Specialists in Seals & Service
Hi-Tech Seals Inc.

TECH TALK
VOLUME 42

API Approved Materials

API, American Petroleum Institute, is a national trade association representing all aspects of America's oil and natural gas industry. They have been establishing and maintaining standards since 1924. Adherence to these standards creates an environment of confidence and efficiency, whereby companies and personnel can be assured of safety, reliability, and reduced downtime.

Hi-Tech Seals is proud to offer numerous, high quality compounds that have been independently tested to API 6A, Appendix F, sour fluid: Petroleum and natural gas industries – Drilling and production equipment – Wellhead and Christmas tree equipment immersion testing – standard test fluids for non-metallic seals:

Material class DD/EE – Gas Phase mixture: 10% H_2S + 5% CO_2 + 85% CH_4

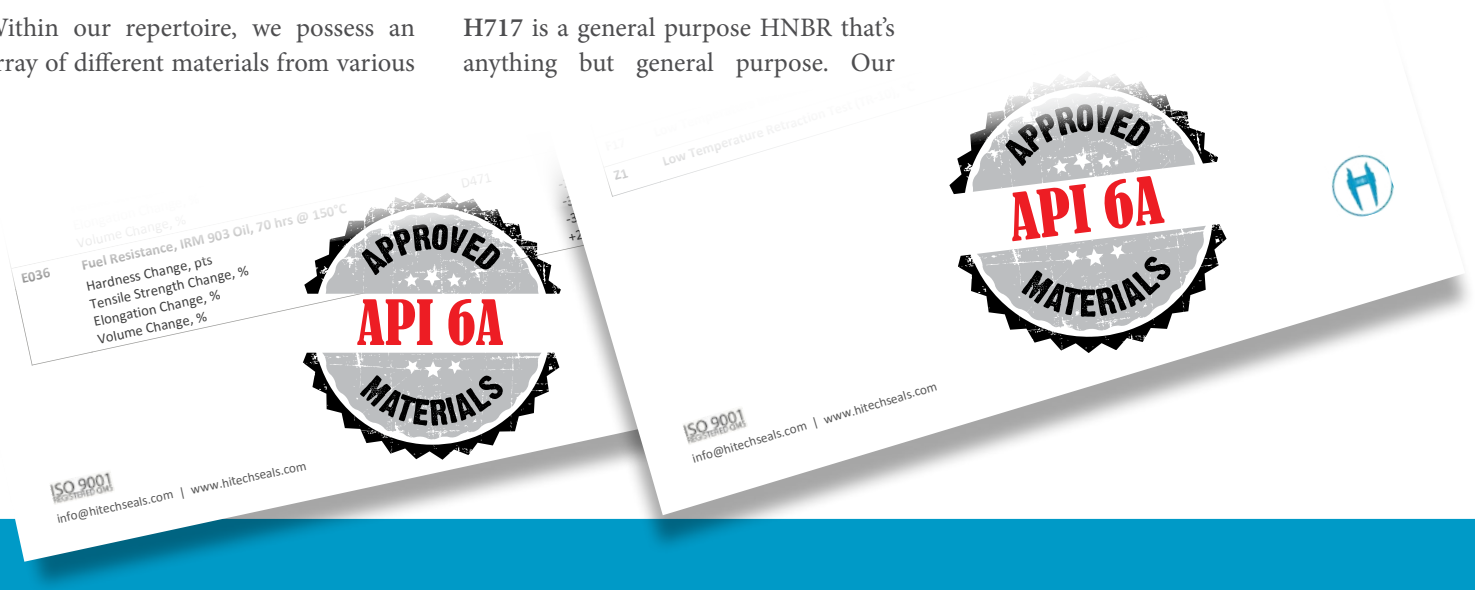
Within our repertoire, we possess an array of different materials from various elastomer families. Our selection provides you the flexibility to tailor your seal selection to the environment in which you are operating.

The ultimate in resilience, our **H966** hydrogenated nitrile (HNBR) compound offers you unparalleled pressure handling capabilities, abrasion resistance, and is impermeable to small molecule gases. With excellent chemical and thermal stability, this workhorse will manage your most demanding applications.

