



Business from technology

# Testing of the TwisterPump

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## Testing of the TwisterPump

- Measurements were done at VTT's laboratory in Jyväskylä, Finland
- Two TwisterPump models were tested
  - TwisterPump TP 130 with  $D_y$  100 mm inlet and outlet
  - TwisterPump TP 195 with  $D_y$  150 mm inlet and outlet
- The TP 130 was tested with water and with rape seed oil
  - Normal rotational speed range was 240 – 600 rpm
  - Some tests with rape seed oil also at 600 – 1000 rpm
- The TP 195 was tested with rape seed oil at 180 – 600 rpm

Measurements included:

- Flow rate  $Q$  (l/s), 1 l/s=3,6 m<sup>3</sup>/h
- Pressure before and after pump  $p_i$  and  $p_o$  (kPa), 1 kPa=0,01 bar
- Mechanical torque  $M$  (Nm)
- Rotational speed  $n$  (rpm)

Mechanical power demand  $P$  (W)  
was calculated as:

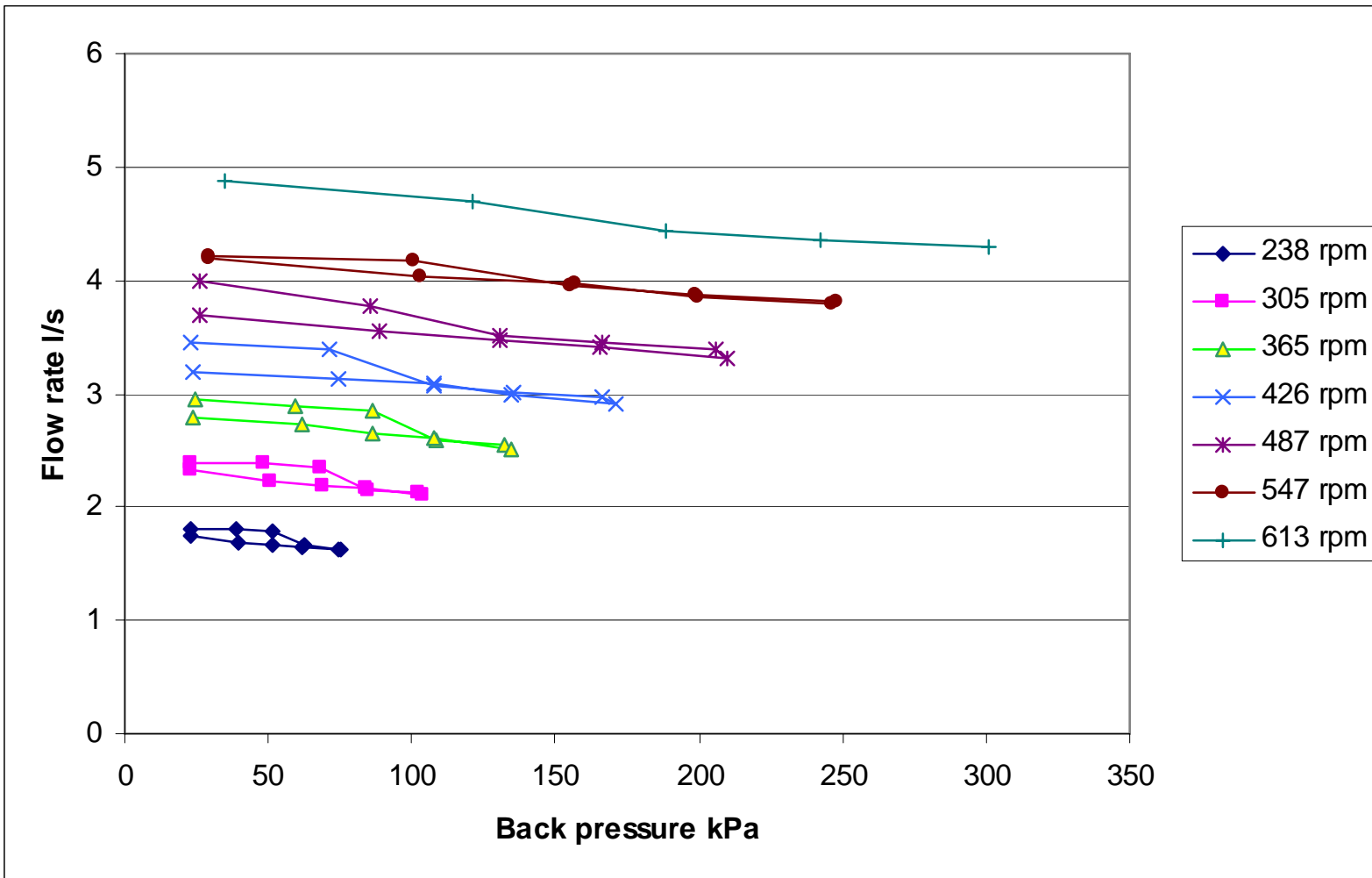
$$P = 2\pi nM/60$$

and mechanical efficiency:

