

MACHINING QUICK TIPS

HYDRAULIC OIL VISCOSITY AND TEMPERATURE

By David Briggs, Sr. Controls Engineer at CLIMAX - November 2021

Hydraulic oil viscosity may not be the most exciting topic of discussion but using the correct viscosity for the operating conditions will help assure that you can get your work done and maximize the service life of your hydraulic power unit. In cold weather, oil that is too heavy may cause cavitation in the suction line and damage the pump. In extremely hot weather, oil that is too light may not properly lubricate the pump and hydraulic motor. This can lead to accelerated wear and premature failure.

Allowable oil viscosity range on Oilgear pumps and Char-Lynn motors is 65-2000 SUS. To stay within the required viscosity range, use the recommended grade of hydraulic oil listed in the **CLIMAX Hydraulic Power Units Oil and Temperature** chart below. Remember, the hydraulic oil will warm up during use, sometimes as much as 80 to 90 degrees F.

CLIMAX HYDRAULIC POWER UNITS OIL AND TEMPERATURE SPECIFICATIONS

1. The hydraulic hoses supplied with your Climax HPU are rated for operation down to -40°F (-40°C)
2. The seals in the pump and motor are rated for operation down to -10°F (-23°C). Below that temperature, the seal material loses elasticity and will wear rapidly and cause premature seal failure.
3. Both the Oilgear Pump and the Char-Lynn Motors are rated to operate at no more than 200°F (93°C) with a minimum oil viscosity of 70 SUS.
4. Allowable oil viscosity range on Oilgear pumps and Char-Lynn motors is 65-2000 SUS.
5. To stay within the required viscosity range, use the recommended grade of hydraulic oil listed in the chart below.

Oil	Minimum oil temperature Deg. F (Deg. C)	Minimum oil temperature Deg. F (Deg. C)
Lubriplate Minus 70 Hydraulic Oil	-10 (-23)	100 (40)
SAE 10W	30 (-1)	150 (66)
Chevron AW22 / Mobile DTE22	14 (-10)	132 (56)
Chevron AW32 / ** Mobile DTE24	27 (-3)	155 (68)
Chevron AW46 / Mobile DTE25	39 (-4)	172 (78)
Chevron AW68 / Mobile DTE26	50 (10)	190 (88)
Chevron AW100 / Mobile DTE Heavy	60 (16)	190 (88)

** CLIMAX RECOMMENDED STANDARD

1. If an HPU is to be operated at ambient temperatures lower than the minimum allowable oil temperature, it will be necessary to provide a tank heater to ensure the oil stays warm.
2. Under continuous operation at moderate to high loads, it can be anticipated that the hydraulic oil temperature will rise between 80-90o F (27-32o C) above ambient temperature. This should be considered when selecting the grade of oil to be used in your HPU, and oil temperature should be monitored carefully if it is likely to approach the maximum allowable temperature.
3. Under normal conditions, all HPUs ship from CLIMAX with no oil in the reservoir. Upon special request, some HPUs are shipped with oil. In those cases, the hydraulic power units are supplied

About the Author: David Briggs is the Senior Controls Engineer at CLIMAX, the world's foremost manufacturer of portable machining, welding, and valve testing equipment. For the past 20 years, David has been working closely with on-site machinists, helping them to be successful in their most challenging projects.

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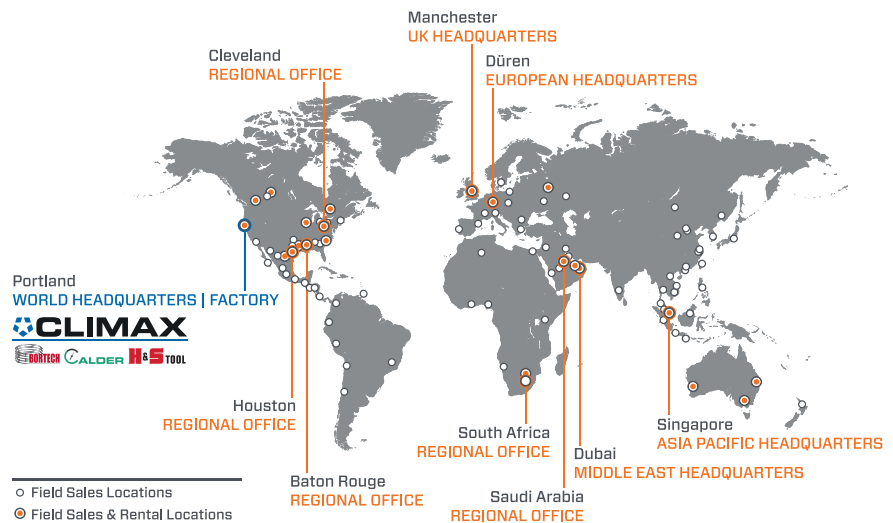
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