Low temperature capability without compromising mechanics is hard to find. Our **H925** HNBR compound allows for worry-free sealability in your coldest ambient environments, having been tested to -55C. It also offers remarkable ability to resist set, offering reliable seal contact across a broad range of temperatures.

H717 is a general purpose HNBR that's anything but general purpose. Our lower durometer **H717** is specifically compounded to offer stretch and flexibility features, allowing for installation in almost any application and reliable at the lowest of pressures. Chemical and abrasion resistance combined with low temperature flexibility makes this a very capable compound.

Our **V9M2** is a proven GLT based Viton™ compound possessing both API 6A and NORSOK M710 certification. **V9M2** has a long pedigree of successful performance in some of the most challenging downhole applications. With a strong resilience to a broad range of chemicals including steam, this compound performs superbly in high pressure, high temperature applications. It's extremely low compression set makes it ideal for both temperature and pressure cycling environments.



Hi-Tech Seals strongly believes in safety through seal performance and is committed to the offering of high quality products and materials, proven through the most respected regulating bodies. We formulate our unique, proprietary offerings with the guidance of our most important partners, you, the customer. If you are looking to solve your next sealing challenge, make it right, make it with Hi-Tech Seals.

Dustin Jackston, BSc, CFSP, *has worked at Hi-Tech Seals for over 13 years. Starting as a Front Counter Sales Rep, Dustin has worked his way through many job titles and is now a Regional Sales Manager, working out of our Edmonton Head Office.*

Instructions for Success

Printing Instruction Manuals for Your Kits

When selling or sending your kits into the field, do you include instructions manuals or diagrams with the kit? If you don't, would you like to? At Hi-Tech Seals we can assemble your kits and print out documents for your kit using our in-house production printer. Having an instruction manual or documentation can help with brand recognition and increase the ease of installation for anyone using the kit.

Our production printer allows for us print documents as small as 4" x 6" up to 11" x 17". We can print in colour or black and white on one or both sided of the page. Our printer can corner staple your instructions, or even make it into a proper booklet. If your document requires folding our printer has that covered; as it can single, double, or accordion fold your documents.

Need to order a kit to put the instruction manual in? Our kit creation program provides customers with an easy to use reordering system for various types of seal kits. Whether it is for maintenance or manufactured equipment, our seal kits are an excellent system to help our customers stay organized. Our sales staff will identify the individual items within your kit and create a single part number in our system. When placing an order, simply provide us with that single part number and receive all of the components in one bag.

At Hi-Tech Seals we offer both manually packaged kits or can utilize our specialized packaging equipment to meet our clients' needs. Based on the customer's kitting requirements, quantities, and various other factors, our dedicated packaging staff will determine the most efficient and economical method to complete the packaging. Kit intricacy can be custom tailored to meet our customers' needs, from a very basic kit, to a very complex kit with specific bagging and labelling requirements.

Technically Speaking

Hi-Tech Seals' Machinable Materials - Part II

This edition of Technically Speaking will cover the second half of the last installment in of our Hi-Tech Seals compound series. Previous installments have covered the keys to compounding successful sealing solutions, downhole tool industry compounds, rapid gas decompression (RGD) compounds, mud motor boot compound, UL listed material, and some machinable materials. In this Technically Speaking edition we will feature a few of our machinable materials, MP85, MA11, and MU90.

MP85, MA11, and MU90 compounds are ideal for rod and piston seals, wiper seals, rotary seals, and static seals. Our experienced staff can also quickly design and manufacture new, replacement, and prototype parts.

MP85 is our unreinforced, extruded polyetheretherketone (PEEK) material. It offers chemical and hydrolysis resistance similar to polyphenylene sulphide (PPS) but can operate at higher temperatures. Our MP85 has good wear resistance and can be used continuously at 480°F (250°C). It can be used in hot water or steam without permanent loss in physical properties. For hostile environments, PEEK is a high strength alternative to fluoropolymers. PEEK carries a V-O flammability rating and exhibits very low smoke and toxic gas emission when exposed to flame.

