



25 - 27 October / Ekim 2018

TÜYAP Fair, Convention & Congress Center, **İstanbul**

Tüdöksad Akademi **10. Uluslararası Döküm Kongresi / 10th International Foundry Congress** by Tüdöksad Academy

In conjunction with **ANKIROS / ANNOFER / TURKCAST** fairs

«A356 Alaşımının Tane İnceltme İşleminde Bifilmin Mekanik Özelliklere Etkisi»

«The Effect Of Bifilm Index To Grain Refinement and Mechanical Properties Of A356 Alloy»

Özen Gürsoy, Eray Erzi, Derya Dışpınar (İstanbul Üniversitesi)

3.Oturum / 3rd Session

Oturum Başkanı / Session Chairman: Prof. Dr. Altan Türkeli (Marmara Üniversitesi)



356 ALAŞIMININ TANE İNCELTME İŞLEMİNDE BİFİLMİN MEKANİK ÖZELLİKLERE ETKİSİ



Özen GÜRSOY

Eray ERZİ

Derya DIŞPINAR

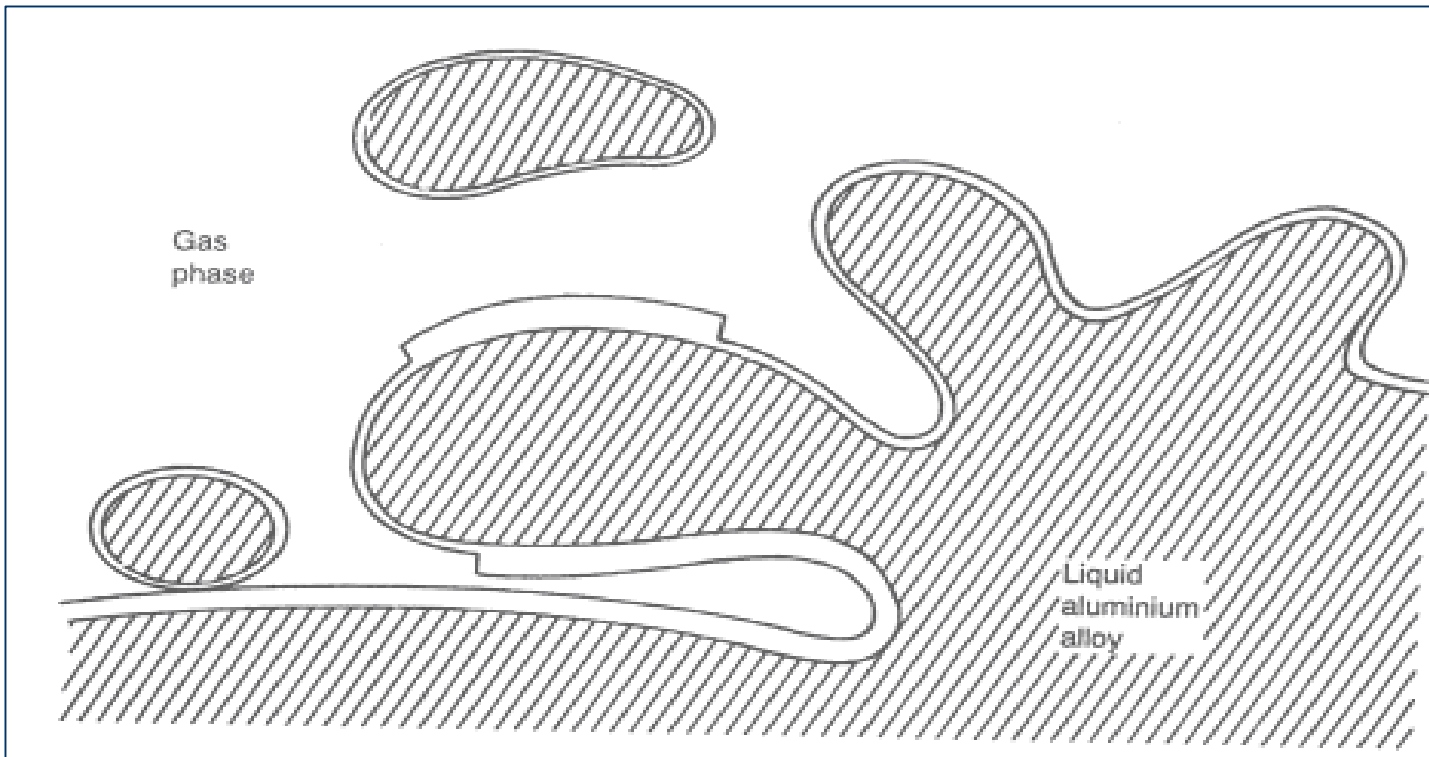
İstanbul Üniversitesi-Cerrahpaşa, Metalurji ve Malzeme Mühendisliği Bölümü



