

**LINK SEALS ARE AVAILABLE IN CANADA THROUGH CANADIAN DISTRIBUTOR
POWER PLANT SUPPLY CO
CANADIAN LOCATIONS SEE**

http://www.powerplantsupplyco.com/products.php?prod_id=42

MANUAL SIZING CALCULATIONS



Link-Seal® Manual Sizing

Calculate the correct size Link-Seal® Modular Seal by using the following procedure and charts. You may also want to use this procedure to verify the Link-Seal® Modular Seal suggested in our standard pipe size charts.

In Canada, Power Plant Supply Co, serve customers in Ontario ON, Quebec QC, Nunavut, Northwest Territories, NWT, and Yukon. We supply customers in Atlantic Canada including New Brunswick NB, PEI, Nova Scotia NS, and Newfoundland Labrador NL. We ship same day in Toronto, GTA. We also ship to Canada provinces, British Columbia, BC, Alberta, *Saskatchewan*, Manitoba; including cities Vancouver, Calgary, Fort McMurray, Edmonton, Regina, Winnipeg, Thunder Bay, Churchill, Hamilton, Ottawa, Montreal, Quebec City, Saint John, Fredericton, Moncton, Halifax, Charlottetown, Sydney, ST John's.

In Canada, Power Plant Supply Co, ship to customers usually on the same day to Ontario ON, Quebec QC, Nunavut, Northwest Territories, NWT, and Yukon. We supply customers in Atlantic Canada including New Brunswick NB, PEI, Nova Scotia NS, and Newfoundland Labrador NL. We ship same day in Toronto, GTA. We also ship to Canada provinces, British Columbia, BC, Alberta, *Saskatchewan*, Manitoba; including cities Vancouver, Calgary, Fort McMurray, Edmonton, Regina, Winnipeg,

Thunder Bay, Churchill, Hamilton, Ottawa, Montreal, Quebec City, Saint John, Fredericton, Moncton, Halifax, Charlottetown, Sydney, ST John's. Power Plant Supply Co offer a complete project quote for Link Seals and Wall Sleeves, with engineering submission documents for as a complete package.

Contact:

Ontario/Quebec/Western Canada 416 752 3339

Atlantic: NS: 902 435 9899

NL: 709 747 7650



Sizing Procedure

1. Calculate the annular space. The annular space is half the difference between the actual pipe O.D. and the actual wall I.D. opening diameter. Use the following formula.

$$\text{Annular Space} = \frac{\text{Wall Opening I.D.} - \text{Actual Pipe O.D.}}{2}$$

2. From the adjacent chart, select the size closest to the annular space calculated in step 1. You have selected the correct size Link-Seal® modular seal if...the free state thickness is less than the annular space...and the expanded state thickness is greater than the annular space.

3. Calculate the number of links required to fit around the pipe and seal the annular space.

A. Determine the bolt circle for your Link-Seal® modular seal assembly by using the following formula.

$$\text{Bolt Circle} = \frac{\text{Wall Opening I.D.} + \text{Pipe Diameter O.D.}}{2}$$

B. Find the Link-Seal® modular seal chord length (Column 4) and use the following formula to determine required number of links per Link-Seal® modular seal assembly.

$$\text{Links Per Seal} = \frac{\text{Bolt Circle} \times 3.14}{\text{Chord Length}}$$

The result must be **rounded down** to the next whole number. The figures are accurate if the calculation results in **13** or more links per belt. If the results are fewer than 13 links verify using the tables on pages 3 and 4.

Example

Wall Opening I.D. = 12"
Actual Pipe O.D. = 9.05"

Calculate the annular space (1.475"). Select the Link-Seal® modular seal size closest to the annular space. LS-400 is chosen from the chart, because 1.475" falls between 1.43 & 1.81 (the free state and expanded state thickness.)

$$\text{Annular Space} = \frac{12 - 9.05}{2} = 1.475$$

Determine the number of links for a complete assembly.

