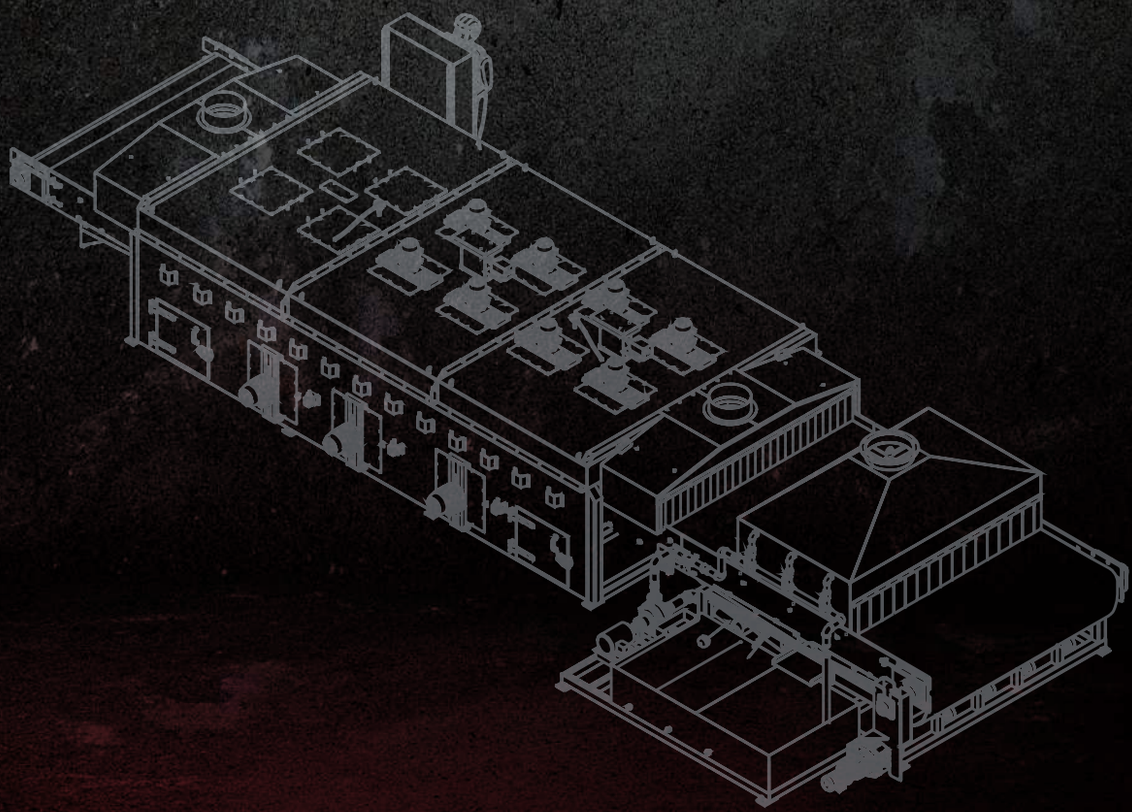
# PYROMAÎTRE
INC.

*Ovens with a Dragon inside*



# ABOUT US

Based in Québec, Canada, since 1986, Pyromaître is a manufacturer of high-precision industrial stress relieving and tempering ovens for the automotive and agriculture, heavy-duty industries. Our unique design and process expertise have driven PYRO to become one of the premier global manufacturers of thermal processing equipment.

We established our market presence with the development and commercialization of the high-speed stress relieving and tempering process. Ultimately, Pyromaître ovens are the highest precision heat transfer machines on the market.

Over the past decades, our products have gained recognition among industry leaders such as Airbus, Caterpillar, NTN Driveshaft, GKN, etc. Approved in 1997 by GM for valve springs, the "PYRO Process" is the acknowledged industry standard for precision automotive springs. It has also been successfully expanded to tempering applications and approved in 1999 by Ford for CV Joints, axle shafts, and transmission gears.

In addition to PYRO's state of the art line-up of standard ovens, our ability to listen to our customers' needs allow us to continue our growth while bringing cost-effective & innovative solutions to the marketplace with custom-built products.

Pyromaître has expanded its global presence in four continents with licensee agreements in India, China and Mexico.

