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|  | |  | | --- | | **Simülasyon - hidrolik\_tasima**  **Tarih: 15 Ağustos 2025 Cuma Tasarımcı: Solidworks**  **Etüt adı: Static 1**  **Analiz tipi: Static** | | İçindekiler  [Etüt Özellikleri 1](#_Toc206163169)  [Birimler 1](#_Toc206163170)  [Malzeme Özellikleri 2-6](#_Toc206163171)  [Yükler ve Fikstürler 7](#_Toc206163172)  [Etkileşim Bilgisi 8](#_Toc206163174)  [Mesh bilgisi 9](#_Toc206163175)  [Sonuç Kuvvetleri 10](#_Toc206163177)  [Etüt Sonuçları 11-14](#_Toc206163179)  [Sonuç 14](#_Toc206163180) | |
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| Etüt Özellikleri  |  |  | | --- | --- | | Etüt adı | Static 1 | | Analiz tipi | Static | | Mesh tipi | Katı Mesh | | Termal Etki: | Açık | | Termal seçenek | Sıcaklık yüklerini ekle | | Sıfır gerilim sıcaklığı | 298 Kelvin | | SOLIDWORKS Flow Simulation'dan akışkan basınç etkilerini ekle | Kapalı | | Çözümleyici tipi | Otomatik | | Düzlemde Etkisi: | Kapalı | | Yumuşak Yay: | Kapalı | | Atalet Kabartması: | Kapalı | | Uyumsuz bağlama seçenekleri | Otomatik | | Büyük yer değiştirme | Kapalı | | Serbest gövde kuvvetlerini hesapla | Açık | | Sürtünme | Kapalı | | Uyumlu Yöntemi Kullan: | Kapalı | | Sonuç klasörü | SOLIDWORKS belgesi (C:\Users\Cem Onur\Downloads\hidrov3\hidroyeni) | |

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| Birimler  |  |  | | --- | --- | | Birim sistemi: | SI (MKS) | | Uzunluk/Yer Değiştirme | mm | | Sıcaklık | Kelvin | | Açısal hız | Rad/sn | | Basınç/Gerilim | N/m^2 | |

