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I. GENERAL INFORMATION

Genova Products Inc. began with one man's idea to develop a "complete plastic plumbing system" but his dream was limited to the confines of a metal shed, four employees, and one pipe extrusion machine. With determination to make a better product, the founder of Genova Products, Mr.R.F.Williams succeeded in turning his concept into a reality. In what seems to be a short moment in time, "plastic" has become a dominate and important material in the plumbing industry.

For over fourty years, Genova has maintained a tradition of providing the building and plumbing products industry with value added products, emphasizing quality, reliability and durability. These values remain strong as Genova continues to develop products designed to meet the demanding needs of a changing marketplace. Its products have continued to evolve to satisfy the rapidly expanding Do-It-Yourself markets, as well as those of the professional contractor. To do this, Genova has designed a complete range of easy to install water handling products manufactured to exacting specifications which are easily used in practical requirements.

During the past decades, the name Genova has become synonymous with innovation. Starting from humble beginnings in 1962 Genova currently operates 5 modern manufacturing plants throughout the United States and it is now recognized as one of the world's leading producers of thermoplastic plumbing and building products.

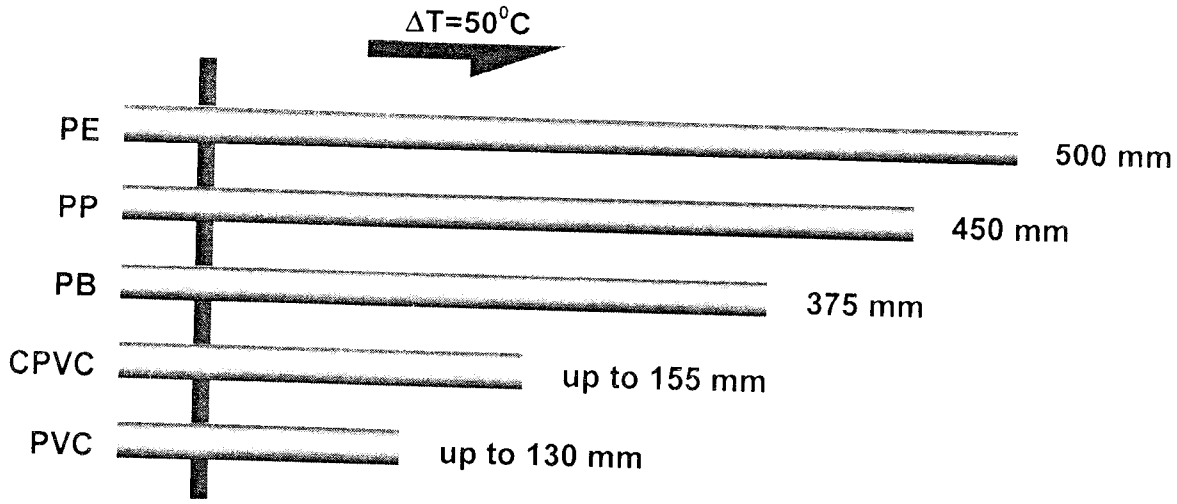
Genova looks to the next 40 years, prepared for the challenges and opportunities of current and future generation. With the same determination and vision that originated in 1962, Genova Products will continue to successfully grow and remain an innovative leader in the plumbing and building materials industry.

II. PVC AND CPVC PHYSICAL PROPERTIES

CPVC pipe and fittings stand the 10 bar test at 99°C for 48 hours. All parts of the installation system have the same strength, which is a big advantage compared to other plastic installations. The durability of CPVC installations is calculated to reach 50 years minimum, based on detailed laboratory research using accelerated aging tests. Since CPVC was first used in the USA in 1960, it was been working without any failure according to installers and end users.

Properties	PVC	CPVC	Unit
Mechanical, at 23°C			
1. Specific Weight	1.41	1.57	g/cm^3
2. Tensile Strength	48.3	57.9	MPa
3. Flexural Strength	100	107.7	MPa
4. Compressive Strength	62.0	62.0	MPa
5. Young's elasticity modulus	2758	2898	MPa
6. Rockwell hardness R	110-120	120	MPa
Thermal			
1. Coefficient of linear expansion	5.2	6.2	$\times 10^{-5}$
2. Thermal conductivity	0.22	0.16	W/mK

Change in pipe length (50m) due to thermal changes ($\Delta T=50^{0}C$)



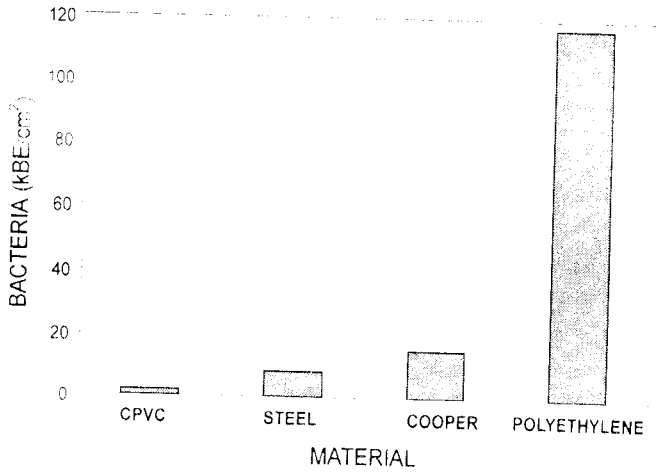
Where: **PE** - Polyethylene
PP - Polypropylene
PB - Polybutylene
CPVC - Chlorinated polyvinyl chloride
PVC - Polyvinyl chloride

III. PVC AND CPVC CHEMICAL PROPERTIES

PVC and CPVC domestic water, fire sprinkler, and industrial piping installations have been used successfully for more than 40 years in the construction, re-pipe and repair. Genova products are ideally suitable for these applications due to their outstanding corrosion resistance.
Genova products is non-toxic, odorless, and tasteless - facts important in the handling of potable water. PVC & CPVC pipe and fittings resists chemical attack by most mineral acids, bases, salts, and organic materials. When they are used within their allowable pressure and temperature ranges, they will provide a good alternative to metallic piping which corrodes when exposed to the same aggressive chemical solutions. Humidity, salt water, weather, atmosphere, or underground conditions can not harm Genova products.
If a chemical attack occurs, its effect on plastics is substantially different from its attack on metals, which is known as corrosive. Metal corrosion means the slow wearing away by chemical or electrolytic action. Chemical attack on plastics indicates a process of swelling and dissolving. Chemical resistance data given (see table of chemical resistance of thermoplastics) are based on laboratory tests. These data are only a basis for recommendation.

