

Do you know how much your drum heating ACTUALLY costs?

The following results were achieved at Comma Chemical.
The savings by using THERMOSAFE® induction heaters led to a national productivity award.

	8 drum steam oven	3 individual THERMOSAFE
Average drum throughput (variable operating temps of 50° to 70°C)	5 per day	20 per day
Energy Cost per year	£7200	£1200
Maximum drum capacity per year (5 day week, 50 week year)	1250	5000
Average energy cost per drum	£5.76	£0.24
Capital Cost	Existing	Nett £4500
Paypack period		8 months

Comparisons with a typical 48 drum hazardous area steam oven heating organic fluid

	48 drum steam oven	12 individual THERMOSAFE	24 individual THERMOSAFE	48 individual THERMOSAFE
Average drum throughput (to reach typical 80°C)	48 every 2 days	12 per day shift or 24 per 24 hours	24 per day shift or 48 per 24 hours	48 per day shift or 96 per 24 hrs
Energy cost per year (day shifts) Running 24 hours per day	£64,800	£9,144 (days) £18,288 (24 hrs)	£18,288 (days) £36,576 (24 hrs)	£36,576 (days) £73,152 (24hrs)
Maximum drum capacity per year (6 day week, 50 week year)	7200	3600 (days) 7200 (24 hrs)	7200 (days) 14400 (24 hrs)	14400 (days) 28800 (24 hrs)
Average energy cost (per drum)	£9.00	£2.54	£2.54	£2.54
Typical installed capital cost (Hazardous area, Zone 1 or 2)	£150,000	£36,000	£70,000	£120,000
Payback period (capital & running cost TH vs steam running cost)		< 1 yr	<18 months (day use)	< 2 yrs
2 year full cost (cap + 7200 drum/yr)	£279,600	£54,288	£106,576	£156,576

Drum heating cost assumptions:

Electricity cost average for mid-sized industrial user, Q4 2007 estimated at 9.39p per kWh.

Typical TH heat rate 10 – 15°C per hour. For “difficult” product to 80C from 20C (ie 60C rise) assume only 5°C/hr average, ie 12 hrs to temp

Cost per drum is 12hrs x 2.25kW x 9.39p

Steam cost: 2001, typically £9 per tonne, generated from natural gas. (BP Energy Consultant). Q4 2007 typically £15 per tonne (Dow)

16 drum oven steam consumption:

322.13 kg/hr on 20C start temp = 203.55kW 273.31 kg/hr on 40C start temp = 171.34kW 227.98kg/hr on 60C start temp = 141.39kW

185.29 kg/hr on 80C start temp = 113.47kW 145.04 kg/hr on 100C start temp = 87.48kW 106.62 kg/hr on 120C start temp = 63.24kW

Heating ca 75 sq m of carbon steel. Existing steam pressure at site 10.0 bar abs = 179.89C (Source Conthermo) For 80°C operation, assume 200 kg/hr for 48 hours (likely to be higher in practice)