

Alçak Basıncılı Döküm Proseslerinde “Giriş Kalite Kontrol” GGK İndeksi Geliştirilmesi

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Derya Dispinar

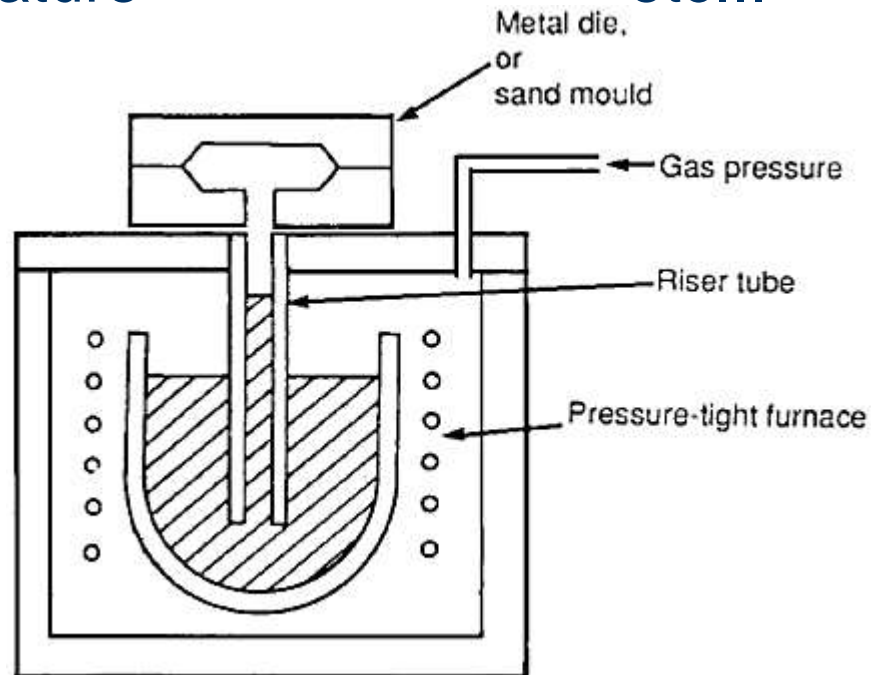


8. ULUSLARARASI DÖKÜM KONGRESİ
29 Eylül - 1 Ekim 2016



LPDC

- Runner design
- Pressure profiles
- Pressure adjustments
- Die temperature
- Coolers
- etc...
- Degassing duration
- Flow rate
- Modifiers
- etc...



motivation

- Even after optimization of all parameters in LPDC, reject parts can still be found.
- What has always been disregarded is the quality assessment of suppliers



Quality control

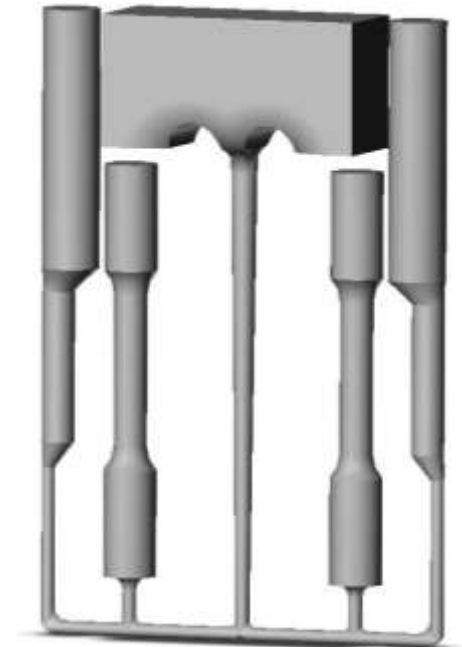
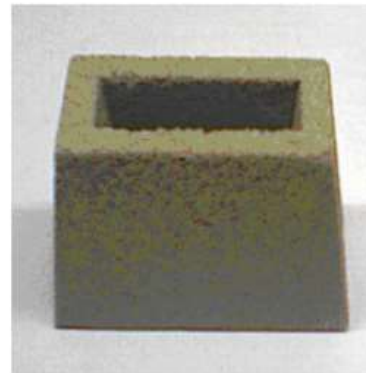
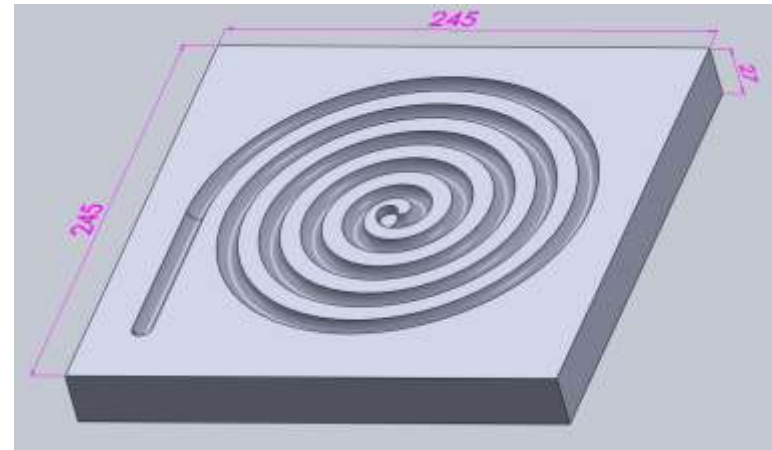
- Chemical spec
- Hydrogen content
- Density index



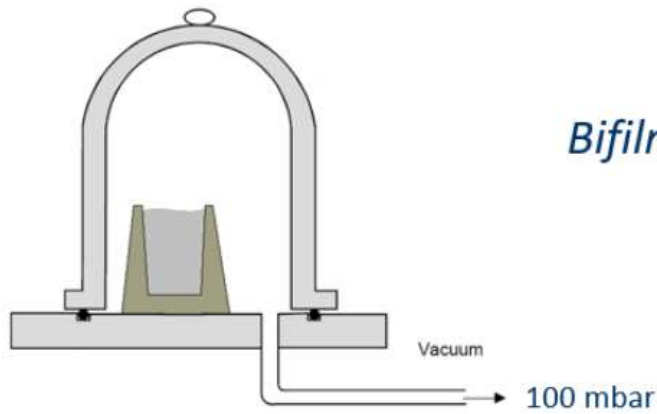
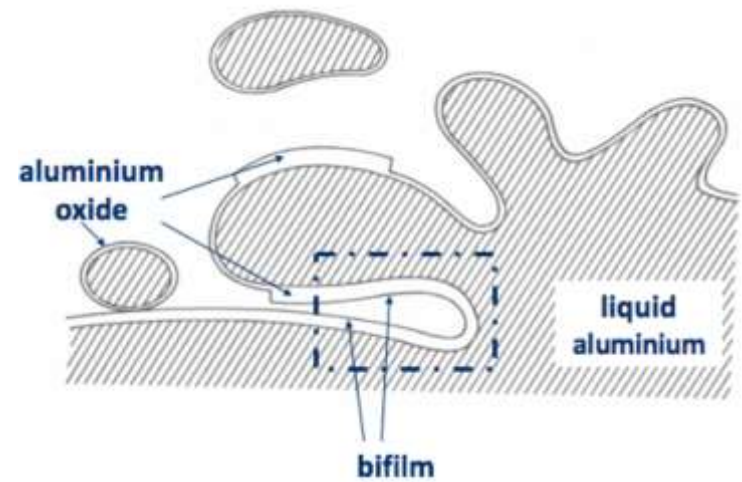
Experimental