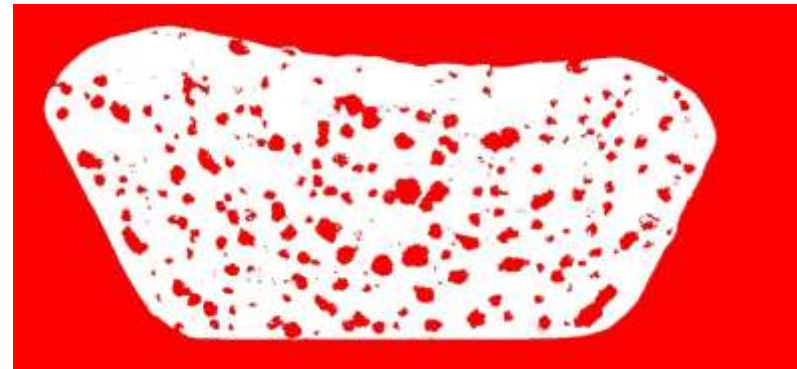
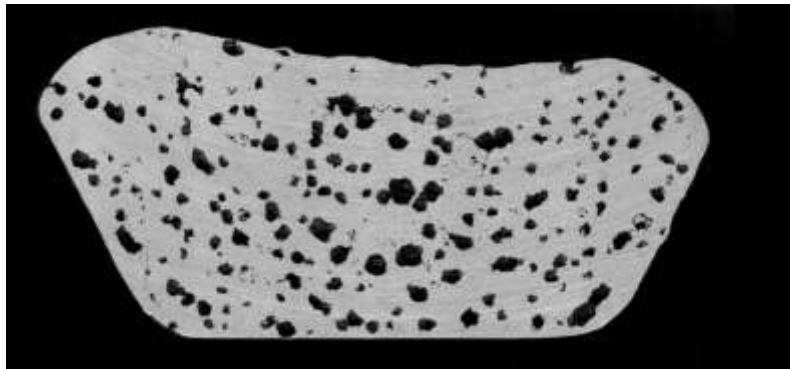
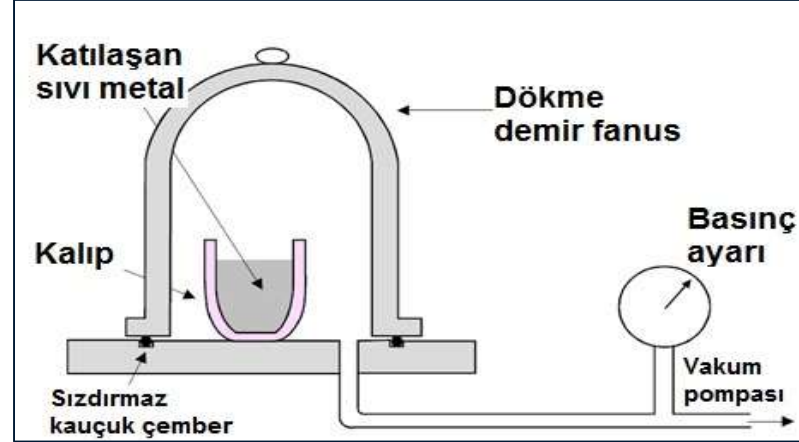
Motivasyon

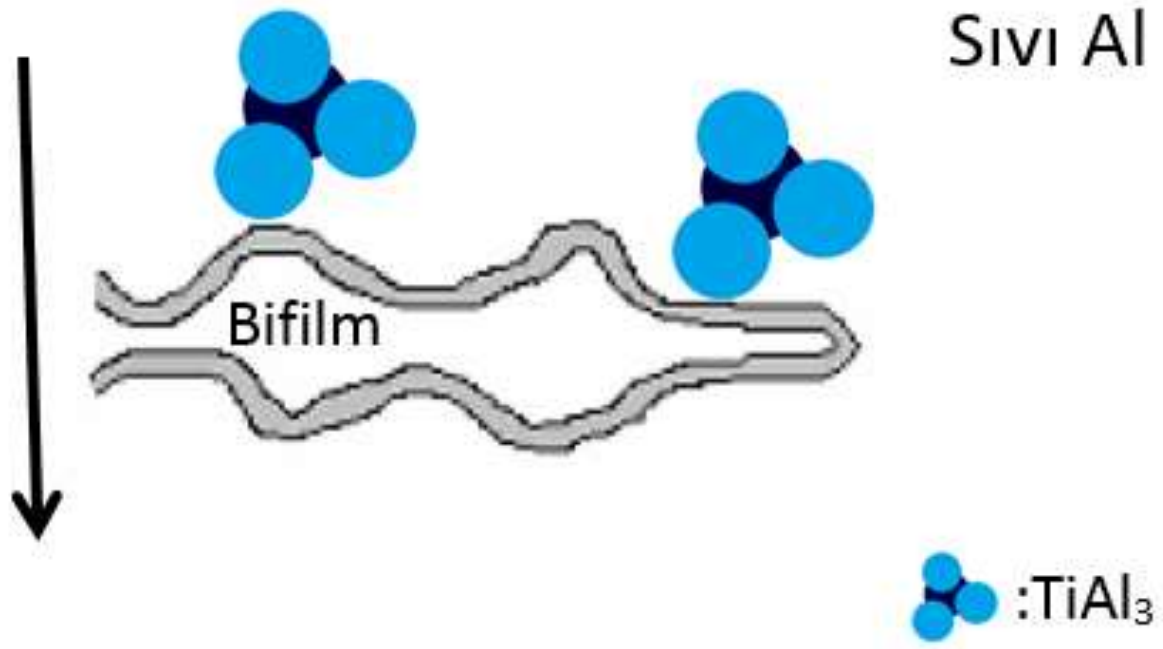
- Al-Ti-B tane inceltici master alaşımlarının sıvı metal kalitesi üzerindeki etkisinin incelenmesi.