MA11 is our standard tetrafluoroethylene-propylene copolymer (FEPM, TFE/P) material. FEPM (TFE/P) is used in numerous applications in the oilfield industry. It is resistant to water, steam, methanol, amines, phosphate esters, brake fluids, ethylene glycol, acids (H2S up to 10%), mineral-based lubricating and hydraulic oils, some synthetic lubricants, air, ozone oils and gases, cold water, and diluted acids and bases.

MU90 is a premium polyurethane compound that is resistant against mineral oil, HFD-U and HETG=biological base, oils, gases, cold water, and diluted acids and bases. MU90 is Hi Tech Seals' standard compound for machined polyurethane products.

	DIN Standard	MP85	MA11	MU90
Original Physical Properties				
Hardness, Shore A	53505	85	85 ± 5	95 ± 3
Tensile Strength, MPa	53504	110	7.2	56-65
Elongation, %	53504	40	236	382
Modulus @ 100%, MPa	53504	110	4.2	15.3
Compression Set, 24 hrs @ 175°C, %	ISO 815	-	24.5	-
Compression Set, 24 hrs @ 100°C, %	ISO 815	-	-	27
General Operating Temperature		-70°C to 260°C	-40°C to 100°C	-54°C to 105°C

For full specification sheets on these, or any other compound, contact a Hi-Tech Seals Representative today.

Understanding Abbreviations

Making Sense of it All

Have you ever read an email, document, or piece of literature and not understood the abbreviations being utilized? You wouldnt be alone in your experience. With all the abbreviations used in the sealing industry, it can be hard to understand what you are reading and what people are saying sometimes. As part of an on-going series, we will be covering abbreviations you likely come across in your daily work life. These abbreviations can be for anything from industry specific terms to associations, or engineering lingo. This edition of the series will cover ASTM designations for commonly used elastomers and thermoplastics.

ASTM Designation Abbreviations	Material Name	Material Trade Name
AU, EU	Polyurethane	Lubrithane - SKF, Hythane® - Hallite, Molythane® - Parker Hannifin
CR	Chloroprene	Neoprene - DowDuPont, Baypren® - ARLANXEO
EPDM, EPM	Ethylene Propylene	Nordel™ - Dow, Keltan® - ARLANXEO
FFKM	Perfluoroelastomer	Kalrez® - DowDuPont, Chemraz® - Greene Tweed, Perlast® - PPE
FKM	Fluorocarbon	Viton™ - Chemours, Dai-el™ - Daikin, Tecnoflon® - Solvay
FEPM, TFE/P	Tetrafluoroethylene-Propylene Copolymer	Viton™ Extreme™ ETP - Chemours, Aflas® - Asahi Glass Co
FVMQ	Fluorosilicone	Silastic® LS/FSR - Dow Corning
HDPE	High Density Polyethylene	
HNBR	Hydrogenated Nitrile	Therban® - ARLANXEO, Zetpol® - Zeon Chemical
LDPE	Low Density Polyethylene	
NBR	Nitrile	Perbunan® - ARLANXEO, Krynac® - ARLANXEO, Nipol® - Zeon Chemical
PEEK	Polyetheretherketone	Ketron® - Quadrant
PE	Polyethylene	
PA	Polyamide	Nylon - DuPont
PAI	Polyamide-imide	Duratron® - Quadrant, Torlon® - Solvay
POM	Polyoxymethylene (Acetal)	Delrin® - Dupont
PPS	Polyphenylene Sulphide	Techtron®- Quadrant, Ryton® - Solvay
PTFE	Polytetrafluoroethylene	Fluon® - AGC Chemicals, Polyflon™ - Daikin
TPC-ET	Thermoplastic Elastomers	Hytrel® - DowDupont, Fluorotrel® - SKF
UHMWPE	Ultra High Molecular Weight Polytheylene	Tivar® - Quadrant
VMQ	Silicone	Silastic® - Dow Corning, Elastosil® - Wacker

Metal Machining Capabilities

Start to Part, We Deliver the Complete Solution

In addition to our Rapid Seal offering of rubber and plastic machined parts, Hi-Tech Seals offers in-house metal machining services, available through our Winnipeg facility. We routinely provide customers with low run turned and mill products using our CNC lathes and milling machines.

