LAMPIRAN 1

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1.1. Perhitungan Berat Produk

Diketahui :

V_{produk} = 14519,56 mm^3

ρ_{pc} =1260 kg/m^3 ⟶ 0.00126 g/mm^3

Ditanya :

Massa produk ?

Jawab :

$m = V_{produk} \cdot \rho_{pc}$

= 14519,56 $mm^3 \times 0.00126\ g/mm^3$

=18,3 g

1.2. Perhitungan *Cavity*

Diketahui :

Shrinkage material PC = 0,4% ⟶ 0,004

Panjang produk = 82 mm

Lebar produk = 157,86 mm

Tebal produk = 8,6 mm

Ditanya :

a. Dimensi *cavity* (rongga) ?

Jawab :

a. $L_{cavity} = \frac{L_{molding}}{(1-s)}$

$= \frac{157{,}86\ mm}{(1-0{,}004)}$

= 158,5 mm

1.3. Perhitungan Diameter *Gate*

Diketahui :

Tebal produk = 1 mm

Diameter *Gate* = 0,8 mm

Shot volume/total volume = 34 cm^3 (diambil dari moldflow insight)

Fill time = 0,9 s (diambil dari moldflow insight)

Maximum shear rate material = 4000001/s (diambil dari moldflow insight)

Ditanya :

a. Shear rate ?

Jawab :

$$Q = \frac{Shot\ volume}{injection\ time}$$

$$= \frac{34\ cm^3}{0{,}9\ s}$$

$$= 37{,}78\ cm^3/s$$

a. Shear rate $= \sqrt[3]{\frac{4 \cdot Q}{3{,}14 \cdot r^3}}$

$$= \sqrt[3]{\frac{4 \cdot 37{,}78\ cm^3/s}{3{,}14 \cdot 0{,}4}}$$

$$= 34{,}68\ 1/s$$

1.4. Perhitungan Diameter *Runner*

Diketahui :

ρ material PC = 1,26 g/cm^3 (didapat pada Tabel 2.2)

V = 14,53 cm^3

L = 50 mm

Ditanya

Diameter *runner* ?

Jawab

m = V·ρ

= 14,53 cm^3·1,26 g/cm^3

= 18,3 g

$$d = \frac{W^{0,5} \cdot L^{0,25}}{3,7}$$

$$= \frac{18,3^{0,5} \cdot 50^{0,25}}{3,7}$$

= 3 mm

1.5. Perhitungan Jarak *Circuit Cooling*

Perhitungan jarak *circuit cooling*, berdasarkan buku dari peter jones, 2008. Dapat dilihat pada Gambar 2.27.

Diketahui :

d = 10 mm

w = 4,3 mm

Ditanya :

a. c (jarak circuit *cooling* dengan produk) ?

b. b (jarak circuit *cooling*) ?

Jawab

a. c = 2·d

= 2·10 mm

=20 mm

b. b = 3·d

= 3·10 mm

=30 mm

Berdasarkan perhitungan diatas, maka tinggi *circuit cooling* yaitu 20 mm, dengan masing-masing jarak circuit *cooling* 30 mm.

1.6. Perhitungan Kekuatan *Pin Ejector*

Diketahui :

Diameter pin ejector	= 7 mm
L panjang pin ejector	= 154,1 mm
Tebal produk	= 2 mm
Luas bidang kontak terhadap *cavity* (A)	= 53000 mm^2
Koefisien gesek PP terhadap baja (μ)	= 0,2
Koefisien ekspansi thermal PP	= 0,000180 ^0C
Poiton ratio (γ)	= 0,392
Gaya *cavity* (F_c)	= 235 N/mm^2
E modulus material SUJ2	= 210000 N/mm^2
E modulus PC	=2900 N/mm^2 (dilihat tabel 2.2)
Koefisiensi ekspansi thermal	= 0,00058/^0C (dilihat tabel 2.2)
Suhu cairan PC	= 350 ^0C
Suhu *mold*	= 85 ^0C
Luas bidang kontak terhadap *cavity*	= 32,5 mm^2
Koefisien gesek, plastik pada baja (μ)	= 0,5
Poisson ratio (γ)	= 0,4466
ΔT	= 265 ^0C

Ditanya :

a. Gaya *buckling* ?

b. Gaya *cavity* terhadap permukaan *ejector* ?

c. *Ejection load* ?

Jawaban :

Momen inertia I $= \frac{\pi \cdot d^4}{64}$

$= \frac{\pi \cdot (7^4)\ mm}{64}$

$= 117{,}85$ mm

a. *Collapsing load* FL $= \frac{m \cdot \pi^2 \cdot \epsilon \cdot I}{L^2}$

$= \frac{2 \cdot \pi^2 \cdot \epsilon \cdot I}{L^2}$

$= \frac{2 \cdot 3{,}14^2 \cdot 210000\ \text{N}/mm^2 \cdot 117{,}85\text{mm}}{(154{,}1^2)\ mm}$

= 20550 N

b. Gaya *cavity* terhadap permukaan *ejector* = gaya *cavity*$\cdot \frac{\pi \cdot D^2}{4}$

= 235 N/mm$^2 \cdot \frac{\pi \cdot (7^2)\ mm}{4}$

= 9043 N/mm^2

Keliling *cavity* = 2·(P+l)

= 2·(82 mm+157,86 mm)

= 479,7 mm

Kontraksi thermal (st) = dimensi *cavity*·Koefisiensi ekspansi thermal·ΔT

= 479,7 mm·0,00058 /^{0}C·265 ^{0}C

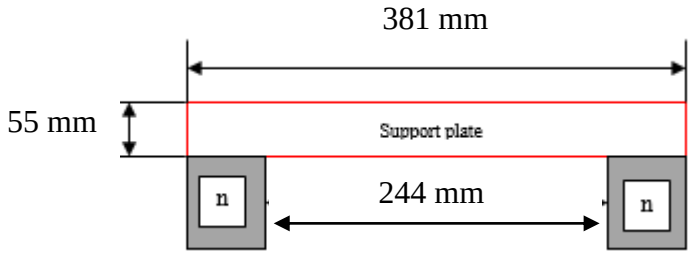
= 73,7 mm

c. *Ejection load* $= \frac{St \cdot E\ modulus\ pc \cdot A \cdot \mu}{d\ (\frac{d}{2 \cdot t} - \frac{d}{4 \cdot t}) \cdot \gamma}$

$= \frac{73{,}7\ mm \cdot 2900\ N/mm^2 \cdot 32{,}5\ \text{mm}2 \cdot 0{,}5}{479{,}7\ \text{mm} \cdot (\frac{479{,}7\ \text{mm}}{2 \times 1} - \frac{479{,}7\ \text{mm}}{4 \times 1}) \cdot 0{,}4466}$

= 135,18 N

1.7. Perhitungan *Support Plate*



Diketahui .

σy material JIS SKD61 = 1380 N/mm^2

N = 2

P_{inj} material PC = 235 N/mm^2

Ditanya :

a. σt yang terjadi pada *support plate* ?

Jawab :