A356 from 4 different suppliers

- Reduced Pressure Test
- Spiral test
- Tensile test



Bifilm Index

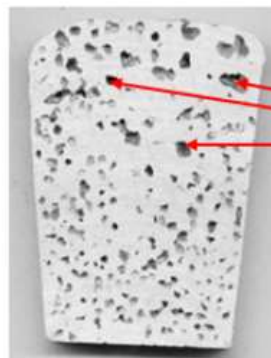


$$\text{Bifilm Index} = \frac{\sum(\text{max pore length})}{\text{total oxide length}}$$

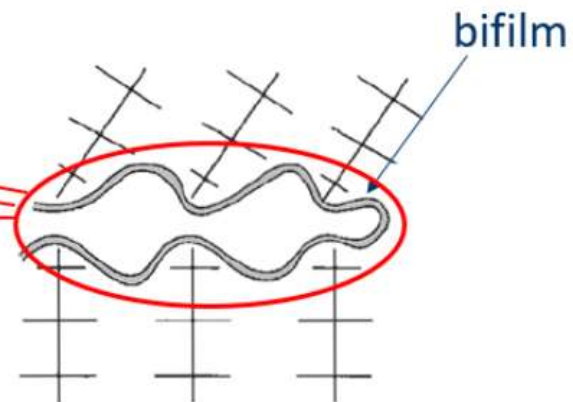
total oxide length