Bacteria are encountered in nearly all situations where there is exposure to the natural environment or where water is handled. Products manufactured from CPVC have extremely smooth surface and thus provide few places for bacteria to attach and multiply. Studies of piping materials in water service have shown that CPVC supports the lowest bacterial growth of all materials tested.

Bacterial growth in water piping at 120 days

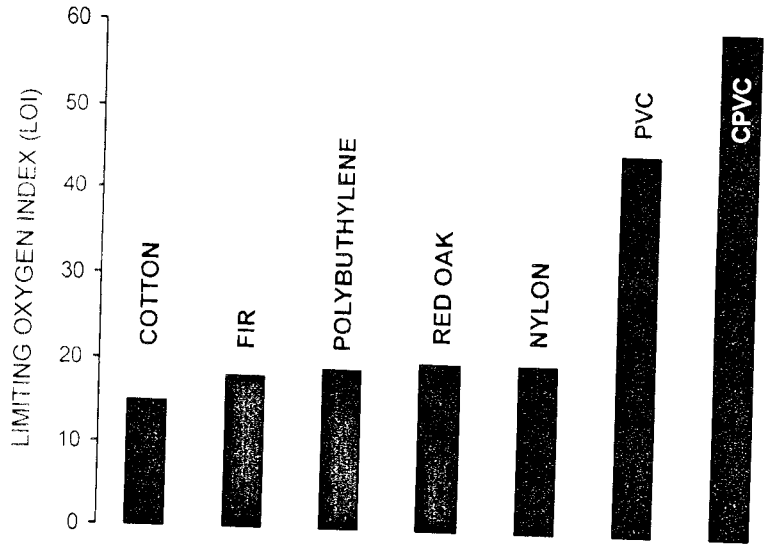


Source: *Bakterielle Oberflächenbesiedlung in trinkwasserdurchstromten Schlauch - und Rohrleitungen; Dr. Georg-Joachim Tuschewitzki; Privatdozent am Hygiene-Institut der Universität Bonn*

IV. PVC AND CPVC FIRE - RESISTANT PROPERTIES

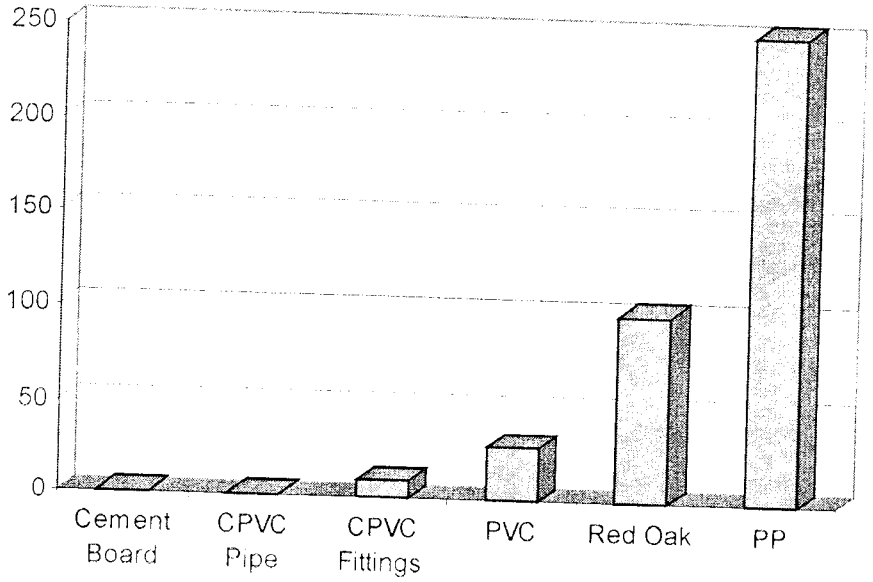
PVC, as well CPVC, has excellent fire-resisting properties. The ignition temperature of CPVC exceeds 433°C. The LOI - Limiting Oxygen Index - amounts to 60 for CPVC. This means that CPVC materials require 60% oxygen to burn. Since there is only 21% of oxygen present in the earth's atmosphere, CPVC does not sustain the burning process and extinguishes by itself after removing the fire source. For comparison, here are the LOI values for other materials such as polybutylene - 18, cotton - 15, nylon - 20, show the advantage of CPVC.