Ap = P·I

= 300 mm·200 mm

= 60000 mm^2

W = $A_p \cdot P_{inj}$

= 60000 mm^2·235 N/mm^2

= 14100000 N

Z = $\frac{b \cdot d^2}{6}$

= $\frac{381\ mm \cdot (55^2)\ mm}{6}$

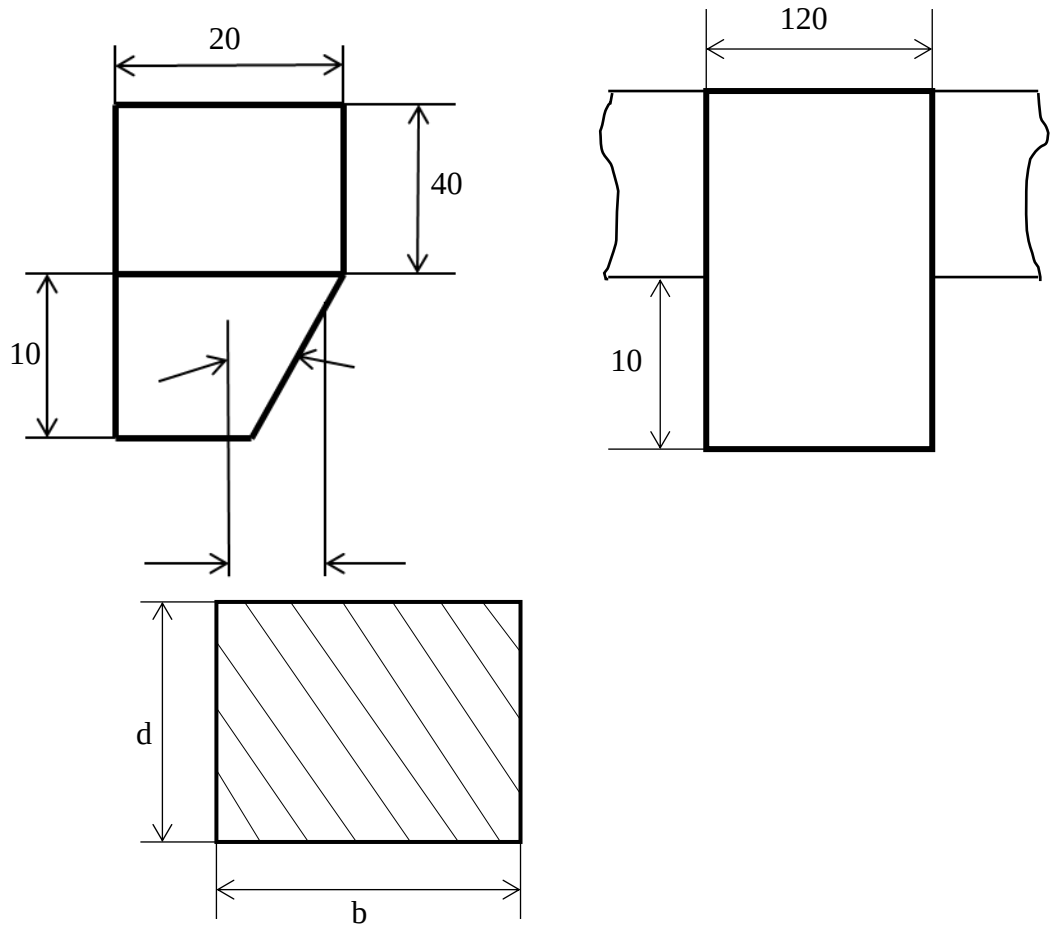
= 192087 mm^3

a. σy = $\frac{W \cdot L}{n \cdot 8 \cdot Z}$

= $\frac{14100000\ N \cdot 244\ mm}{2 \cdot 8 \cdot 192087\ mm^3}$

= 1119,41 N/mm^2

1.8. Perhitungan *Locking Block*



Diketahui :

Clamping force =326,2 ton ⟶ 3198929 N (didapat pada simulasi modlflow)

$E_{\text{modulus JIS SKS3}}$ = 193000 N/mm^2

$P_{\text{inj material PC}}$ = 235 N/mm^2

$\sigma_{\text{t bahan material sks3}}$ = 880 N/mm^2

Ditanya :

Moment inertia ?

Deformasi maksimal ?

Tegangan maksimal yang terjadi ?

Jawab :

Ap $= P \cdot L$

$= 66{,}22 \text{ mm} \cdot 161{,}5 \text{ mm}$

$= 10694 \text{ mm}^2$

F $= Ap \cdot P_{\text{inj material PC}}$

$= 10694 \text{ mm}^2 \cdot 235 \text{ N/mm}^2$

$= 2513090 \text{ N}$

Beban terdistribusi (w) $= \frac{F}{unit\ lenght}$

$= \frac{2513090\ N}{10\ mm}$

$= 251309 \text{ N}$

a. Moment inertia, I $= \frac{1}{12} b \cdot d^3$

$= \frac{1}{12} 20\ mm \cdot 120^3$

$= 2880000 \text{ mm}^4$

b. Y_{max} $= -\left(\frac{w \cdot L^4}{8.E.I}\right)$

$= -\left(\frac{251309\ N \cdot 10^4\ mm}{8 \cdot 193000 \text{ N/mm}^2 \cdot 2880000\ mm^4}\right)$

$= -5{,}65 \cdot 10^{-4}$

$= 0{,}000565 \text{ mm}$

c. σ_{max} $= \frac{W \cdot L^2 \cdot c}{2 \cdot I}$

$= \frac{251309 \text{ N} \cdot 10^2 \cdot \left(\frac{120\ mm}{2}\right)}{2 \cdot 2880000\ mm^4}$

$= 261{,}78 \text{ N/mm}^2$

1.9. Perhitungan *Push Back Spring*

Diketahui :

$V_{ejector\ plate}$ = 1424038 mm^3

$V_{ejector\ back\ plate}$ = 254368 mm^3

g = 9,81 m/s^2

$\rho_{material\ s55c}$ = 7850 $kg/m^3 \longrightarrow$ 7,85x10^{-6} kg/mm^3

Ditanya :

a. Gaya yang dibutuhkan *spring* ?

b. Gaya yang dibutuhkan satu pegas ?

Jawab:

V tot = $V_{ejector\ plate} + V_{ejector\ back\ plate}$

= 1424038 mm^3+254368 mm^3

= 1678406 mm^3

a. w = $V \cdot g \cdot \rho_{material\ s55c}$

= 1678406 $mm^3 \cdot 9{,}81\ m/s^2 \cdot 7{,}85\ kg/mm^3 \cdot 10^{-6}$

= 129,25 N

b. $F_{1,pegas} = \frac{w}{4}$

$= \frac{129{,}25\ N}{4}$

= 32,31 N

1.10. Perhitungan Baut Pengikat

Diketahui :

$V_{\text{clamping } plate} = 4396813\ mm^3$

$V_{cavity\ plate} = 3153509\ mm^3$

$V_{core\ plate} = 3295315\ mm^3$

$V_{support\ plate} = 5830588\ mm^3$

$V_{\text{spacer } plate} = 411811\ mm^3$

$V_{\text{bottom clamping } plate} = 2781501\ mm^3$

$\rho_{\text{material astm a307}} = 7700\ kg/m^3 \longrightarrow 0{,}0077 g/mm^3$

$\sigma t_{\text{ijin astm a307}} = 156{,}9\ N/mm^2$

$\tau_{\text{g ijin astm a307}} = 94.1438\ N/mm^2$

$P_{\text{injection}} = F_{\text{injection}} = 235\ N/mm^2$

Ditanya :

a. d_i ?

Jawab :

Perhitungan baut pengikat 1

$V_{tot} = V_{\text{clamping } plate} + V_{cavity\ plate}$

$= 4396813\ mm^3 + 3153509\ mm^3$

$= 7550322\ mm^3$

$m = V_{tot} \cdot \rho_{\text{material scm 435}}$

$= 7550322\ mm^3 \cdot 0{,}0077 g/mm^3$

$= 58137{,}47\ g \longrightarrow 58{,}13\ kg$

$w = m \cdot g$

$= 58{,}13\ kg \cdot 9{,}81\ m/s^2$

$= 570{,}25\ N$

$\sigma_t = \frac{\sigma t_{ijin\ astm\ a307}}{v}$

$= \frac{156{,}9\ N/mm^2}{6}$

$= 26{,}15\ N/mm^2$

τ_g = 0,6·σ·g

= 0,6· 94.14 N/mm^2·9,81 m/s^2

= 554,10 N/mm^2

d_i = $\sqrt{\frac{4 \cdot F}{\tau g \cdot \pi}}$ (dengan τ_g)

= $\sqrt{\frac{4 \cdot 570{,}25\ N}{554{,}10\ N/mm^2 \cdot \pi}}$

= 1,14 mm ⟶ M1.6

di = $\sqrt{\frac{4 \cdot F_{injection}}{\sigma t \cdot \pi}}$ (dengan σ_t)

= $\sqrt{\frac{4 \cdot 235\ N/mm^2}{26{,}15\ N/mm^2 \cdot \pi}}$

= 3,38 mm ⟶ M4.5

Perhitungan baut pengikat 2

V_{tot} = V *core plate*+V *support plate*+V spacer *plate*+V bottom clamping *plate*

= 3295315 mm^3+5830588 mm^3+411811 mm^3+2781501 mm^3

= 12319215 mm^3

m = V_{tot}·ρ material scm 435

= 12319215 mm^3·0,0077g/mm^3

= 94857,95 g ⟶ 94,85 kg

w = m·g

= 94,85 kg ·9,81 m/s^2

= 930,47 N

σ = $\frac{\sigma t_{\text{ijin astm a307}}}{v}$

= $\frac{156{,}9\ N/mm^2}{6}$

= 26,15 N/mm^2

τ_g = 0,6·σ·g

= 0,6·94.14 N/mm^2·9,81 m/s^2

= 554,10 N/mm^2

$d_i = \sqrt{\frac{4 \cdot F}{\tau g \cdot \pi}}$ (dengan τ_g)

$= \sqrt{\frac{4 \cdot 930{,}47\ N}{554{,}10\ N/mm^2 \cdot \pi}}$

= 1,46 mm ⟶ M2

$d_i = \sqrt{\frac{4 \cdot F_{injection}}{\sigma t \cdot \pi}}$ (dengan σ_t)

$= \sqrt{\frac{4 \cdot 235\ N/mm^2}{26{,}15\ N/mm^2 \cdot \pi}}$

= 3,38 mm ⟶ M4.5

1.11. Perhitungan Diameter *Eye Bolt*

Diketahui :

$\sigma t_{\text{astm a307}}$ = 156,9 N/mm^2

$\rho_{\text{material mold}}$ = 7700 kg/m^3 ⟶ 0,0077 g/mm^3

V_{mold} = 49376794 mm^3

Ditanya :

d_i ?

