



News & Views from Hi-Tech Seals
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Micro-Vu Matrix

Tolerances vs. Dimension

ISO 3302 Classification System

Tolerance refers to the allowable amount of variation of a part or component's targeted dimensions. There are different classification systems in which to classify tolerance levels. The RMA MO-1 classification system organizes allowable tolerance levels on an A scale, whereas the ISO 3302 classification system organizes allowable tolerance levels on an M scale. Although both scales are widely accepted, the M class scale is more frequently used at Hi-Tech Seals.

The ISO 3302 M classification scale is organized into groups, M1 through M4. M1 is considered the tightest tolerance classification and indicates a high precision product. Due to the deflection characteristics of rubber and plastic components, M2 is the standard tolerance level used by Hi-Tech Seals. It indicates a precision product and involves much of the close controls required to achieve M1. M3 is the tolerance level used for producing a commercial grade product and is widely accepted. M4 is known as a non-critical grade. In this class, product control is second to cost.

The chart below shows the relationship between targeted or specified dimensions and the acceptable tolerance levels for each M class, in both imperial and metric.

	Size	M1	M2	M3	M4
	Above – Incl.	Fixed +/-	Fixed +/-	Fixed +/-	Fixed +/-
Imperial Tolerances	0.000 – 0.157	0.003	0.004	0.010	0.020
	0.157 – 0.248	0.004	0.006	0.010	0.020
	0.248 – 0.394	0.004	0.008	0.012	0.028
	0.394 – 0.630	0.006	0.008	0.016	0.032
	0.630 – 0.984	0.008	0.010	0.020	0.039
	0.984 – 1.575	0.008	0.014	0.024	0.051
	1.575 – 2.480	0.010	0.016	0.032	0.063
	2.480 – 3.937	0.014	0.020	0.039	0.078
	3.937 – 6.299	0.016	0.028	0.051	0.098
	>6.299	0.3%	0.5%	0.8%	1.5%
Metric Tolerances	0.0 – 4.0	0.08	0.10	0.25	0.50
	4.0 – 6.3	0.10	0.15	0.25	0.50
	6.3 – 10.0	0.10	0.20	0.30	0.70
	10.0 – 16.0	0.15	0.20	0.40	0.80
	16.0 – 25.0	0.20	0.25	0.50	1.00
	25.0 – 40.0	0.20	0.35	0.60	1.30
	40.0 – 63.0	0.25	0.40	0.80	1.60
	63.0 – 100.0	0.35	0.50	1.00	2.00
	100.0 – 160.0	0.40	0.70	1.30	2.50
	>160.0	0.3%	0.5%	0.8%	1.5%





There are 3 types of dimensions used at Hi-Tech Seals; nominal, metal and actual. A nominal dimension is a standardized measurement approximation of the part or component; it is not the exact dimension. Nominal dimensions are used for general reference and/or naming purposes. A metal dimension is the measurement of the gland or groove where the part or component will be placed. An actual dimension is the exact measurement of the part or component, and is most accurately measured by the Micro-Vu Matrix.

The Micro-Vu Matrix provides reliable measurements, within six decimal places. It is a unique investment offered to provide improved service and quality control. To learn more about tolerance levels, dimensions and the Micro-Vu Matrix, contact a Hi-Tech Seals representative.

Pipe Rollers

Winnipeg Cast Urethane Facility

Polyurethane pipe rollers have quickly become one of Hi-Tech Seals' most popular cast urethane product lines. Polyurethane provides pipe rollers with good wear resistance and load-bearing ability. Our Winnipeg facility can supply metal hardware or use customer supplied components.



