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Extruder



HPE Horizontal Extruder

Overview

The HPE Horizontal extruder from Davis-Standard exemplifies processor demands with a small footprint, performance features, and a fast delivery for co-extrusion and multilayer applications. This extruder is available in sizes ranging from 3/4 inch (19mm) to 1 3/4 inches (44mm), utilizes a direct coupled motor, and has a smaller footprint for close proximity to the common die.

Features

- High quality design and manufacture
- Increased torque capacity to handle high viscosity resins
- All sliding/swiveling components can be locked firmly in place for rigid position
- Available in 3/4-inch (20mm), 1-inch (25mm), 1 1/4-inch (30mm), 1 1/2-inch (40mm), and 1 3/4-inch (45mm) sizes
- Adjustment of +/- 1/2-inch (13mm)

HPE Horizontal Extruder

Machine Design Parameters

Model	HPE-075H	HPE-075H	HPE-100H	HPE-100H	HPE-125H	HPE-125H	HPE-150H	HPE-150H	HPE-175H	HPE-175H
Nominal Screw L/D Ratio	24:1	30:1	24:1	30:1	24:1	30:1	24:1	30:1	24:1	30:1
Screw Diameter	3/4" (20mm)	3/4" (20mm)	1" (25mm)	1" (25mm)	1 1/4" (30mm)	1 1/4" (30mm)	1 1/2" (40mm)	1 1/2" (40mm)	1 3/4" (45mm)	1 3/4" (45mm)
Standard Drive Size (hp)	3	3	5	5	7.5	7.5	15	15	20	20
AGMA HP Rating @ 100 RPM with Unity (1.0) S.F.	8 hp	8 hp	8 hp	8 hp	21 hp	21 hp	42 hp	42 hp	42 hp	42 hp
Resultant Service Factor	2.1	2.1	1.25	1.25	2.8	2.8	2.8	2.8	2.1	2.1
Thrust Bearing L10 Life (hrs) @ 5,000 psi and 100 screw RPM	2,500,000	2,500,000	370,000	370,000	186,000	186,000	570,000	570,000	200,000	200,000
Max Internal Pressure (psi)	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Machine Weight (lbs)	800	800	800	800	1,000	1,000	1,600	1,600	1,700	1,700
Barrel Zones	3	4	3	4	3	4	4	5	4	5
Barrel Zone Wattage	1,000	1,000	1,200	1,200	1,800	1,800	2,000	2,000	2,600	2,600
Die/Adapter Zone Wattage	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Standard Voltage	230/3/60	230/3/60	230/3/60	230/3/60	230/3/60	230/3/60	230/3/60	230/3/60	230/3/60	230/3/60

Heat Zone Data

Drive Unit

The AC drive and power unit is designed to handle the typical range of polymer requirements. A direct-coupled motor provides efficient transmission of power to the gear reducer.

Gear Reducer and Thrust Housing

The gear reducer is a parallel shaft helical gear unit. Gearing is manufactured from alloy steel and is hardened and ground. The standard overall gear reduction ratio is 17:1 nominal, to provide around 100 rpm feedscrew speed when the reducer is driven at 1750 rpm. The drive torque capacities are sized to be suitable for most commonly processed materials. The thrust bearing is sized for 60,000 to 100,000 hours L10 life based on actual operating conditions. Internals are immersion lubricated and the thrust housing bearings are grease lubricated.

Feed Section and Hopper

The feed section is casting cored for water cooling. It incorporates an air space to minimize heat transfer from the barrel to the gear reducer, and provides maintenance access to the bushing and thrust shaft socket. For feeding efficiency, the feed throat is angled back 30 degrees from perpendicular with the feedscrew bore. The hopper is constructed of stainless steel and includes a slide shut-off gate, sight glass, and dump tube.

Barrel And Feedscrew

The one-piece, 4140 steel tube barrel with bi-metallic cast-in liner is engineered for operating pressures up to 10,000 psi. The general-purpose lining allow is iron-based and is adequate for most applications.

Heating And Cooling

Each barrel zone is fitted with a bolt-on cast aluminum heater. Each barrel control zone has a separate motorized blower. The blowers are attached to the bottom of individual air shrouds mounted around each heater zone.

Extruder Screw

Standard feedscrews supplied with the HPE machine are single-stage mixing type chrome-plated feedscrews.

Head Flange

A standard four-bolt flange is provided with the die. A clamp flange and clamp assembly is optional. The flange has a pressure top at the 12 o'clock position for a supplied pressure transducer. A temperature pressure transducer is optional. Over-pressurization protection is provided by a 9,000 psi (620 bar) rupture disc at the 6 o'clock position.

Control Cabinet

Temperature controllers are provided for each control zone. Standard scale is 0-600°F (0-300 C for export). Die zone power and thermocouples plug directly into the cabinet. The standard drive OCS consists of digital feedscrew rpm and Motor Load meters, Start and Stop pushbuttons, a speed potentiometer, and drive fault pilot light.