Jawab :

$m = V_{mold} \cdot \rho_{\text{material mold}}$

= 49376794 mm^3·0,0077 g/mm^3

= 380201 g ⟶ 380.201 kg

$w = m \cdot g$

= 380.201 kg ×9,81 m/s^2

= 3729,77 N

$d_i = \sqrt{\frac{4 \cdot F}{\sigma t \cdot \pi}}$

$= \sqrt{\frac{4 \cdot 3729{,}77\ N}{156{,}9\ N/mm^2 \cdot \pi}}$

= 5,5 mm ⟶ M 7 (minimal)

1.12. Baut *Core Stop Block*

Diketahui :

V_{slider} = 209578 mm^3

g = 9,81 m/s^2

$\sigma t_{\text{ijin astm a307}}$ = 156,9 N/mm^2

$\rho_{\text{material skd 61}}$ = 7700 kg/m^3 ⟶ 0,0077 g/mm^3

Ditanya :

a. d_i ?

Jawab :

m = $V_{slider} \cdot \rho_{\text{material skd 61}}$

= 209578 $mm^3 \cdot$ 0,0077 g/mm^3

= 1613,75 g ⟶ 1,61 kg

w = m·g

= 1,61 kg·9,81 m/s^2

= 15,8 N

a. d_i = $\sqrt{\frac{4 \cdot F}{\sigma t \cdot \pi \cdot n}}$

= $\sqrt{\frac{4 \cdot 15{,}8 \text{ N}}{156{,}9\ kg/mm^2 \cdot \pi \cdot 2}}$

= 0,25 mm ⟶ M 1,2 (minimal)

1.13. Perhitungan *Jarak Pembuangan* Dan Panjang *Angular Pin*

Diketahui :

s = 1 mm

sin β = 25^0

Ditanya :

a. S_1 ?

b. Cos α ?

c. L ?

Jawaban :

a. S_1 = S+5mm ke atas

= 1+22 mm

= 23 mm

b. Cos α = sin β+(2^0~5^0)

= 25^0+2^0

= 27^0

L = $\frac{S}{\sin \alpha}$

= $\frac{22\ mm}{\sin 25^0}$

= 52 mm

H = S·cos α

= 22 mm·25^0

= 20 mm

1.14. Perhitungan Pemilihan *Coil Spring*

Diketahui :

S = 40 mm

$D_{retun\ pin}$ = 15,875 mm

Ditanya :

a. Kedalaman penerimaan *spring* ?
b. *Volume initial deflection* ?
c. *Volume final deflection* ?
d. Beban awal ?
e. Beban akhir ?

Jawab :

a. A = L (*Spring* free length)-F (Deflection volume)+2 mm
= 100 mm-50 mm+2 mm
= 52 mm (coil *spring* SWR 60-100)

A = L (*Spring* free length)-F (Deflection volume)+2 mm
= 110 mm-55 mm+2 mm
= 57 mm (coil *spring* SWR 60-110)

A = L (*Spring* free length)-F (Deflection volume)+2 mm
= 100 mm-40 mm+2 mm
= 62 mm (coil *spring* SWS 60-100)

A = L (*Spring* free length)-F (Deflection volume)+2 mm
= 110 mm-44 mm+2 mm
= 68 mm (coil *spring* SWS 60-110)

b. B = L (*Spring* free length)-(A (Kedalaman penerimaan *spring*)+S (*Stroke*))
= 100 mm-(52 mm+40 mm)
= 8 mm (coil *spring* SWR 60-100)

B = L (*Spring* free length)-(A (Kedalaman penerimaan *spring*)+S (*Stroke*))
= 110 mm-(57 mm+40 mm)
= 13 mm (coil *spring* SWR 60-110)

B = L (*Spring* free length)-(A (Kedalaman penerimaan *spring*)+S (*Stroke*))

= 100 mm-(62 mm+40 mm)

= -2 mm (coil *spring* SWS 60-100)

B = L (*Spring* free length)-(A (Kedalaman penerimaan *spring*)+S (*Stroke*))

= 110 mm-(68 mm+40 mm)

= 2 mm (coil *spring* SWS 60-110)

c. *Volume final deflection* = B (*Volume initial deflection*)+S (*Stroke*)

= 8 mm+40 mm

= 48 mm (coil *spring* SWR 60-100)

Volume final deflection = B (*Volume initial deflection*)+S (*Stroke*)

= 13 mm+40 mm

= 53 (coil *spring* SWR 60-110)

Volume final deflection = B (*Volume initial deflection*)+S (*Stroke*)

= -2 mm+40 mm

= 38 mm (coil *spring* SWS 60-100)

Volume final deflection = B (*Volume initial deflection*)+S (*Stroke*)

= 2 mm+40 mm

= 42 mm (coil *spring* SWS 60-110)

d. Ws (Beban awal) = 0,80 kg/mm·B (*Volume initial deflection*)

= 0,80 kg/mm·8 mm

= 6,4 kg (coil *spring* SWR 60-100)

Ws (Beban awal) = 0,73 kg/mm·B (*Volume initial deflection*)

= 0,73 kg/mm·3 mm

= 9,49 kg (coil *spring* SWR 60-110)

Ws (Beban awal) = 1,45 kg/mm·B (*Volume initial deflection*)

= 1,45 kg/mm·(-2) mm

= -2,9 kg (coil *spring* SWS 60-100)

Ws (Beban awal) = 1,45 kg/mm·B (*Volume initial deflection*)

= 1,32 kg/mm·2 mm

= 2,64 kg (coil *spring* SWS 60-110)

e. We (beban akhir) = 0,80 kg/mm·*Volume final deflection*
= 0,80 kg/mm·48 mm
= 38,4 kg

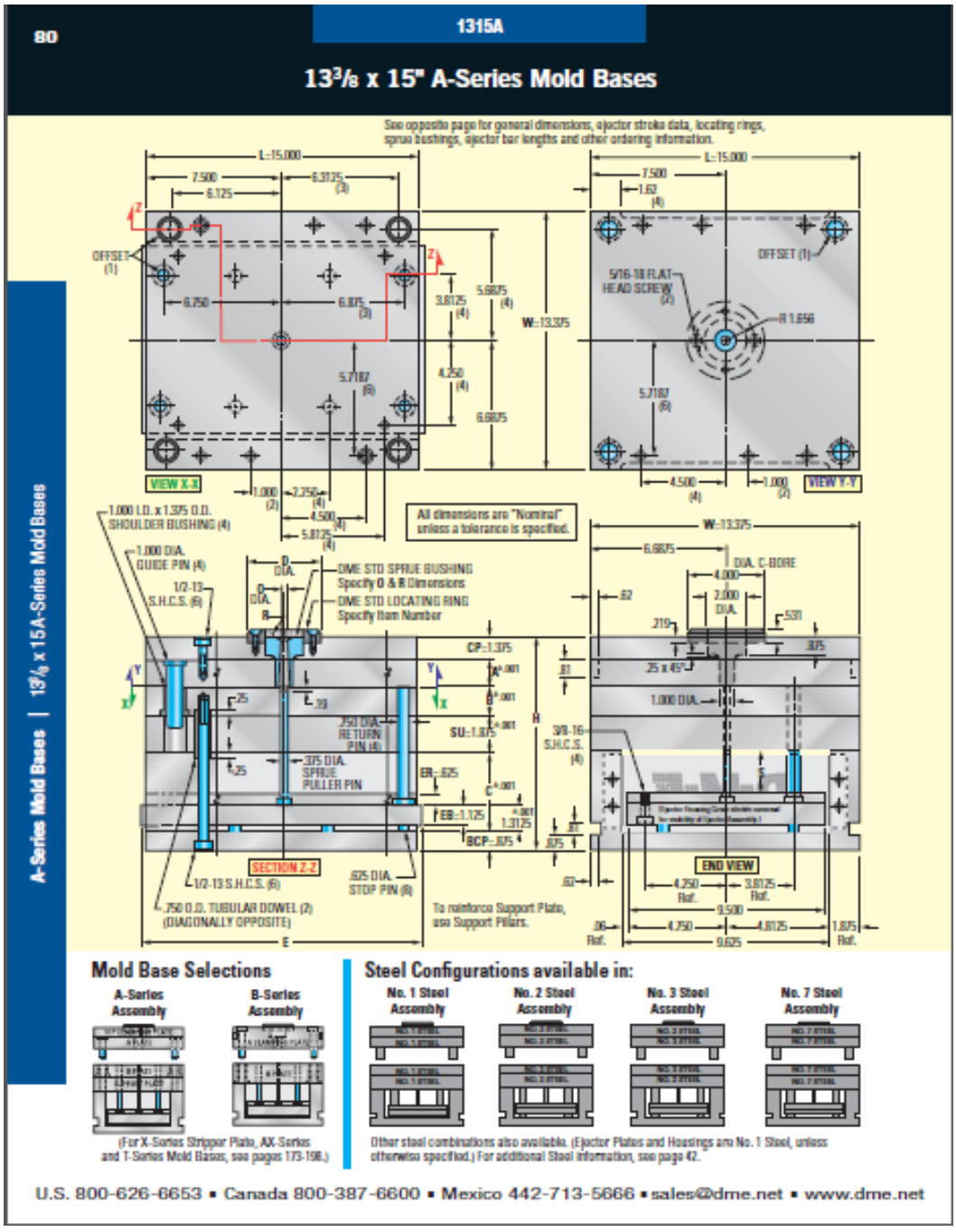
We (beban akhir) = 0,73 kg/mm·*Volume final deflection*
= 0,73 kg/mm·53 mm
= 38,7 kg

We (beban akhir) = 1,45 kg/mm·*Volume final deflection*
= 1,45 kg/mm·38 mm
= 55,1 kg

We (beban akhir) = 1,32 kg/mm·*Volume final deflection*
= 1,32 kg/mm·42 mm
= 55,44 kg

LAMPIRAN 2

2.1. *Moldbase* DME 1315A



2.2. *Mold* material DME

D-M-E American Standard Steel Types

Synonymous with mold making are the D-M-E American Standard Steel Types. Our experience in mold steel ensures the cleanliness, durability and machinability appropriate to your application.

