMASONIC®

Water-free formula for flaw detection, thickness gaging, flow metering, and acoustic emission testing where long inspection time and/or water solubility are required. 0° to 325°F

Polymer Fume Fever

Sonotech couplants do **NOT** contain perfluorocarbons found in many "high temperature" greases. "Polymer fume fever" is not an operator hazard with Sonotech Couplants.



SONO 600

Biodegradable formula for flaw detection, thickness gaging, and acoustic emission testing in petrochemical, power generating industries, food processing machinery, and pharmaceutical manufacturing and storage equipment. 0° to 600°F



PYROGEL®

Provides coupling over a wide temperature range for thickness gaging, flow metering, acoustic emission testing, and flaw detection. -50° to 800°F



SONOTEMP®

Useful in high temperature thickness gaging and flow metering where elevated temperature, curved or very rough surfaces present coupling difficulties. Sonotemp is our highest acoustic impedance high temperature couplant. 0° to 700°F



SONO 900

A thick, gritty, stay in place paste for thickness gaging. Used worldwide since 1977. 600° to 900°F



SONO 950

Sono 950 will maintain acoustic coupling to give ample time for obtaining good thickness readings at temperatures between 600° and 950° Thinner, smoother consistency than Sono 900.



SONO 1100

Sono 1100 will maintain acoustic coupling to give ample time for obtaining good thickness readings from 700° to 1100°F



SONO 1200+

Provides coupling for thickness gaging from 700° to well over 1200 °F



Couplant Feature Comparison Chart

Product	Min. Temp ^a		Max. Temp ^a		Corrosion Inhibition ^b	Relative Viscosity ^c	Actual Viscosity (Brookfield)
	°F	°C	°F	°C			
Industry Standard Series							
Ultragel II	-10	-23	210	99	90	4	~80,000 cps (Helipath Spindle E @1.5 rpm)
Sonotrace Gr 20	25	-4	175	79	80	3	~37,500 cps (Helipath Spindle E @1.5 rpm)
Sonotrace Gr 30	25	-4	175	79	80	4	~65,000 cps (Helipath Spindle E @1.5 rpm)
Sonotrace Gr 40	25	-4	175	79	80	5	~125,000 cps (Helipath Spindle E @1.5 rpm)
Echogel Gr 10	27	-3	140	60	65	3	~3,000 cps (LV #4 @ 60 rpm)
Echogel Gr 14	27	-3	140	60	65	4	~25,000 cps (LV #4 @ 6 rpm)
Echogel Gr 20	27	-3	140	60	65	6	~75,000 cps (LV #4 @ 6 rpm)
Echogel Gr 30	27	-3	140	60	65	7	~160,000 cps (LV #5 @ 6 rpm)
Echogel XP Gr 14	5	-15	190	87	80	4	~25,000 cps (LV #4 @ 6 rpm)
Echogel XP Gr 20	5	-15	190	87	80	6	~75,000 cps (LV #4 @ 6 rpm)
Environmentally Benign Series							
Soundsafe	0	-18	200	93	75	4	~80,000 cps (Helipath Spindle E @1.5 rpm)
Soundsafe HV	0	-18	200	93	75	6+	~200,000 cps (Helipath Spindle E @1.5 rpm)
SonoGlide Gr 7	-60	-51	250	121	75*	1	<1,000 cps (LV #4 @ 60 rpm)
SonoGlide Gr 10	-60	-51	250	121	75*	2	~2,500 cps (LV #2 @ 6 rpm)
SonoGlide Gr 20	-60	-51	250	121	75*	4	~25,000 cps (LV#4 @12 rpm)
SonoGlide Gr 40	-60	-51	250	121	75* *FE Grades Only	6	~80,000 cps (LV#4 @1.5 rpm)
Soundclear Gr 40	20	-7	200	93	45	5	~105,000 cps (Helipath Spindle E @1.5 rpm)
Soundclear Gr 60	20	-7	200	93	45	6	~170,000 cps (Helipath Spindle E @1.5 rpm)
UT-X Powder	32	0	120	49	10	1 to 7	variable by altering water amount
UT-X/FE Powder	32	0	120	49	40	1 to 7	variable by altering water amount
Specialty Couplants							
High Z LV	0	-18	200	93	70	3	~40,000 cps (LV #5 @ 1.5 rpm)
High Z HV	0	-18	200	93	70	8	~500,000 cps (LV #5 @ 1.5 rpm)
Shear Gel	40	4	90	32	85	7	>4,000,000 cps
Gel 3000 Gr 60	0	-18	325	163	85	7	~600,000 cps (LV #5 @1.5 rpm)
Thermasonic Gr 8	0	-18	325	163	85	3	~20,000 cps (LV #5 @1.5 rpm)
Thermasonic Gr 25	0	-18	325	163	85	5	~140,000 cps (LV #5 @1.5 rpm)
Thermasonic Gr 60	0	-18	325	163	85	7	~600,000 cps (LV #5 @1.5 rpm)
Extended & Extreme Temperature Series							
Sono 600 Fluid	0	-18	600	315	100	2	~2,500 cps (LV #3 @ 30 rpm)
Sono 600 Gel	0	-18	600	315	100	6	~500,000 cps (LV #5 @1.5 rpm)
Sono 900	600	315	900	482	N/A	N/A	N/A
Sono 950	600	315	950	510	N/A	N/A	N/A
Sono 1100	700	371	1100	593	N/A	N/A	N/A
Sono 1200+	700	371	1200+	650	N/A	N/A	N/A
Sonotemp	0	-18	700	371	90	7	>4,000,000 cps (LV #5 @ 0.3 rpm)
Pyrogel Gr 7	-50	-45	800	427	100	1	~620 cps (LV #2 @ 30 rpm)
Pyrogel Gr 25	-50	-45	800	427	100	5	~150,000 cps (LV #5 @ 1.5 rpm)
Pyrogel Gr 60	-50	-45	800	427	100	8	~550,000 cps (LV# 5 @1.5 rpm)
Pyrogel Gr 100	-50	-45	800	427	100	10	>4,000,000 cps (LV#5 @ 0.3 rpm)