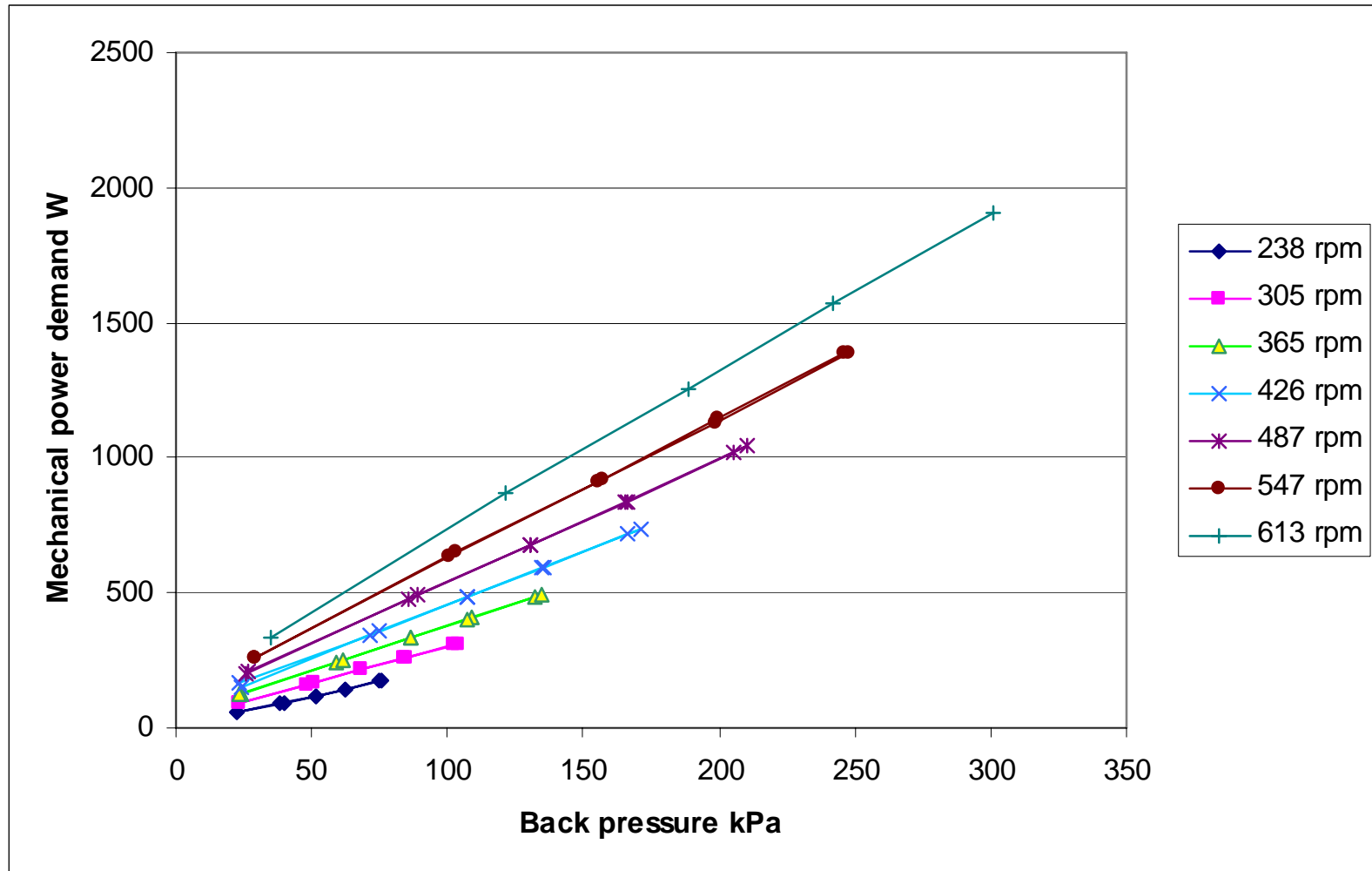
$$\eta = Q(p_o - p_i)/P$$



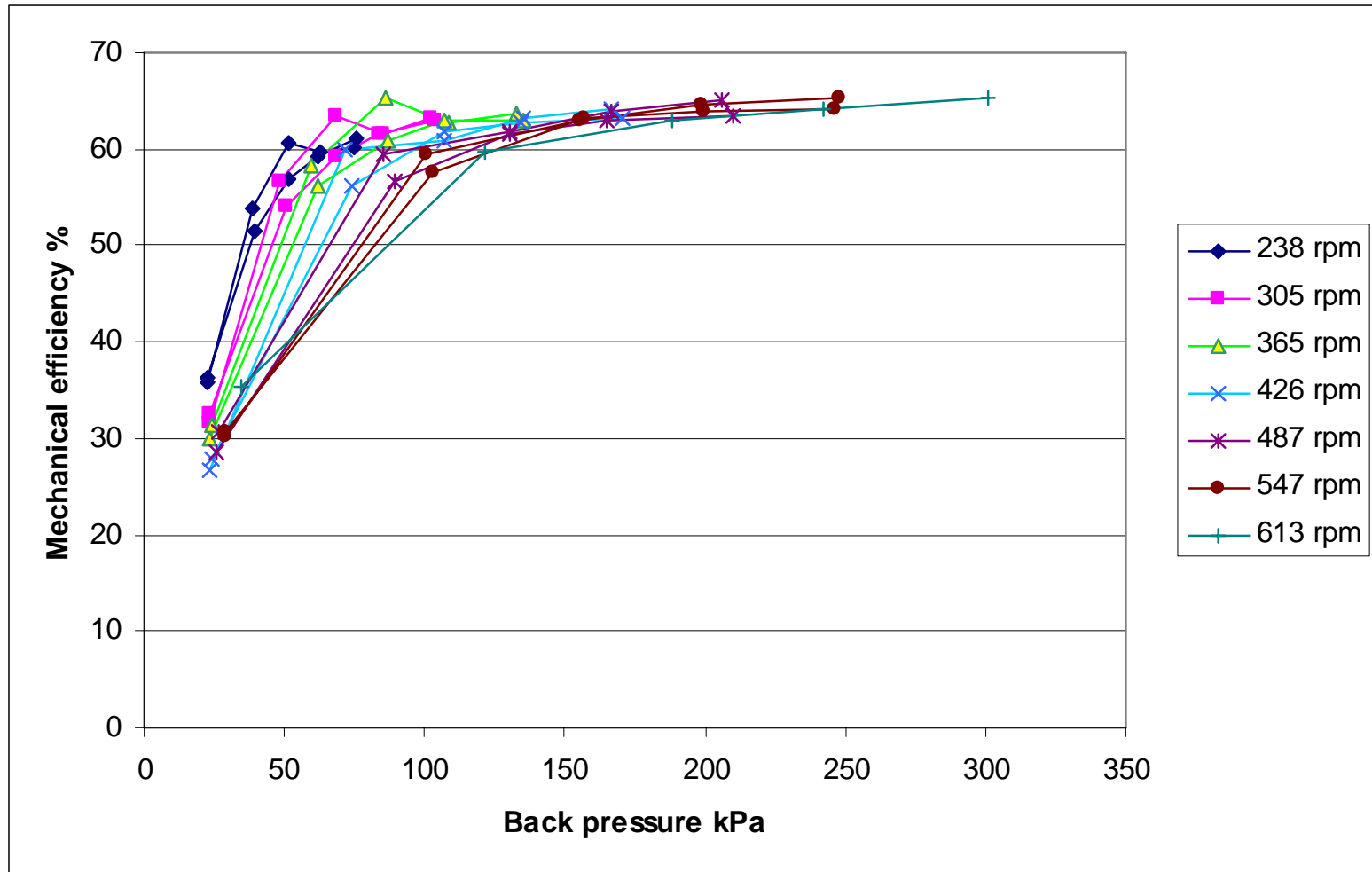
## TwisterPump TP 130 with rape seed oil