Guide Roller



Hourglass Roller



Technically Speaking

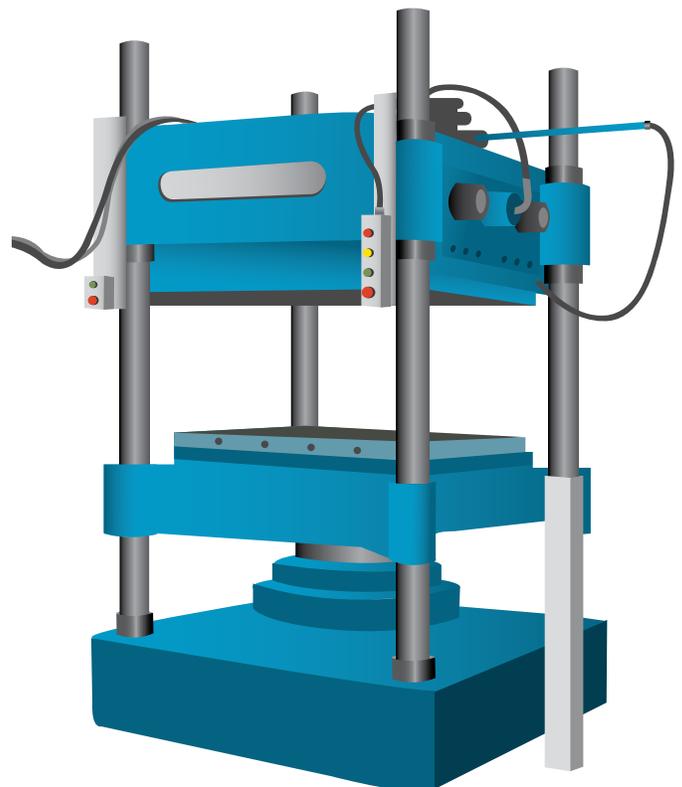
Compression Moulding

This edition of Technically Speaking will continue with the second installment in a six part series on moulding techniques. The first installment introduced five different types of moulding techniques, along with some advantages and disadvantages of each. This installment will discuss compression moulding techniques.

Compression moulding is the least complex of the moulding techniques. The compression moulding press is made up of two plates, removable moulds consisting of two or more plates or inserts, and hydraulic rams. An uncured rubber pre-form of a specific shape and weight is placed between the plates. Depending on the part being moulded, the pre-form can be a rubber blank, a strip of rubber, or a sheet of rubber. Once the mould is closed, heat and pressure is applied to the rubber, forcing the material into the mould's cavity. Excess material which flows into the flash and tear trim gates must later be trimmed to complete the finished part.

Curing of the rubber takes place as soon as the material begins to flow. Depending on the rubber being moulded and complexity of the part, aspects of the moulding process, such as temperature, curing time, and pressure used will vary. This moulding process works best when a hardness between 60 shore A and 90 shore A is required.

Compression moulding can be used to create simple parts, such as O-rings, to more intricate parts, such as a mud motor



boot. This moulding technique is ideal for manufacturing low quantity or large diameter components. The most well-known sealing component manufactured by compression moulding is the O-ring. Some O-ring moulds may produce upwards of a thousand O-rings in as little as 60-90 seconds.

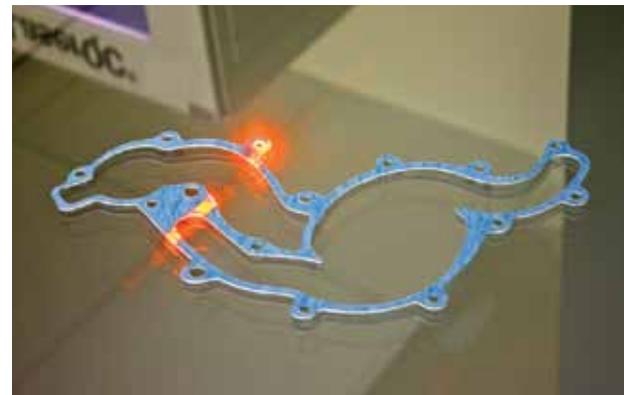
Hi-Tech Seals works with a select group of manufacturers, specialized in unique materials/compounds, dimensional parameters, and moulding techniques to bring our clients the best option for their application. The next installment of this six part series on moulding techniques will discuss injection moulding.

We Are Celebrating Our 2nd Anniversary

Hi-Tech Gaskets

April 2014 will mark Hi-Tech Gaskets' 2nd anniversary. Hi-Tech Gaskets would like to thank our customers for their continued business and support. Since opening in 2012, Hi-Tech Gaskets has made various advancements to our manufacturing capabilities, expanded our product offering, and improved our stock levels.