Hi-Tech Seals' experience began over 10 years ago machining tooling and moulds to support our cast urethane products. Over the years our metal machining services have expanded to provide many customers with everything from prototype, bespoke, and low volume production parts in various materials. These materials include aluminum, bronze, stainless steel, with secondary services including anodizing and hardening available.

We also offer mid to high production metal parts including raw and finished castings through our global supply partners. We are presently producing a wide range of metal machined products used in the following industries with expertise in reverse engineering discontinued and difficult to source components.

- Water & Waste
- Transportation
- Mining
- Agricultural Equipment
- Oil & Gas
- Food & Beverage
- Pharmaceutical
- Forestry

Our ability to manufacture and source high quality metal components further enhances our vision to provide superior value to our customers with a comprehensive range of quality related products. For more information on our metal machining capabilities, talk to your Hi-Tech Seals representative.

Tony Boken *has worked at Hi-Tech Seals for over 23 years and has over 30 years of sealing experience. Tony is the Branch manager for our Winnipeg, MB location and Cast Urethane Division.*

Upcoming Trade Shows

Join Us and See What's New at Hi-Tech

Hi-Tech Seals will be wrapping up our trade show season for 2018 with the Lloydminster Heavy Oil Show (L'HOS) and the 2018 Permian Basin International Oil Show (PBIOS).

L'HOS is taking place September 12th & 13th in Lloydminster, Saskatchewan. This show is uniquely situated on the border of Alberta and Saskatchewan and is surrounded by thousands of heavy oil wells, both cold and thermal production. Visit Hi-Tech Seals at booth #255 to learn more about our unique product and service offering, including our treater gasket measuring and manufacturing services.

The 2018 PBIOS is taking place in Odessa, Texas, October 16th – 18th. Every two years the PBIOS bring petroleum, oil, and gas professionals from around the world together to learn about the latest technologies, newest equipment's, and so much more. Visit us in building B, booth # B84 & B85 to learn about our high temperature steam materials and our ever expanding product offering.

MILESTONES

We are pleased to share with you employees that have achieved milestones of service in recent months.

5 Year Anniversary
Al Argue
Jeff Vandramelli
Selena Rivera

15 Year Anniversary
Jade Blatz
Pierre Couture

10 Year Anniversary
Rosity Chan
Cherish Wong
Brian Moffat

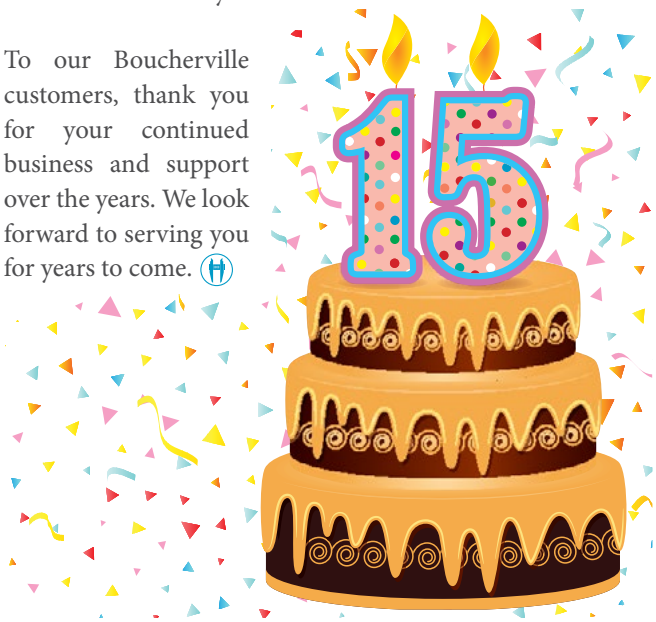
20 Year Anniversary
Travis Sturko

From all of us at Hi-Tech Seals, we thank you for your hard work and dedication over the years.