LOI Comparison



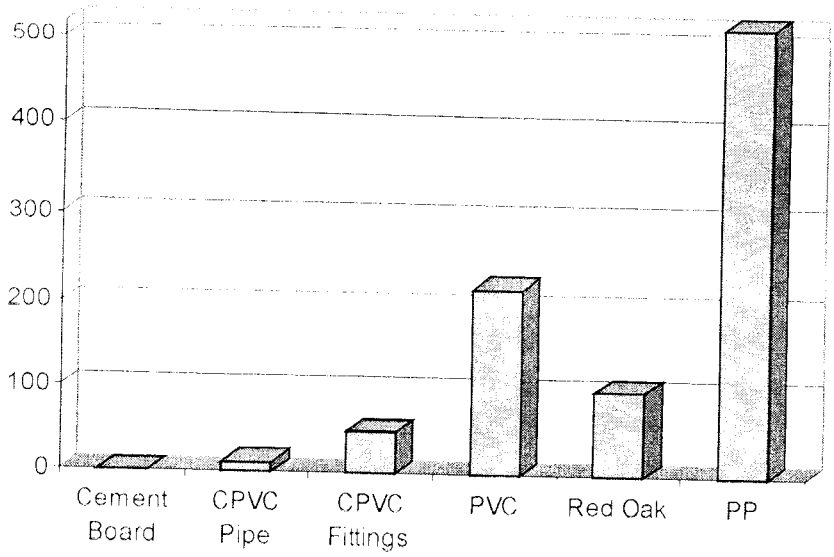
Another parameter responsible for the material's fire-resistant properties is flame spread factor. This factor ranges from 0 for cement, 15 for CPVC, 15-25 for PVC, 250 for PP and 100 for wood. The smaller the flame spread factor is, the smaller the absorption of oxygen, the smaller the heat emission and production of harmful substances are, for instant CO.

Flame Spread



The burning process of CPVC is accompanied by little amount of smoke. The smoke development factor is <50 for CPVC, whereas it is ca. 500 for PP. The above properties led to the material's widespread use in the building industry.

Smoke Developed



Ignition temperature is the minimum temperature of a material at which sustained combustion can be initiated under specified test conditions. It is an estimate of the lower flammability limit. CPVC has a flash ignition temperature of 482°C which is the lowest temperature at which sufficient combustible gas is evolved that can be ignited by an ignition source, such as a small external flame.

Flash Ignition Temperature Comparisons

Material	°C	°F
CPVC	482	900
PVC	399	750
Polypropylene	343	650
Polyethylene	343	650
White Pine	204	400
Paper	232	450

Conversation: (°C x 1.8) + 32 = °F
(°F - 32) x 0.555 = °C

V. GENOVA PRODUCTS ADVANTAGES

- Resistance against scaling
- Resistance against corrosion
- Resistance against several hundred chemical substances
- High pressure resistance
- Physiologically and microbiologically neutral - can be widely used in Health Service buildings
- Simple and quick assembling and installation, without the necessity to use special tools
- Consistently reliable joints
- Estimated durability: at least 50 years
- Vibration and noise damping properties
- Much less weight compared to traditional materials
- High inner smoothness of pipes - reduction of pressure drop, reduction of the diameter of the installed pipe systems becomes possible

- Lowest coefficient of linear thermal expansion among all plastic materials used in sanitary systems (twice as low as PP)
- High degree of thermal insulation - it is possible either to completely do away with the pipe's thermal insulation or to significantly reduce its thickness
- Superb fire-resistant properties
- Electrical insulating - no galvanic or electrochemical corrosion
- No oxygen permeation
- Straight, professional appearance
- Compatible with traditional materials (steel, copper) - old systems can be easily modernized
- Meet Health & Safety requirement
- Computer Software "Instal-san 2.2" for Genova installations is already available

We invite you to compare, point by point, the Genova Products plumbing system with copper pipe.

Performance Characteristics	Genova Products Pipe & Fittings	Copper
Pitting from aggressive water	No	Yes. May cause leaks
Corrodes, allows scale build up	No	Yes. May be severe
Pitting from soil conditions	No	Yes. In some areas
Heat retention	Very high	Low. Copper loses heat rapidly as it is highly conductive
Condensation resistance	Very high	Below average. May cause drip damage
Water hammer potential	Low	High
Water sound in pipes	Quiet	Noisy. Metallic systems can resonate sound
Water flow	Full flow over life of system	Can be reduced by scale and corrosion
Impact strength	Superior	Distorts on impact
Special tools required	None	Torch, solder, brushes, personal protection
Fire hazard	None	Torch flame necessary for assembly
Prone to job-site theft	No	Yes. Copper has scrap value.

VI. GENOVA PRODUCTS PIPE TYPES AND PARAMETERS

PVC pressure pipes are used for cold water and other liquids up to 60°C. PVC pipes are designed to withstand operating pressure 21atm (SDR 13.5) and 12-41atm (SCH40) depending upon pipe diameter at water temperature 23°C.

CPVC pressure pipes are used for supplying cold/hot water, other liquids and heating with temperature not over 95°C (T=23°C; PN=27.6atm). Genova PVC and CPVC pipe and fittings are fully approved for potable water applications.

Caution:

1) Do not use PVC and CPVC pipes for compressed air and gas systems.
2) For temperatures above 23°C the maximum working pressure is decreased. The decreasing coefficient (K_t) is given in the table below:

Water temperature, °C	K_r for PVC	Working pressure for PVC (SCH40-1/2"), KPa	K_r for CPVC	Working pressure for CPVC (CTS(SDR11)-1/2"), KPa
23	1.00	4140	1.00	2760
27	0.90	3726	0.96	2649
32	0.75	3105	0.92	2539
38	0.62	2566	0.85	2346
43	0.50	2070	0.77	2125
49	0.40	1656	0.70	1932
54	0.30	1242	0.62	1711
60	0.22	910	0.55	1518
66	-	-	0.47	1297
71	-	-	0.40	1104
77	-	-	0.32	883
82	-	-	0.25	690
93	-	-	0.18	496
99	-	-	0.15	414