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| Malzeme Özellikleri  |  |  |  | | --- | --- | --- | | ****Model Referansı**** | ****Özellikler**** | ****Bileşenler**** | |  | |  |  | | --- | --- | | ****Ad:**** | **Dövme Paslanmaz Çelik** | | ****Model tipi:**** | **İzotropik Doğrusal Elastik Analizi** | | ****Varsayılan hata kriteri:**** | **Maks. von Mises Gerilimi** | | ****Akma mukavemeti:**** | **2,06807e+08 N/m^2** | | ****Gerilme mukavemeti:**** | **5,17017e+08 N/m^2** | | ****Elastik modül:**** | **2e+11 N/m^2** | | ****Poisson oranı:**** | **0,26** | | ****Kütle yoğunluğu:**** | **8.000 kg/m^3** | | ****Yırtılma modülü:**** | **7,9e+10 N/m^2** | | ****Termal genleşme katsayısı:**** | **1,1e-05 /Kelvin** | | **SolidBody 1(Döndür1)(Parça7^hidrolik\_tasima-1),**  **SolidBody 1(Döndür1)(Parça8^hidrolik\_tasima-1),**  **SolidBody 1(Yükseklik-Ekstrüzyon1)(bar-1),**  **SolidBody 1(Yükseklik-Ekstrüzyon1)(bar-2),**  **SolidBody 1(Yükseklik-Ekstrüzyon1)(bar-5),**  **SolidBody 1(Yükseklik-Ekstrüzyon1)(bar-6),**  **SolidBody 1(Radyus1)(base\_1-1),**  **SolidBody 1(Kes-Ekstrüzyon13)(base\_2-1),**  **SolidBody 1(Boss-Extrude1)(model 9-1/ase 1-1),**  **SolidBody 1(Boss-Extrude1)(model 9-1/ase 1-2),**  **SolidBody 1(Boss-Extrude1)(model 9-1/ase 1-3),**  **SolidBody 1(Boss-Extrude1)(model 9-1/ase 1-4),**  **SolidBody 1(Chamfer1)(model 9-1/ase 2-1),**  **SolidBody 1(Cut-Extrude1)(model 9-1/ase 3-1),**  **SolidBody 1(Cut-Extrude4)(model 9-1/ase 4-1),**  **SolidBody 1(Cut-Extrude4)(model 9-1/ase 4-2),**  **SolidBody 1(Chamfer1)(model 9-1/ase 5-1),**  **SolidBody 2(Boss-Extrude5)(model 9-1/ase 5-1),**  **SolidBody 1(Chamfer1)(model 9-1/ase 5-2),**  **SolidBody 2(Boss-Extrude5)(model 9-1/ase 5-2),**  **SolidBody 1(Boss-Extrude1)(model 9-2/ase 1-1),**  **SolidBody 1(Boss-Extrude1)(model 9-2/ase 1-2),**  **SolidBody 1(Boss-Extrude1)(model 9-2/ase 1-3),**  **SolidBody 1(Boss-Extrude1)(model 9-2/ase 1-4),**  **SolidBody 1(Chamfer1)(model 9-2/ase 2-1),**  **SolidBody 1(Cut-Extrude1)(model 9-2/ase 3-1),**  **SolidBody 1(Cut-Extrude4)(model 9-2/ase 4-1),**  **SolidBody 1(Cut-Extrude4)(model 9-2/ase 4-2),**  **SolidBody 1(Chamfer1)(model 9-2/ase 5-1),**  **SolidBody 2(Boss-Extrude5)(model 9-2/ase 5-1),**  **SolidBody 1(Chamfer1)(model 9-2/ase 5-2),**  **SolidBody 2(Boss-Extrude5)(model 9-2/ase 5-2),**  **SolidBody 1(Boss-Extrude1)(model 9-3/ase 1-1),**  **SolidBody 1(Boss-Extrude1)(model 9-3/ase 1-2),**  **SolidBody 1(Boss-Extrude1)(model 9-3/ase 1-3),**  **SolidBody 1(Boss-Extrude1)(model 9-3/ase 1-4),**  **SolidBody 1(Chamfer1)(model 9-3/ase 2-1),**  **SolidBody 1(Cut-Extrude1)(model 9-3/ase 3-1),**  **SolidBody 1(Cut-Extrude4)(model 9-3/ase 4-1),**  **SolidBody 1(Cut-Extrude4)(model 9-3/ase 4-2),**  **SolidBody 1(Chamfer1)(model 9-3/ase 5-1),**  **SolidBody 2(Boss-Extrude5)(model 9-3/ase 5-1),**  **SolidBody 1(Chamfer1)(model 9-3/ase 5-2),**  **SolidBody 2(Boss-Extrude5)(model 9-3/ase 5-2),**  **SolidBody 1(Boss-Extrude1)(model 9-4/ase 1-1),**  **SolidBody 1(Boss-Extrude1)(model 9-4/ase 1-2),**  **SolidBody 1(Boss-Extrude1)(model 9-4/ase 1-3),**  **SolidBody 1(Boss-Extrude1)(model 9-4/ase 1-4),**  **SolidBody 1(Chamfer1)(model 9-4/ase 2-1),**  **SolidBody 1(Cut-Extrude1)(model 9-4/ase 3-1),**  **SolidBody 1(Cut-Extrude4)(model 9-4/ase 4-1),**  **SolidBody 1(Cut-Extrude4)(model 9-4/ase 4-2),**  **SolidBody 1(Chamfer1)(model 9-4/ase 5-1),**  **SolidBody 2(Boss-Extrude5)(model 9-4/ase 5-1),**  **SolidBody 1(Chamfer1)(model 9-4/ase 5-2),**  **SolidBody 2(Boss-Extrude5)(model 9-4/ase 5-2),**  **SolidBody 1(Yükseklik-Ekstrüzyon1)(pim-1),**  **SolidBody 1(Yükseklik-Ekstrüzyon1)(pim-2),**  **SolidBody 1(Yükseklik-Ekstrüzyon1)(pin-1),**  **SolidBody 1(Yükseklik-Ekstrüzyon1)(pin-2),**  **SolidBody 1(Yükseklik-Ekstrüzyon1)(pin-3),**  **SolidBody 1(Yükseklik-Ekstrüzyon1)(pin-4)** | | **Eğri Verisi:N/A** | | | |

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| **Yükler ve Fikstürler**  | ****Fikstür adı**** | ****Fikstür Resmi**** | ****Fikstür Detayları**** | | --- | --- | --- | | **Sabitlenmiş-1** |  | |  |  | | --- | --- | | Objeler: | **1 kenarlar, 14 yüzler** | | Tip: | **Sabit Geometri** | | | ****Sonuç Kuvvetleri****   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Bileşenler** | **X** | **Y** | **Z** | **Sonuç** | | **Tepki kuvveti(N)** | **6,29236** | **25.145,8** | **17,1852** | **25.145,8** | | **Tepki Momenti(N.m)** | **0** | **0** | **0** | **0** | | | |  | ****Yük adı**** | ****Resim Yükle**** | ****Yük Detayları**** | | --- | --- | --- | | **Yerçekimi-1** |  | |  |  | | --- | --- | | Referans: | **Üst Düzlem** | | Değerler: | **0 0 -9,81** | | Birimler: | **m/s^2** | | | **Kuvvet-1** |  | |  |  | | --- | --- | | Objeler: | **1 yüzler** | | Tip: | **Normal kuvvet uygula** | | Değer: | **15.000 N** | | |