Bifilm – Sıvı Metal Kalitesi



Bifilm İndeks





Deneysel Çalışma

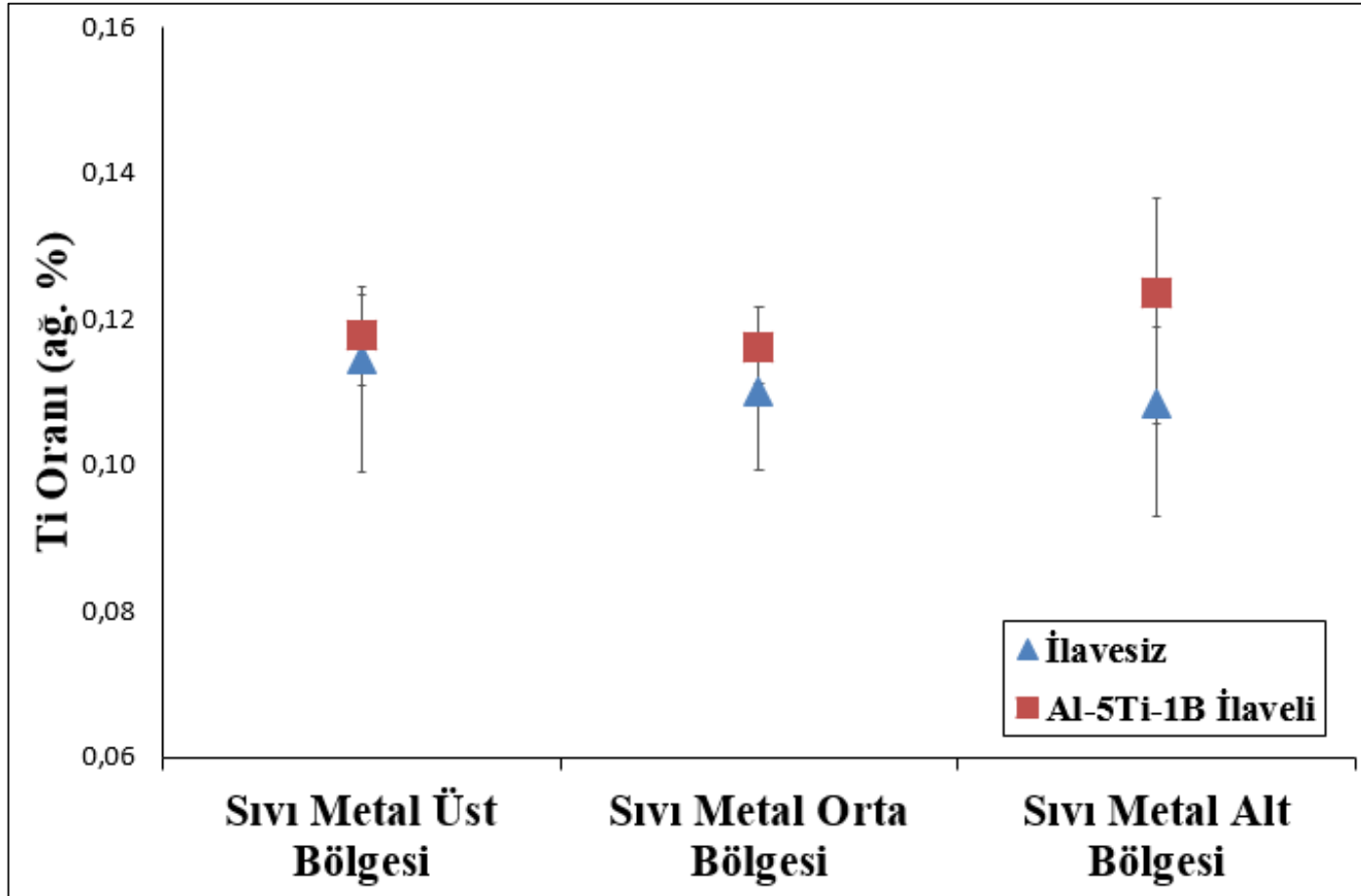
- **Şarj:** Sekonder 356 (otomotiv hurdası) - 8'er kg
- **Ergitme:** Rezistanslı fırında 725°C
- **Tane İnceltici:** Al-5Ti-1B (İlave oranları: (i)→%0, (ii)→%0,1)
- **Isıl İşlem:** Yok

Element	Si	Fe	Cu	Mg	Ti	B	Sr	Al
(%)	7,31	0,13	0,04	0,26	0,11	0,001	0,008	Kalan

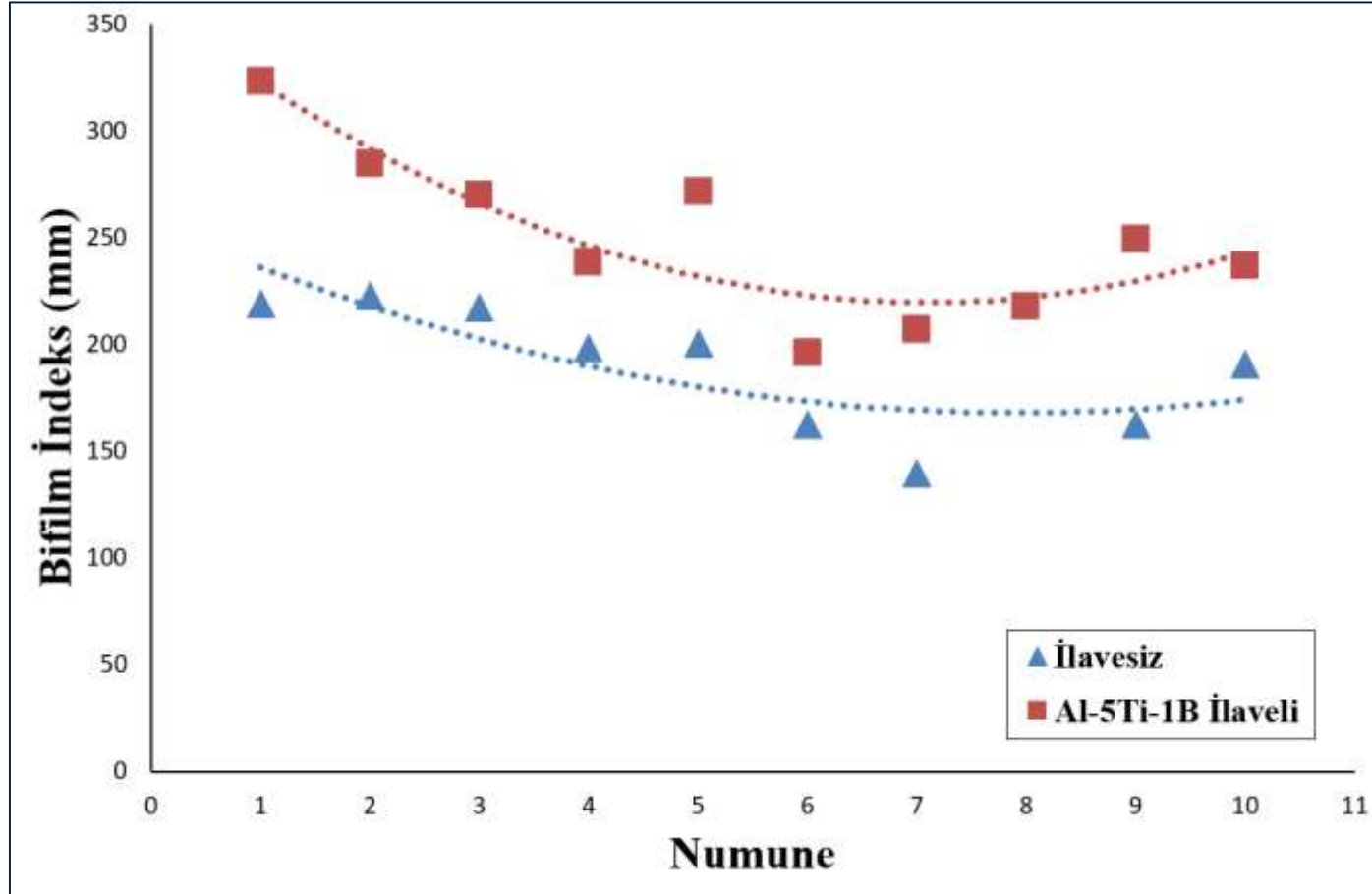
Döküm:

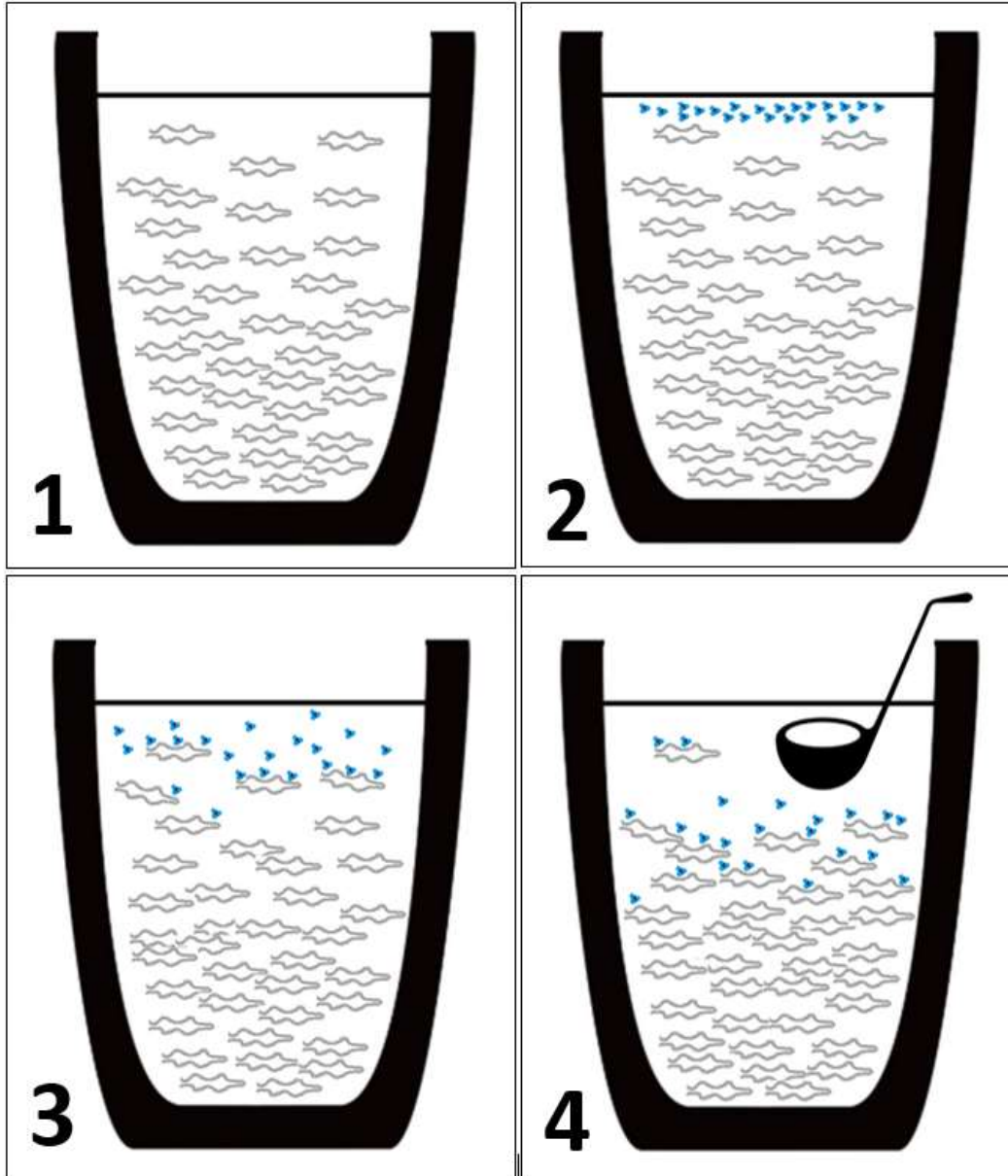
- Zippo (kokil kalıp) → Kimyasal Analiz
- RPT (kokil kalıp) → Bifilm İndeks Analizi
- Basamak → Mikroyapı Analizi
- Çekme Çubuğu → Çekme Testi