Steels for Structural and Holder Block Applications

D-M-E #1 Steel is a medium carbon quality steel with greater tensile strength than typical plain carbon warehouse steels. It machines easily, but is not "sticky", permitting a faster and smoother cut. International comparisons: DIN 1.1178 (Ck 30) and 1.1730 (C 45 W); JIS S 30 CM, S50C, S55C; ISO 683-1 C30E4.

D-M-E #2 Steel is a medium alloy steel specified for durability in structural applications. It is supplied pre-heat treated to 28-34 HRC (271-321 Bhn). A high strength steel, it is ideal for cavity and core retainer plates, clamping plates and support plates in molds. International comparisons: DIN 1.2312 (40CrMnMoS 8 6), 1.7218 (25CrMo4) and 1.2331 (41CrMoS4); JIS SCM 430; ISO 683-2 Type 1.

D-M-E #7 Steel is a modified AISI 400 series stainless steel for holder block applications. It is supplied pre-heat treated to 32-36 HRC (302-340 Bhn). This stainless steel offers corrosion-resistance and exceptional machinability but cannot be further hardened (see D-M-E #6). For humid environments, corrosive plastics, "clean room" or "100% stainless" applications, it is an ideal choice for all structural mold plates. International comparisons: none.

Steels for Cavity & Core Applications

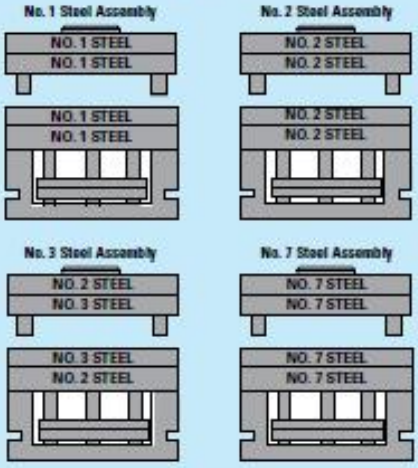
D-M-E #3 Steel is a P-20 AISI 4130 type cavity steel. Exceptionally clean, it is pre-heat treated to 28-34 HRC (271-321 Bhn). It provides good machinability, the ability to heat treat to higher hardness, and exceptional polishability. International comparisons: DIN 1.2311 (40CrMnMo7; JIS none; ISO none.

D-M-E #5 Steel is an AISI/SAE H-13 type thermal shock resistant, hotwork die steel. Supplied fully annealed (approximately 200 Bhn; 13-20 HRC) for easy machinability, it can be subsequently heat treated to the desired hardness with a minimum of deformation. Mainly used for die cast dies, it is also suitable for plastic molds with exceptional hardness or polishability requirements. D-M-E #5 Steel meets or exceeds the acceptance criteria established by the NADCA as detailed in Technical Digest Number 01-80-01D. International comparisons: DIN 1.2344 (X40CrMoV5-1); JIS SKD 61; ISO 4956 H13.

D-M-E #6 Steel is a modified AISI 420 type stainless steel. It is supplied fully annealed to 179-241 Bhn (8-23 HRC), making it readily machinable. Unlike D-M-E #7 steel, D-M-E #6 steel is a cavity-grade material that can be subsequently heat treated to the desired hardness and has excellent polishability. International comparisons: DIN 1.4028 (X30Cr13); JIS SUS 420 J 2; ISO none.

Typical Steel Types Configurations

"A" Series Mold Bases are available in over 40 standard sizes, 7-7/8 x 7-7/8 to 23-3/4 x 35-1/2. Each size offers a wide variety of standard cavity plate thickness combinations, plus your choice of D-M-E No. 1, No. 2, No. 3 or No. 7 steel.



2.3. *Mold* material DME

Steel Selections: Available in 43 Nominal Sizes

MOLD PLATE		STEEL TYPES					
		#1	#2	#3	#7	#5	#6
TOP CLAMP PLATE		⚡	⚡	⚡	⚡		
AC PLATE		⚡	⚡	⚡	⚡		
A PLATE		⚡	⚡	⚡	⚡*		
B PLATE		⚡	⚡	⚡	⚡*		
AX, BX PLATES		⚡	⚡	⚡	⚡		
XP, X-1 AND X-2 PLATES		⚡	⚡	⚡	⚡		
SUPPORT PLATE		⚡	⚡	⚡	⚡		
EJECTOR RETAINER PLATE		⚡			⚡		
EJECTOR BAR PLATE		⚡			⚡		
EJECTOR HOUSING ASSEMBLY	WELDED	⚡					
	THREE PIECE	⚡			⚡		

D-M-E regularly mixes steel types within a mold base assembly to deliver plates configured to your application requirements. You can select steel types for each plate, as available from the table at left, in any combination for your mold base.

⚡ = Ships in 5 days or less

= Contact D-M-E for quote. D-M-E Customer Service can quote up to 5.875 thickness plates on all plates.

= Not available

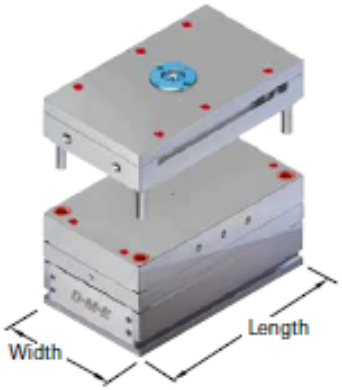
*Up to 2.375 thickness

NOTE: AC plates are not recommended.

The American Standard Mold Base is available in 43 nominal sizes to match the mold space requirements for your application.

As the creator of the American mold base standard, D-M-E has the largest selection of mold base sizes and most are available in less than five business days.

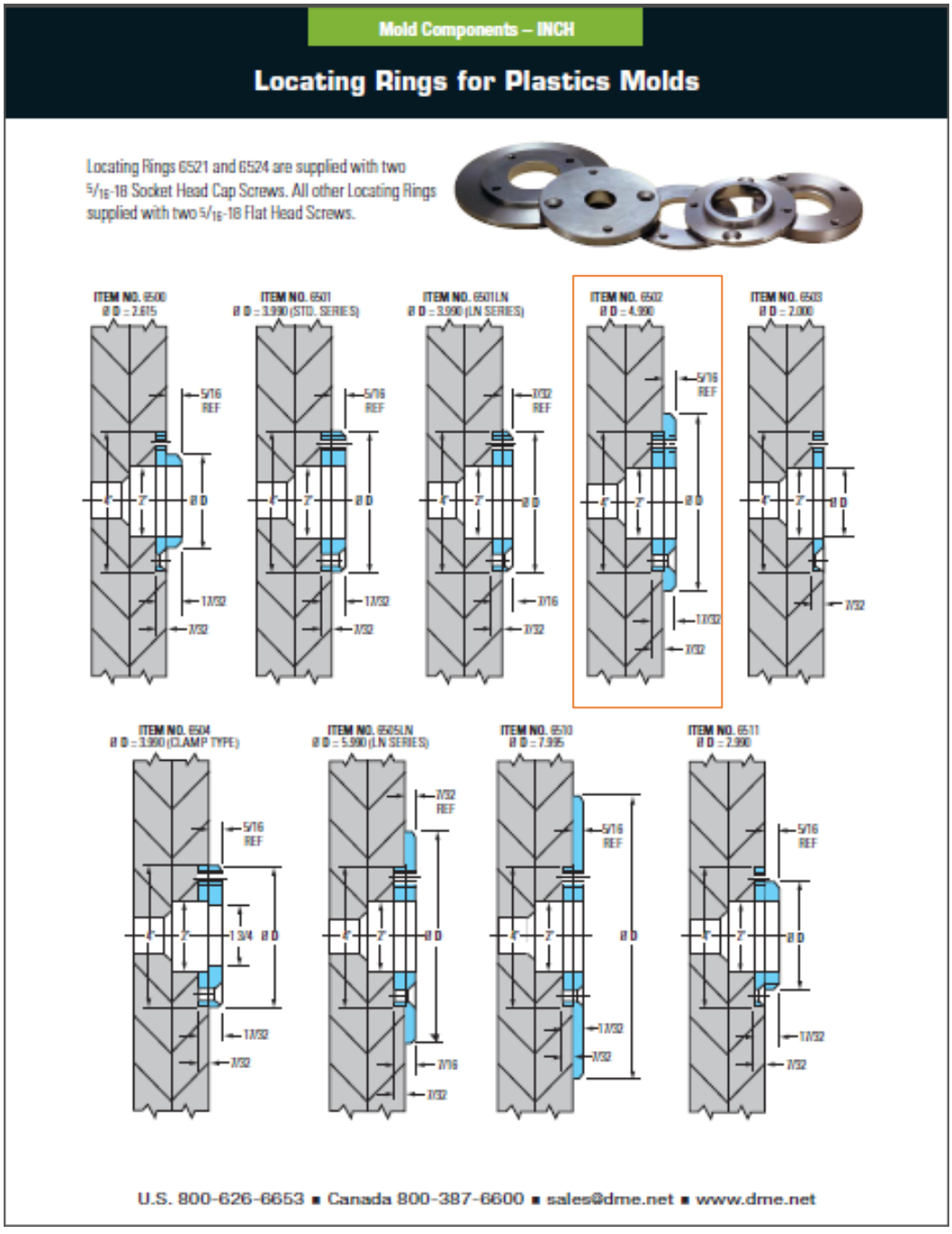
NOTE: Drilled complete replacement plates available with quick delivery.