# PYRO TECHNOLOGY

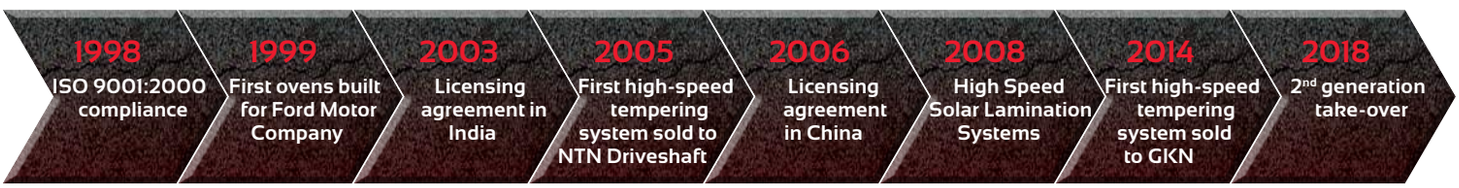
Stress Relief and Tempering recipes of old were developed in the past with imprecise batch furnaces whose temperature controls were merely mechanical needles, leaving the finished product largely to educated guesswork. With modern technology and much higher quality requirements, most manufacturers still use the same technolgy that has been the standard for decades.

Pyromaître uses technology based on the Larsen Miller and Hollomon-Jaffe parameters. Finding the right time and temperature to achieve same results with Pyromaître's ovens can now be done in minutes compared to hours required with standard methods. Using precise speed controls and temperature uniformity, Pyromaître's ovens cut cycle time up to 10 times and reduce rejected parts by up to 98%.

Parts that previously stayed in the oven for hours are now treated in minutes resulting in a significant production time increase and floor space saving up to 70%. The reduction in oven size also correlates to shorter pre-heat time, better uniformity and heat loss control.

## Pyro Ovens Advantages

- **Heavy duty construction, proven reliability (3-5 years warranty)**
- **Cut cycle time from 3 to 10 fold**
- **Floor space reduction up to 70%**
- **Powerful Burner, reduce heat up time up to 75%**
- **High velocity motors and fans, increased uniformity for less scrap**
- **Easy maintenance**



# ELECTRIC AND GAS OVENS

## ELECTRIC OVENS

| MODEL | CHAMBER | | | | OVERALL | | | | CAPACITY | | | | | | POWER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Width | | Length | | Width | | Lenght | | 590°F | 700°F | 790°F | 310°C | 370°C | 420°C | Kw |
| | in | mm | ft | mm | in | mm | in | mm | lb/hr | lb/hr | lb/hr | kg/hr | kg/hr | kg/hr | |
| PS-106E | 10 | 255 | 6 | 1830 | 46 | 1170 | 116 | 2945 | 925 | 750 | 640 | 420 | 340 | 290 | 24 |
| PS-128E | 12 | 305 | 8 | 2440 | 48 | 1220 | 142 | 3605 | 1485 | 1210 | 1025 | 675 | 550 | 465 | 39 |
| PS-168E | 16 | 405 | 8 | 2440 | 52 | 1320 | 142 | 3605 | 1715 | 1365 | 1155 | 780 | 620 | 525 | 45 |
| PS-208E | 20 | 510 | 8 | 2440 | 56 | 1420 | 142 | 3605 | 1715 | 1365 | 1155 | 780 | 620 | 525 | 45 |
| P-208E | 20 | 510 | 8 | 2440 | 56 | 1420 | 142 | 3605 | 2420 | 1980 | 1650 | 1100 | 900 | 750 | 63 |
| P-1611E | 16 | 405 | 11 | 3355 | 52 | 1320 | 178 | 4520 | 3960 | 3300 | 2860 | 1800 | 1500 | 1300 | 96 |
| P-368E | 36 | 915 | 8 | 2440 | 75 | 1905 | 164 | 4165 | 3795 | 3080 | 2640 | 1725 | 1400 | 1200 | 96 |
| P-3611E | 36 | 915 | 11 | 3355 | 75 | 1905 | 200 | 5080 | 4620 | 3740 | 3300 | 2100 | 1700 | 1500 | 120 |
| P-508E | 50 | 1270 | 8 | 2440 | 89 | 2260 | 164 | 4165 | 3410 | 2750 | 2310 | 1550 | 1250 | 1050 | 96 |
| P-5011E | 50 | 1270 | 11 | 3355 | 89 | 2260 | 200 | 5080 | 4070 | 3300 | 2805 | 1850 | 1500 | 1275 | 120 |
| | | | | | | | | | HIGHER OUTPUT AVAILABLE | | | | | | |

* 80% of the theoretical steady state capacity.