Chord Length for LS-400 = 3.625"

$$\text{Bolt Circle} = \frac{12 + 9.05}{2} = 10.525$$

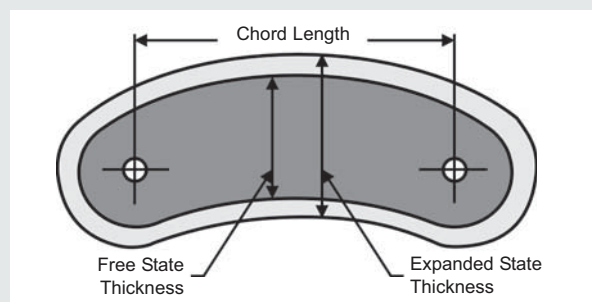
Links Per Seal = 9.12, rounded down = 9

Since the final calculation results in fewer than 13 links,

$$\text{Links Per Seal} = \frac{10.525 \times 3.14}{3.625} = 9.12$$

it is advisable to verify the accuracy of the calculation by using the verification tables on pages 3 and 4.

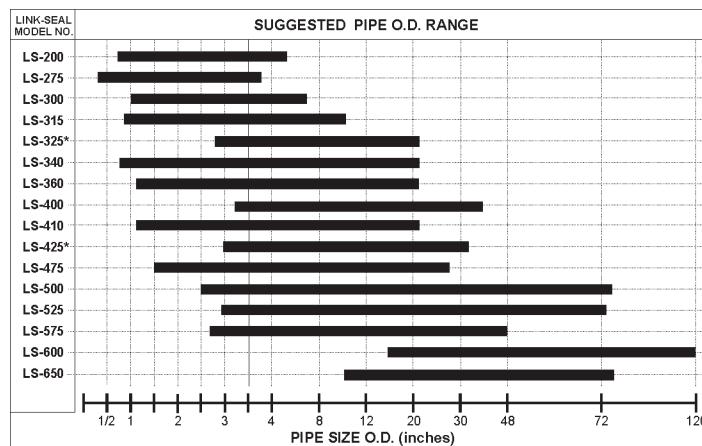
Link-Seal Model Selected for Penetration	Minimum Required Seating Width
LS-200/275	2.25"
LS-300/315	3.00"
LS-325/340/360	4.00"
LS-400/410/425/475	5.00"
LS-500/525/575	5.00"
LS-600/650	6.00"



LINK-SEAL SIZE	FREE STATE THICKNESS	EXPANDED STATE THICKNESS	CHORD LENGTH
LS-200	0.50"	0.64"	1.120"
LS-275	0.62"	0.80"	0.906"
LS-300	0.71"	0.92"	1.510"
LS-315	0.82"	1.10"	1.469"
LS-325	0.94"	1.14"	3.110"
LS-340	1.05"	1.33"	1.575"
LS-360	1.29"	1.65"	2.106"
LS-400	1.43"	1.87"	3.622"
LS-410	1.48"	1.91"	2.598"
LS-425	1.13"	1.43"	3.622"
LS-475	1.62"	2.08"	2.630"
LS-500	2.37"	2.81"	3.860"
LS-525	2.18"	2.58"	3.860"
LS-575	1.88"	2.35"	3.100"
LS-600	3.20"	4.00"	6.000"
LS-650	2.76"	3.57"	4.16"

* = Free state thickness includes an insertion tolerance, and therefore, differs from the actual thickness as listed in Link-Seal modular seal dimensional data on page 6.

Suggested Pipe O.D. Range



* = Whenever possible use thicker links, such as the LS-400, LS-475 or LS-500 series to provide more leeway.

Calculations using Link-Seal modular seal sizing Method 2 may indicate that a smaller link may be used when compared to data on the above chart. NOTE: This chart is based on using an average of two pipe size differential opening.





Sizing Procedure

Verification - Link-Seal® Modular Seal Sizing

The following charts will allow you to confirm the accuracy of this information.

1. Refer to the chart for the Link-Seal® modular seal size calculated in the previous procedure - (LS-200, LS-300 etc.)
2. Find the range your pipe O.D. falls within.
(It may fall in either Range #1 or Range #2).

You now have minimum and maximum wall opening dimensions. If your wall opening size falls between these dimensions, your Link-Seal® modular seal size is correct. You may also verify the number of links from column 6. If your wall opening size is not in the range indicated by the chart, either choose another Link-Seal® modular seal size, change your wall opening size or call PSI for assistance: 1-800-423-2410

Example:

Link-Seal® Size = LS-300
Actual Pipe O.D. = 2.900

2.900 falls within Range #2 on LS-300 Chart.