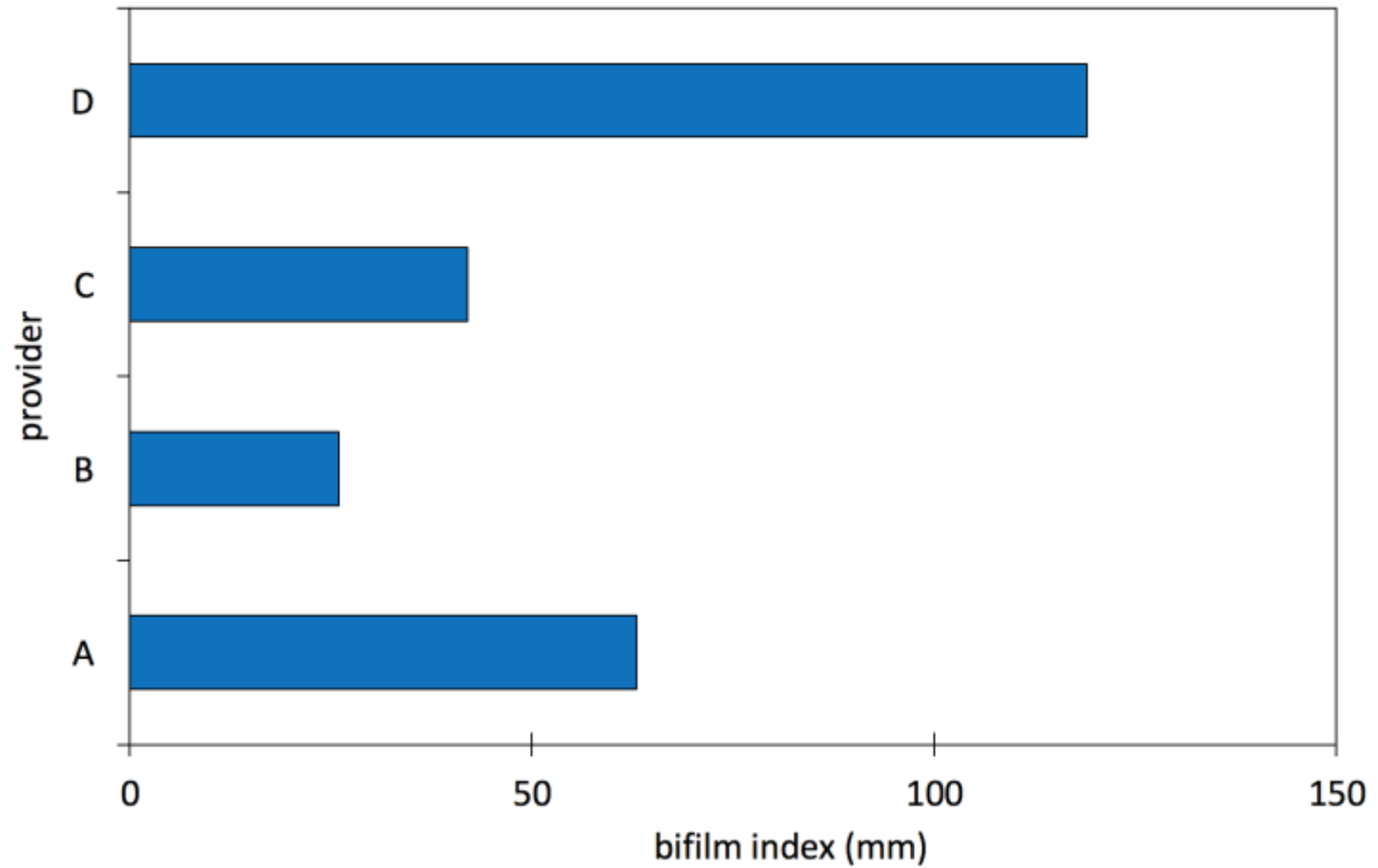
air



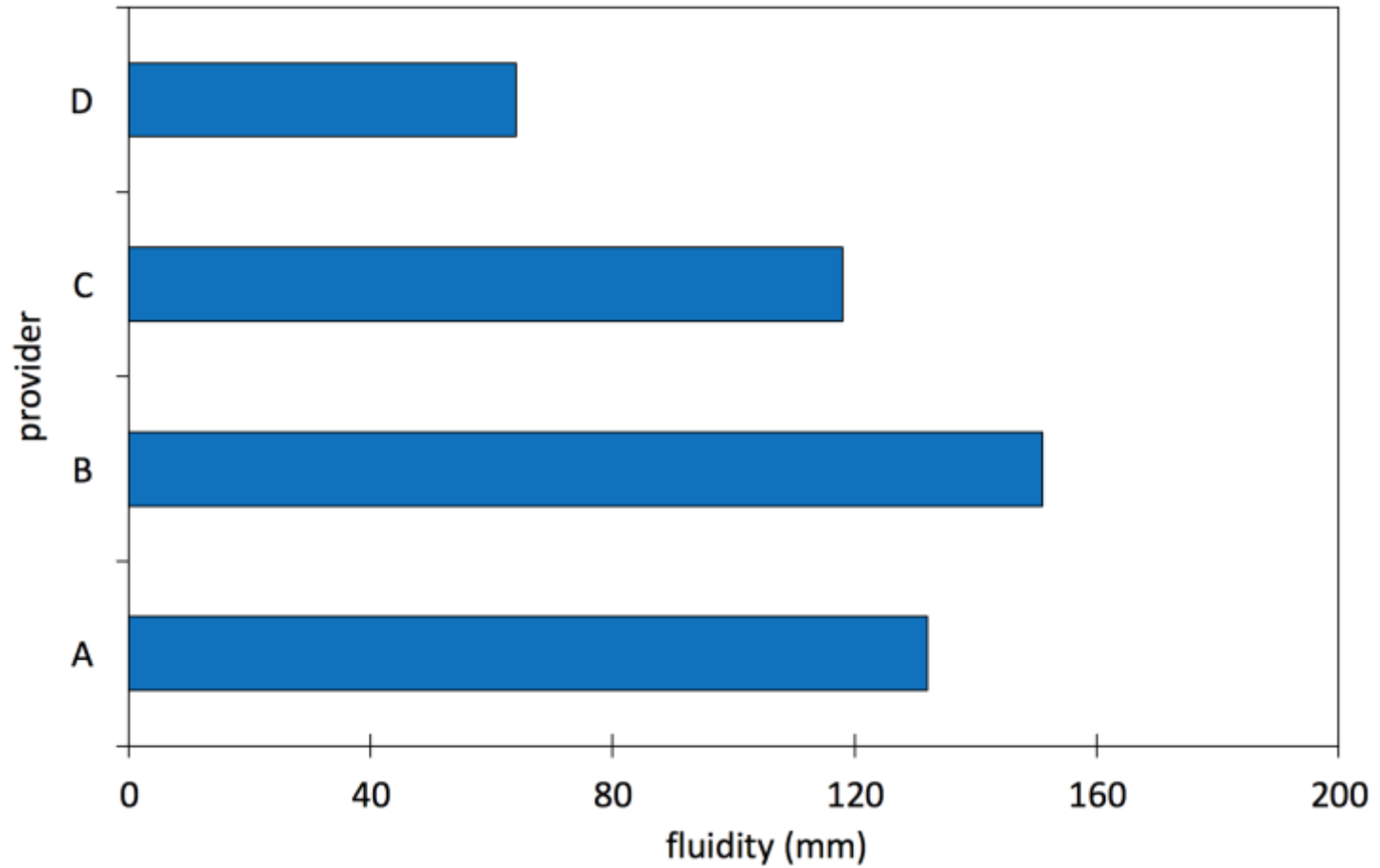
vacuum



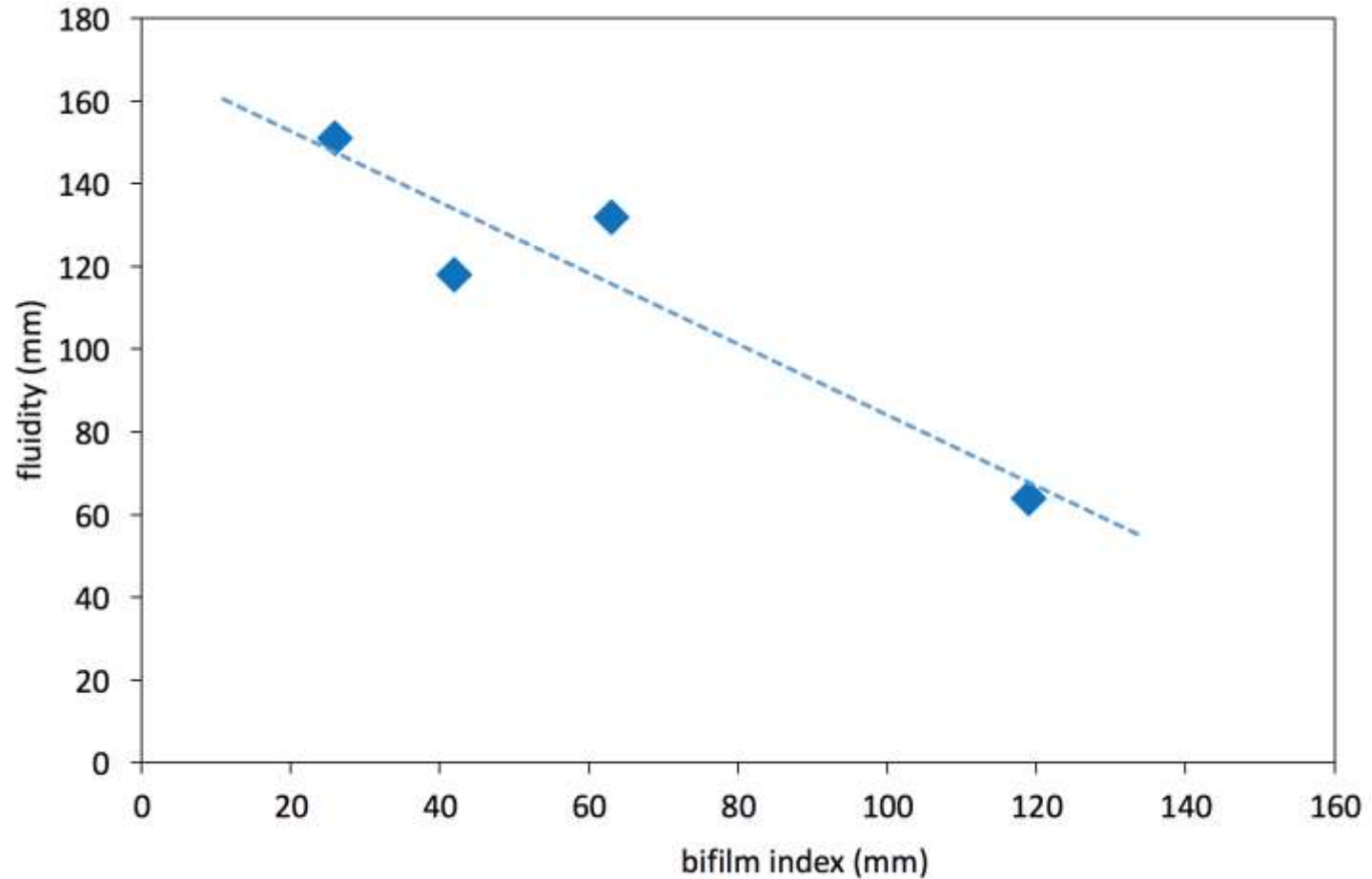
Bifilm index