Characteristics of Genova PVC Pipe

Nr.	GENOVA Cat. Nr.	Description	Pipe Type	Diameter in inches	Diameter in mm	Inside diameter mm	Outside diameter mm	Min. wall thickness mm	Max. working pressure Bar (T=23°C)
		Pipes SDR L=3.048m							
1	31005	PVC Pipe SDR 13.5 1/2"	SDR 13.5	1/2"	15	17.68	21.30	1.57	21.00
2	31007	PVC Pipe SDR 21 3/4"	SDR 21	3/4"	20	22.14	26.70	2.02	13.80
3	31010	PVC Pipe SDR 21 1"	SDR 21	1"	25	28.84	33.40	2.02	13.80
4	31011	PVC Pipe SDR 21 11/4"	SDR 21	11/4"	32	37.59	42.15	2.02	13.80
5	31012	PVC Pipe SDR 21 11/2"	SDR 21	11/2"	40	43.17	48.25	2.28	13.80
6	31022	PVC Pipe SDR 21 2"	SDR 21	2"	50	54.11	60.35	2.86	13.80
		Pipes SCH L=3.048m							
7	310057	PVC Pipe SCH40 1/2"	SCH40	1/2"	15	15.26	21.30	2.76	41.40
8	310077	PVC Pipe SCH40 3/4"	SCH40	3/4"	20	20.46	26.70	2.86	33.00
9	310107	PVC Pipe SCH40 1"	SCH40	1"	25	26.14	33.40	3.38	31.00
10	310117	PVC Pipe SCH40 11/4"	SCH40	11/4"	32	34.53	42.15	3.56	25.50
11	70011	PVC Pipe SCH40 11/2"	SCH40	11/2"	40	40.37	48.25	3.86	22.80
12	70021	PVC Pipe SCH40 2"	SCH40	2"	50	52.03	60.35	3.90	19.30
13	310257	PVC Pipe SCH40 2 1/2"	SCH40	21/2"	63	61.00	73.03	5.16	20.70
14	70031	PVC Pipe SCH40 3"	SCH40	3"	75	77.92	88.90	5.48	17.90
15	70041	PVC Pipe SCH40 4"	SCH40	4"	100	101.56	114.30	6.02	15.20
16	70061	PVC Pipe SCH40 6"	SCH40	6"	150	153.22	168.30	7.10	12.40

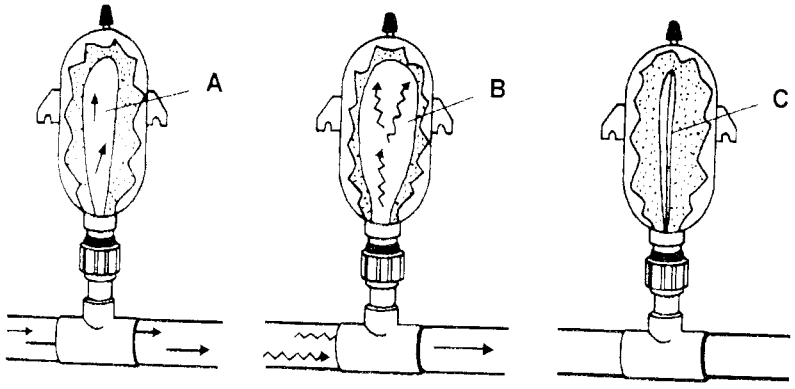
Characteristics of Genova CPVC Pipe

Nr.	GENOVA Cat. Nr.	Description	Pipe Type	Diameter in inches	Diameter in mm	Inside diameter mm	Outside diameter mm	Min. wall thickness mm	Max. working pressure Bar (T=23°C)
		Pipes CTS L=3.048m							
1	500055	CPVC Pipe CTS (SDR11) 1/2"	SDR 11	1/2"	15	12.2	15.86	1.73	27.60
2	500077	CPVC Pipe CTS (SDR11) 3/4"	SDR 11	3/4"	20	17.9	22.22	2.03	27.60
3	50010	CPVC Pipe CTS (SDR11) 1"	SDR 11	1"	25	22.6	28.56	2.59	27.60
4	50011	CPVC Pipe CTS (SDR11) 11/4"	SDR 11	11/4"	32	27.9	34.91	3.18	27.60
5	50012	CPVC Pipe CTS (SDR11) 11/2"	SDR 11	11/2"	40	33.1	41.26	3.76	27.60
6	50022	CPVC Pipe CTS (SDR11) 2"	SDR 11	2"	50	43.2	53.96	4.70	27.60

VII. WATER HAMMER

Water hammers appear in case of rapid closing of the valves or changing the direction of high speed flowing water. The pressure rise is caused by the momentum of the fluid, therefore, the pressure increases with the velocity of the liquid, the length of the system from the fluid source, or with an increase in the speed with which it is started or stopped. The Genova Water Hammer Muffler effectively solves the water hammer problem and never needs replacing. The Water Hammer Muffler should be used wherever frequent water hammer problems are likely to occur. It is recommended to use one on each of the hot and cold water lines, and as close as possible to water supplier fixtures and appliances.

The Water Hammer Muffler absorbs the shock of quick shutoffs:



Where:

A - Normal water flow
B - Water Hammer
C - System without pressure

VIII. THERMAL EXPANSION AND CONTRACTION

Like all piping material, Genova CPVC pipe expand when heated and contract when cooled. CPVC piping (regardless of pipe diameter) will expand about 1 inch per 50 feet of length when subjected to a 50^{0}F temperature increase. Therefore, allowances must be made for this resulting movement. However, laboratory testing and installation experience have demonstrated that the practical issues are smaller than the coefficient of thermal expansion would suggest. The stresses developed in CPVC pipe are generally smaller than those developed in metal pipe for equal temperature changes because of the difference in elastic modulus.
Expansion is mainly a concern in hot water lines. Generally, thermal expansion can be accommodated with changes in direction; a long straight run may require an offset or loop. Only one expansion loop, properly sized, is required in any single straight run, regardless of its total length. If more convenient, two or more expansion loops, properly sized, can be utilized in a single run of pipe to accommodate the thermal movement. Be sure to hang pipe with smooth straps that will not restrict movement. For convenience, loop (or offset) lengths have been calculated for different pipe sizes and different run lengths with a temperature increase (ΔT). Loop length can be calculated utilizing the following equations:

$$L_K = (3E \times D \times \delta/\partial)^{1/2} \text{ (mm)}$$

Where:
E = Modulus of elasticity at max. temperature (MPa)
D = Outside diameter of pipe (mm)
δ = Change in length due to change in temperature (mm)
∂ = Working Stress at max. temperature (MPa)