Determine Minimum Wall Opening = 2.900 + 1.408 (from col. 4)

$$\text{Minimum Wall Opening} = 2.900 + 1.408 = 4.308$$

Determine Maximum Wall Opening = 2.900 + 1.831 (from col. 5)

$$\text{Maximum Wall Opening} = 2.900 + 1.831 = 4.731$$

$$\text{Number of Links} = 7 \text{ (from col. 6)}$$

Link-Seal® LS-200 Verification Chart

Range #1 Pipe O.D. Min. - Max.	Range #2 Pipe O.D. Min. - Max.	for Range #1 Minimum Wall Opening	for Range #2 Pipe O.D. plus Number Below = Min. Wall Opening	for Range #1 & 2 Pipe O.D. plus Number Below = Max. Wall Opening	No. Links/ Seal
0.757-0.909	0.909-1.084	2.033	1.124	1.277	4
1.072-1.323	1.323-1.475	2.349	1.026	1.277	5
1.400-1.713	1.713-1.862	2.677	0.964	1.277	6
1.775-2.051	2.051-2.208	3.052	1.000	1.277	7
2.146-2.390	2.390-2.563	3.422	1.032	1.277	8
2.512-2.731	2.731-2.925	3.789	1.057	1.277	9
2.874-3.074	3.074-3.291	4.151	1.077	1.277	10
3.235-3.419	3.419-3.658	4.511	1.093	1.277	11
3.593-3.764	3.764-4.027	4.870	1.106	1.277	12

Link-Seal® LS-275 Verification Chart

Range #1 Pipe O.D. Min. - Max.	Range #2 Pipe O.D. Min. - Max.	for Range #1 Minimum Wall Opening	for Range #2 Pipe O.D. plus Number Below = Min. Wall Opening	for Range #1 & 2 Pipe O.D. plus Number Below = Max. Wall Opening	No. Links/ Seal
0.194-0.554	0.554-0.797	1.786	1.231	1.592	4
0.475-0.828	0.828-1.190	2.067	1.239	1.592	5
0.773-1.079	1.079-1.550	2.365	1.286	1.592	6
1.062-1.334	1.334-1.917	2.654	1.320	1.592	7
1.345-1.593	1.593-2.289	2.937	1.344	1.592	8
1.625-1.853	1.853-2.663	3.216	1.363	1.592	9
1.901-2.115	2.115-3.039	3.493	1.378	1.592	10
2.176-2.378	2.378-3.417	3.768	1.391	1.592	11
2.450-2.641	2.641-3.795	4.042	1.401	1.592	12

Link-Seal® LS-300 Verification Chart

Range #1 Pipe O.D. Min. - Max.	Range #2 Pipe O.D. Min. - Max.	for Range #1 Minimum Wall Opening	for Range #2 Pipe O.D. plus Number Below = Min. Wall Opening	for Range #1 & 2 Pipe O.D. plus Number Below = Max. Wall Opening	No. Links/ Seal
1.018-1.278	1.278-1.415	2.849	1.571	1.831	4
1.460-1.857	1.857-2.024	3.291	1.434	1.831	5
1.919-2.404	2.404-2.605	3.750	1.346	1.831	6
2.449-2.873	2.873-3.107	4.280	1.408	1.831	7
2.969-3.347	3.347-3.617	4.800	1.453	1.831	8
3.482-3.825	3.825-4.132	5.313	1.487	1.831	9
3.990-4.306	4.306-4.650	5.821	1.515	1.831	10
4.494-4.788	4.788-5.171	6.325	1.538	1.831	11
4.996-5.271	5.271-5.693	6.828	1.556	1.831	12

Link-Seal® LS-315 Verification Chart

Range #1 Pipe O.D. Min. - Max.	Range #2 Pipe O.D. Min. - Max.	for Range #1 Minimum Wall Opening	for Range #2 Pipe O.D. plus Number Below = Min. Wall Opening	for Range #1 & 2 Pipe O.D. plus Number Below = Max. Wall Opening	No. Links/ Seal
0.665-0.982	0.982-1.208	2.860	1.878	2.195	4
1.082-1.530	1.530-1.795	3.278	1.748	2.195	5
1.517-2.047	2.047-2.359	3.712	1.665	2.195	6
1.961-2.549	2.549-2.917	4.156	1.607	2.195	7
2.448-3.003	3.003-3.428	4.643	1.640	2.195	8
2.933-3.455	3.455-3.941	5.128	1.673	2.195	9
3.413-3.909	3.909-4.458	5.609	1.699	2.195	10
3.891-4.366	4.366-4.977	6.086	1.720	2.195	11
4.366-4.823	4.823-5.498	6.561	1.738	2.195	12