NOMINAL SIZE	WIDTH (IN)	LENGTH (IN)	WEIGHT RANGE (LBS) MIN	MAX
88	7.875	7.875	116	305
812	7.875	11.875	175	460
108	9.875	10.000	156	389
1012	9.875	11.875	235	582
1016	9.875	16.000	316	788
1020	9.875	20.000	395	987
1112	10.875	12.000	261	659
1114	10.875	14.000	305	769
1116	10.875	16.000	352	988
1123	10.875	23.500	511	1290
1212	11.875	12.000	285	719
1215	11.875	15.000	379	899
1220	11.875	20.000	505	1199
1223	11.875	23.500	564	1409
1315	13.375	15.000	427	1038
1318	13.375	18.000	512	1246
1321	13.375	20.750	590	1438
1323	13.375	23.500	669	1627
1326	13.375	26.000	740	1800
1329	13.375	29.500	839	2042
1518	14.875	17.875	589	1410
1524	14.875	23.750	796	1873
1529	14.875	29.500	989	2327
1616	15.875	16.000	573	1347
1620	15.875	20.000	716	1683
1623	15.875	23.500	841	1978
1626	15.875	26.000	930	2189
1629	15.875	29.500	1056	2483
1635	15.875	35.500	1270	2988
1724	16.500	23.750	883	2078
1729	16.500	29.500	1097	2581
1818	17.875	18.000	725	1706
1820	17.875	20.000	806	1896
1823	17.875	23.500	947	2227
1826	17.875	26.000	1048	2464
1829	17.875	29.500	1189	2796
1835	17.875	35.500	1430	3365
1924	19.500	23.750	1044	2456
1929	19.500	29.500	1297	3050
1935	19.500	35.500	1648	3758
2424	23.750	23.750	1343	3062
2429	23.750	29.500	1668	3804
2435	23.750	35.500	2008	4579

NOTE: Approximate mold base weight can be estimated with the following formula: WEIGHT = WIDTH x LENGTH x HEIGHT x .283 x 90%

2.5. Locating Ring



2.6. Sprue Bushing

Mold Components – INCH

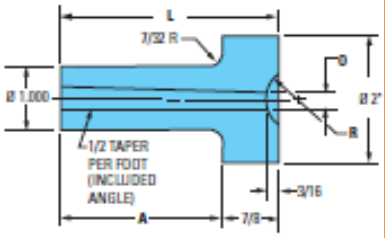
Sprue Bushings

Sprue Bushings – A, B, LN and AR

S.A.E. 6145 Steel Hardened, Ground and Polished
(HRC 43-45, except "LN" Series – carburized .050-.060 deep to HRC 60-62, drillable with carbide-tipped drill.)

NOTE: 1/2° taper per foot = 2° 23' 13" included angle.

"B" Series

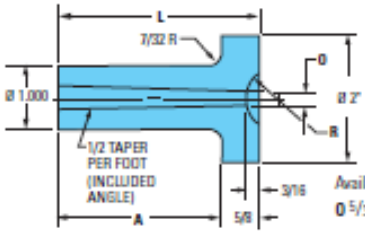


Available with O 5/32, 7/32, 9/32 or 11/32 R 1/2 or 3/4

ITEM NUMBER PREFIX	A	L
B00__	3/32	1 3/32
B01__	1 1/32	2 1/32
B02__	1 29/32	2 29/32
B03__	2 27/32	3 9/32
B04__	2 29/32	3 11/32
B05__	3 27/32	4 9/32
B06__	3 29/32	4 11/32
B07__	4 27/32	5 9/32
B08__	4 29/32	5 11/32
B10__ *	5 29/32	6 11/32
B12__ *	6 29/32	7 11/32

*B10: O 9/32 R 3/4
*B12: O 9/32 R 3/4 available on special order.

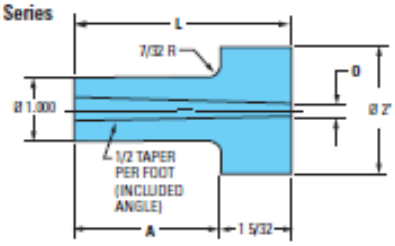
"A" Series



Available with:
O 5/32, 7/32, 9/32 or 11/32 R 1/2 or 3/4

ITEM NUMBER PREFIX	A	L
A00__	1 3/16	1 13/16
A01__	1 11/16	2 5/16
A02__	2 3/16	2 13/16
A03__	2 11/16	3 5/16
A04__	3 3/16	3 13/16
A05__	3 11/16	4 5/16
A06__	4 3/16	4 13/16

"LN" Series

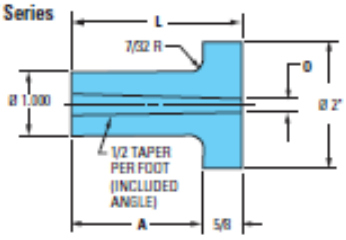


ITEM NUMBER PREFIX	A	L
LN00__	29/32	2 1/16
LN01__	1 13/32	2 9/16
LN02__	1 29/32	3 1/16
LN03__	2 13/32	3 9/16
LN04__	2 29/32	4 1/16
LN05__	3 13/32	4 9/16

Available with:
O 5/32, 7/32 or 9/32
R No spherical radius

O 11/32 available on special order.

"AR" Series



ITEM NUMBER PREFIX	A	L
AR00__	1 3/16	1 13/16
AR01__	1 11/16	2 5/16
AR02__	2 3/16	2 13/16

Available with:
O 5/32 or 7/32
R No spherical radius

O 9/32 available on special order.

HOW TO ORDER:
Specify Item Number Prefix with O numerator, and R numerator. Include zeros where shown, but omit all denominators, slashes and NA.

	Item Number Prefix	O	R		ITEM NUMBER
Example:	B02__	7/32	1/2	=	B0271
Example:	LN02__	9/32	NA	=	LN025
Example:	A05__	11/32	3/4	=	A05113

U.S. 800-626-6653 ■ Canada 800-387-6600 ■ sales@dme.net ■ www.dme.net

2.7. Return Pins

INCH Return Pins

- Precision made of superior quality thermal shock resisting hotwork die steel
- Hot-forged heads provide uniform grain flow, higher tensile strength
- Outside diameter nitrided to 65-74 HRC hardness and finished to minimize wear
- Centerless ground and polished outer diameter

.500 (1/2") Diameter Series

ITEM NUMBER	Ø D PIN DIA	Ø H HEAD DIA	L PIN LENGTH
7410	.500	.750	3.563
7411			4.063
7412			4.563
7413			5.063
7414			5.563
7415			6.063
7416			6.563

For longer lengths, use EX20 Ejector Pins.

.625 (5/8") Diameter Series

ITEM NUMBER	Ø D PIN DIA	Ø H HEAD DIA	L PIN LENGTH
7510	.625	.875	4.063
7511			4.563
7512			5.063
7513			5.563
7514			6.063
7515			6.563
7516			7.063
7517			7.563
7518			8.063

For longer lengths, use EX37 Ejector Pins.

.750 (3/4") Diameter Series

ITEM NUMBER	Ø D PIN DIA	Ø H HEAD DIA	L PIN LENGTH
7610	.750	1.000	4.938
7611			5.438
7612			5.938
7613			6.438
7614			6.938
7615			7.438
7616			7.938
7617			8.438
7618			8.938
7619			9.438

For longer lengths, use EX41 Ejector Pins.