Hi-Tech Gaskets' investment in manufacturing equipment provides customer with a unique rapid gasket manufacturing process. Our team utilizes the new Virtek LaserQC[®] 1200 to rapidly and accurately plot custom designed gaskets dimensions beyond the accuracy of a caliper. Data from the LaserQC[®] is transferred to our drafting department where a production drawing is developed. Our team then uses our ATOM Flashcutter Flex S to manufacture a new gasket without producing an expensive die.



Hi-Tech Gaskets is continually receiving large shipments of product to improve service. We look forward to the opportunity to serve you for years to come.

Hi-Tech Seals' New Engineering Lab

Opening April 2014

This coming April, Hi-Tech Seals Edmonton will unveil our newly constructed in-house engineering laboratory. The engineering lab will be used to test elastomer properties, promptly identify elastomer compounds, verify product quality and troubleshoot general concerns.

Some of the new equipment will include:

- Fourier transform infrared spectroscopy (FTIR) to identify materials & material compositions
- Precision mechanical convection oven for compression set testing & heat aging
- Micro-Vu Excel for automated measurement
- Tensile tester

The engineering lab is an additional step in the continual advancement of our quality control program and unique services.



New Certificate of Registration

ISO 9001 Registered QMS

ISO 9001
REGISTERED QMS

Over the past year, Hi-Tech Seals has been updating and refining our quality control procedures in our Conroe, Winnipeg, and Hi-Tech Gaskets facilities. We are pleased to report that all locations have been audited and recommended for ISO 9001 registration. Congratulations to our quality control supervisors as well as the teams at each facility. A strong quality control program allows us to provide consistent quality products that meets our customers' requirements and expectations.

All branches and facilities are now covered under one certificate of registration. To obtain a copy please contact a sales representative or download a copy at www.hitechseals.com/ISO9001.asp.



Expanding Winnipeg's Warehouse

To Serve You Better

Hi-Tech Seals' Winnipeg location has expanded their facility with the addition of 4000 sq. ft. This expansion will allow us to house Winnipeg's engineering department and the 3D printer within the manufacturing building, while still allowing space for new equipment. Stay tuned for more information on the expansion of our manufacturing capabilities.

Events & Lectures

Tradeshows:

Visit the Hi-Tech Seals team at one of the three tradeshows we will be attending this year.

May 5 - 8, 2014	Offshore Technology Conference	Houston, TX	Booth 7453
June 10 - 12, 2014	Global Petroleum Show	Calgary, AB	Booth 5214
Sept. 10 - 11, 2014	Lloydminster Heavy Oil Show	Lloydminster, AB	Booth 320

Lunch and Learns:

In 2013, Hi-Tech Seals hosted three seal training sessions with guest speakers from DuPont, Can-Tech Elastomers, and Quadrant Plastics. The training sessions consisted of informative discussions regarding materials and seal design.

If you were unable to attend these events or are interested in another training session, Hi-Tech Seals can bring the training session to you! Our engineering and customer service team can prepare a custom lecture based on your specific needs. Hi-Tech Seals' lectures can be presented to any size of group. The length of lectures varies depending on material being covered as well as time allotted by customers. As an added bonus, one of our sales representatives will treat your team to lunch.

For full event details visit us online at www.hitechseals.com/events.asp.



Hi-Tech Seals' Word Search

Complete the word search below and be entered to win an Apple TV.

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

- TOLERANCE
- M-SCALE
- NOMINAL
- COMPRESSION
- HYDRAULIC RAM
- FLASHCUTTER
- POLYURETHANE
- WINNIPEG
- QUADRANT
- MICRO-VU
- PIPE ROLLER
- RUBBER BLANK
- LASER QC
- SPECTROMETER
- PETROLEUM
- CAN-TECH

Please fax your responses to 780.409.9149 by April 15th, 2014.

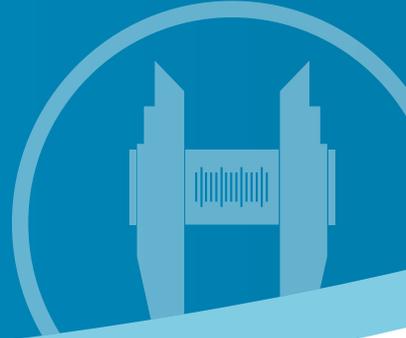
Name: _____
 Company: _____
 Day Time Phone #: _____

Congratulations to last edition's word search winner, Ravi Mani.





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

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

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