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| Etkileşim Bilgisi  | Etkileşim | Etkileşim Görüntüsü | Etkileşim Özellikleri | | --- | --- | --- | | Global Etkileşim |  | |  |  | | --- | --- | | Tip: | **Birleşmiş** | | Bileşenler: | **1 bileşenler** | | Seçenekler: | **Bağımsız mesh** | | |

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| Mesh bilgisi  |  |  | | --- | --- | | Mesh tipi | Katı Mesh | | Kullanılan Meshleyici: | Karışık eğrilik tabanlı mesh | | Yüksek kaliteli mesh için jakoben noktalar | 16 Noktalar | | Maksimum eleman boyutu | 147,051 mm | | Minimum eleman boyutu | 7,35255 mm | | Mesh Kalitesi | Yüksek | | Başarısız parçaları bağımsız olarak yeniden meshle | Kapalı | | Bir montajdaki aynı gövdeler için meshi yeniden kullan (Yalnızca karışık eğrilik tabanlı meshleyici) | Kapalı |  Mesh bilgisi - Detaylar  |  |  | | --- | --- | | Toplam Düğüm | 134630 | | Toplam Elemanlar | 71858 | | Maksimum En Boy Oranı | 10,632 | | En-Boy oranı < 3 olan elemanların % oranı | 91,7 | | En-Boy Oranı > 10 olan elemanların yüzdesi | 0,025 | | Şekli bozulmuş elemanların yüzdesi | 0 | | Mesh tamamlama süresi (sa;dk;sn): | 00:00:16 | | Bilgisayar adı: |  |  Mesh Kalitesi Grafikleri  | Ad | Tip | Min | Maks. | | --- | --- | --- | --- | | Kalite1 | Mesh | - | - | | **hidrolik\_tasima-Static 1-Kalite-Kalite1** | | | | |

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| Sonuç KuvvetleriTepki kuvvetleri  | Seçim seti | Birimler | Toplam X | Toplam Y | Toplam Z | Sonuç | | --- | --- | --- | --- | --- | --- | | Tüm Model | N | 6,29236 | 25.145,8 | 17,1852 | 25.145,8 |  Tepki Momenti  | Seçim seti | Birimler | Toplam X | Toplam Y | Toplam Z | Sonuç | | --- | --- | --- | --- | --- | --- | | Tüm Model | N.m | 0 | 0 | 0 | 0 | |
| Serbest gövde kuvvetleri  | Seçim seti | Birimler | Toplam X | Toplam Y | Toplam Z | Sonuç | | --- | --- | --- | --- | --- | --- | | Tüm Model | N | -54,6126 | 6.217,99 | -15,8379 | 6.218,25 |  Serbest gövde momentleri  | Seçim seti | Birimler | Toplam X | Toplam Y | Toplam Z | Sonuç | | --- | --- | --- | --- | --- | --- | | Tüm Model | N.m | 0 | 0 | 0 | 1e-33 | |

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| Etüt Sonuçları  | Ad | Tip | Min | Maks. | | --- | --- | --- | --- | | Stres1 | VON: von Mises Stresi | 3,167e+01N/m^2  Düğüm: 68986 | 3,032e+08N/m^2  Düğüm: 33359 | | **hidrolik\_tasima-Static 1-Stres-Stres1** | | | |  | Ad | Tip | Min | Maks. | | --- | --- | --- | --- | | Yer değiştirme1 | URES: Sonuç Yer Değiştirmesi | 0,000e+00mm  Düğüm: 51830 | 5,380e+00mm  Düğüm: 2908 | | **hidrolik\_tasima-Static 1-Yer değiştirme-Yer değiştirme1** | | | |  | Ad | Tip | Min | Maks. | | --- | --- | --- | --- | | Gerinim1 | ESTRN: Eşdeğer Gerilme | 1,533e-10  Eleman: 43534 | 7,140e-04  Eleman: 69011 | | **hidrolik\_tasima-Static 1-Gerinim-Gerinim1** | | | |  |  | | --- | |  | | **Resim-1** |  |  | | --- | |  | | **Resim-2** | |

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| Sonuç: Ortalama 800kg olan araç için güvenlik faktörünü 1,875 olarak ele alıp 15000 N kuvvet uygulandığındaki test sonuçlarımız görüldüğü gibidir.  Etüt sonuçları detaylı incelendiğinde von Misses stress testimiz oldukça iyi sonuçlar vermiştir. Gerilme testleri de mükemmel istikrardadır. Yer değiştirme testi de risk oluşturmayacak şekilde 5mm civarında esnemiştir. Demirin dayanabildiği Pascal basıncının maksimumunu 208 MPa olarak ele aldığımızda bizim mevcut MPa basıncımız da 3,032 MPa olduğundan demirin deforme olmadan bütünlülüğünü koruyacağı sonucuna ulaştık. |
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