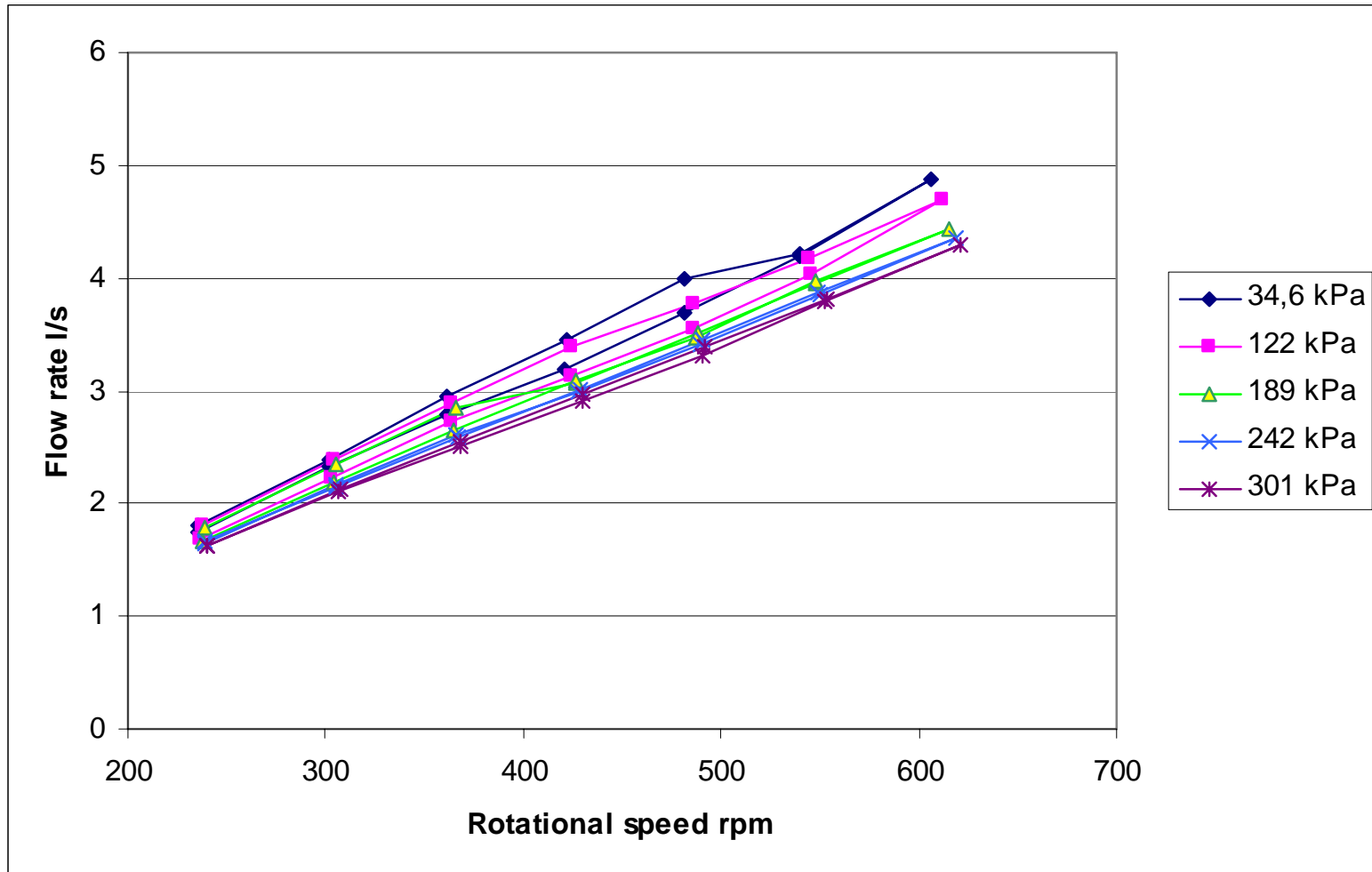
## TwisterPump TP 130 with rape seed oil



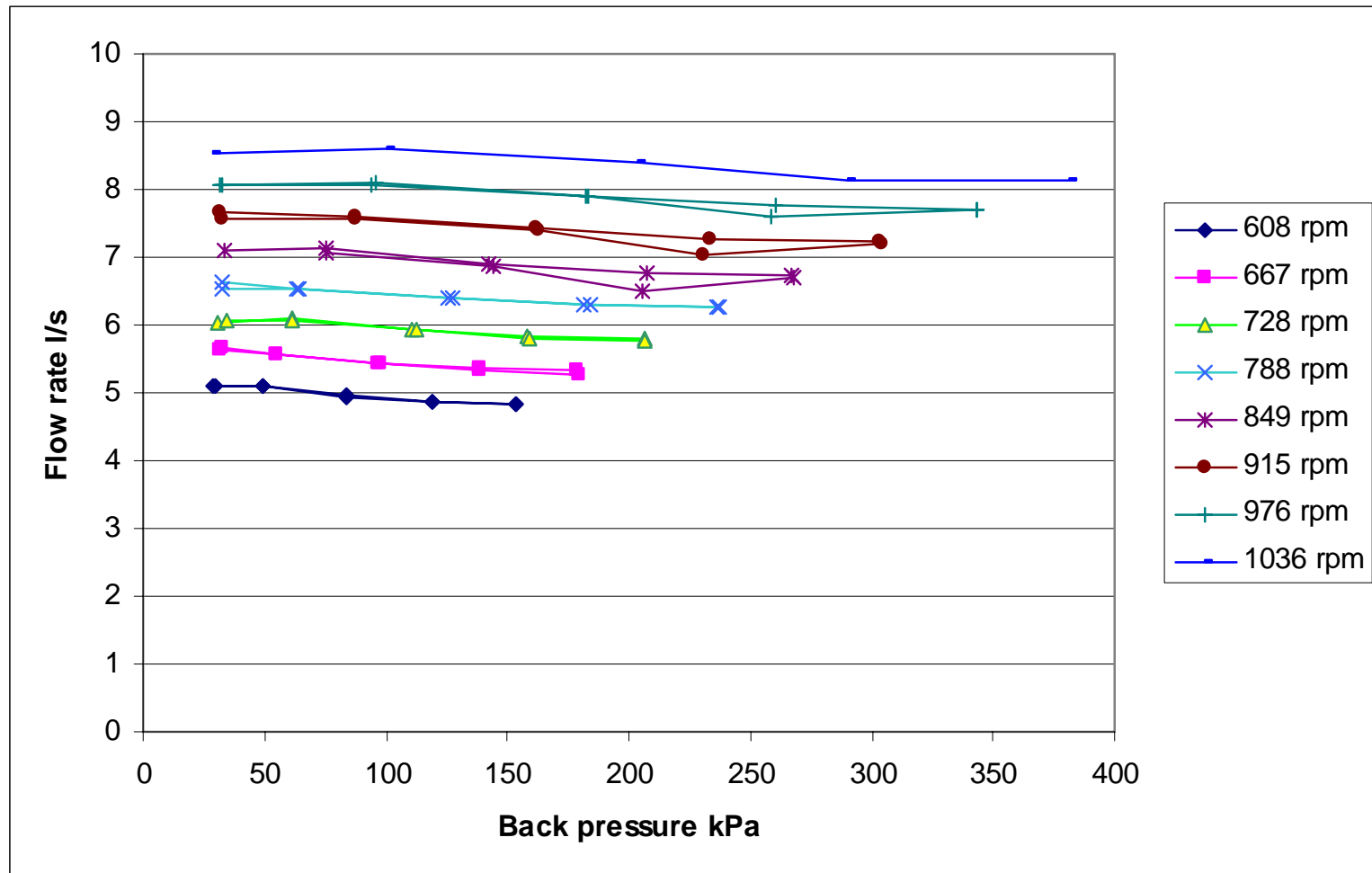
## TwisterPump TP 130 with rape seed oil