Thermal Expansion Formula

$$\delta = L \times \alpha \times \Delta T \text{ (mm)}$$

Where: **L** = Length of pipe (mm)

α = Coefficient of thermal expansion ($1/^0C$):

for PVC $\alpha = 5.2 \times 10^{-5}$ ($1/^0C$)

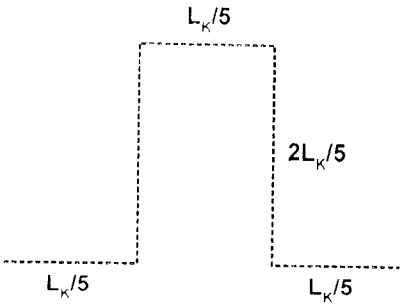
for CPVC $\alpha = 6.2 \times 10^{-5}$ ($1/^0C$)

ΔT = Change in temperature (^0C)

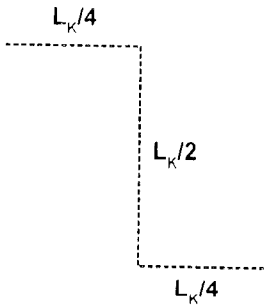
Modulus of Elasticity and Working Stress

Temperature (^0C)	Modulus E (MPa)	Stress ∂ (MPa)
23	2920	13.8
32	2780	12.4
43	2560	10.4
49	2450	9.0
60	2227	6.9
71	2006	5.2
82	1855	3.5

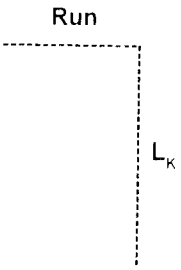
Thermal expansion of long installation sections can be compensated using:



LOOP

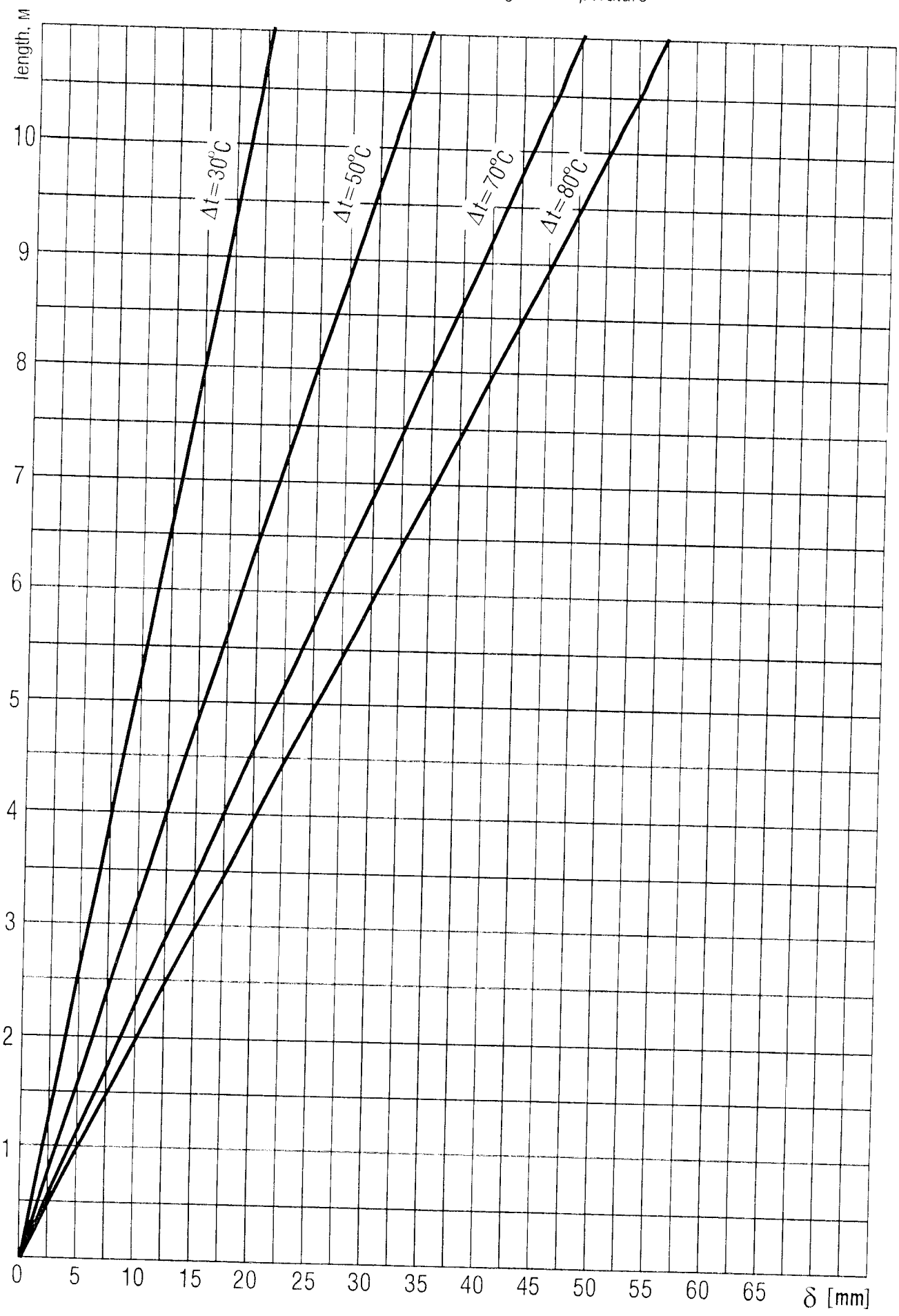


OFFSET



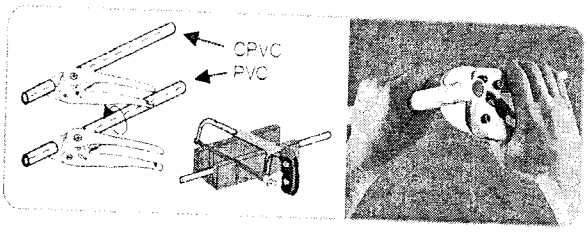
CHANGE IN DIRECTION

Change in length due to change in temperature



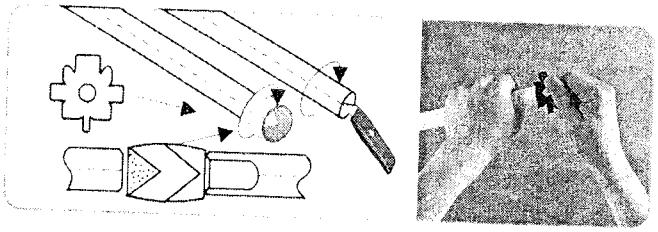
IX. JOINING GENOVA PRODUCTS PIPE AND FITTINGS

Assembling and installation of Genova Products PVC & CPVC pipe and fittings can be done quickly and easy with Genova "All Purpose Cement". The "gluing" process is based on the mutual penetration (diffusion) of the walls of the elements being connected. In such a way they become unified material. Tools required are very simple and inexpensive (chamfering tool and pipe cutter only), see the following instruction:



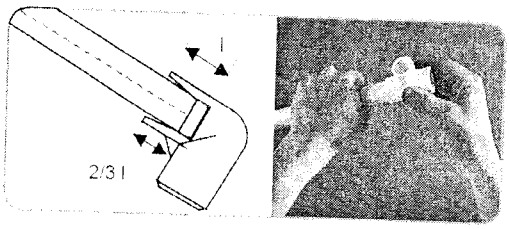
1. **Cutting**

Genova Products pipe can be easily cut with special cutters or, in case of bigger diameters, a wheel tube cutter. It's also possible to cut them with a metal cutting saw. Pipes should be cut perpendicularly to the axis.



2. **Deburring / Bevelling**

Burrs and filings should be removed from outside and inside of the pipe (and ensure proper contact between pipe and fitting during assembly) by chamfering tool or sand paper. Pocketknife is also suitable for this purpose. A slight bevel on the end of the tubing will ease entry of the tubing into the fitting socket and minimize the chance of pushing solvent cement to the bottom of the joint.

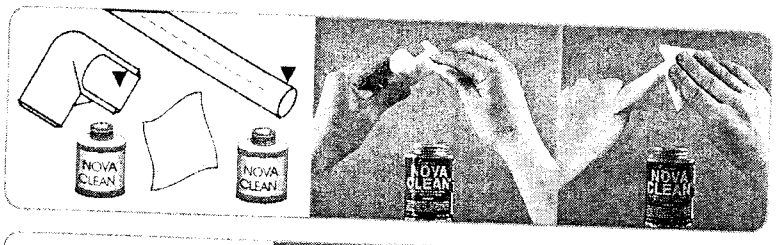


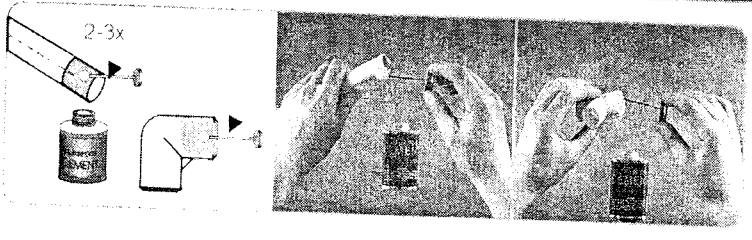
3. **Fitting of the joined elements**

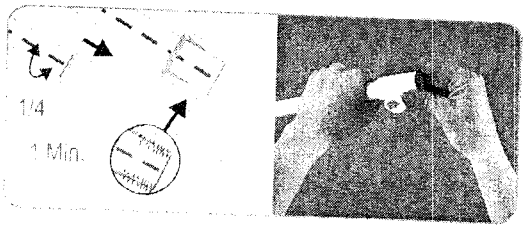
Using a dry, clean cloth, wipe dirt and moisture from the pipe end. Check the dry fit of the pipe and fitting to ensure proper fit and alignment. The tube should enter 1/3 to 2/3 of the socket depth. It should not bottom out in the socket without resistance.

4. **Gluing**

Only Genova Products cleaners and glues should be used for gluing. The other ones do not guarantee the correct connection. Glues should be new. Glues should not be used when they become thick and have jelly-like consistence. The cleaner "Nova Clean" should be applied the surfaces to be joined. Be certain that the surfaces are clean and dry. Apply a thin, even coat of Genova "All Purpose Cement" to the fitting socket. Apply a liberal coat to the pipe. Make sure no bare spots are left. Immediately insert the pipe into the fitting socket. It is recommended to turn the pipe ¼ turn when inserting into the fitting socket. This motion ensures an even distribution of cement within the joint. Hold the assembly for approximately 10 seconds, allowing the joint to set-up.
Solvent cement set and cure times are a function of pipe size, temperature and relative humidity. Curing time is shorter for drier environments, smaller sizes, and higher temperatures. Refer to the following table for minimum cure times after the last joint has been made before pressure testing can begin.







Estimated time after that the connection can be loaded

Ambient temperature	Diameter of joined item	Cure time	Should be tested after*
+40°C ÷ +15°C	½" - 1 ¼" 1 ½" - 3" 4" - 6"	15 minutes 30 minutes 1 hour	1 hour 2 hours 6 hours
+15°C ÷ +5°C	½" - 1 ¼" 1 ½" - 3" 4" - 6"	1 hour 2 hours 4 hours	2 hours 4 hours 12 hours
Below +5°C	½" - 1 ¼" 1 ½" - 3" 4" - 6"	3 hours 6 hours 12 hours	8 hours 16 hours 48 hours

* after this time you can check the installation with cold water at 1 1/2 times the normal line pressure up to a maximum of 1.05 MPa / 10.5 Bar

Caution: Solvent cements are inflammable. Keep away from fire! Temperature for storing cements 0°C + 35°C. Avoid direct contact of the cement and skin, ensure proper ventilation.