Use Item Number in charts above for ordering. All items in stock.

2.8. Guide Pins/Leader Pins

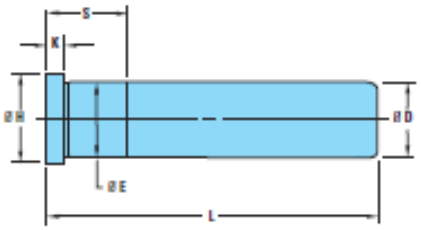
Mold Components – INCH

Guide Pins – Hardened and Precision Ground

Guide Pins – GL
Hardened and Precision Ground

General Dimensions

NOMINAL DIA	ØD +.000 -.005	ØH +.000 -.010	K	ØE +.005 -.000
3/8	.749	.990	3/16	.751
7/16	.874	1.115	1/4	.876
1"	.999	1.240	1/4	1.001
1 1/4	1.249	1.490	5/16	1.251
1 1/2	1.499	1.740	5/16	1.501



L LENGTH ±.02	ØD = 3/8 DIA .749 +.000 -.005		ØD = 7/16 DIA .874 +.000 -.005		ØD = 1" DIA .999 +.000 -.005		ØD = 1 1/4 DIA 1.249 +.000 -.005		ØD = 1 1/2 DIA 1.499 +.000 -.005		L LENGTH ±.02
	S	ITEM NUMBER	S	ITEM NUMBER	S	ITEM NUMBER	S	ITEM NUMBER	S	ITEM NUMBER	
1 1/4	1/8	5000GL	1/8	5099GL	1/8	5198GL	—	—	—	—	1 1/4
1 3/4	1/8	5001GL	1/8	5100GL	1/8	5199GL	—	—	—	—	1 3/4
2 1/4	1/8	5002GL	1/8	5101GL	1/8	5200GL	1/8	5300GL	—	—	2 1/4
2 3/4	1/8	5003GL	1/8	5102GL	1/8	5201GL	1/8	5301GL	—	—	2 3/4
3 1/4	1/8	5004GL	1/8	5103GL	1/8	5202GL	1/8	5302GL	1 1/8	5402GL	3 1/4
3 3/4	1/8	5005GL	1 1/8	5104GL	1 1/8	5203GL	1/8	5303GL	1 1/8	5403GL	3 3/4
4 1/4	1 1/8	5006GL	1 1/8	5105GL	1 1/8	5204GL	1 1/8	5304GL	1 1/8	5404GL	4 1/4
4 3/4	1 1/8	5007GL	1 1/8	5106GL	1 1/8	5205GL	1 1/8	5305GL	1 1/8	5405GL	4 3/4
5 1/4	1 1/8	5008GL	1 1/8	5107GL	1 1/8	5206GL	1 1/8	5306GL	1 1/8	5406GL	5 1/4
5 3/4	1 1/8	5009GL	1 1/8	5108GL	1 1/8	5207GL	1 1/8	5307GL	1 1/8	5407GL	5 3/4
6 1/4	1 1/8	5010GL	1 1/8	5109GL	1 1/8	5208GL	1 1/8	5308GL	1 1/8	5408GL	6 1/4
6 3/4	1 1/8	5011GL	1 1/8	5110GL	1 1/8	5209GL	1 1/8	5309GL	—	—	6 3/4
7 1/4	1 1/8	5012GL	1 1/8	5111GL	1 1/8	5210GL	1 1/8	5310GL	1 1/8	5410GL	7 1/4
7 3/4	—	—	1 1/8	5112GL	1 1/8	5211GL	1 1/8	5311GL	—	—	7 3/4
8 1/4	—	—	1 1/8	5113GL	1 1/8	5212GL	1 1/8	5312GL	1 1/8	5412GL	8 1/4
8 3/4	1 1/8	5015GL	—	—	1 1/8	5213GL	1 1/8	5313GL	—	—	8 3/4
9 1/4	—	—	—	—	1 1/8	5214GL	1 1/8	5314GL	1 1/8	5414GL	9 1/4
9 3/4	—	—	—	—	1 1/8	5215GL	1 1/8	5315GL	—	—	9 3/4
10 1/4	—	—	1 1/8	5117GL	1 1/8	5216GL	1 1/8	5316GL	1 1/8	5416GL	10 1/4
10 3/4	—	—	—	—	1 1/8	5217GL	1 1/8	5317GL	—	—	10 3/4
11 1/4	—	—	—	—	1 1/8	5218GL	1 1/8	5318GL	1 1/8	5418GL	11 1/4
11 3/4	—	—	1 1/8	5120GL	1 1/8	5219GL	1 1/8	5319GL	—	—	11 3/4
12 1/4	—	—	—	—	—	—	1 1/8	5320GL	1 1/8	5420GL	12 1/4
13 1/4	—	—	—	—	—	—	1 1/8	5322GL	1 1/8	5422GL	13 1/4
14 1/4	—	—	—	—	—	—	1 1/8	5324GL	1 1/8	5424GL	14 1/4
15 1/4	—	—	—	—	—	—	1 1/8	5326GL	1 1/8	5426GL	15 1/4

NOTE: Grooved guide pins also available on special order. **All items in stock.**

QUANTITY DISCOUNTS: Leader Pins and Bushings. Discounts apply to current Net Prices. Any combination of pins and bushings may be mixed for quantity discounts. 16 to 27…Less 10%; 28 or more…Less 15%

2.9. Shoulder Bushings

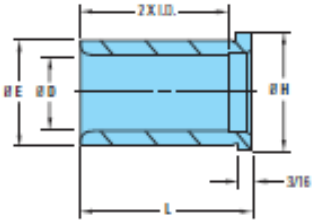
Mold Components – INCH

Shoulder Bushings and Straight Bushings Hardened and Precision Ground

Shoulder Bushings

General Dimensions

NOMINAL I.D.	ØD +.0005 -.0000	ØE +.0005 -.0000	ØH +.000 -.005
3/4	.7505	1.1255	1.302
7/8	.8755	1.2505	1.427
1"	1.0005	1.3755	1.552
1 1/4	1.2505	1.6255	1.802
1 1/2	1.5005	2.0005	2.177



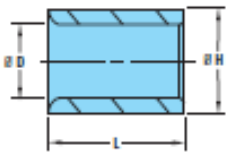
Surface Treatment: Case-hardened .030 to .040 deep

L LENGTH +.062	ØD = 3/4 DIA .7505 +.0005 -.0000	ØD = 7/8 DIA .8755 +.0005 -.0000	ØD = 1" DIA 1.0005 +.0005 -.0000	ØD = 1 1/4 DIA 1.2505 +.0005 -.0000	ØD = 1 1/2 DIA 1.5005 +.0005 -.0000	L LENGTH +.062
	ITEM NUMBER	ITEM NUMBER	ITEM NUMBER	ITEM NUMBER	ITEM NUMBER	
1/2	5700	5710	5730	5750	5770	1/2
1 1/2	5701	5711	5731	5751	5771	1 1/2
1 1/2	5702	5712	5732	5752	5772	1 1/2
2 1/2	5703	5713	5733	5753	5773	2 1/2
2 1/2	5704	5714	5734	5754	5774	2 1/2
3 1/2	5705	5715	5735	5755	5775	3 1/2
3 1/2	5706	5716	5736	5756	5776	3 1/2
4 1/2	5707	5717	5737	5757	5777	4 1/2
4 1/2	5708	5718	5738	5758	5778	4 1/2
5 1/2	5709	5720	5740	5760	5780	5 1/2

Straight Bushings

Surface Treatment: Case-hardened .030 to .040 deep

NOMINAL I.D.	ØD +.0005 -.0000	L +.062 LENGTH	ØH +.0005 -.0000	ITEM NUMBER
3/4	.7505	1/2	1.1255	5500
		1 1/2	1.1255	5501
7/8	.8755	1 1/2	1.2505	5502
1"	1.0005	1 1/2	1.3755	5503
1 1/4	1.2505	1 1/2	1.6255	5504
		1 1/2	1.6255	5505
1 1/2	1.5005	1 1/2	2.0005	5506
		1 1/2	2.0005	5507
2"	2.0005	3 1/2	2.5005	5508
2 1/2	2.5005	4 1/2	3.2505	5509
3"	3.0005	4 1/2	3.7505	5510



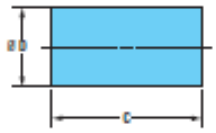
All items in stock.

QUANTITY DISCOUNTS: Shoulder and Straight Bushings. Discounts apply to current Net Prices. Any combination of pins and bushings may be mixed for quantity discounts. 16 to 27....Less 10%; 28 or more....Less 15%.