# TwisterPump TP 130 with rape seed oil (max pressures at 600 rpm)

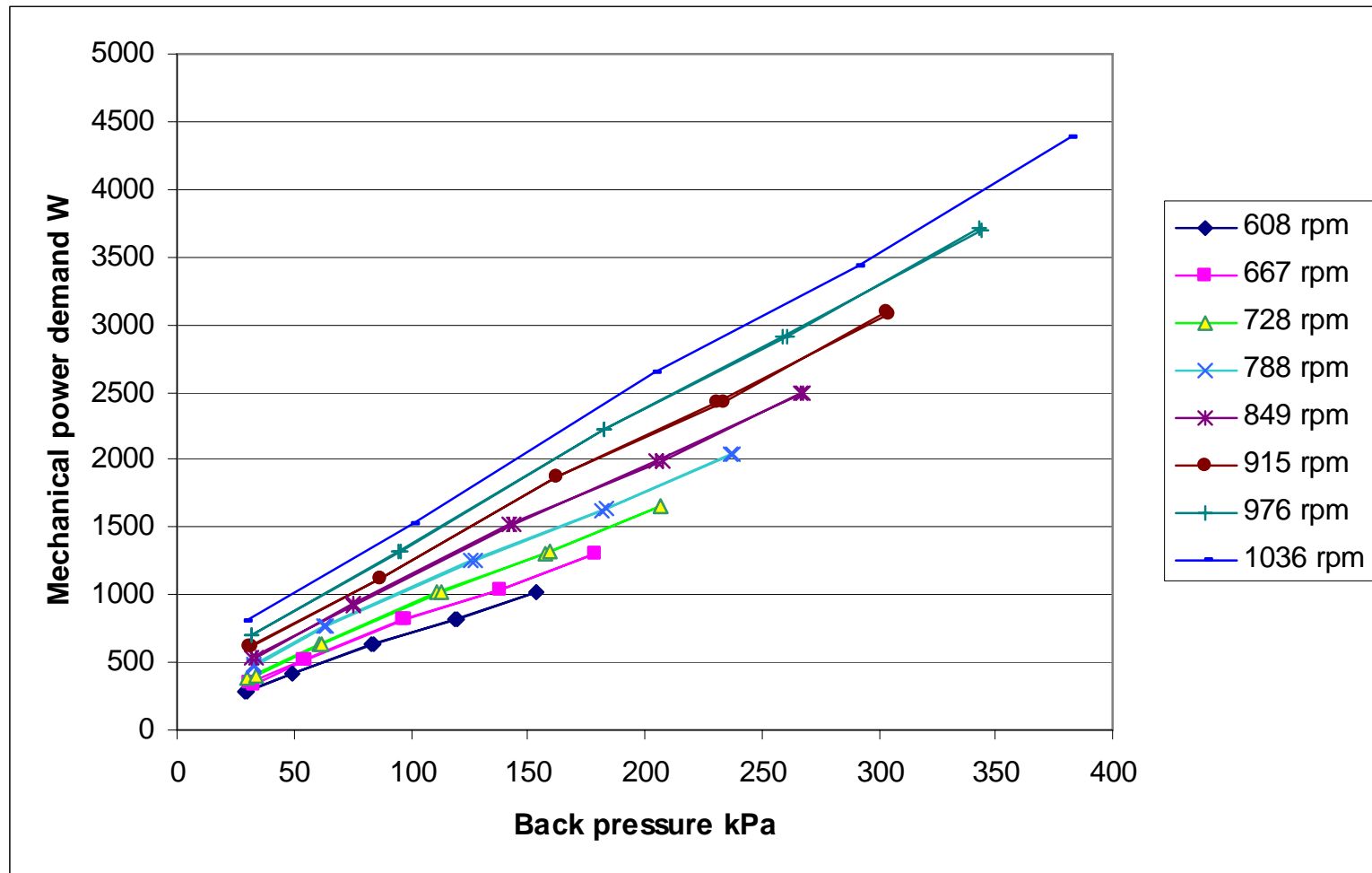


## TwisterPump TP 130 with rape seed oil at