Bulgular

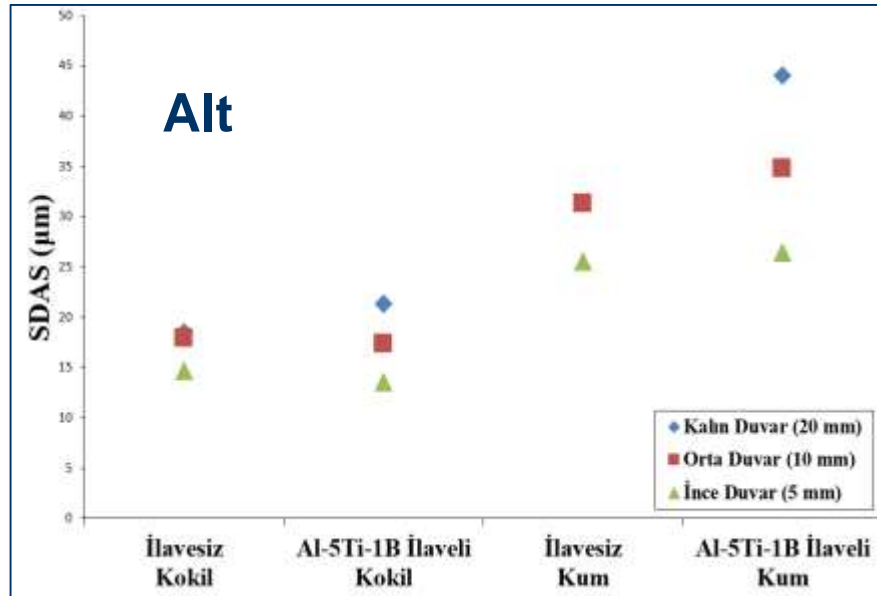
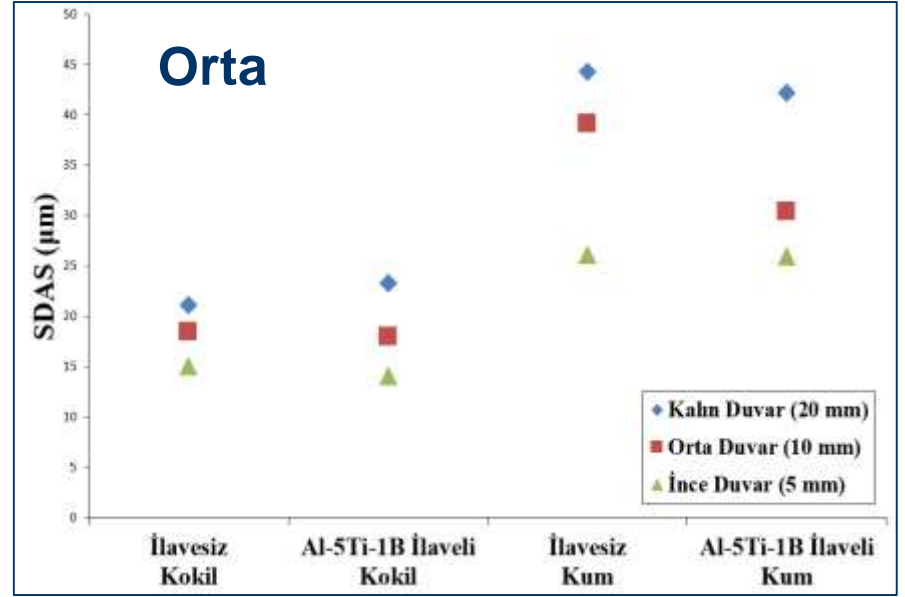
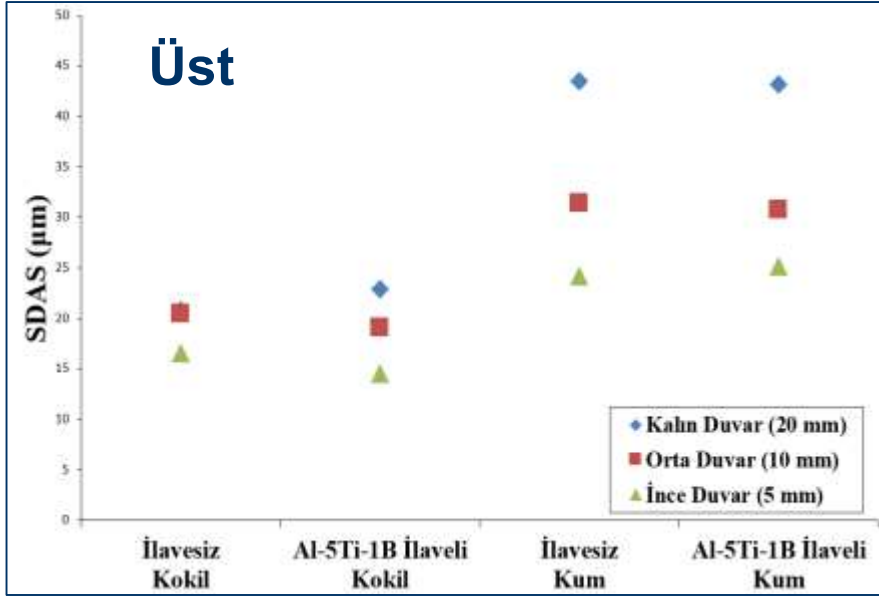