Link-Seal® LS-325 Verification Chart

Range #1 Pipe O.D. Min. - Max.	Range #2 Pipe O.D. Min. - Max.	for Range #1 Minimum Wall Opening	for Range #2 Pipe O.D. plus Number Below = Min. Wall Opening	for Range #1 & 2 Pipe O.D. plus Number Below = Max. Wall Opening	No. Links/ Seal
2.593-2.593	2.593-2.775	5.214	2.272	2.272	4
3.748-3.748	3.748-4.010	6.095	2.272	2.272	5
4.739-4.839	4.839-5.178	7.012	2.172	2.272	6
5.675-5.896	5.896-6.309	7.947	2.051	2.272	7
6.621-6.933	6.933-7.418	8.893	1.961	2.272	8
7.574-7.955	7.955-8.512	9.846	1.891	2.272	9
8.532-8.968	8.968-9.596	10.805	1.836	2.272	10
9.494-9.975	9.975-10.673	11.766	1.791	2.272	11
10.458-10.976	10.976-11.744	12.730	1.754	2.272	12

Link-Seal® LS-340 Verification Chart

Range #1 Pipe O.D. Min. - Max.	Range #2 Pipe O.D. Min. - Max.	for Range #1 Minimum Wall Opening	for Range #2 Pipe O.D. plus Number Below = Min. Wall Opening	for Range #1 & 2 Pipe O.D. plus Number Below = Max. Wall Opening	No. Links/ Seal
0.544-0.914	0.914-1.032	3.204	2.290	2.660	4
0.992-1.501	1.501-1.695	3.652	2.151	2.660	5
1.457-2.055	2.055-2.320	4.117	2.062	2.660	6
1.932-2.592	2.592-2.927	4.592	2.000	2.660	7
2.458-3.073	3.073-3.469	5.118	2.046	2.660	8
2.978-3.557	3.557-4.016	5.638	2.081	2.660	9
3.493-4.004	4.004-4.565	6.153	2.109	2.660	10
4.004-4.532	4.532-5.117	6.664	2.132	2.660	11
4.512-5.022	5.022-5.670	7.172	2.151	2.660	12

Link-Seal® LS-360 Verification Chart

Range #1 Pipe O.D. Min. - Max.	Range #2 Pipe O.D. Min. - Max.	for Range #1 Minimum Wall Opening	for Range #2 Pipe O.D. plus Number Below = Min. Wall Opening	for Range #1 & 2 Pipe O.D. plus Number Below = Max. Wall Opening	No. Links/ Seal
0.901-1.269	1.269-1.430	4.200	2.931	3.299	4
1.502-2.056	2.056-2.318	4.800	2.744	3.299	5
2.127-2.801	2.801-3.156	5.426	2.625	3.299	6
2.765-3.522	3.522-3.969	6.063	2.542	3.299	7
3.410-4.228	4.228-4.765	6.709	2.480	3.299	8
4.107-4.879	4.879-5.498	7.406	2.528	3.299	9
4.798-5.532	5.532-6.235	8.097	2.565	3.299	10
5.485-6.188	6.188-6.974	8.784	2.596	3.299	11
6.168-6.845	6.845-7.715	9.467	2.621	3.299	12





Sizing Procedure

Link-Seal® LS-400 Verification Chart

Range #1 Pipe O.D. Min. - Max.	Range #2 Pipe O.D. Min. - Max.	for Range #1 Minimum Wall Opening	for Range #2 Pipe O.D. plus Number Below = Min. Wall Opening	for Range #1 & 2 Pipe O.D. plus Number Below = Max. Wall Opening	No. Links/ Seal
2.711-2.711	2.711-3.350	6.490	3.748	3.748	4
3.779-4.071	4.071-4.920	7.527	3.456	3.748	5
4.858-5.356	5.356-6.267	8.606	3.250	3.748	6
5.960-6.601	6.601-7.671	9.708	3.107	3.748	7
7.074-7.821	7.821-8.938	10.822	3.001	3.748	8
8.196-9.025	9.025-10.163	11.944	2.919	3.748	9
9.325-10.218	10.218-11.363	13.073	2.854	3.748	10
10.457-11.403	11.403-12.549	14.205	2.802	3.748	11
11.593-12.583	12.583-13.735	15.341	2.758	3.748	12