higher rpm's

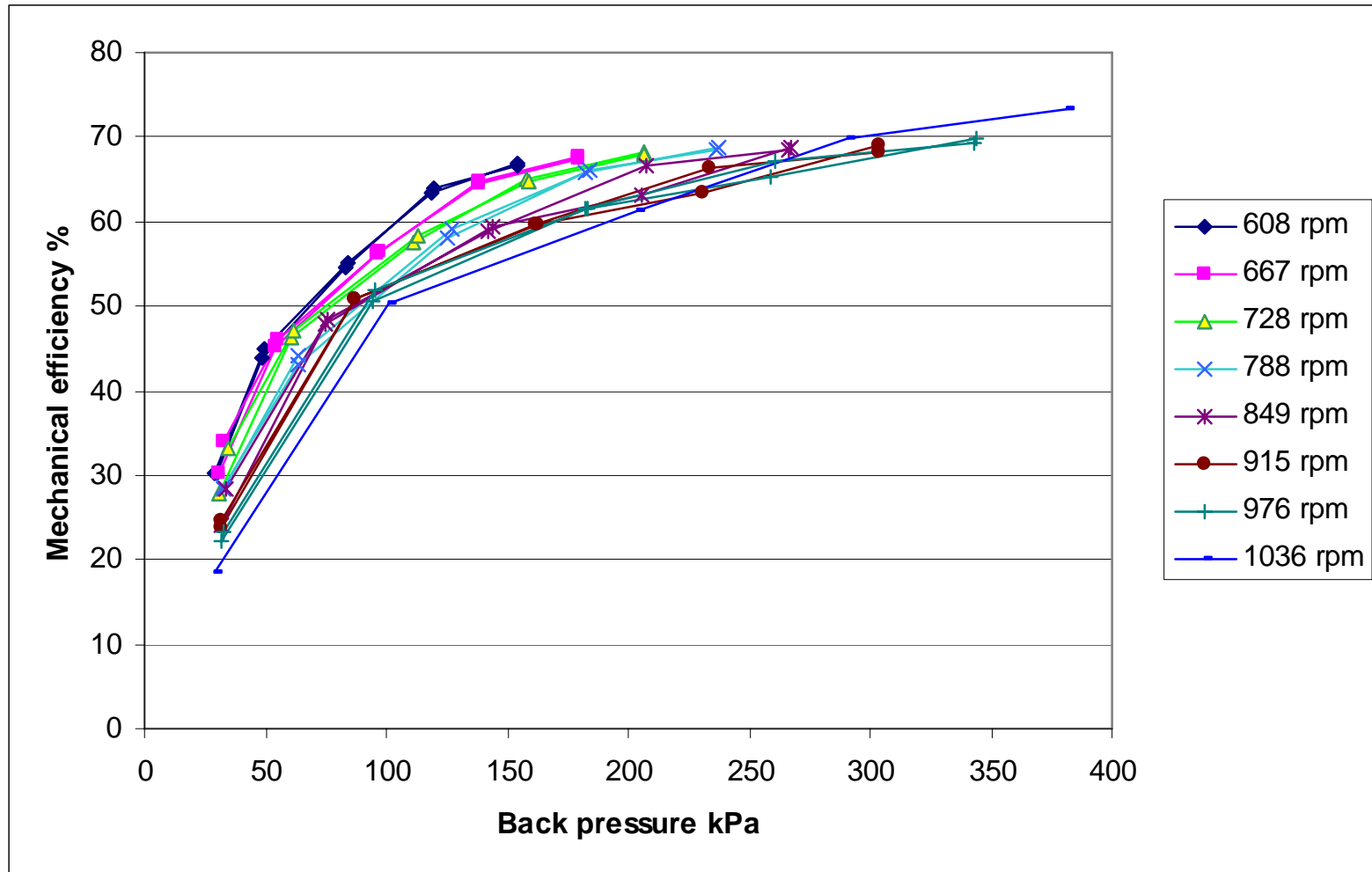




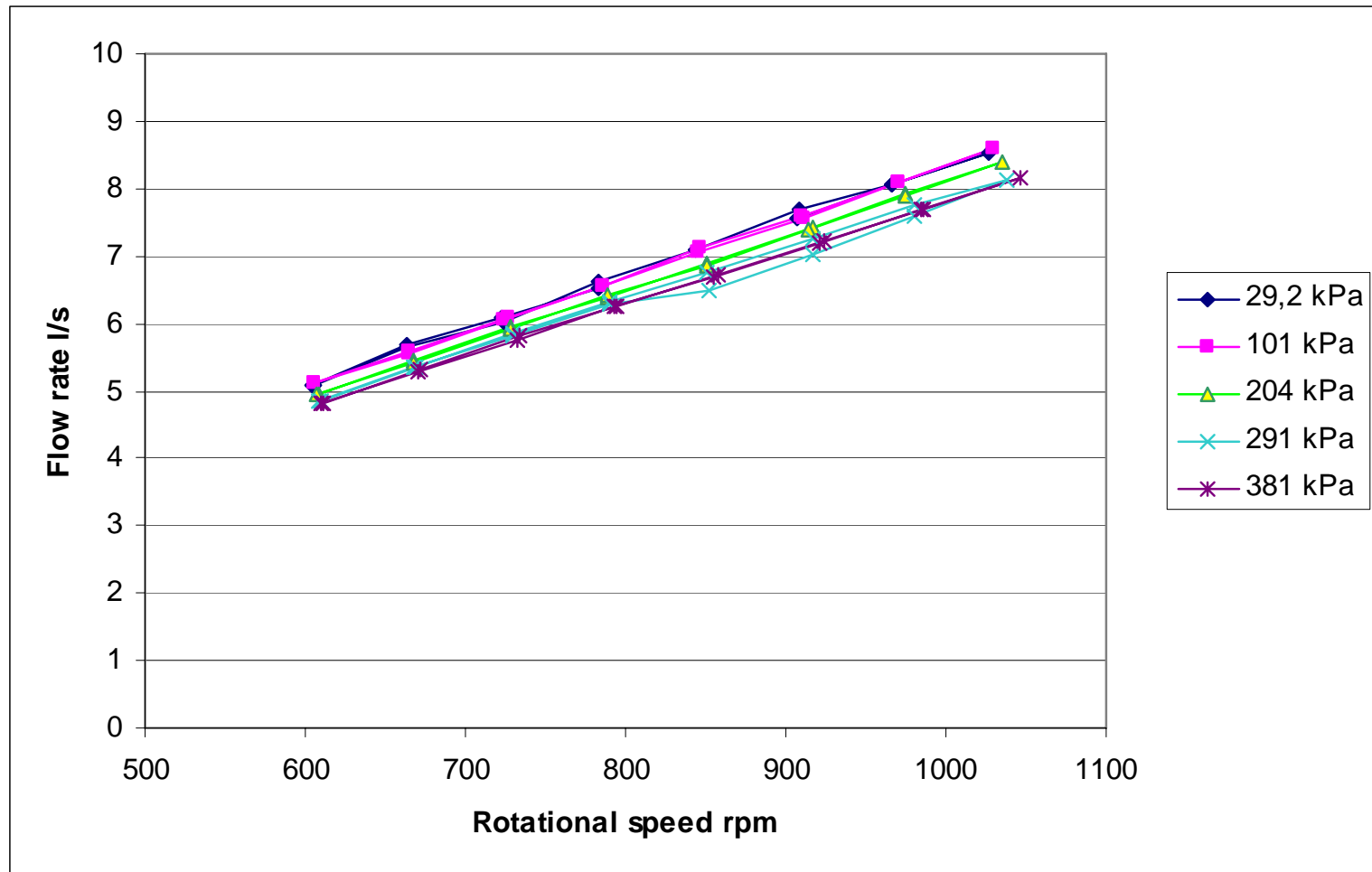
## TwisterPump TP 130 with rape seed oil at higher rpm's