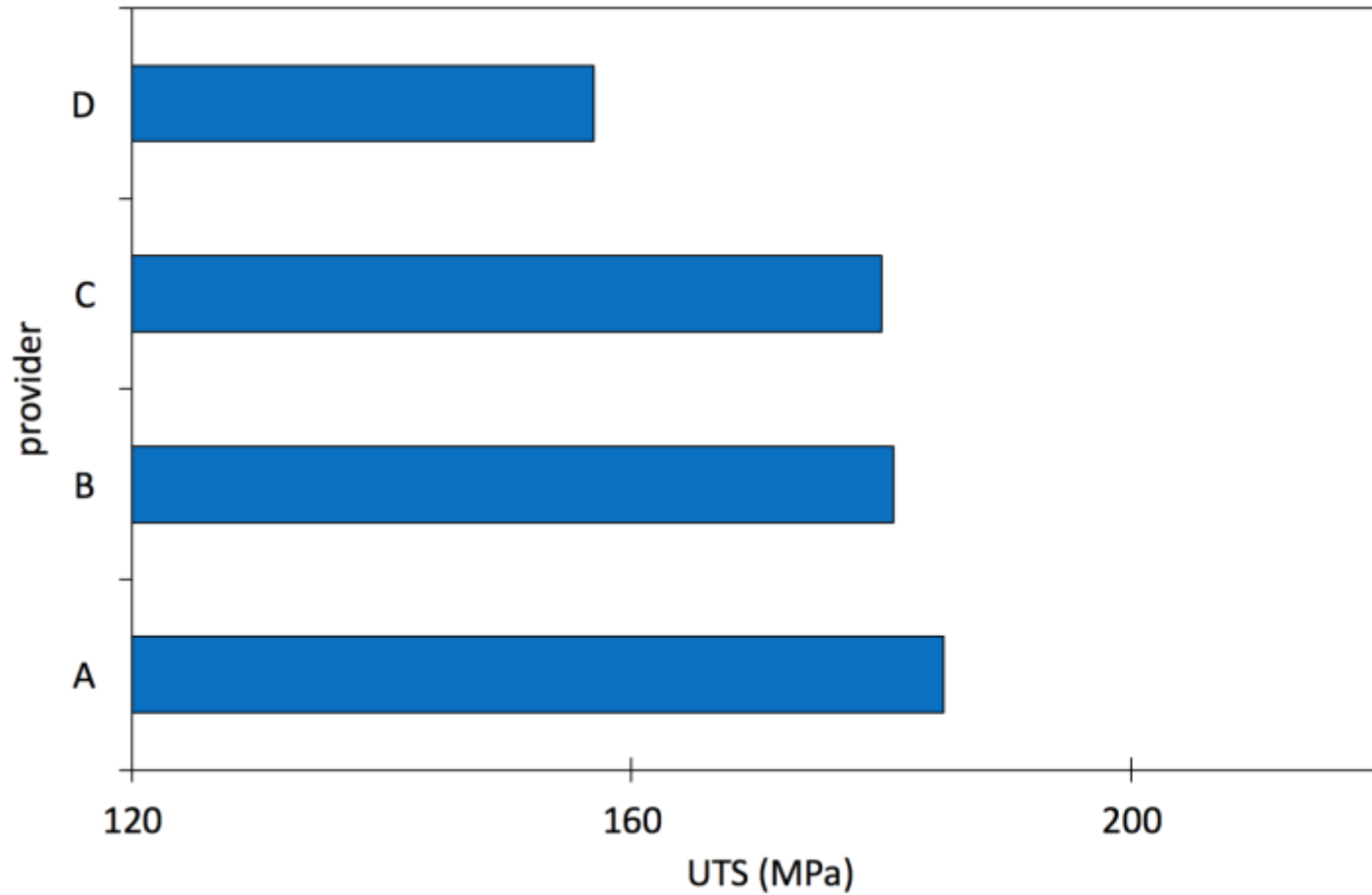
Fluidity



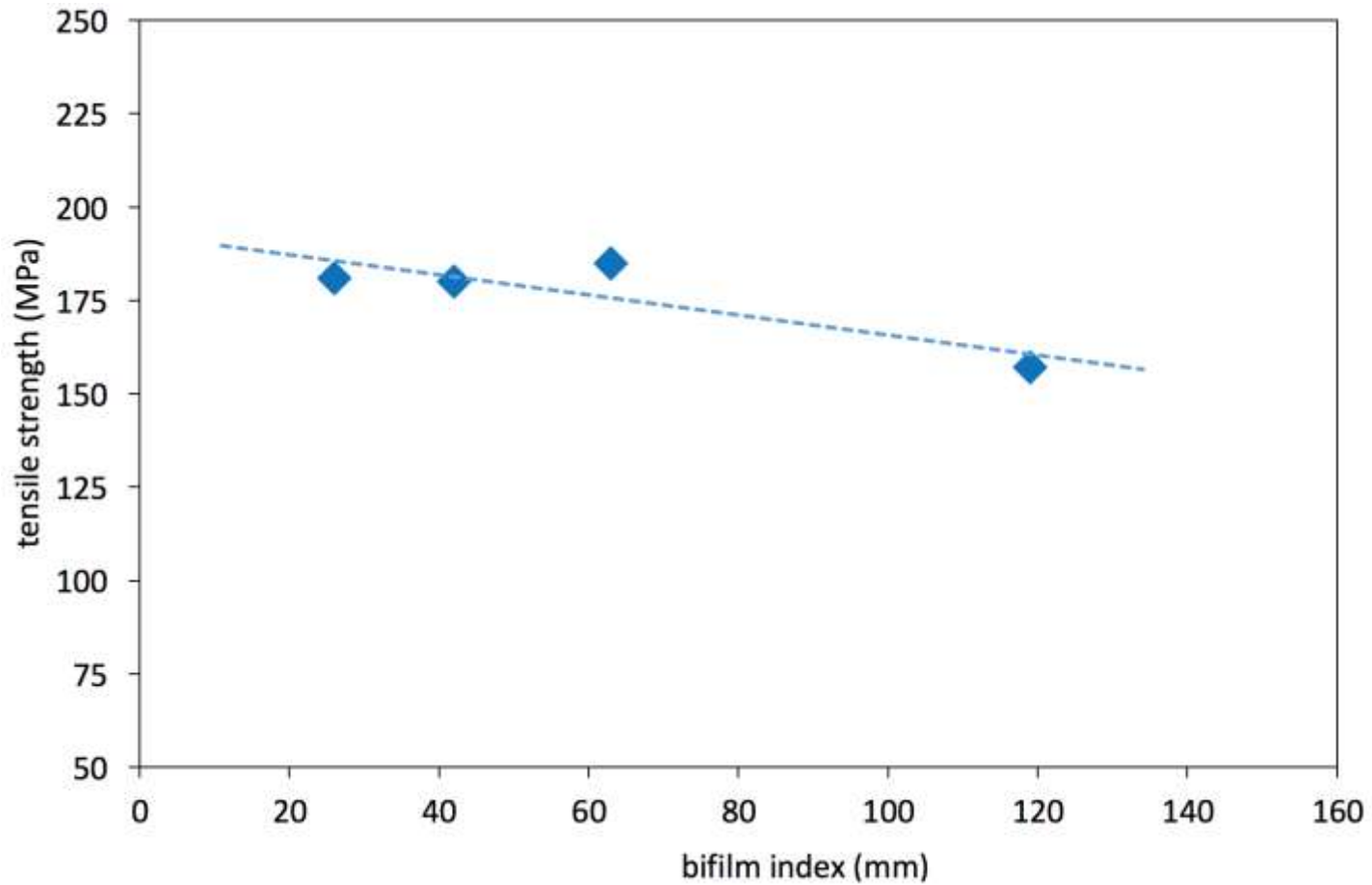
Bifilm vs fluidity



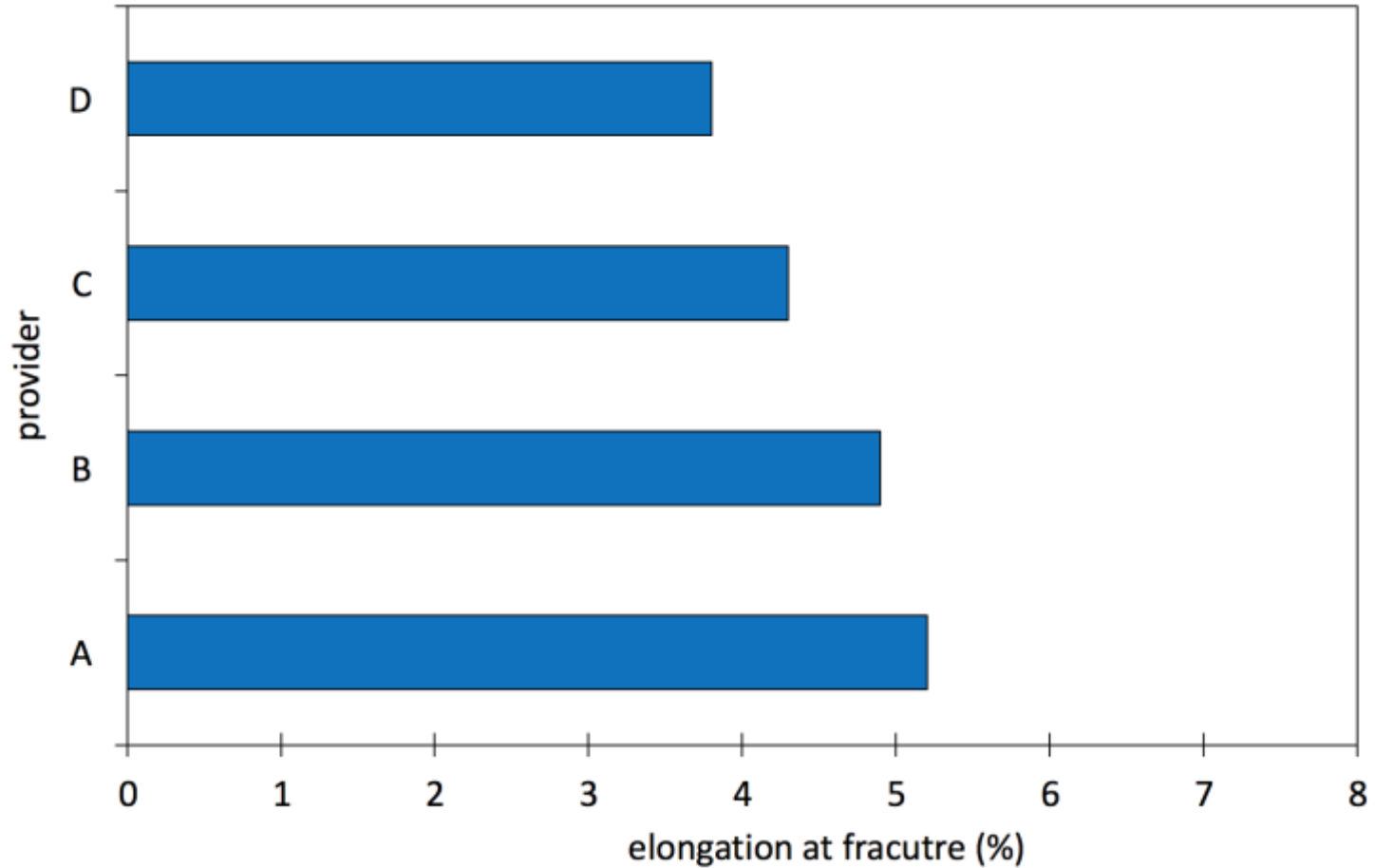