Link-Seal® LS-410 Verification Chart

Range #1 Pipe O.D. Min. - Max.	Range #2 Pipe O.D. Min. - Max.	for Range #1 Minimum Wall Opening	for Range #2 Pipe O.D. plus Number Below = Min. Wall Opening	for Range #1 & 2 Pipe O.D. plus Number Below = Max. Wall Opening	No. Links/ Seal
1.288-1.677	1.677-1.888	5.110	3.433	3.822	4
2.034-2.655	2.655-2.989	5.856	3.201	3.822	5
2.809-3.579	3.579-4.029	6.632	3.053	3.822	6
3.601-4.473	4.473-5.037	7.423	2.950	3.822	7
4.402-5.350	5.350-6.025	8.224	2.874	3.822	8
5.268-6.157	6.157-6.933	9.090	2.933	3.822	9
6.125-6.968	6.968-7.846	9.948	2.979	3.822	10
6.977-7.782	7.782-8.763	10.800	3.017	3.822	11
7.825-8.599	8.599-9.682	11.647	3.049	3.822	12

Link-Seal® LS-425 Verification Chart

Range #1 Pipe O.D. Min. - Max.	Range #2 Pipe O.D. Min. - Max.	for Range #1 Minimum Wall Opening	for Range #2 Pipe O.D. plus Number Below = Min. Wall Opening	for Range #1 & 2 Pipe O.D. plus Number Below = Max. Wall Opening	No. Links/ Seal
3.039-3.039	3.039-3.312	6.186	2.867	2.867	4
4.360-4.403	4.403-4.799	7.227	2.824	2.867	5
5.442-5.691	5.691-6.204	8.309	2.618	2.867	6
6.546-6.940	6.940-7.564	9.413	2.474	2.867	7
7.664-8.163	8.163-8.898	10.531	2.367	2.867	8
8.790-9.371	9.371-10.214	11.656	2.286	2.867	9
9.921-10.567	10.567-11.519	12.788	2.220	2.867	10
11.057-11.756	11.756-12.814	13.924	2.168	2.867	11
12.195-12.939	12.939-14.103	15.062	2.124	2.867	12

Link-Seal® LS-475 Verification Chart

Range #1 Pipe O.D. Min. - Max.	Range #2 Pipe O.D. Min. - Max.	for Range #1 Minimum Wall Opening	for Range #2 Pipe O.D. plus Number Below = Min. Wall Opening	for Range #1 & 2 Pipe O.D. plus Number Below = Max. Wall Opening	No. Links/ Seal
1.017-1.490	1.490-1.773	5.174	3.685	4.158	4
1.750-2.451	2.451-2.754	5.907	3.457	4.158	5
2.512-3.359	3.359-3.692	6.670	3.311	4.158	6
3.291-4.238	4.238-4.621	7.448	3.210	4.158	7
4.078-5.101	5.101-5.544	8.236	3.135	4.158	8
4.920-5.903	5.903-6.493	9.078	3.175	4.158	9
5.763-6.700	6.700-7.272	9.921	3.221	4.158	10
6.601-7.501	7.501-8.139	10.758	3.258	4.158	11
7.434-8.303	8.303-9.009	11.592	3.289	4.158	12

Link-Seal® LS-500 Verification Chart

Range #1 Pipe O.D. Min. - Max.	Range #2 Pipe O.D. Min. - Max.	for Range #1 Minimum Wall Opening	for Range #2 Pipe O.D. plus Number Below = Min. Wall Opening	for Range #1 & 2 Pipe O.D. plus Number Below = Max. Wall Opening	No. Links/ Seal
2.065-2.065	2.065-2.271	7.778	5.625	5.625	4
3.249-3.503	3.503-3.853	8.874	5.372	5.625	5
4.391-4.861	4.861-5.347	10.016	5.154	5.625	6
5.555-6.177	6.177-6.795	11.180	5.003	5.625	7
6.733-7.467	7.467-8.214	12.358	4.890	5.625	8
7.920-8.740	8.740-9.614	13.545	4.804	5.625	9
9.113-10.002	10.002-11.002	14.738	4.736	5.625	10
10.310-11.255	11.255-12.380	15.935	4.680	5.625	11
11.510-12.502	12.502-13.752	17.135	4.634	5.625	12