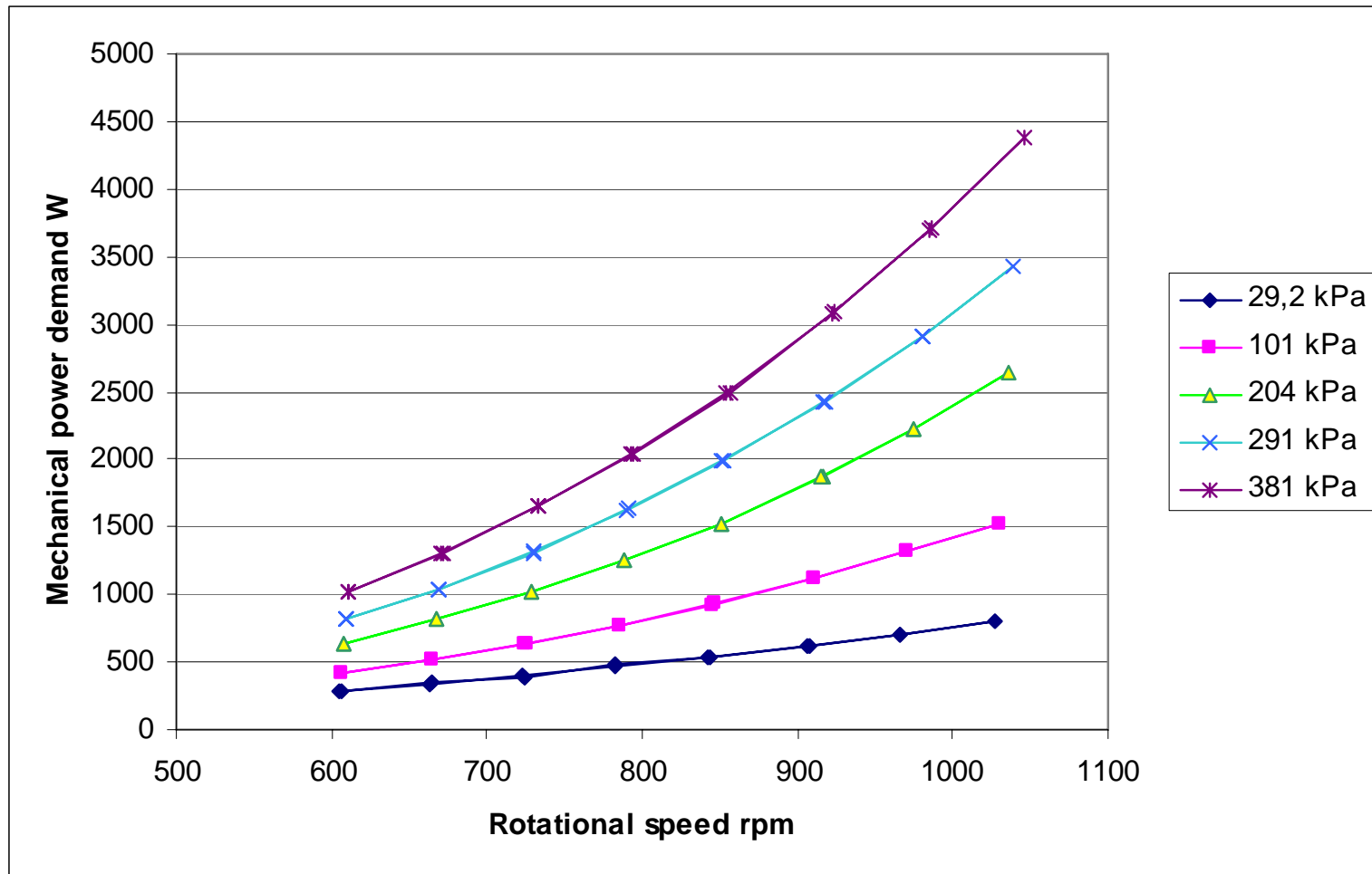
## TwisterPump TP 130 with rape seed oil at higher rpm's



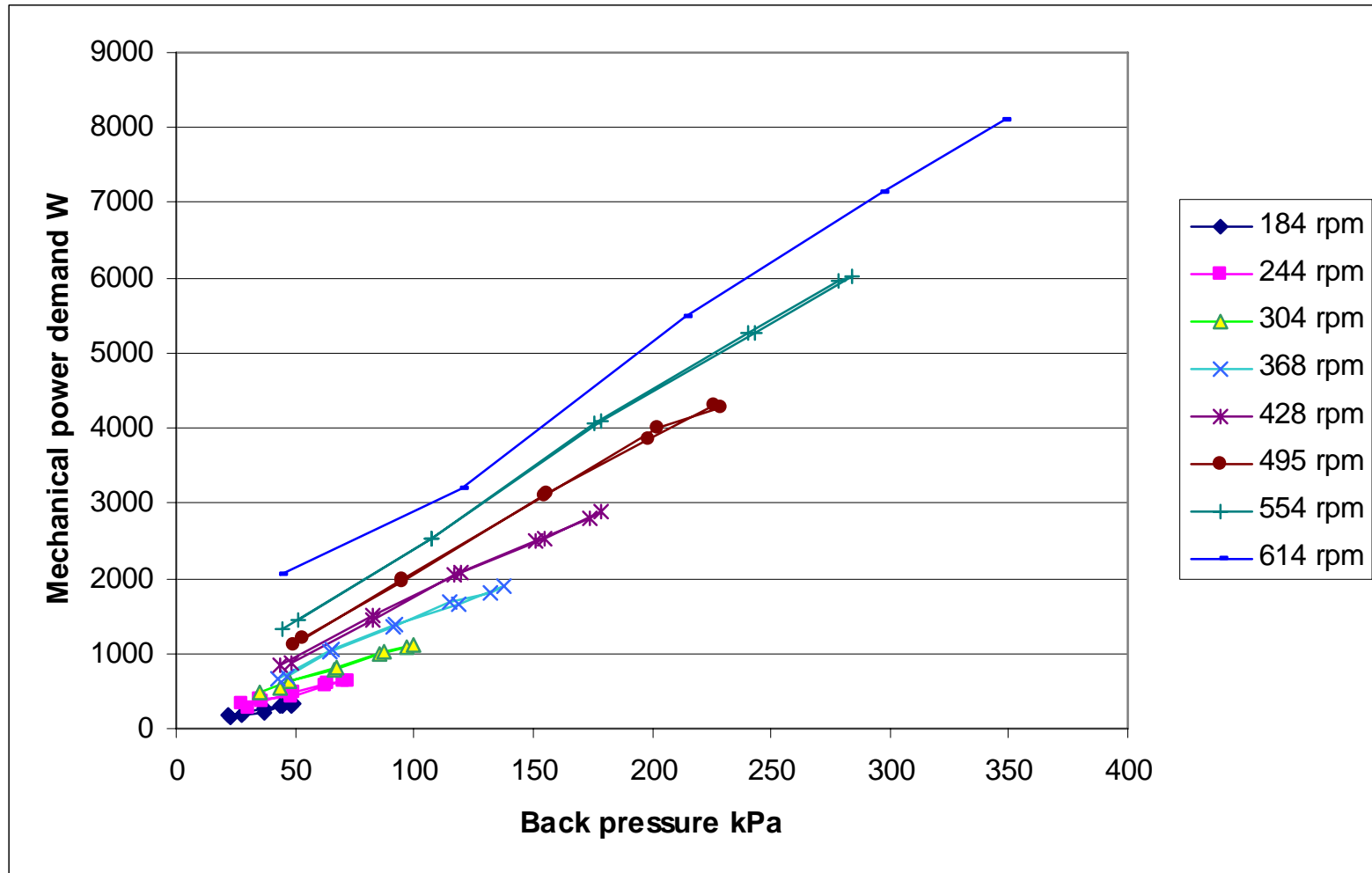
# TwisterPump TP 130 with rape seed oil at higher rpm's (max pressures at 1000 rpm)