Ultimate tensile strength



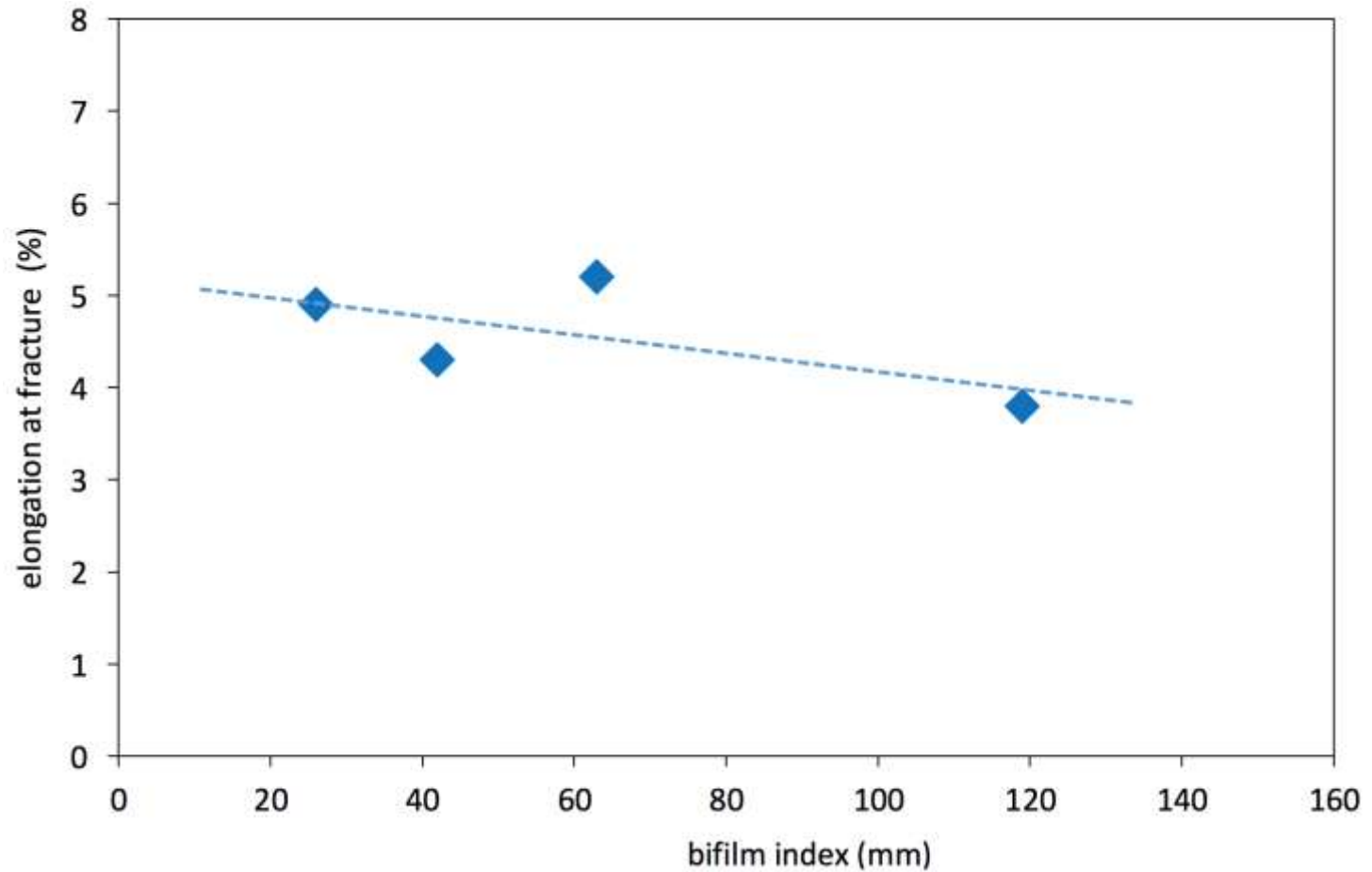
Bifilm vs tensile



Elongation at fracture



Bifilm vs elongation

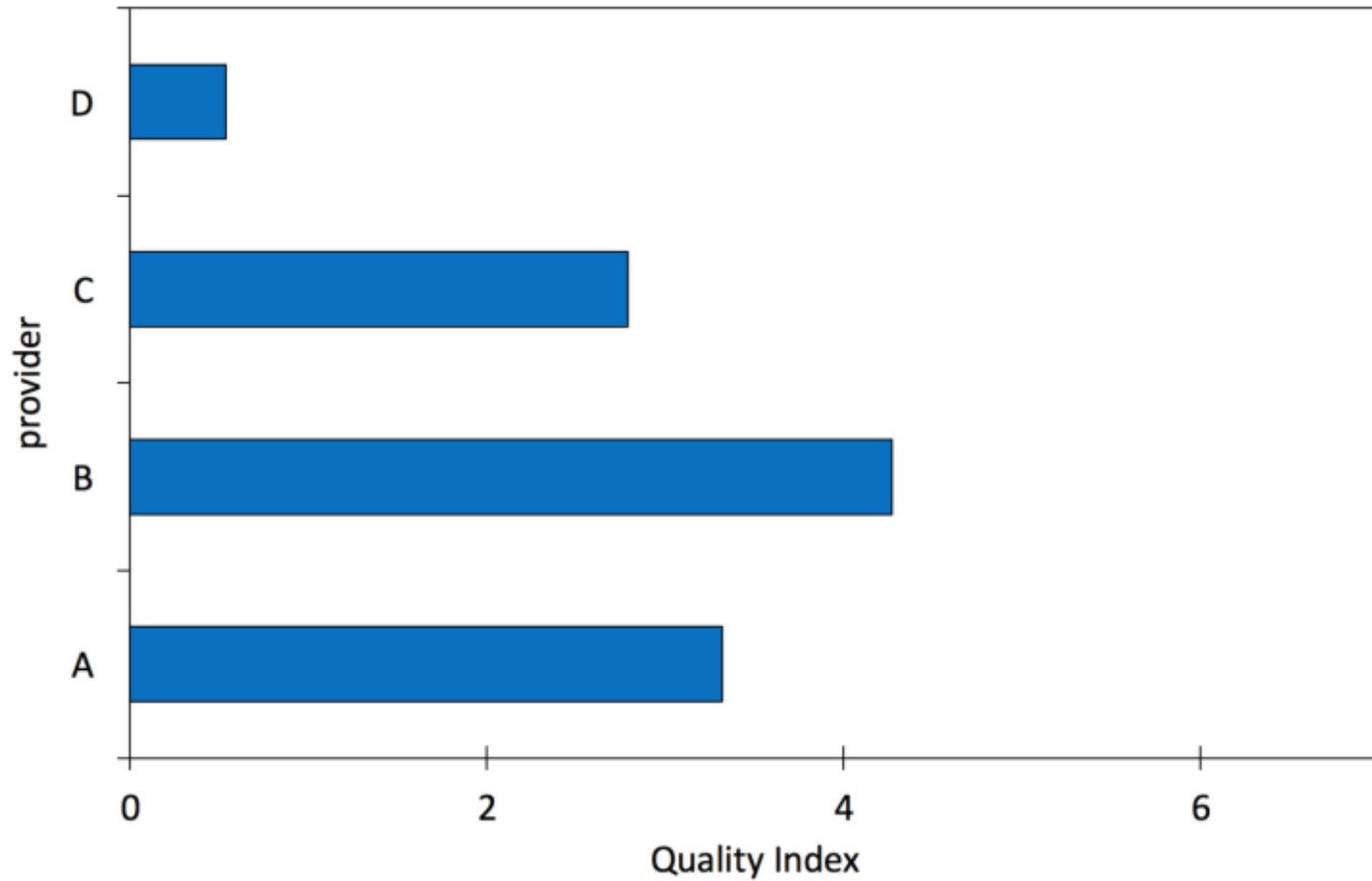