2.10. Stop Pins

Mold Components – INCH

Support Pillars and Stop Pins



Material: S.A.E. 1040 Steel

ø D +.000 −.001 DIAMETER	C +.010 −.010 HEIGHT	ITEM NUMBER
1"	2.500	6090
	3.000	6091
	3.500	6092
	4.000	6093
	4.500	6094
1¼	2.500	6130
	3.000	6131
	3.500	6132
	4.000	6133
	4.500	6134
	5.000	6135
	6.000	6136
1½	2.500	6140
	3.000	6141
	3.500	6142
	4.000	6143
	4.500	6144
	5.000	6145
	6.000	6146
2"	2.500	6150
	3.000	6151
	3.500	6152
	4.000	6153
	4.500	6154
	5.000	6155
	6.000	6156
3"	5.000	6235
	6.000	6236
	8.000	6238
4"	5.000	6245
	6.000	6246
	8.000	6248

Support Pillars

Support pillars are universally adaptable for cap screw, threaded locating pin, or socket set screw applications.

Order pillars from chart at left and required "fasteners" as listed below.

Cap Screw (S.H.C.S.) Applications

3/8-16 or 5/8-11 socket head cap screws can be ordered in length required.
Please reference page 332 for Socket Head Cap Screw information.

Threaded Locating Pin Applications

Locating pins unavailable for 3" and 4" diameter pillars.

ø D PILLAR	ITEM NUMBER
1" to 2"	TLP38

Socket Set Screw Applications

Order pins and screws in package lots only.

ø D PILLAR	ITEM NUMBER	QTY PER PACKAGE
1" to 2"	SSS38114	10
3" and 4"	SSS562	5

QUANTITY DISCOUNTS:
Support Pillars. Discounts apply to current Net Prices. Sizes may be mixed for quantity discounts.
9 to 16 Less 10%;
17 or more Less 20%

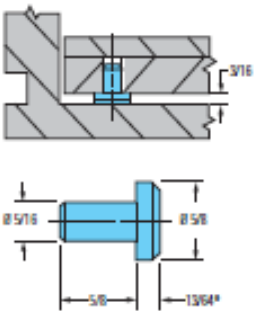
Stop Pins

Although every DME Mold Base assembly has flat stop pins welded to the underside of the ejector plate, many moldmakers require these dowel-type Stop Pins for special assemblies.

Order pins in package lots only.

ITEM NUMBER	QTY PER PACKAGE
7100	50

Typical Installation



*Head thickness .020 oversize to permit fitting at assembly.

Coil Spring

SWR (MISUMI CORPORATION)

D	d	L	Spring constant N/mm{kgf/mm}	ℓ min (Solid height)	F=L×50% Fmm	F=L×50% N {kgf}	Catalog No. Type D－L	¥ U/Price 1~19
26	16.5	25	31.38 {3.20}	10.0	12.5	392.3 {40.0}	SWR 26－25	190
		30	26.15 {2.67}	12.0	15.0		30	200
		35	22.42 {2.29}	14.0	17.5		35	210
		40	19.61 {2.00}	16.0	20.0		40	220
		45	17.43 {1.78}	18.0	22.5		45	230
		50	15.69 {1.60}	20.0	25.0		50	240
		55	14.26 {1.45}	22.0	27.5		55	250
		60	13.08 {1.33}	24.0	30.0		60	260
		65	12.07 {1.23}	26.0	32.5		65	270
		70	11.21 {1.14}	28.0	35.0		70	275
		75	10.46 {1.07}	30.0	37.5		75	285
		80	9.81 {1.00}	32.0	40.0		80	290
		90	8.72 {0.89}	36.0	45.0		90	300
		100	7.85 {0.80}	40.0	50.0		100	310
		110	7.13 {0.73}	44.0	55.0		110	320
		120	6.54 {0.67}	48.0	60.0		120	330
		125	6.28 {0.64}	50.0	62.5		125	330
		130	6.03 {0.62}	52.0	65.0		130	340
		140	5.60 {0.57}	56.0	70.0		140	350
		150	5.23 {0.53}	60.0	75.0		150	350
		175	4.48 {0.46}	70.0	87.5		175	400
		200	3.92 {0.40}	80.0	100.0		200	455
		225	3.49 {0.36}	90.0	112.5		225	475
		250	3.14 {0.32}	100.0	125.0		250	500

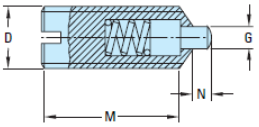
SWS (MISUMI CORPORATION)

D	d	L	Spring constant N/mm{kgf/mm}	ℓ min (Solid height)	F=L×40% Fmm	F=L×40% N {kgf}	Catalog No. Type D—L	¥ U/Price 1~19
26	16.5	30	47.42 {4.84}	15.0	12.0	569.0 {58.0}	SWS 26—30	220
		35	40.64 {4.14}	17.5	14.0		35	230
		40	35.56 {3.63}	20.0	16.0		40	240
		45	31.61 {3.22}	22.5	18.0		45	250
		50	28.45 {2.90}	25.0	20.0		50	260
		55	25.86 {2.64}	27.5	22.0		55	270
		60	23.71 {2.42}	30.0	24.0		60	275
		65	21.88 {2.23}	32.5	26.0		65	285
		70	20.32 {2.07}	35.0	28.0		70	290
		75	18.97 {1.93}	37.5	30.0		75	300
		80	17.78 {1.81}	40.0	32.0		80	310
		90	15.81 {1.61}	45.0	36.0		90	330
		100	14.23 {1.45}	50.0	40.0		100	350
		110	12.93 {1.32}	55.0	44.0		110	360
		120	11.85 {1.21}	60.0	48.0		120	365
		125	11.38 {1.16}	62.5	50.0		125	375
		130	10.94 {1.12}	65.0	52.0		130	380
		140	10.16 {1.04}	70.0	56.0		140	390
		150	9.48 {0.97}	75.0	60.0		150	400
		175	8.13 {0.83}	87.5	70.0		175	455
		200	7.11 {0.73}	100.0	80.0		200	510
		225	6.32 {0.64}	112.5	90.0		225	550
		250	5.69 {0.58}	125.0	100.0		250	605

Plunger

Spring loaded set screws (plunger)

- Tornillos de presión caragados por resorte
- Parafusos de regulagem de mola (êmbolo)
- Butées à ressort
- Federnde Druckstücke (Gegenstoßel)



KEY

D = Diameter
M = Thread length
G = Plunger diameter
N = Socket size
N1 = Starting load
N2 = Final load

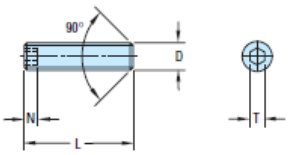
Mat. 1.0716

ITEM NUMBER	D	M	AVAILABILITY	G	N	N1	N2
FM49	M4	9		1.8	1.5	6	16
FM512	M5	12		2.4	2	6	17
FM614	M6	14		2.7	2	7	18
FM816	M8	16		4	2	20	35
FM1019	M10	19	⚡	4.5	2.5	20	45
FM1222	M12	22		6	3.5	25	60
FM1624	M16	24	⚡	8.5	4.5	50	95
FM2030	M20	30		10	6.5	80	140
FM2434	M24	34		12	8	100	180

Locking Screw

Grub screws

- Tornillos sin cabezal
- Parafusos sem cabeça
- Vis de réglage
- Gewindestifte



KEY

D = Thread diameter
L = Length
T = Socket size
N = Socket depth

DIN 913-45 H

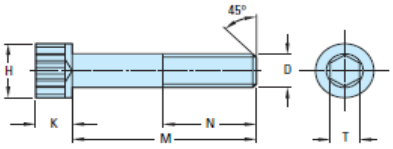
ITEM PREFIX*	T	N	D	L											
				004	005	006	008	010	012	016	020	025	030	040	050
GS913	1.5	2.5	M03												
GS913	2	2.5	M04												
GS913	2.5	3	M05												
GS913	3	3.5	M06					⚡							
GS913	4	5	M08							⚡		⚡			
GS913	5	6	M10								⚡		⚡	⚡	
GS913	6	8	M12									⚡	⚡	⚡	⚡
GS913	6	8	M16												

*To order, specify Item Number in following fashion:
Prefix D L
GS913 ☐ ☐ e.g. GS913 M06 010
GS913 M12 030

Cap Screw

Socket head cap screws

- Tornillos prisioneros de cabeza hueca
- Parafuso de cabeça sextavada
- Vis G-pans téte cylindrique
- Zylinderkopfschrauben



KEY

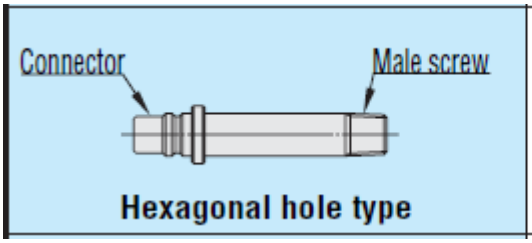
M = Length
D = Thread diameter
N = Thread length
H = Head diameter
K = Head length
T = Socket size