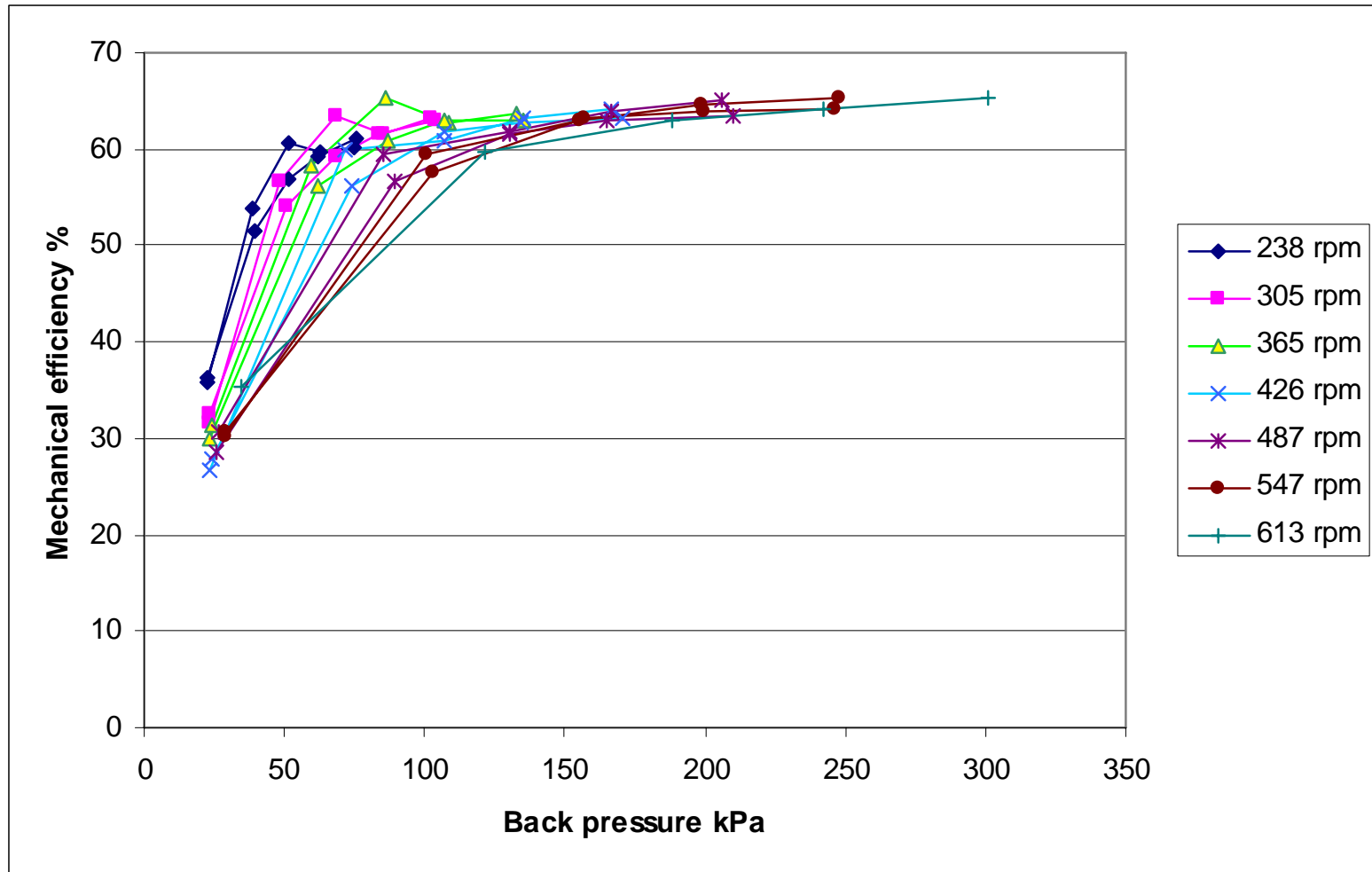
# TwisterPump TP 130 with rape seed oil at higher rpm's (max pressures at 1000 rpm)



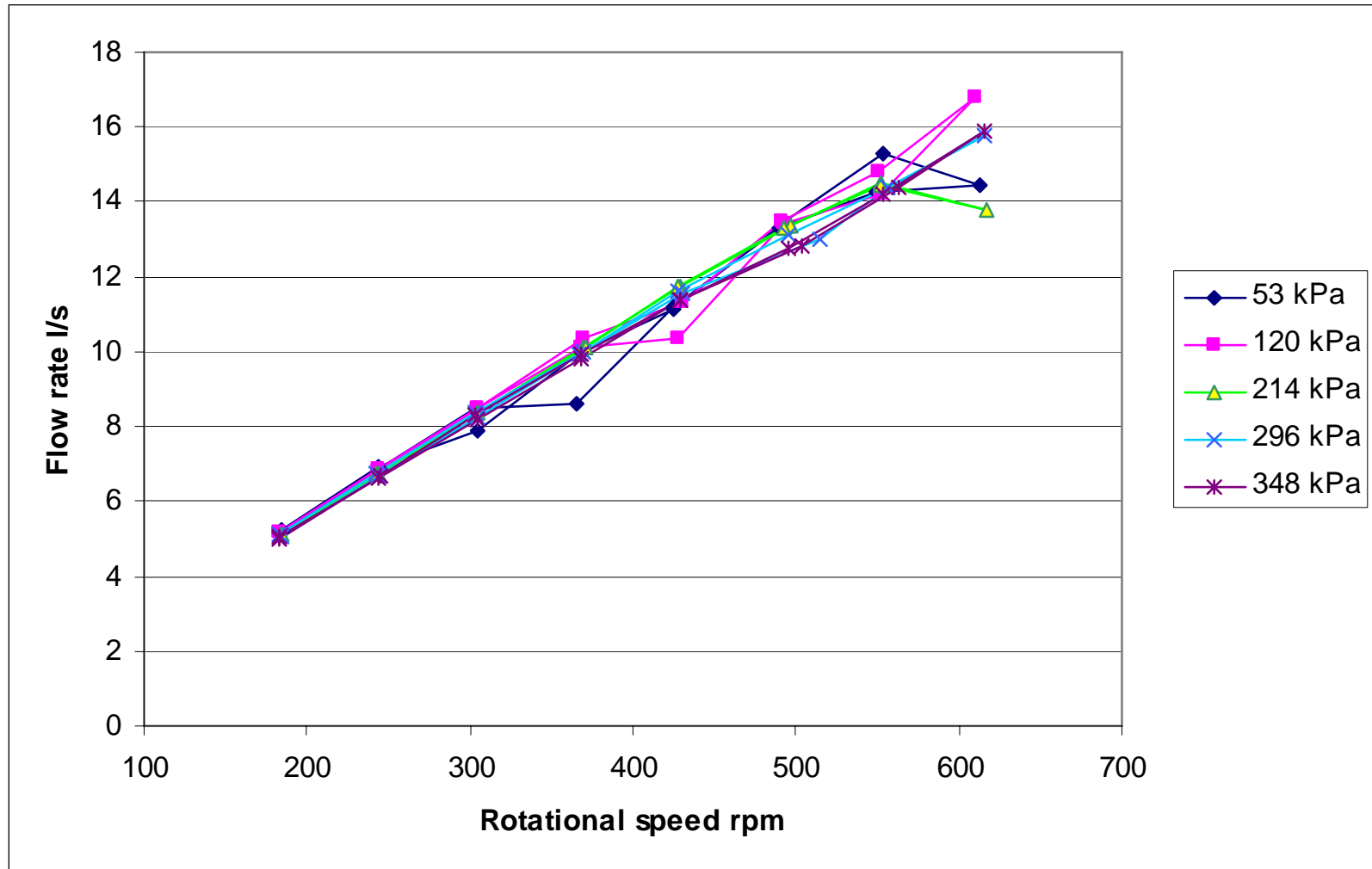
## TwisterPump TP 195 with rape seed oil