Bifilm İndeks

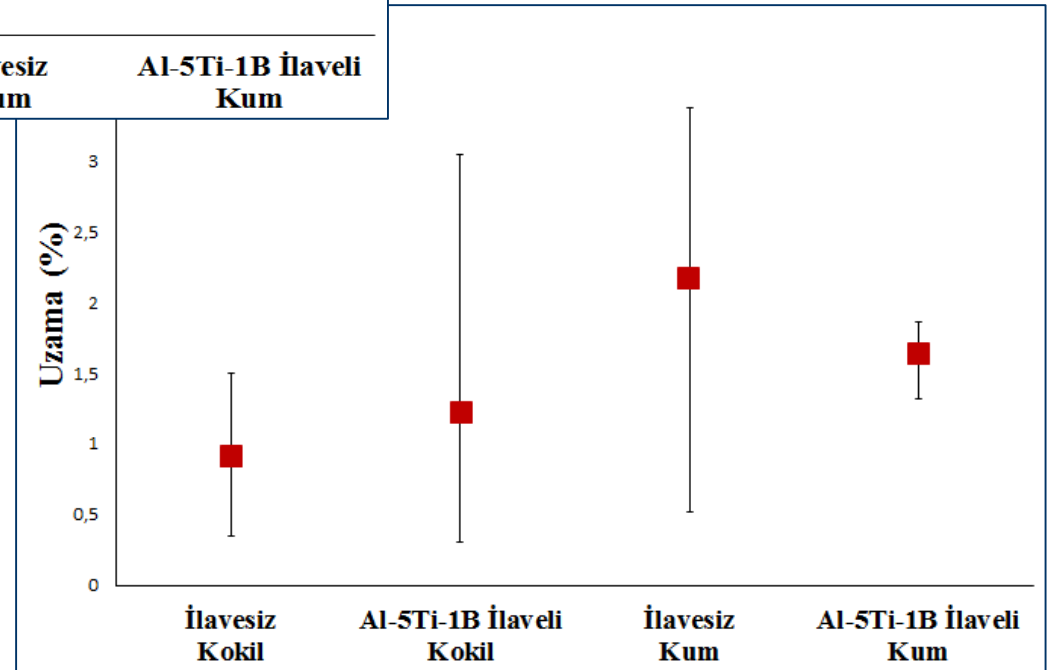
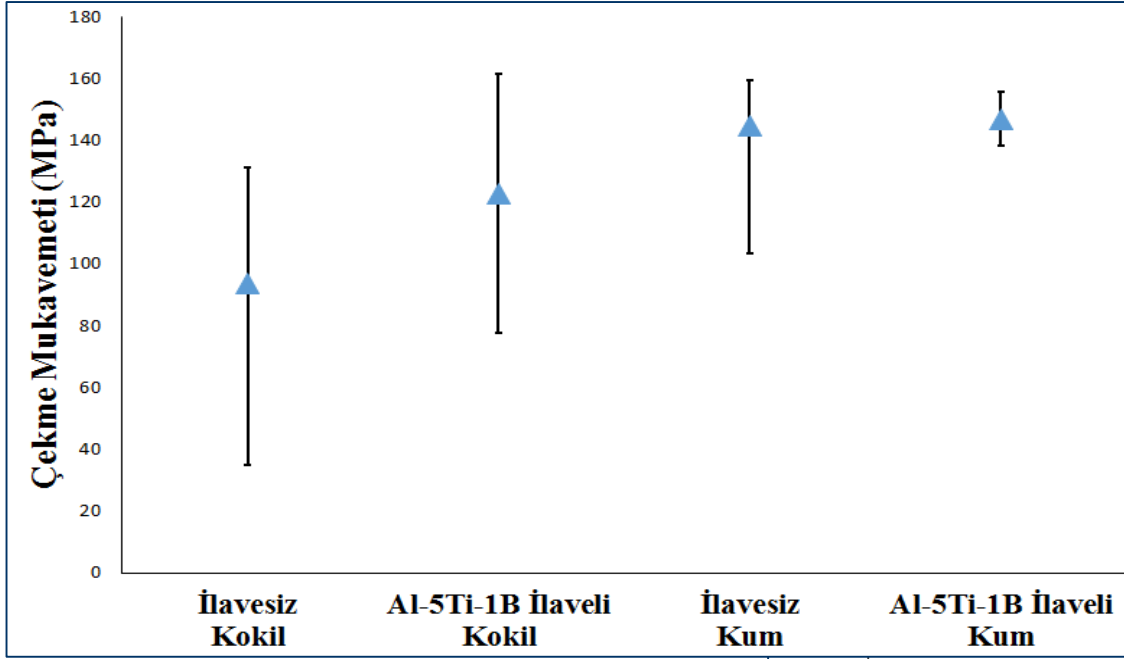