^a For thickness gaging (lower Max. for flaw insp.)

^b Duration of ferrous corrosion inhibition (mild steel & cast iron): 100=long term protection, 80=60 days-steel, 14 days-iron, 60=30 days-steel, 7 days-iron, 40=7 days-steel, 2 to 8 hours-iron, 20=8 hours-steel, 0 to 2 hours-iron,

^c 10=thick paste, 5=slow flowing gel, 0=water

0=no inhibition, like plain water.

Couplant Feature Comparison Chart

Long Velocity (x10 ⁵ cm/sec)	Impedance (Mrayls)	Acoustic Performance ^d	Typical Max Halogens ^e	Typical Max Sulfur ^e	Water Solubility ^f	
Industry Standard Series						
1.65	1.80	85	<50 ppm	<50 ppm	90	g, h, i, j, k, l
1.52	1.55	55	<50 ppm	<50 ppm	90	j
1.52	1.55	55	<50 ppm	<50 ppm	90	j
1.52	1.55	55	<50 ppm	<50 ppm	90	j
1.55	1.60	50	<50 ppm	<50 ppm	80	g, l
1.55	1.60	50	<50 ppm	<50 ppm	80	g, l
1.55	1.60	50	<50 ppm	<50 ppm	80	g, l
1.55	1.60	50	<50 ppm	<50 ppm	80	g, l
1.55	1.60	60	<50 ppm	<50 ppm	80	g
1.55	1.60	60	<50 ppm	<50 ppm	80	g
Environmentally Benign Series						
1.64	1.72	80	<50 ppm	<50 ppm	90	i
1.64	1.72	80	<50 ppm	<50 ppm	90	i
1.53	1.55	70	<50 ppm	<50 ppm	80	h, i (UP only)
1.53	1.55	70	<50 ppm	<50 ppm	80	h, i (UP only)
1.53	1.55	70	<50 ppm	<50 ppm	80	h, i (UP only)
1.53	1.55	70	<50 ppm	<50 ppm	80	h, i (UP only)
1.56	1.63	60	<50 ppm	<50 ppm	90	
1.56	1.63	60	<50 ppm	<50 ppm	90	
1.51	1.53	40	<50 ppm	<50 ppm	80	
1.55	1.57	40	N/A	N/A	80	
Specialty Couplants						
2.64	3.69	100	<100 ppm	<100 ppm	80	
2.64	3.69	100	<100 ppm	<100 ppm	80	
2.03	2.89	N/A	<100 ppm	<100 ppm	70	
1.35	1.45	75	<150 ppm	<150 ppm	90	
1.35	1.45	75	<200 ppm	<150 ppm	90	
1.35	1.45	75	<200 ppm	<150 ppm	90	
1.35	1.45	75	<200 ppm	<150 ppm	90	
Extended & Extreme Temperature Series						
1.50	1.37	70	N/A	N/A	20	
1.50	1.37	70	N/A	N/A	20	
N/A	N/A	N/A	N/A	N/A	0	
N/A	N/A	N/A	N/A	N/A	0	
N/A	N/A	N/A	N/A	N/A	0	
N/A	N/A	N/A	N/A	N/A	0	
.65	1.55	N/A	N/A	N/A	0	
1.20	1.35	55	N/A	N/A	10	
1.20	1.35	55	N/A	N/A	10	
1.20	1.35	55	N/A	N/A	10	
1.20	1.35	55	N/A	N/A	10	

^d For thickness gaging
(lower Max. for flaw inspection)

^e typical values only, request current
C of A for actual values

^f 100=easiest to remove with appropriate solvent
0=difficult to remove even with solvent and scrubbing

N/A = Not Available,
Information in green
indicates best estimates.