Number of joints made with one solvent cement package

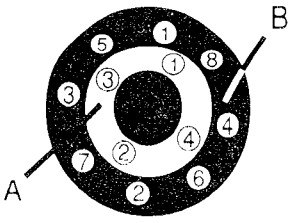
Pipe and fitting dimensions	Package size		
	118 ml	237 ml	473 ml
½"	63	126	255
¾"	42	84	170
1"	34	68	137
1 ¼"	24	50	98
1 ½"	17	34	68
2"	9	18	38
3"	7	14	30
4"	5	10	21
6"	2	4	9

Before checking the leak tightness, the installation should be flushed several times with water. The leak tightness test should be conducted before covering the wall chasings and channels before applying thermal insulation. It is recommended to test the system at 1 1/2 times the normal line pressure. After the pressure test is done the cold water for impurities removing.
Note: Computer Software "Instal-san 2.2" for Genova installation is already available. The program packaged is designed for comprehensive cold & hot water system installations. If you are interested in this program, please contact us.

X. TRANSITION TO OTHER SYSTEMS

It is possible Genova pipe to connect with any other installation systems due to wide range of PVC and CPVC fittings. Genova can offer numerous PVC & CPVC fittings with male and female transitions, pass tube shells and metal screw sets with CPVC elements and etc. A variety of valves are commonly also available for use with Genova pipe. Various connection methods (solvent cement threaded, flanged, etc.) can be utilized to transition from the pipe to the valve. CPVC pipes should be protected against extensive, uncontrolled temperature increase. Any heating devices to which the CPVC system is connected should be equipped with thermostatic protection. The system should be connected through metal connector pipes of 25cm in length.

Flanged PVC and CPVC pipe has an advantage when used in a system where there is need to dismantle the pipe occasionally or when the system is temporary and mobility is required. Flanging can also be used when it is environmentally impossible to make solvent cemented joints on location.
The flanges should be carefully aligned and the bolts inserted through matching holes. Each bolt should be partially tightened in the alternating sequence indicated in the picture below.



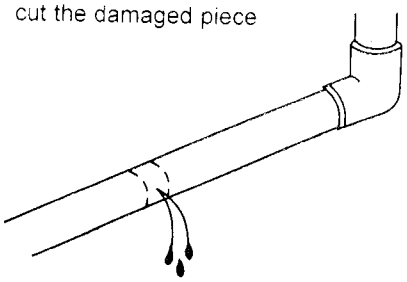
A - 4-Bolt Flange
B - 8-Bolt Flange

Pipe size	Number of Bolt Holes	Bolt size	Flange diameter	Recommended Torque (Nm)
½"	4	12.70	88.90	13.56-20.33
¾"	4	12.70	98.43	13.56-20.33
1"	4	12.70	107.95	13.56-20.33
1 ¼"	4	12.70	117.48	13.56-20.33
1 ½"	4	12.70	127.00	13.56-20.33
2"	4	15.88	152.40	27.12-40.67
2 ½"	4	15.88	177.80	27.12-40.67
3"	4	15.88	190.50	27.12-40.67
4"	8	15.88	228.60	27.12-40.67
6"	8	19.05	279.40	44.74-67.80

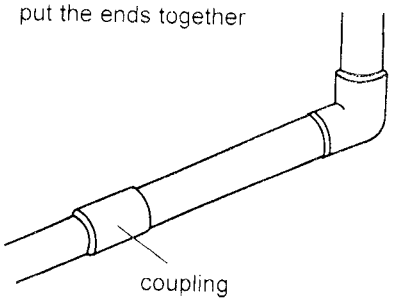
XI. INSTALLATION REPAIRS

In case of pipe leaks, damaged sections should be cut. If both pipe ends can be put together, they should be glued together with a pipe coupling. If this is impossible, it is necessary to use a new pipe with two couplings. When the leaks at a fitting it is recommended to cut out the fitting along the pipe pieces and then insert a new fitting with two couplings.

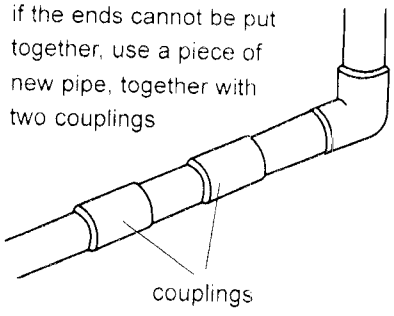
cut the damaged piece



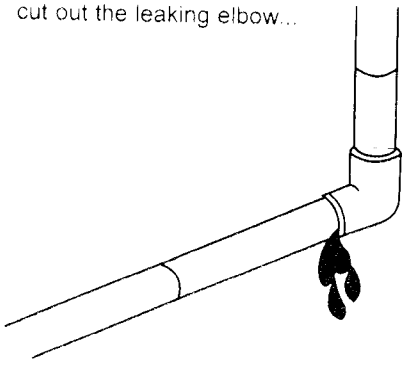
put the ends together



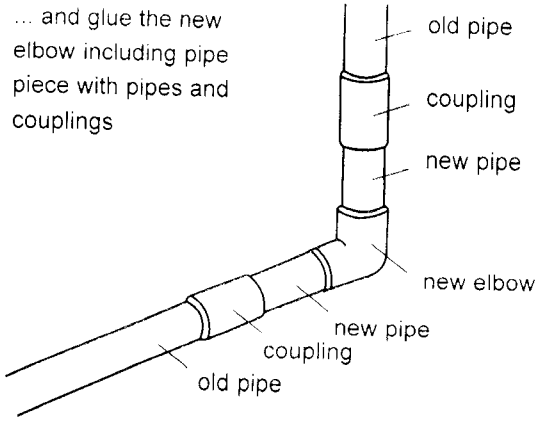
if the ends cannot be put together, use a piece of new pipe, together with two couplings



cut out the leaking elbow...