Link-Seal® LS-525 Verification Chart

Range #1 Pipe O.D. Min. - Max.	Range #2 Pipe O.D. Min. - Max.	for Range #1 Minimum Wall Opening	for Range #2 Pipe O.D. plus Number Below = Min. Wall Opening	for Range #1 & 2 Pipe O.D. plus Number Below = Max. Wall Opening	No. Links/ Seal
2.330-2.330	2.330-2.565	7.676	5.156	5.156	4
3.634-3.791	3.791-4.337	8.791	5.000	5.156	5
4.794-5.172	5.172-6.002	9.950	4.779	5.156	6
5.977-6.509	6.509-7.555	11.133	4.625	5.156	7
7.174-7.819	7.819-9.003	12.330	4.511	5.156	8
8.379-9.113	9.113-10.364	13.536	4.423	5.156	9
9.592-10.395	10.395-11.642	14.748	4.353	5.156	10
10.808-11.668	11.668-12.817	15.965	4.297	5.156	11
12.028-12.935	12.935-13.825	17.184	4.250	5.156	12

Link-Seal® LS-575 Verification Chart

Range #1 Pipe O.D. Min. - Max.	Range #2 Pipe O.D. Min. - Max.	for Range #1 Minimum Wall Opening	for Range #2 Pipe O.D. plus Number Below = Min. Wall Opening	for Range #1 & 2 Pipe O.D. plus Number Below = Max. Wall Opening	No. Links/ Seal
1.554-1.698	1.698-1.911	6.259	4.561	4.706	4
2.444-2.865	2.865-3.124	7.149	4.284	4.706	5
3.370-3.968	3.968-4.275	8.075	4.108	4.706	6
4.314-5.036	5.036-5.402	9.020	3.984	4.706	7
5.270-6.082	6.082-6.514	9.976	3.894	4.706	8
6.233-7.116	7.116-7.616	10.939	3.824	4.706	9
7.201-8.139	8.139-8.710	11.907	3.768	4.706	10
8.173-9.156	9.156-9.797	12.879	3.723	4.706	11
9.147-10.168	10.168-10.880	13.853	3.685	4.706	12

Link-Seal® LS-600 Verification Chart

Range #1 Pipe O.D. Min. - Max.	Range #2 Pipe O.D. Min. - Max.	for Range #1 Minimum Wall Opening	for Range #2 Pipe O.D. plus Number Below = Min. Wall Opening	for Range #1 & 2 Pipe O.D. plus Number Below = Max. Wall Opening	No. Links/ Seal
8.358-8.358	8.358-8.784	16.334	7.416	7.416	6
10.210-10.425	10.425-10.956	17.626	7.202	7.416	7
11.605-12.450	12.450-13.085	19.021	6.571	7.416	8
13.214-14.450	14.450-15.187	20.630	6.181	7.416	9
15.194-16.323	16.323-17.155	22.611	6.288	7.416	10
17.162-18.203	18.203-19.131	24.578	6.376	7.416	11
19.120-20.088	20.088-21.113	26.536	6.448	7.416	12

Link-Seal® LS-650 Verification Chart

Range #1 Pipe O.D. Min. - Max.	Range #2 Pipe O.D. Min. - Max.	for Range #1 Minimum Wall Opening	for Range #2 Pipe O.D. plus Number Below = Min. Wall Opening	for Range #1 & 2 Pipe O.D. plus Number Below = Max. Wall Opening	No. Links/ Seal
3.882 - 4.968	4.968 - 5.221	11.032	6.064	6.670	6
5.144 - 6.394	6.394 - 6.720	12.294	5.900	6.670	7
6.421 - 7.793	7.793 - 8.190	13.571	5.778	6.670	8
7.708 - 9.173	9.173 - 9.641	14.858	5.685	6.670	9
9.001 - 10.154	10.154 - 11.078	16.151	5.997	6.670	10
10.299 - 11.898	11.898 - 12.505	17.449	5.551	6.670	11
11.600 - 13.250	13.250 - 13.926	18.750	5.500	6.670	12

Contact:

Ontario/Quebec/Western Canada 416

752 3339

Atlantic: NS: 902 435 9899

NL: 709 747 7650