## GAS OVENS

| MODEL | CHAMBER | | | | OVERALL | | | | CAPACITY | | | | | | POWER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Width | | Length | | Width | | Lenght | | 590 °F | 700 °F | 790 °F | 310 °C | 370 °C | 420 °C | Kw |
| | in | mm | ft | mm | in | mm | in | mm | lb/hr | lb/hr | lb/hr | kg/hr | kg/hr | kg/hr | |
| P-1611G | 16 | 405 | 11 | 3355 | 56 | 1420 | 185 | 4700 | 3450 | 2700 | 2250 | 1570 | 1225 | 1025 | 146 |
| P-1615G | 16 | 405 | 15 | 4570 | 56 | 1420 | 233 | 5920 | 5850 | 4700 | 3950 | 2660 | 2135 | 1795 | 234 |
| P-2015G | 20 | 510 | 15 | 4570 | 60 | 1525 | 233 | 5920 | 5700 | 4500 | 3800 | 2590 | 2045 | 1725 | 234 |
| P-2415G | 24 | 610 | 15 | 4570 | 64 | 1625 | 233 | 5920 | 5450 | 4250 | 3500 | 2475 | 1930 | 1590 | 234 |
| P-2420G | 24 | 610 | 20 | 6095 | 64 | 1625 | 293 | 7440 | 11000 | 8750 | 7400 | 5000 | 3975 | 3365 | 440 |
| P-3611G | 36 | 915 | 11 | 3355 | 101 | 2565 | 212 | 5385 | 11000 | 8750 | 7400 | 5000 | 3975 | 3365 | 440 |
| P-3615G | 36 | 915 | 15 | 4570 | 101 | 2565 | 260 | 6605 | 10750 | 8600 | 7200 | 4885 | 3910 | 3275 | 440 |
| P-5011G | 50 | 1270 | 11 | 3355 | 115 | 2920 | 212 | 5385 | 19000 | 15250 | 13000 | 8635 | 6930 | 5910 | 732 |
| P-5015G | 50 | 1270 | 15 | 4570 | 115 | 2920 | 260 | 6605 | 18500 | 14750 | 12500 | 8410 | 6705 | 5680 | 732 |
| P-7215G | 72 | 1830 | 15 | 4570 | 137 | 3480 | 260 | 6605 | 25400 | 20200 | 16850 | 11545 | 9180 | 7660 | 1025 |
| P-7220G | 72 | 1830 | 20 | 6095 | 137 | 3480 | 320 | 8130 | 24250 | 19000 | 16000 | 11025 | 8635 | 7275 | 1025 |
| P-10020G | 100 | 2540 | 20 | 6095 | 165 | 4190 | 320 | 8130 | 34500 | 27500 | 23000 | 15680 | 12500 | 10455 | 1465 |
| P-10030G | 100 | 2540 | 30 | 9145 | 165 | 4190 | 440 | 11175 | 32000 | 24500 | 20000 | 14545 | 11135 | 9090 | 1465 |
| P-10040G | 100 | 2540 | 40 | 12190 | 165 | 4190 | 560 | 14225 | 37500 | 29000 | 23500 | 17045 | 13180 | 10680 | 1757 |
| | | | | | | | | | HIGHER OUTPUT AVAILABLE | | | | | | |

* 80% of the theoretical steady state capacity.