Quality index

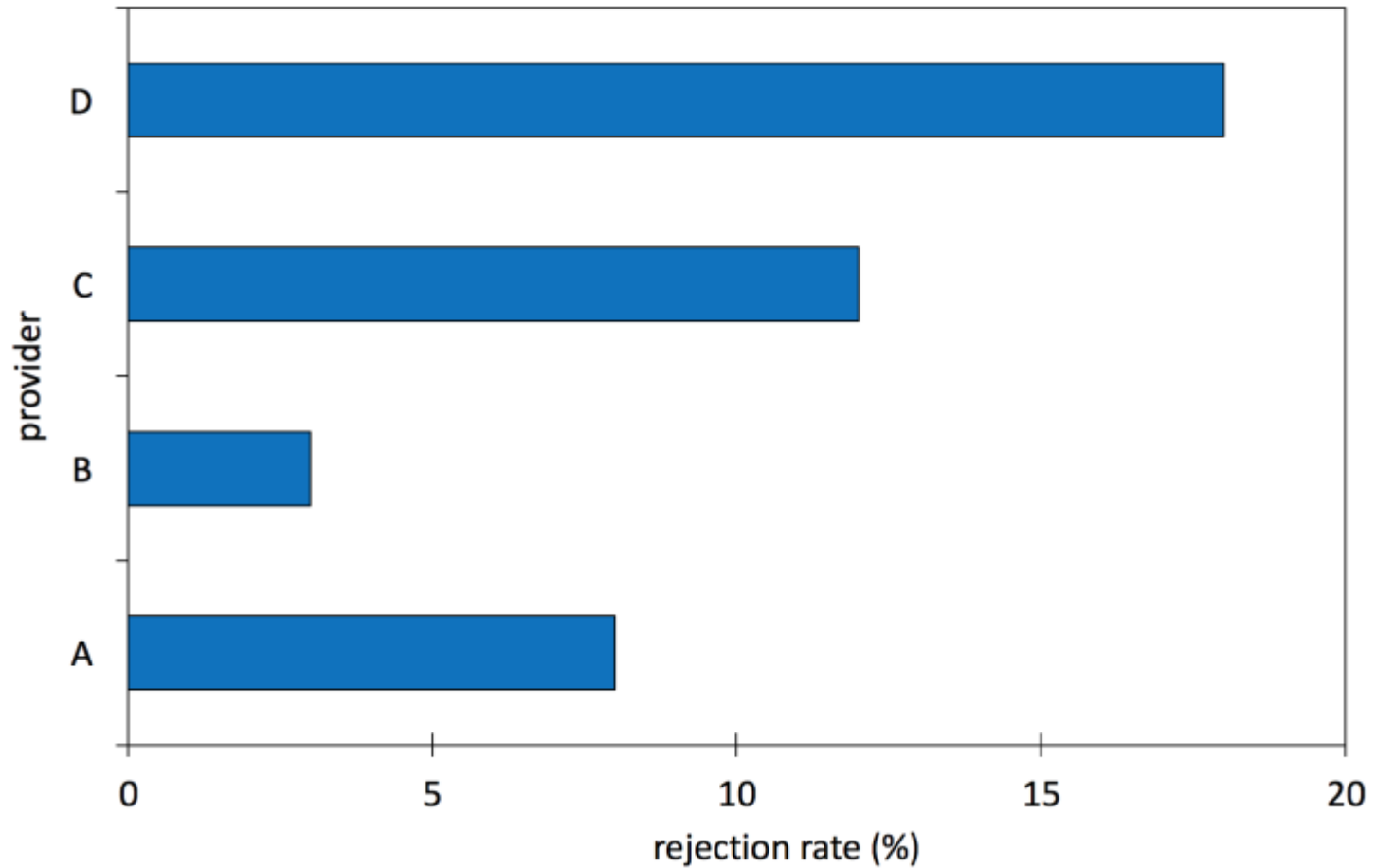
$$QI = (\textit{Fluidity} + UTS + \textit{Yield} + \%e) - (\textit{Bifilm index})$$