Did You Know...

Our Boucherville location turns 15 this year. Opened in 2003, Boucherville was Hi-Tech Seals 4th and most eastern branch. Thank you to the Boucherville team for your hard work and dedication over the years.

To our Boucherville customers, thank you for your continued business and support over the years. We look forward to serving you for years to come.



DEFINING TERMS

Technical Terminology and What They Mean

Transfer Moulding

A manufacturing process where a predetermined quantity of uncured material is placed into the transfer pot of a mould. The mould is then closed and under hydraulic pressure the material is forced into a heated cavity. The part is kept there until it has cooled and is cured.

Specific Gravity

The ratio of the density of a substance to the density of a reference substance. The reference substance is usually water for a liquid or solid and air for a gas.

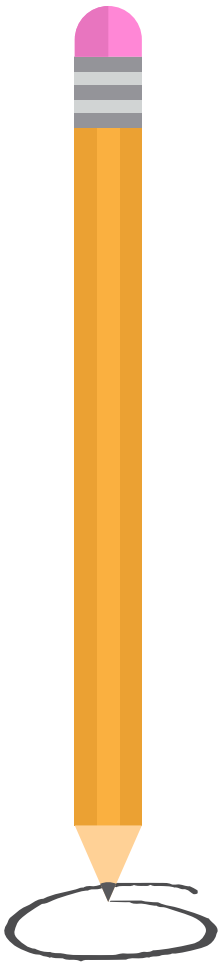
Polymer Chain

The chain of elements that form the basis of the structure of a polymer. They are essentially long chains of repeating chemical units called monomers.

Creep

The tendency of a solid material to move slowly or deform permanently under the influence of mechanical stresses.

September Tech Talk



K E S A A Q O P S T V E F M F
X N N N S P R J A X N Q E A G
N A B J O I I Y C E Q T A C B
R H H Z N I P A L D A C L H Z
Y T D T J L T Y P L F O N I P
Z E E V C E H C M P U A A N G
H R P D L T K A U M R E O A M
A U G K E Z C R J R X O Y B P
N Y J Y J H O K R U T S V L M
P L L Z I E X Y X J V S E E L
I O Q N X X Y R E E L U N O D
P P I P E R M I A N B A S I N
S N O I T A I V E R B B A D N
G R E T S N I M D Y O L L W K
B O U C H E R V I L L E O K U

HTS Word Search

Complete the word search and you could win a Bluetooth Speaker from BOSE

ABBREVIATIONS
API APPROVED
BOUCHERVILLE
INSTRUCTIONS
LLOYDMINSTER
MACHINABLE
METAL MACHINING
PERMIAN BASIN
POLYETHYLENE
POLYURETHANE
PRINTER
STURKO

Please fax your responses to 780.409.9149 by October 15th, 2018.

Name: _____
Company: _____
Location: _____
Day Time Phone #: _____

Congratulations to last edition's Trivia winner, Alben D'Silva!

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Manufacturing Centre | 9504 - 41 Ave NW | Edmonton, AB | T6E 6G9 | Ph: 780.439.4894 | Fax: 780.436.9502

Calgary Branch | Bay #3, 5940 - 30 St. SE | Calgary, AB | T2C 1X8 | Ph: 403.720.2856 | Fax: 403.279.2662

Winnipeg Branch | 445 Egesz St. | Winnipeg, MB | R2R 2V5 | Ph: 204.775.7881 | Fax: 204.775.7954

Toronto Branch | 1180 Kerrisdale Blvd; Unit #8 | Newmarket, ON | L3Y 8Z9 | Ph: 905.953.9666 | Fax: 905.953.8739

Montreal Branch | 1450 Rue Nobel, Suite #20 | Boucherville, QC | J4B 5H3 | Ph: 450.655.7325 | Fax: 450.655.7359

Conroe Branch | 105 Gladstell St. | Conroe, TX | United States | 77301 | Ph: 936.206.3124 | Fax: 936.756.0538