^g ASTM F519 ^h ASTM F945-PWA 36604 ⁱ PWA 36700 ^j BAC 5968 ^k BAC 5980 ^l BAC 5439-PSD 622

UT Water Treatment Series

<p>ECHOWET®</p> <p><i>Concentrated, biodegradable wetting agent reduces surface tension and improves wetting. ¹</i></p>	<p>Wetting Agent</p> <ul style="list-style-type: none"> • Reduces surface tension and eliminates air trapped in immersion bath • Reduces the need to heat immersion bath or allow bath to de-air • Lowers interfacial tension between oil and water, improving the wetting of oily parts and reducing the incidence of small air bubbles that cling to parts • Approved material per Boeing BAC5968 and BAC5980 • Compatible with Echonox I and Echonox II • 1 gallon treats 400 to 800 gallons of water • Complimentary splash goggles accompany every Echowet order • Recommended disposal: municipal sewer • Concentration Needed: 0.125 - 0.25%
<p>ECHONOX® I</p> <p><i>Corrosion inhibiting additive for ultrasonic inspection of most metals.</i></p>	<p>Corrosion Inhibitor</p> <ul style="list-style-type: none"> • Good ferrous corrosion (rust) inhibitor and is compatible with most metals • Concentrated liquid reduces shipping costs • Compatible with Echowet • 1 gallon treats 65 to 130 gallons of water • Recommended disposal: municipal sewer • Concentration Needed: 0.75 - 1.5%
<p>ECHONOX® II</p> <p><i>Longer term ferrous corrosion inhibitor for ultrasonic inspection of ferrous parts.</i></p>	<p>Corrosion Inhibitor</p> <ul style="list-style-type: none"> • Most effective ferrous corrosion inhibitor - provides longer term protection than Echonox I • Concentrated liquid reduces shipping costs • Compatible with Echowet • 1 gallon treats 65 to 130 gallons of water • Recommended disposal: municipal sewer • Concentration Needed: 0.75 - 1.5%

¹ River die away test for biodegradability.

Selection and Use Tips

Performance is closely related to water quality, other chemicals present and conditions of use. Request a sample to confirm that the product(s) will work in your application.

When to add more

System maintenance depends on many factors including parts throughput, aeration, contamination levels, temperature, etc. Only experience reveals the optimal maintenance schedule for each system; a guideline is to add proportional amounts of water treatment chemicals to compensate for “make up” water added.

Terms of Sale and Service

DELIVERY

All shipments are FOB Bellingham, WA
UPS ground service unless otherwise requested
Motor freight for 55-gallon drums and bulk orders

FREIGHT CHARGES

We ship via the least expensive method unless otherwise requested
Freight charges are prepaid and added on most UPS ground shipments
Most air shipments are billed to the customer's account
Motor freight items are shipped freight collect

TERMS OF SALE

New accounts require prepayment of first order
Net 30 days on current accounts
Prepayment by check, credit card or wire transfer required for all international shipments
We accept VISA, MASTERCARD and AMERICAN EXPRESS
\$25.00 NSF fee

BACK ORDERS

We ship 95% of all orders from stock within 24 hours ARO. However, peaks in demand can lead to backorders. Customers are notified immediately of backordered items and expected ship date.

RETURN POLICY

Unopened units in usable condition may be returned within 30 days of purchase. A restocking fee of 15% will be deducted from the returned product cost. **Opened containers and items over 30 days from the date of purchase cannot be returned.** Contact Sonotech for a Returned Material Authorization (RMA) number; no returns will be accepted without an RMA.

DAMAGED GOODS

In the event that your item is damaged upon receipt, we will replace it at no cost to you. Please contact Sonotech for directions on how to proceed. All damages must be reported within 10 days of receipt. In the unlikely event we have shipped an incorrect product, please notify Sonotech and we will issue a call tag for the incorrect product and ship a replacement immediately.

SAMPLES

Contact Sonotech for FREE ultrasonic couplant samples for application testing or to test for material compatibility (such as testing for corrosion on magnesium alloys).

COUPLANT SELECTION TRAINING PROGRAM

Visit our website to download a presentation which provides guided steps in choosing the right couplant. This CD is useful for classroom demonstrations or as an introduction to couplant features and applications.



certification & analysis

COMPATIBILITY TESTING

Sonotech can perform specific corrosion testing (metallurgical couplant compatibility testing) on parts provided. Call Sonotech for a quote.

UT COUPLANT TESTING AND CERTIFICATION

For most products, Sonotech supplies a Certificate of Analysis from an independent testing laboratory. This analysis is based on a chemical batch. Our standard tests are detailed below. *If you require certification to a specific standard with additional requirements, please include a copy of the standard with your order.*

CUSTOM ANALYSIS

For Sonotech products not routinely analyzed or for customers with additional requirements, Sonotech will provide custom Certificates of Analysis for a fee. Custom analysis is based on the exact tests and testing methods specified and references the product batch supplied to the customer. **Note:** *Please specify any special analysis requirements when placing orders with customer service. Please allow a minimum of two weeks for custom analysis.*

STANDARD ANALYSIS

Halogens
- ASTM D808/ASTM D512/ASTM D1179
Sulfur
- ASTM D129

WWW.SONOTECH-INC.COM

Visit our website for additional product information including MSDS, datasheets, current pricing, to set up an account for easy on-line ordering or to request product samples. Current as well as prior issues of **SonoNews**, our quarterly technical newsletter, are also available.



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