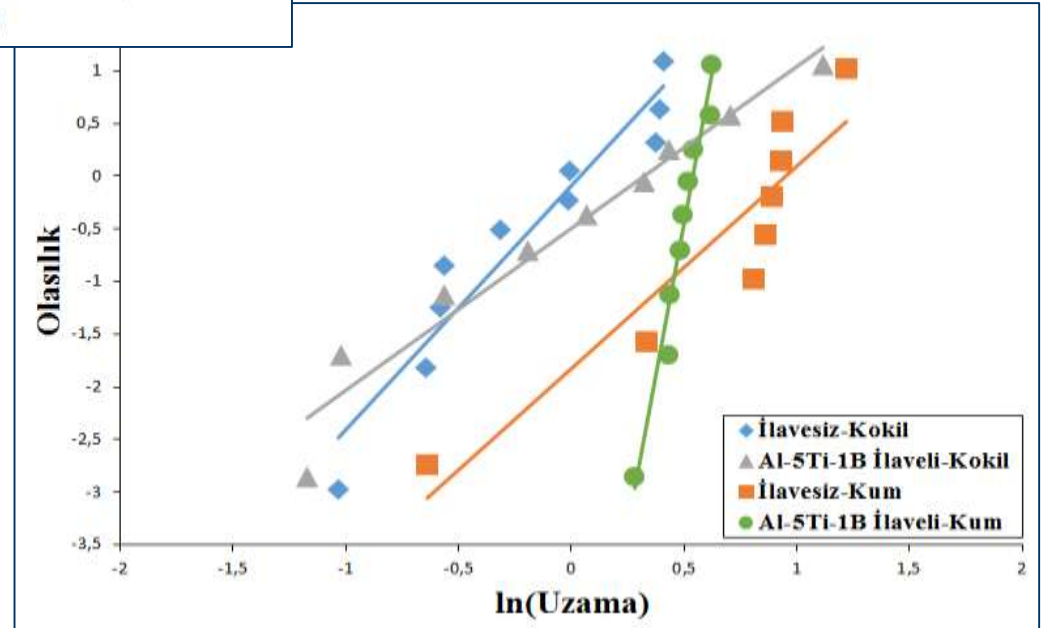
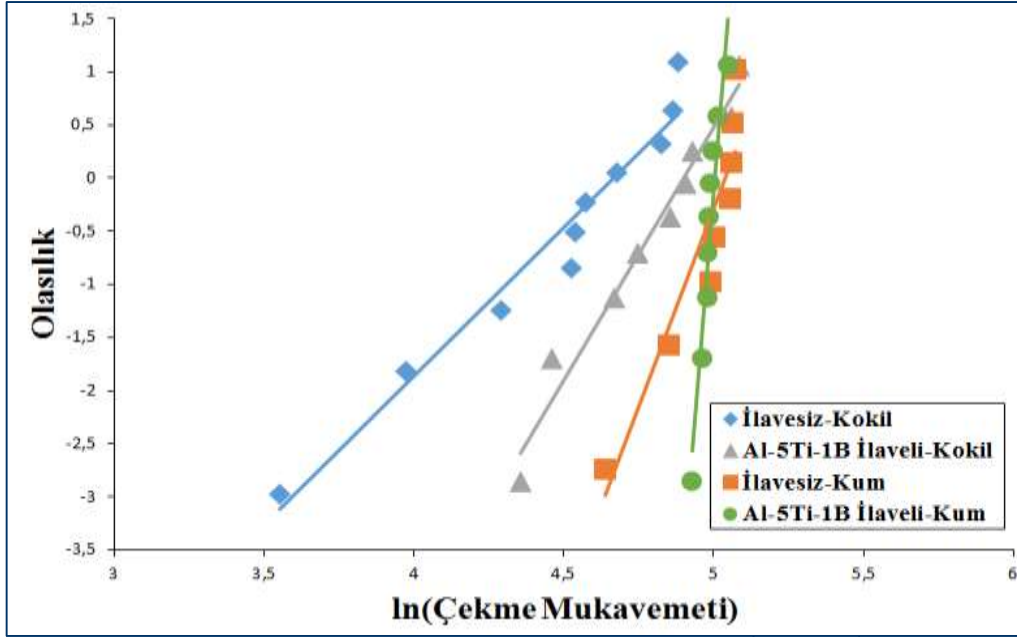
İkincil Dentrit Kol Aralığı (Secondary Dendrite Arm Spacing – SDAS)

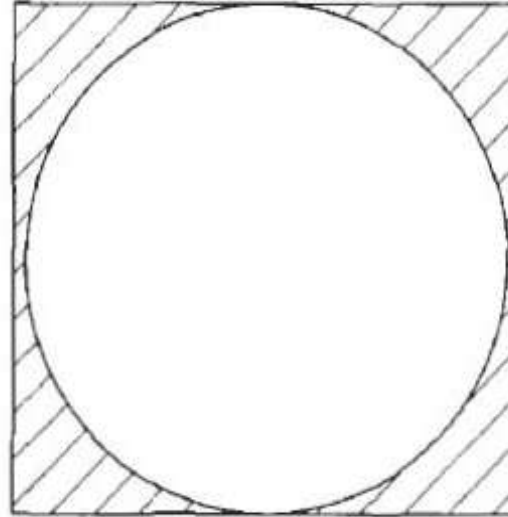
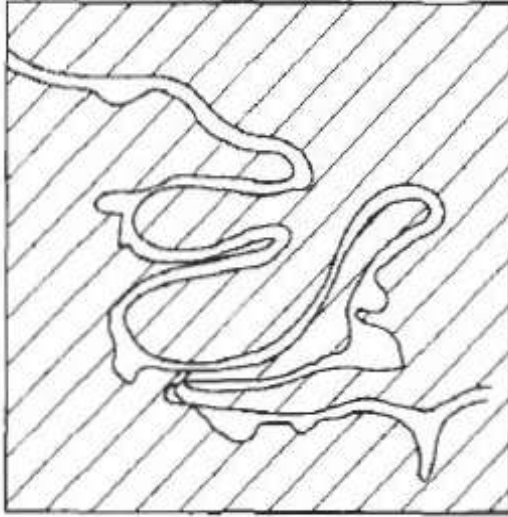