... and glue the new elbow including pipe piece with pipes and couplings



XII. HANDLING AND STORAGE

Genova Products pipe and fittings are made from a tough, corrosion resistant material, but it does not have the mechanical strength of metal. Reasonable care should be exercised in handling pipe and fittings. They should not be dropped, stepped on, or have objects thrown on them. If improper handling or heavy impact results in cracks, splits, or gouges, cut at least 2" beyond the visible damage and discard. The storage area should not be located near steam lines or other heat sources. Pipes with a greater diameter should be placed on the bottom. If the number of the stored pipe layers is too big, pipes placed at the bottom can deform at higher temperatures. Within buildings, the pipes should be placed on stands. If possible, they should be supported on the whole pipe length (they are manufactured as 3m pipes).
Fittings and flanges should be kept in their original packaging, protecting them against dirt and damage until they are needed. They should never be mixed in with metal piping components. If it is possible, they should be stored inside the building.

XIII. USEFUL TABLES

Length

Foot (Ft)	Inch (In)	Metre (m)	Centimetre (cm)	Millimetre (mm)	Micron	Angstrom
1	12	0.3048	30.48	304.800	$3.048x10^5$	$3.048x10^5$
0.0833	1	0.0254	2.54	25.40	$2.54 x10^4$	$2.54x10^8$
3.28083	39.37	1	100	1000	$1 x10^6$	$1x10^{10}$
0.03281	0.3937	0.01	1	10	$1x10^4$	$1x10^8$
$3.281x10^{-3}$	0.03937	0.001	0.01	1	1000	$10x10^7$
$3.281x10^{-6}$	$3.937x10^{-5}$	$1x10^{-5}$	$1x10^{-4}$	$1x10^{-3}$	1	$1x10^4$
$3.281x10^{-10}$	$3.937x10^{-9}$	$1x10^{-10}$	$1x10^{-8}$	$1x10^{-7}$	$1x10^{-4}$	1

Pressure

Pa	Atm	Bar	Kg/cm^2	PSI
1	$9.8692x10^{-6}$	$1x10^{-5}$	$1.0197x10^{-5}$	$1.4504x10^{-4}$
101325	1	1.01325	1.0332	14.696
100000	0.98692	1	1.01971	14.504
98066.5	0.96784	0.98067	1	14.223
6894.757	0.06805	0.06895	0.07031	1
3386.389	0.03342	0.033386	0.03453	0.49116
0.133322	$1.3158x10^{-6}$	$1.3332x10^{-6}$	$1.3295x10^{-6}$	$19.337x10^{-6}$

MPa=1 $x10^6$

Volume

m^3	Gallon (Gal)	Litres (L)	Quarter	In^3	cm^3
1	264.20	1000	1056.80	61023	$1x10^6$
$28.317x10^{-3}$	7.4822	28.317	29.92	1728	$28.317x10^3$
$3.785x10^{-3}$	1	3.785	4	231	3785
$1x10^{-3}$	0.2642	1	1.057	61.023	1000
$9.463x10^{-4}$	0.25	0.9463	1	57.75	946.25
$1.638x10^{-5}$	43.29x104	0.01639	0.01732	1	16.387
$1x10^{-6}$	$2.642x10^{-4}$	$1x10^{-3}$	$10.568x10^{-4}$	0.06101	1

Volumetric Rate of Flow (Liquid)

Gallon/Hour	Gallon/Min	Ft^3/Hour	Ft^3/Min	cm^3/Min
1	0.01667	0.1337	$2.228x10^{3}$	63.08
60	1	8.022	0.1337	3784.80
7.48	0.1247	1	0.01667	472.00
448.80	7.48	60	1	$28.32x10^{3}$
0.26118	$4.403x10^{3}$	0.03531	$5.886x10^{4}$	16.67
15.8502	$264.18x10^{3}$	2.11887	0.03531	1000
0.01585	$264.20x10^{6}$	$2.1187x10^{9}$	$35.315x10^{6}$	1

Conversations

UK Gall	x 0.83267	= US Gall
US Gall	x 1.20095	= UK Gall
UK Gall	x 4.546	= Litres (L)
Litres (L)	x 0.22	= UK Gall
Litres (L)	x 0.2642	= US Gall
UK Gall/Min	x 0.0758	= L/sec
In	x 25.40	= mm
In	x 2.54	= cm
In	x 6.45159	= cm^2
In^3	x 16.38703	= cm^2
Ft	x 0.305	= m
Ft^3	x 0.028	= m^3
m^3	x 35.31	= Ft^3
In/Ft	x 8.3333	= cm/m
L/sec	x 13.1987	= UK Gall/min
mm	x 0.039	= In
cm	x 0.3937	= In
m	x 3.28	= Ft
cm/m	x 0.1200	= In/Ft
cm^2	x1.55	= In^2
cm^3	x 0.06103	= In^3
lb	x 0.45	= Kg
kg	x 2.2	= lb
psi	x 0.069	= Bar
psi	x 6.89	= KPa (kN/m^2)
Bar	x 14.5	= psi
Bar	x 100	= KPa (kN/m^2)
KPa (kN/m^2)	x 0.145	= psi
KPa (kN/m^2)	x 0.01	= Bar
Ft/min	x 0.0051	= m/s
m/s	x 197	= Ft/min
Ft/s	x 0.305	= m/s
m/s	x 3.28	= Ft/s

(^0C x 1.8) + 32 = ^0F

(^0F - 32) x 0.555 = ^0C