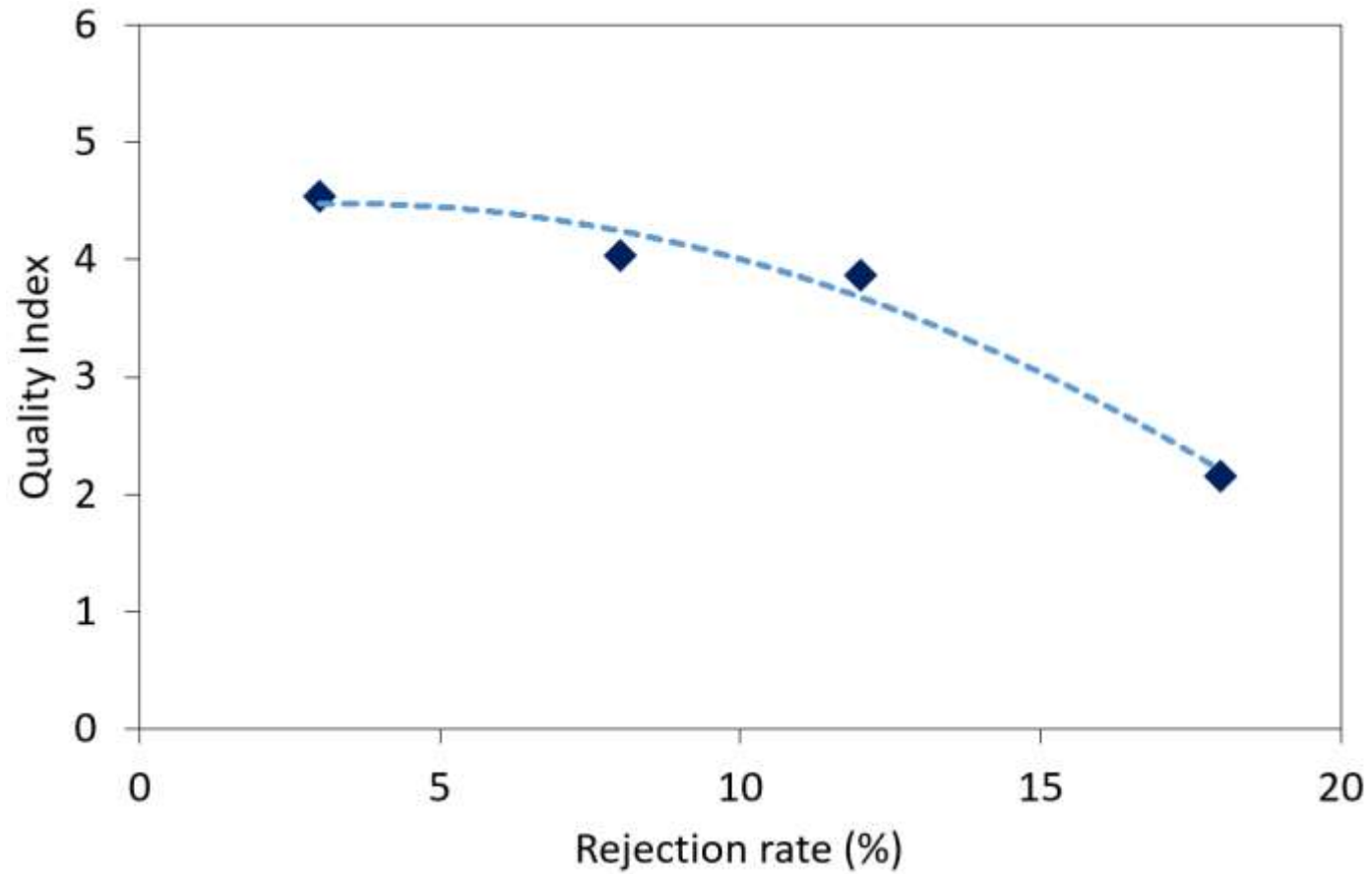
Quality index



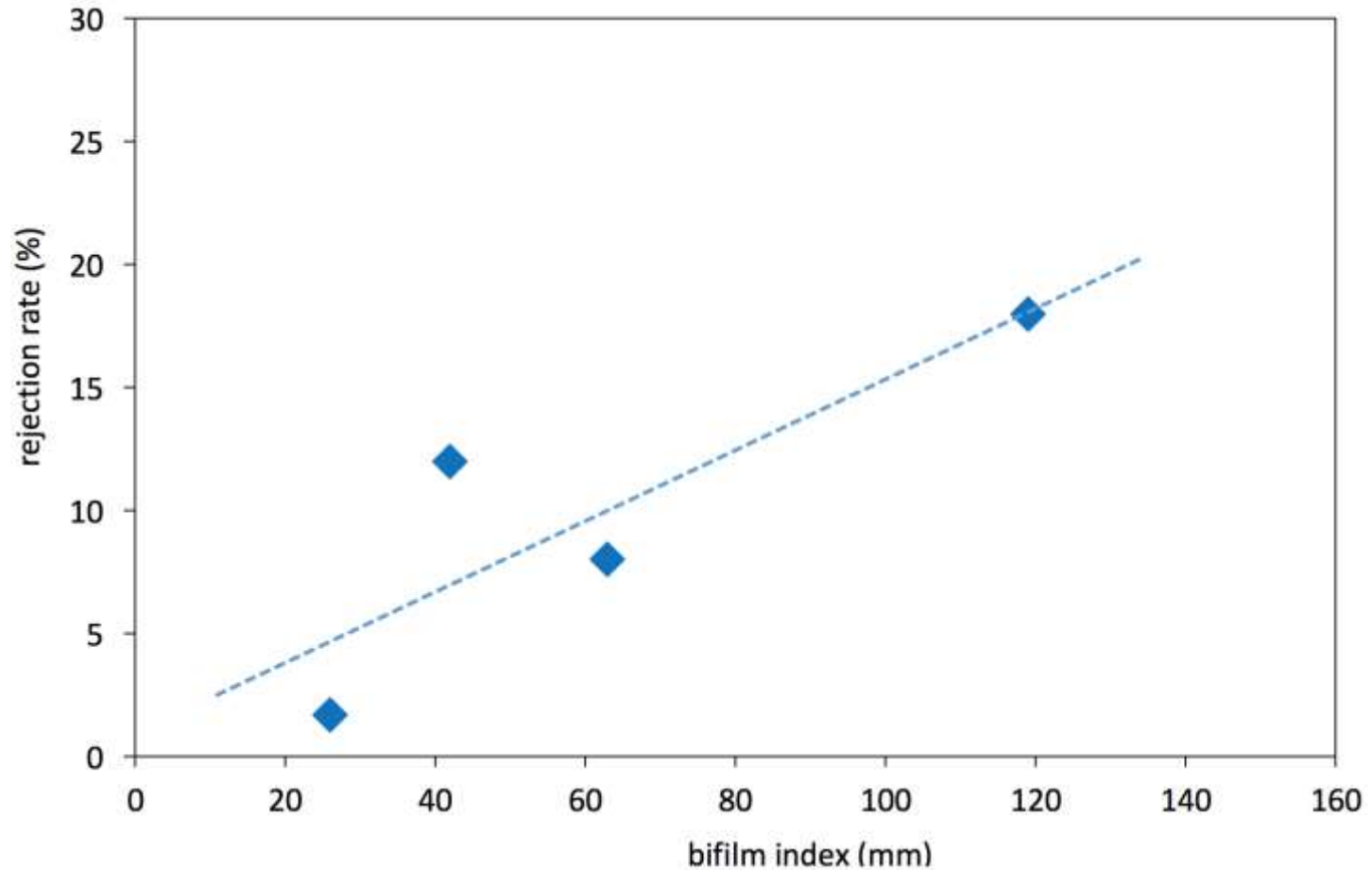
Rejection rate



QI vs RR



Bifilm vs rejection rate



Thank You