Çekme Testi



Çekme Testi



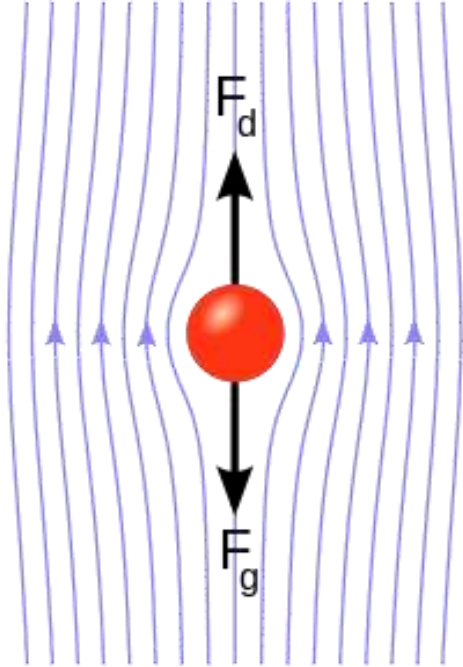


Sonuçlar

- Master alaşımı ilavesi bifilm indeksi arttırmaktadır.
- Söz konusu şartlarda tane inceltici (Al-5Ti-1B) ilavesi ile mikroyapı arasında bariz bir ilişki tespit edilememiştir.
- Zaman ve $TiAl_3$ bifilmeleri çökeltir.
- Bifilmelerin şekil faktörü mekanik özellikler üzerinde etkilidir.

Teşekkürler...





$$t = \frac{18\eta}{g(\rho_p - \rho_s)d^2} S$$

t : süre

η : dinamik viskozite

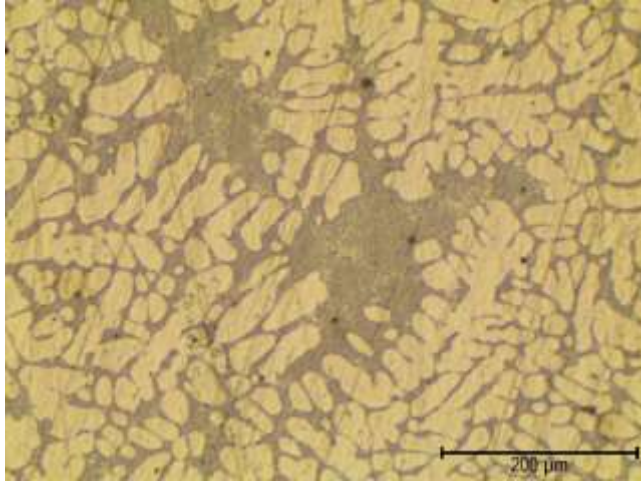
g : yerçekimi ivmesi

ρ : yoğunluk (p: partikül, s: sıvı)

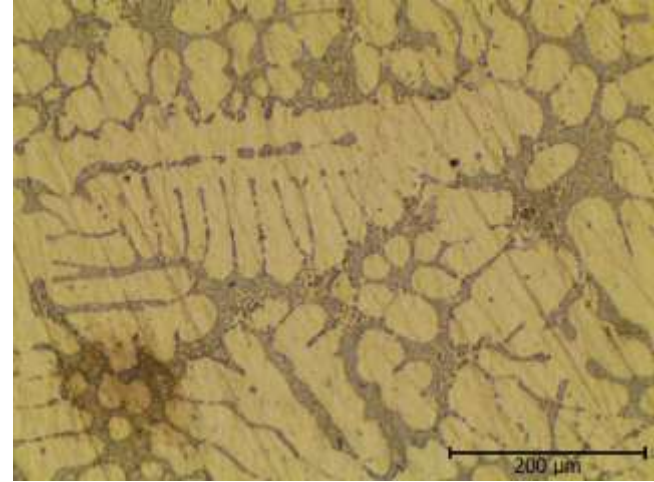
d : partikül çapı

S : partikülün aldığı yol

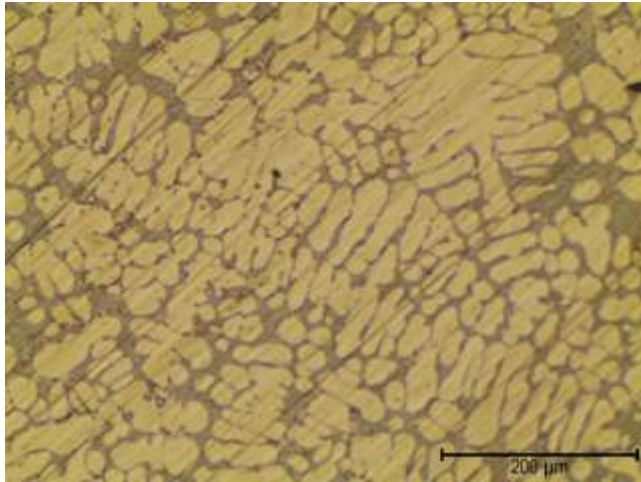
Mikroyapı Analizi



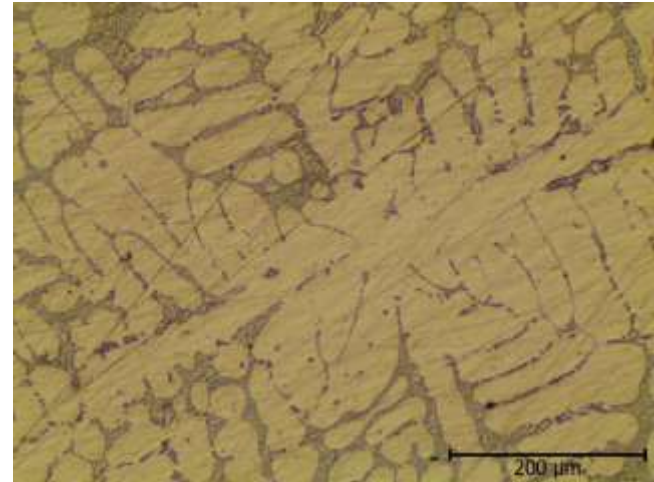
Kokil Kalıp - İlavesiz



Kum Kalıp - İlavesiz



Kokil Kalıp – Al-5Ti-1B İlaveli



Kum Kalıp – Al-5Ti-1B İlaveli