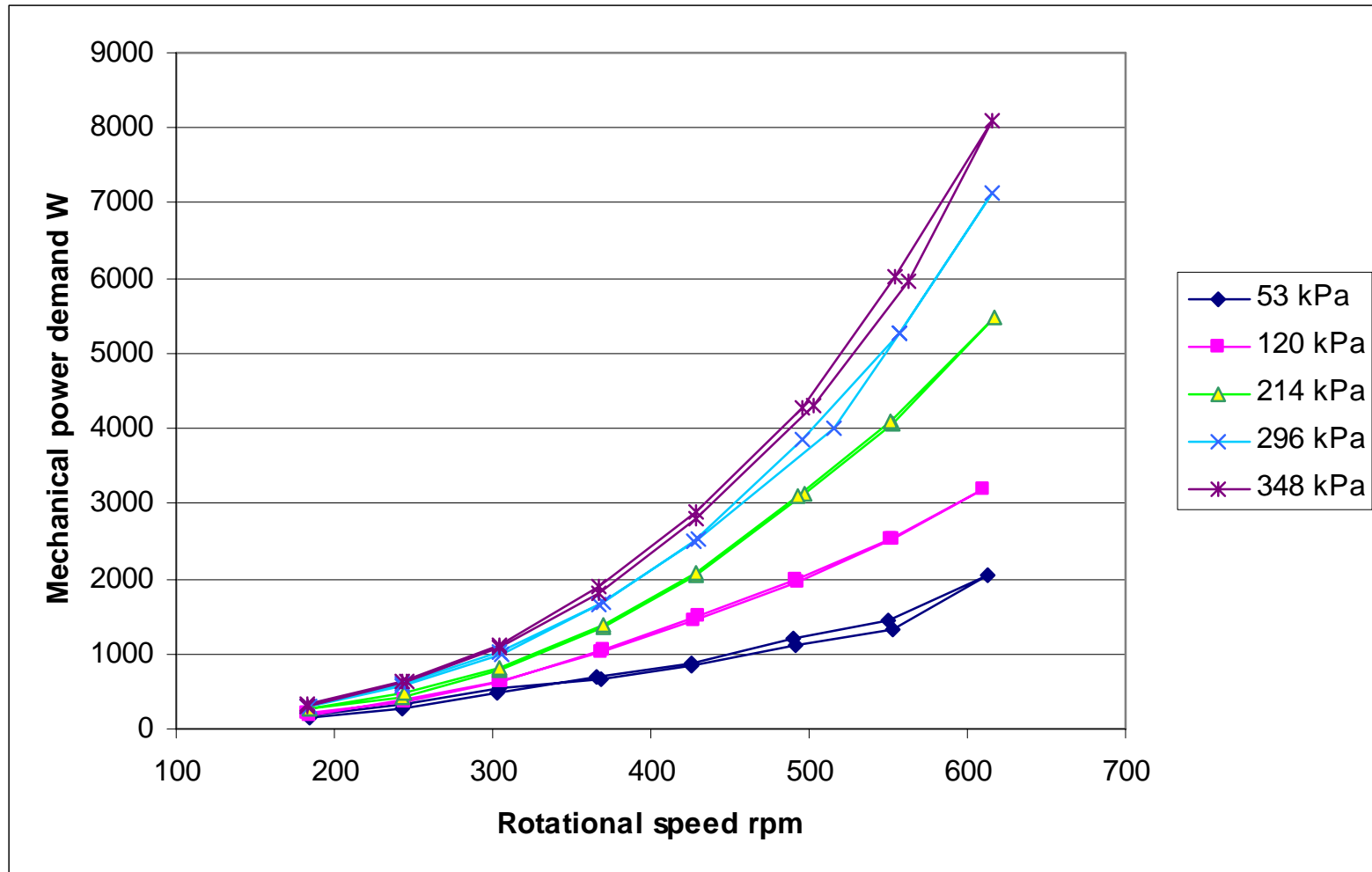
## TwisterPump TP 195 with rape seed oil



## TwisterPump TP 195 with rape seed oil (max pressures at 600 rpm)



## TwisterPump TP 195 with rape seed oil (max pressures at 600 rpm)





## Conclusions

- Both TwisterPumps were running smoothly with rape seed oil
- Flow rates stayed quite constant and not depending of the back pressure
- Flow rates of the TP 130 were 2 – 5 l/s at 240 – 600 rpm and 5 – 8,5 l/s at 600 – 1000 rpm
- Flow rates of the TP 195 were 5 – 16 l/s at 180 – 600 rpm
- With rape seed oil the efficiencies were very good; > 60 % (at higher rpm's even > 70 %)
- Minimum back pressure of about 50 – 70 kPa is needed for good efficiency



# VTT creates business from technology