DIN 912 -12.9

ITEM PREFIX*	N	H	K	T	M																								
					8	10	12	16	20	25	30	40	50	60	70	80	90	100	110	120	130	140	150	160	180	200	220	240	260
M4	12	7	4	3		■				■	■																		
M6	18	10	6	5	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				■					
M8	22	13	8	6		■	■	■	■	■	■	■	■	■	■	⚡	■	⚡	■	⚡	■	■	■	■	■				
M10	25	16	10	8			■	■	■	⚡	⚡	■	■	■	■	⚡	■	⚡	■	⚡	■	■	■	■	■	■			■
M12	28	18	12	10					■	■	⚡	■	■	■	■	⚡	■	⚡	■	⚡	⚡	⚡	⚡	⚡	⚡	⚡	■		⚡
M16	38	24	16	14						■	■	■	⚡	■	■	⚡	■	⚡	■	⚡									■
M16	44	24	16	14																	⚡	⚡	⚡	⚡	⚡				
M16	57	21	10	14																						⚡	⚡	⚡	
M20	65	30	20	17										■						■		■	■	■	⚡				
M20	52	30	20	17																						⚡		⚡	⚡

*To order, specify Item Number in following fashion:
Prefix □ M ■ e.g. M20 240
M10 30

Connector Plug



MISUMI's mold coupler • plug
Long type (Hexagonal hole type)

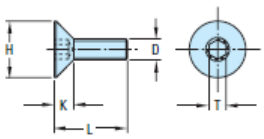
LJPS□ (Example : LJPS2-100)

P.1233

Flat Head Screw

Flat head screws

- Tornillos de cabeza hueca avellanada
- Parafusos de cabeça cônica com fenda
- Vis creuses
- Senkkopfschrauben



KEY

D = Thread diameter
L = Thread length
H = Head diameter
K = Head length
T = Socket size

DIN 7991-8.8

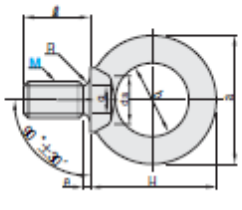
ITEM PREFIX*	H	K	T	D	L									
					8	10	12	16	20	25	30	35	40	45	50
SM3	6	2.5	1.7	M3		⚡	■	■	■	■	■				
SM4	8	3	2.3	M4	■	⚡	⚡	■	■	■	■				
SM5	10	4	2.8	M5		⚡	⚡	⚡	■	■	■	■	■		
SM6	12	5	3.3	M6		■	⚡	⚡	■	■	■	■	■	■	■
SM8	16	6	4.4	M8				⚡	⚡	■	■	■	■	■	■
SM10	20	8	5.5	M10				■	■	■	■	■	■	■	■
SM12	24	10	6.5	M12					■						

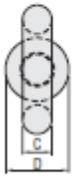
*To order, specify Item Number in following fashion:
Prefix □ L ■ e.g. SM5 16
SM12 20

Eye Bolt

Lifting Eye Bolts—For vertical hanging— RoHS

CHI





A Type
Vertical lifting

B Type
45° lifting

M: SS400
Bolt precision JIS1168

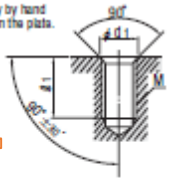
M×P (Coarse thread)	a	b	C	D	H	ℓ	e	g	R	da	Alowable load N{kgf} A:Vertical 1 P	Alowable load N{kgf} B:45° 2 P	Catalog No. Type	Catalog No. M	Y U/Price 1~19
M 6×1.0	24.9	14.5	5.2	12.8	28.45	15	3	4.7	1.0	7.9	392 {40}	392 {40}	CHI	6	100
M 8×1.25	32.6	20	6.3	16	33.3	15	3	6	1.0	9.2	785 {80}	785 {80}		8	80
M10×1.5	41	25	8	20	41.5	18	4	7.7	1.2	11.2	1471 {150}	1471 {150}		10	90
M12×1.75	50	30	10	25	51	22	5	9.4	1.4	14.2	2157 {220}	2157 {220}		12	100
M16×2.0	60	35	12.5	30	60	27	5	13	1.6	18.2	4413 {450}	4413 {450}		16	140
M20×2.5	72	40	16	35	71	30	6	16.4	2	22.4	6178 {630}	6178 {630}		20	210
M24×3.0	90	50	20	45	90	38	8	19.6	2.5	26.4	9316 {950}	9316 {950}		24	420
M30×3.5	110	60	25	60	110	45	8	25	3	33.4	14710 {1500}	14710 {1500}		30	790
M36×4.0	133	70	31.5	70	131.5	55	10	30.3	3	39.4	22555 {2300}	22555 {2300}		36	1,520
M42×4.5	151	80	35.5	80	150.5	65	12	35.6	3.5	45.6	33342 {3400}	33342 {3400}		42	2,850
M48×5.0	170	90	40	90	170	70	12	41	4	52.6	44130 {4500}	44130 {4500}		48	5,040

● Load {kgf}=Load N×0.101972

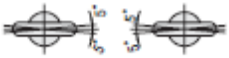
How to Mount

Fasten the eye bolt lightly by hand until its seat firmly sits on the plate.

Catalog No.		d1	ℓ1
CHI	6	9	17
	8	11	17
	10	13	20
	12	16	24
	16	20	30
	20	24	34
	24	28	42
	30	36	50
	36	42	60
	42	48	70
	48	56	75



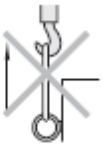
When using two-bolt of the eye bolts, set them in the same direction.



Caution

Incorrect

These applications shown below should never be practiced.



Side lifting

Vertical lifting using a single rope for two eye bolts.

Ukuran Baut

(Sumber**:** Irawan, Purna. DIKTAT ELEMEN MESIN . Universitas Tarumanegara: Jakarta).

Designation (1)	*Pitch* mm (2)	*Major or nominal diameter (Nut and Bolt) (d = D)* mm (3)	*Effective or pitch diameter (Nut and Bolt) (d_p)* mm (4)	*Minor or core diameter (d_c)* mm		*Depth of thread (bolt)* mm (7)	*Stress area* mm^2 (8)
				Bolt (5)	*Nut* (6)		
Coarse series							
M 0.4	0.1	0.400	0.335	0.277	0.292	0.061	0.074
M 0.6	0.15	0.600	0.503	0.416	0.438	0.092	0.166
M 0.8	0.2	0.800	0.670	0.555	0.584	0.123	0.295
M 1	0.25	1.000	0.838	0.693	0.729	0.153	0.460
M 1.2	0.25	1.200	1.038	0.893	0.929	0.158	0.732
M 1.4	0.3	1.400	1.205	1.032	1.075	0.184	0.983
M 1.6	0.35	1.600	1.373	1.171	1.221	0.215	1.27
M 1.8	0.35	1.800	1.573	1.371	1.421	0.215	1.70
M 2	0.4	2.000	1.740	1.509	1.567	0.245	2.07
M 2.2	0.45	2.200	1.908	1.648	1.713	0.276	2.48
M 2.5	0.45	2.500	2.208	1.948	2.013	0.276	3.39
M 3	0.5	3.000	2.675	2.387	2.459	0.307	5.03
M 3.5	0.6	3.500	3.110	2.764	2.850	0.368	6.78
M 4	0.7	4.000	3.545	3.141	3.242	0.429	8.78
M 4.5	0.75	4.500	4.013	3.580	3.688	0.460	11.3
M 5	0.8	5.000	4.480	4.019	4.134	0.491	14.2
M 6	1	6.000	5.350	4.773	4.918	0.613	20.1
M 7	1	7.000	6.350	5.773	5.918	0.613	28.9
M 8	1.25	8.000	7.188	6.466	6.647	0.767	36.6
M 10	1.5	10.000	9.026	8.160	8.376	0.920	58.3
M 12	1.75	12.000	10.863	9.858	10.106	1.074	84.0
M 14	2	14.000	12.701	11.546	11.835	1.227	115
M 16	2	16.000	14.701	13.546	13.835	1.227	157
M 18	2.5	18.000	16.376	14.933	15.294	1.534	192
M 20	2.5	20.000	18.376	16.933	17.294	1.534	245
M 22	2.5	22.000	20.376	18.933	19.294	1.534	303
M 24	3	24.000	22.051	20.320	20.752	1.840	353
M 27	3	27.000	25.051	23.320	23.752	1.840	459
M 30	3.5	30.000	27.727	25.706	26.211	2.147	561
M 33	3.5	33.000	30.727	28.706	29.211	2.147	694
M 36	4	36.000	33.402	31.093	31.670	2.454	817
M 39	4	39.000	36.402	34.093	34.670	2.454	976
M 42	4.5	42.000	39.077	36.416	37.129	2.760	1104
M 45	4.5	45.000	42.077	39.416	40.129	2.760	1300
M 48	5	48.000	44.752	41.795	42.587	3.067	1465
M 52	5	52.000	48.752	45.795	46.587	3.067	1755