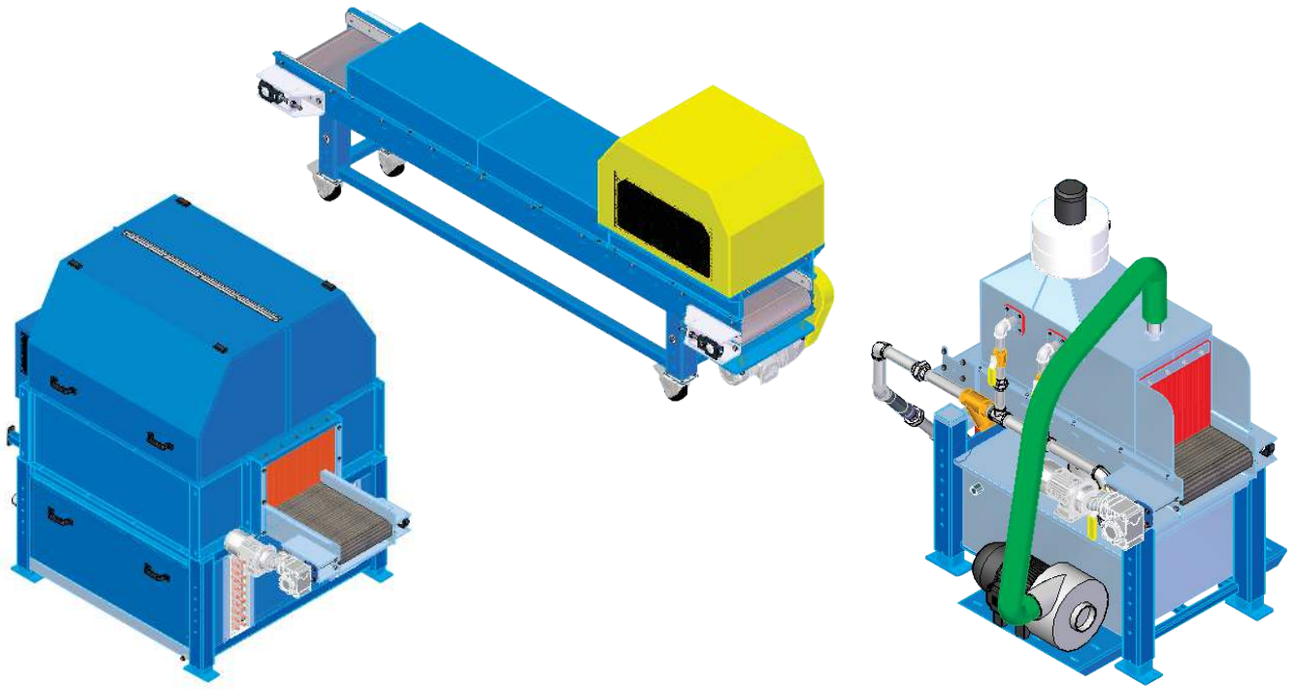
# CUSTOM OVENS

Over the last 30 years, Pyromaître has proven its capability to design, build and deliver a custom product that meets production requirement many times over. Pyro's high-speed technology applies to a variety of products constantly improving and streamline its current process.

# OPTIONAL FEATURES

Pyromaître offers a wide range of options that can be added to your ovens to meet your company's production needs such as cooling chamber, chute, HMI and many others.

- **CQI-9**
- **AMS2750**
- **Cooling Chamber**
  - Water spray cooling chamber
  - Pyrocool chamber
  - Air recycling cooling chamber
- **Inlet/outlet chutes**
- **HMI**
- **Dynamic heat distribution system**



# APPLICATIONS

## Springs

The discovery of high-speed stress relieving started with Torsion Springs back in the 1990s. This first oven yielded 30% rejected parts. After series of time and temperature testing, the result was an increase of 100 °C, far above then recommended temperature. Cycle time was then reduced to 3 minutes from 60 for a CrSi 6 mm wire! Best of all, this new in-line process yielded no rejects. This process efficiency has been proven and reproduced consistently on many other types of springs since then.

## Suspension Springs

One of the many applications where Pyromaître has enjoyed the most success and where the benefits of high-speed stress relief are the most relevant is the suspension spring industry. The customer was stress relieving suspension springs of 16 mm (0.629") wire diameter in 96 minutes. Pyro's high precision heat transfer oven was able to reduce cycle time to an aggressive 6 minutes. The customer's benefits translated in massive energy savings of 25% per part produced and 50% of floor space economy. This resulted in many new systems being sold in rapid succession.

## Leaf Springs

The leaf spring market has presented several opportunities for conversion to lean tempering. In addition to the significant speed advantages, 40-minutes as compared to the conventional 2 hours, our ovens deliver further operating cost advantages. The conventional oven requires a 3 million BTU burner system, compared to 1.5 million BTU for Pyro with the same output. Moreover, the reduced length of the oven enabled the use of air for cooling rather than the traditional use of water.

## CV Joints

The Constant Velocity Joint is one of the many successful examples of high-speed tempering. The story began in 1999 with the acceptance of high-speed tempering at Ford Motor Company. With an aggressive 10-minutes cycle time, manual part handling was eliminated, and work-in-process reduced by 90%. Many major CVJ supplier replaced their in-line induction tempering process with Pyromaître's high-speed technology. As the induction tempering process was once the line bottleneck, its elimination allowed for nearly a doubling of line capacity.

## Torsion Tubes

Another Pyromaître success story relates to tempering of hydro-formed torsion tubes. The conventional process was a 60-minute continuous batch process with an incredible 1056 parts per batch. The lean solution delivered on three different continents uses a 10-minute process with only 60 parts. This high-speed processing provides the opportunity for single-piece workflow thus eliminating part fixtures and external handling equipment. Additional benefits are simplified and more robust robotics program, and significantly reduced capital investment.

## Shafts

Axle shafts are another great example of Pyro precision tempering. Pyro installed three systems with two global manufacturers, producing over 1 million axle shafts annually. For example: a mezzanine mounted monorail trolley conveyor tempering oven at 100-minutes cycle time and 350 parts in-process was replaced with a floor mounted 20-minute tempering process with only 70 parts in-process.

# CONTACT US

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